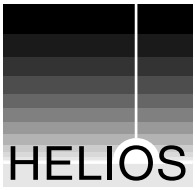

EtherShare

Version 2.6

User manual

April 03, 2000

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HELIOS Software GmbH
Steinriede 3
D–30827 Garbsen, Germany
Internet: **www.helios.de**

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Welcome to EtherShare 2.6

Thank you for purchasing HELIOS EtherShare 2.6.

The idea behind it

HELIOS EtherShare is a powerful networking software for UNIX-based servers and Apple Macintosh clients. It is reliable, flexible, and easy to administer. It offers AppleTalk implementation with routing support, automatic AppleTalk configuration, and an Admin Macintosh tool that allows e.g. “Users”, “Groups”, “Volumes”, and “Printers” administration from a Macintosh. The program includes all you need for successful networking, for example an AppleShare File Server, a Print Server, a Font Server for all printers, a Time Server, multiple servers support, and printer queue and server accounting. EtherShare is extremely fast with AppleShare IP acceleration.
The program includes the “dt” utilities which mimic the functionality of some major UNIX commands for handling files, while maintaining the integrity of the desktop database. Furthermore, the software comprises and automatically installs HELIOS Terminal (a vt320 terminal emulation for Macintosh clients) and HELIOS Mail (a UNIX mail tool for Macintosh clients).
EtherShare 2.6 perfectly supports PCShare 2.5 or later, the HELIOS software product for UNIX-Windows networks, and it forms the basis for the powerful HELIOS expansions EtherShare OPI 2.1, PDF Handshake, and Print Preview.

Course of development

Our EtherShare 2.6 follows EtherShare 2.5. The new program version comes with a large number of improvements.

Details are given in chapter 3.6 “New features of program version 2.6”.

Note: If you need information about a certain update or update level, please check the distribution CD-ROM or the HELIOS Web site: **www.helios.de**

Contents of the software package

Your EtherShare 2.6 software package includes an ISO 9660 CD-ROM, a software manual, and an “Activation Key Request” form that serves to request the individual key (kind of password) you need to license and run the software.

License information

Your individual EtherShare 2.6 software activation key has to be entered during the server installation process. Without the activation key, you cannot start the software. The generation of your key is based on the serial number of your EtherShare copy, on the machine ID of your server, and on the number of users you have purchased the software for. Keep in mind that – in case you buy several EtherShare licenses – you should make a long-term decision about which license you want to use on which server machine and about which license you want to use as base product for expansions you intend to install (like user expansions, PDF Handshake, or EtherShare OPI). These expansions always remain bound to the original EtherShare base product.

What you have to do

We enclose with our software package an “Activation Key Request” form that has to be used for obtaining the key.

➢ The form already contains your 8-digit EtherShare serial number. You have to add your (“Enduser”) name and address, and the machine ID of your server.
The machine ID consists of “8-2” digits. The last two characters serve to identify the make of the machine. We have implemented in our product installer a program that displays the machine ID automatically. So, to find out your server’s machine ID, you have to proceed as follows:

Mount our distribution CD-ROM and follow the instructions given in the accompanying booklet to open the “Networking Products Installer CD-ROM” menu that is shown in figure 0-1. Note that the commands that are required to open the menu are different on different platforms. That is why we have listed all of them in the CD’s booklet. After writing down the machine ID, quit the menu again by entering the number of the “Quit” item (here: 8) and pressing RETURN.

```
   HELIOS Software GmbH

   Networking Products Installer CD-ROM
   ------------------------------------

   The machine ID of this computer is "2be5ffb7-33"

   1)      EtherShare
   2)      PCShare
   3)      EtherShare OPI
   4)      PDF Handshake
   5)      Print Preview
   6)      Install Updates
   7)      Display readme.txt
   8)      Quit
* Your choice ? [] 8
```

Fig. 0-1: Finding out the server’s machine ID

➢ Fax or mail the “Activation Key Request” form to HELIOS Software GmbH, Steinriede 3, 30827 Garbsen, Germany, Fax: +49-5131-70 93 25.

Please note that

- we only accept requests by fax or regular mail.
- in some countries, the keys are issued by our distributors. You should ask your dealer for details.

What you will get in return

On receipt of your request form we will generate your individual activation key and then send you an "Activation Key Reply" summarizing the data that are required for software licensing, namely:

- your *EtherShare serial number* (***digits*** given in line "Serial:")
- the *machine ID of your server* (***hexadecimals*** given in line "MachID:")
- the *number of clients you can connect* (given in line "Units:")
- your *EtherShare Activation key* (***characters*** given in line "Checksum")

Figure 0-2 shows an example of an "Activation Key Reply" form.

Activation Key Reply

Date: 13.10.1998

Distributor:	**Dealer:**	**Enduser:**
Promo Datentechnik und Systemberatung GmbH	Hello MacUsers GmbH	Paul Smiley
Eduardstr. 46-48 20257 Hamburg Deutschland T: 040-851744-0	Schiffgraben 226 30175 Hannover Deutschland T:	Lavesstr. 153 30159 Hannover Deutschland T:

System Information

Product:	**EtherShare**
Serial:	**54080022**
MachID:	**80024a74-8b**
Units:	**20**
Checksum:	**qwer-asdf-yxcv-abcd**

Fig. 0-2: Example of an “Activation Key Reply”

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Contents

1 About the chapters of this manual

In the following, we give a brief summary of every chapter of this manual. These summaries are supposed to help you find the information you are looking for.

Chapter 2 2 “Using the manual” explains how to read and understand the manual. The chapter gives information about the manual version, the structure of the contents, and the meanings of font and syntax conventions.

Chapter 3 3 “Introduction” gives background information about networks in general, and about the components that make up EtherShare. For those who are already familiar with the product it explains the new features of the EtherShare version 2.6.

Installation on server and clients

Chapter 4 4 “Installation” covers all questions that might arise during installation. The chapter contains a list of hardware and software requirements and gives detailed instructions on how to install EtherShare from our CD-ROM. It explains how to add program updates, and how to verify the installation, e.g. by using our “vpoll” utility. Finally, it describes how to uninstall EtherShare, if necessary.

Description of the Macintosh software modules

Chapter 5 5 “EtherShare Admin” thoroughly explains the Macintosh administration program EtherShare Admin. It shows how to configure EtherShare (e.g. users, groups, volumes, printers, and fonts), and how to control print jobs, extension mapping tables, and IP access.

Chapter 6 6 “HELIOS Mail” gives advice on how to use EtherShare’s mail program. It describes how to change the preferences, how to handle incoming mails, how to set up and send new mails, and how to use the program’s functions for process automation, such as address book, signature, and vacation message.

Chapter 7 7 “HELIOS Terminal” describes EtherShare’s terminal emulation that can be used on every Macintosh in the EtherShare network.

Description of the server software modules

Chapter 8 8 “The EtherShare System” describes the AppleTalk protocol stack that forms the core of the EtherShare system.

Chapter 9 9 “The EtherShare File Server” describes the function, the configuration, and the operation of the file server. It explains how the administrator can configure users, groups, and volumes, create folders, and define access privileges. The chapter also gives advice on how to archive data from the file server on mass storage.

Chapter 10 10 “The Desktop Server” describes the function and configuration of the Desktop Server, which is invisible to users, but is responsible for storing icon and application data, and for managing file and directory ID’s for network volumes.

Chapter 11 11 “The Print Server” lists and describes all Print Server and interface programs that belong to the EtherShare installation. The chapter explains the “papsrv” and printer interface parameters that can be set in the main configuration file “atalk.conf”, and describes how to configure printers manually.

Chapter 12 12 “Text-to-PostScript Converter” describes the conversion of “flat” ASCII text files to PostScript print jobs with the help of the “pstext” program.

Chapter 13 13 “The Administration Server” describes the “admsrv” program on the server. The chapter lists all “admsrv” parameters that are recognized in the main configuration file “atalk.conf”, and explains how the Administration Server co-operates with the UNIX Yellow Pages system.

Chapter 14 14 “The Mail Server” describes the “mailsrv” program that implements mail server functions on the server and manages the communication with HELIOS Mail on a Macintosh. The chapter lists all “mailsrv” parameters that are recognized in the main configuration file “atalk.conf”.

Chapter 15 15 “The Terminal Server” describes the “termsrv” program that implements terminal server functions on the server and manages the communication with HELIOS Terminal on a Macintosh. The chapter lists all “termsrv” parameters that are recognized in the main configuration file “atalk.conf”.

Chapter 16 16 “The Time Server” explains how to synchronize the time on a Macintosh client with the time on the EtherShare server.

Technical support

Chapter 17 17 “Technical support” gives information about the HELIOS key and update system. Furthermore, it gives advice on how to set up a complete error description when requesting technical support. Last but not least, the chapter explains the meanings of the error messages you may receive when using HELIOS EtherShare.

Additional information

Appendix 1 A 1: “Sample configurations” shows examples of some major configuration files, such as “atalk.conf”, “printcap”, “afppasswd”, and “afpvolumes”.

Appendix 2 A 2: “Files in the EtherShare directory” lists the directories that belong to an EtherShare installation.

Appendix 3 A 3: “Configuring EtherShare as an AppleTalk network router” provides technical information on EtherShare’s network auto-configure option and also explains manual configuration of the network connection. For that purpose, the HELIOS “netconf” utility is described.

Appendix 4 A 4: “EtherShare utility programs” describes the “logrotate” utility and the HELIOS LanTest.

Appendix 5 A 5: “Standard UNIX utility programs” gives information about UNIX tools that can help you with network diagnostics and EtherShare configuration, namely “hostname”, “uname”, “arp”, “ifconfig”.

Appendix 6 A 6: “Data backup with “dump” and “restore”” shows an example of how to backup and restore an entire partition of a hard disk.

Appendix 7 A 7: “Technical notes” contains a number of technical information that are meant for experienced UNIX users only.

Appendix 8 A 8: “IP configuration – Reference Part” gives background information about IP addresses, “firewalls”, and the settings we recommend for the “AppleShare Client Setup”.

Appendix 9 A 9: “The Desktop utilities” describes the “dt” utilities, which mimic the functionality of some major UNIX commands for handling files, while maintaining the integrity of the desktop database.

Appendix 10 A 10: “Macintosh and Windows characters”

Glossary “Glossary” briefly explains some terms of the network terminology.

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2 Using the manual

2.1 Conventions

Note that our update information files and TechInfo files are also part of our documentation. They may contain details about our products that have not yet made it into the manuals. So, make it a habit to read the update info texts whenever you install updates, and to read the TechInfos regularly. For that purpose, check the folders “UPDATES” and “SUPPORT” on the current CD-ROM, or the support section on our Web site **www.helios.de**.

Do always read the product specific README files on your current CD-ROM. You can access these files e.g. during software installation (see figure 2 in chapter 4.4).

For full-scale information on all our products, you may check the “manuals” directory on the CD-ROM. It contains all manuals, data sheets, and brochures of our products in PDF format.

2.1.1 Structure

This manual contains five main parts, namely:

- installation of EtherShare 2.6 on server and clients
- description of the Macintosh software modules (administration of EtherShare on a Macintosh client and usage of the Macintosh programs Helios Mail and Helios Terminal)
- description of the server software modules (usage and configuration of the different EtherShare programs on the server)
- technical support

- additional information (appendices including description of the “Desktop utilities”).
- a glossary of network-related terms

2.1.2 Font and syntax conventions

Some font and syntax conventions are used in this manual. Their meanings and uses are explained below.

The *italics* style is used for words of particular *importance*.

The `courier` font indicates text that appears on your monitor if you are working on a UNIX platform. It is also used for UNIX commands you have to enter.

The **Chicago** font indicates menu items, folder and button names on your Macintosh computer.

Cross-references to side heads appear in **Helvetica bold**.

The arrow (➢) in the left margin characterizes direct instructions to the user, e.g.:

➢ Select `EtherShare` from the “Networking Products Installer CD-ROM” menu.

Note:	Notes give details that might be useful as additional information. They can also contain a reference to other chapters where additional information can be found.

Important:	These paragraphs should be read carefully. They are supposed to help you avoid problems and save time.

3 Introduction

3.1 General considerations

This chapter discusses basic features of an AppleTalk network and introduces the EtherShare network software. The modules that make up EtherShare are explained and hardware considerations when setting up a network are discussed.

Note: The chapters at the end of this manual describe in detail how to configure EtherShare by modifying the appropriate UNIX configuration files with a standard UNIX editor program such as vi. However, the EtherShare Admin program offers a much easier way to carry out EtherShare configuration and network management tasks.

The EtherShare Admin accesses and modifies the system configuration files directly, just as if the changes had been made with an editor. However, the EtherShare Admin has built-in safety checks to ensure that conflicting or invalid configuration settings are not possible.

In the following chapters, the distinction is often made between “logging on to EtherShare” and “logging on to the UNIX host”. The latter is only necessary if you want to configure the EtherShare system manually instead of using the EtherShare Admin program, or if you want to access the UNIX host in order to develop or run software under the UNIX programming environment. This type of connection needs a conventional terminal (screen and keyboard), or a terminal program such as HELIOS Terminal, and means that you will need to be experienced in the UNIX operating conventions and utility programs, which are very different from those found on the Macintosh.

On the other hand, “logging on to EtherShare” is a routine task for any Macintosh user who needs access to the file server and print server facilities provided by EtherShare. Obviously, in this case too, the workstation is “logged-on” (or connected) to the UNIX host. Fortunately, EtherShare simulates the usual Macintosh environment in every way, as described in Apple’s AppleShare manual, and users may not even be aware that they are linked to a UNIX-based computer rather than just another Macintosh.

3.2 Introduction to EtherShare and AppleTalk

The software which makes up EtherShare provides AppleShare server functions for Apple Macintosh (and DOS/Windows-based) computers connected together in an AppleTalk network. Rather than running on an Apple Macintosh computer like conventional AppleShare servers, EtherShare is based on the powerful multitasking/multiuser features available under the UNIX operating system. Due to the availability of a large range of different UNIX-based computer systems of varying performance and price, with EtherShare, it is very easy to expand the power of your AppleTalk network at a later date, when the amount of work and the number of users increase.

EtherShare includes the EtherShare Admin program, which makes it very easy for the system administrator to configure the network. The EtherShare Admin can also be used by regular users to check the configuration. However, they are prevented from making any changes.

The EtherShare software can be subdivided into eight functional modules:

- The AppleTalk protocol stack with network routing
- File Server with Desktop Server
- Print Server with Font Server
- Text-to-PostScript converter “pstext”
- Terminal Server with the HELIOS Terminal program
- Administration Server with the EtherShare Admin program
- Mail Server with the HELIOS Mail program and “Helios Mail Init”
- Time Server

EtherShare and PCShare

PCShare is a high-end TCP/IP-based file server, print server, and terminal server software for MS-DOS/Windows computers which are attached to UNIX computers through Ethernet, Token Ring, etc. Since PCShare is compatible with EtherShare, DOS/Windows users can share network printers and files with Macintosh and UNIX users, too.

The AppleTalk protocol stack

The AppleTalk protocol stack forms the backbone for the EtherShare servers. It is responsible for basic AppleTalk network functions, including those of network routing. Routing means that EtherShare can be used to interconnect several physically separate AppleTalk networks, and transparently pass information between them as required.

The EtherShare File Server

While maintaining complete compatibility with the AFP specification, the EtherShare “File Server” program allows access to documents and applications throughout the whole network via high speed EtherTalk connections or via other connection such as FDDI, insofar as the interface is supported on the hardware being used.

With the help of an AppleShare 2.0 - 2.2 compatible client, you can also connect IBM-PC-compatible computers under MS-DOS (or PC-DOS) version 3.1 or later to EtherShare. EtherShare actively supports AppleShare connections from PC-compatible computers and even takes care of former MS-DOS file naming conventions. EtherShare can also be used to centrally store MS-DOS files and to access network printers from MS-DOS-based computers.

The following problem can arise when accessing Apple Macintosh files from an MS-DOS computer on the AppleTalk network: the Macintosh system allows up to 31 characters in the file name, whereas (old) MS-DOS file names are in upper case only and consist of a max. 8-character root

file name and a max. 3-character extension separated by a period, e.g. “AAAABBBB.CCC”. Furthermore, Macintosh file names can contain any of the displayable characters from the Macintosh character set, which is different from the character set of the IBM-PC.

To solve this problem, the EtherShare File Server automatically checks and translates file names when PCs access Macintosh files through AppleShare. Characters that cannot be displayed on the IBM-PC, or are disallowed in file names by DOS conventions, are replaced by the underline character “_” and/or a checksum, and PC characters that cannot be displayed on the Macintosh are replaced by a box character.

Another, much faster, way to network your UNIX host and thus your Macintosh computers with IBM-PC-compatible computers is to use HELIOS PCShare (see chapter A 11: “Glossary”). PCShare has its own built-in algorithm for dealing with long file names containing accented characters.

The EtherShare Print Server

The EtherShare “Print Server” program (“papsrv”) is a central spooler for print jobs destined for PostScript devices such as page printers (e.g. LaserWriter) and photo-typesetting machines (e.g. Linotype). The ImageWriter II, and ImageWriter LQ are also supported.

One or more printers can be connected to EtherShare simultaneously, either through, Ethertalk, TCP/IP, or connected directly to the UNIX host via a serial interface. Print jobs are received from the network and temporarily stored on the UNIX host before being sent to the assigned printer (print spooling). This considerably improves the throughput of the workstations on the network, since they can immediate-

ly dispatch their print jobs and do not have to wait for the printer. Other connection types are also supported (see chapter 11 “The Print Server”).

Since EtherShare allows PostScript devices to be directly connected to the print server via a serial interface, it is not necessary for them to support Apple’s “Printer Access Protocol” (PAP). The interface between such printers and AppleTalk networks is implemented in the Print Server, which allows such printers to be accessed from any workstation as if they were directly connected to AppleTalk. However, you may get problems with applications that send images as binary bitmap data, since serially connected PostScript printers interpret certain binary codes as control signals. Accordingly, we recommend AppleTalk, which is transparent to 8-bit data (see chapter 11.6 “Configuring printers manually”). Additionally, it is much faster than a serial connection, which is an important factor for images.

All printers (including those that support AppleTalk) should be driven through the Print Server, in order to take advantage of EtherShare’s print job spooling feature – please select the corresponding *printer queue* from the **Chooser** and NOT the *printer* to which the queue is connected. This is especially important if you need to use different LaserWriter driver versions at the same time, since the Print Server will manage different “prep” file versions automatically without having to reset the printer each time.

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 electronic mail and “afpmsg”. Apart from convenience, this feature allows rapid reaction to situations such as “paper out” or “paper misfed”.

The various features of the Print Server are also available for MS-DOS workstations connected to the network via an AppleShare client or HELIOS PCShare. The “pstext” program which is provided (see paragraph below) can be used for printing DOS or UNIX text files on PostScript printers.

Text-to-PostScript converter

The text-to-PostScript converter “pstext” converts “flat” ASCII files to PostScript, to allow DOS and UNIX text files to be printed on PostScript printers. It also allows you to print from DOS and UNIX applications which do not support PostScript. “pstext” has facilities for switching fonts and for “intelligent” semi-automatic pagination (see chapter 12 “Text-to-PostScript Converter”).

The Terminal Server and HELIOS Terminal

The Macintosh program HELIOS Terminal allows workstations in the AppleTalk network to make one or more simultaneous connections to one or more UNIX hosts via a terminal emulation with multiple session capability. HELIOS Terminal communicates with UNIX through the Terminal Server.

The Mail Server and HELIOS Mail

The Macintosh program HELIOS Mail allows workstations in the AppleTalk network to send electronic mail messages and files to other Macintosh or UNIX users on the network. HELIOS Mail communicates with UNIX through the Mail Server. With the built-in TCP POP3 server in EtherShare 2.6, you can also use workstations other than Macintosh and mail programs other than HELIOS Mail with the EtherShare Mail Server.

HELIOS Mail offers an editor and an address book function. Incoming mail is received in the background and notified by a “Mail Notification Feature”, which displays a dialog box including the **Subject**: and the **New mail from:** lines if you receive mail. You also receive EtherShare serv-

er messages, such as printer messages, via electronic mail. If you have a modem attached to the UNIX host and configured for UNIX mail (uucp), you can also communicate with several hundred thousand users of this worldwide e-mail system.

The Administration Server and EtherShare Admin

The Macintosh program EtherShare Admin makes it very easy for system administrators to configure EtherShare from one of the Macintosh workstations. It can also be used by regular users to check the configuration. However, they are prevented from making any changes.

EtherShare Admin communicates with EtherShare through the Administration Server. The Administration Server runs on the UNIX host while EtherShare Admin runs on the Macintosh workstations. The communication between these two programs takes place through a custom protocol derived from the AppleTalk Filing Protocol (AFP), which was especially developed by HELIOS Software GmbH for this purpose and is transparent to other AppleTalk devices, or via a TCP/IP connection which allows for managing multiple servers remotely and supporting concurrent AppleTalk and TCP/IP connections. (see **via TCP/IP** in chapter 5.3 “Logging on to the Administration Server”).

The Font Server

The Font Server is an integral part of the Print Server. It reduces network loading, increases throughput and allows central administration of printer fonts.

The Desktop Server

The Desktop Server is responsible for storing icon and application data for the entire EtherShare server, and for managing file and directory IDs for network volumes.

The Time Server

The Time Server is provided to allow time synchronization between a server and all connected Macintosh clients.

3.3 EtherShare and UNIX programs and files

Many of the functions of EtherShare are aided by the high performance of the UNIX operating system, and EtherShare is closely integrated with a number of the more common system programs and facilities in UNIX.

For example, EtherShare often uses the UNIX programs “lpr”, “mail” and “syslogd”. All three programs are responsible for passing information within the UNIX system itself, and are used by EtherShare mainly as a medium of transport.

EtherShare also accesses the UNIX system files “/etc/passwd”, “/etc/group”, “/etc/printcap” and “/etc/rc.local”.

syslogd

“syslogd”, which runs continuously in the background within UNIX, has the task of processing status and error messages from other active programs, and sending them to a specific output device or file in accordance with its configuration. All of the EtherShare modules use the services of “syslogd” to output system error messages and warnings.

By changing the configuration file “/etc/syslog.conf” on the UNIX server, the administrator is able to exactly control the flow of messages. For example, messages can be automatically passed on to users logged-on to the system (or entire groups), or simply stored in files or output to the system console.

With some operating systems, EtherShare (as many other UNIX programs) will not log any error messages or warnings unless “syslogd” has been appropriately configured.

lpr

"lpr", which is responsible for passing print jobs to the appropriate printer, is used by the EtherShare Print Server. "lpr" is configured through the UNIX configuration file "/etc/printcap". This file contains an entry for each printer queue assigned to the system in order to define how the printer is connected to the network, and to specify which programs are responsible for transferring data to the printer. The EtherShare Admin updates this file automatically whenever you change the printer configuration.

The Print Server is based on the BSD printing system. If your host uses the System V printing system (e.g. Sun Solaris 2.x), the Print Server automatically uses its own BSD-style "lpr" program, which is provided in the "$ESDIR" directory in such cases.

mail

Under UNIX, the "mail" program is responsible for passing electronic mail messages between users or groups of users. Messages sent by the mail program to a particular user are stored on the host in the user's "mailbox". Either immediately, or at a later point in time, the user can call up "mail" to read the post. "mail" is also used by the EtherShare Print Server to pass printer status and error messages to the appropriate user.

Electronic mail is automatically sent directly to your Macintosh if you have installed our HELIOS Mail program. You no longer need to use the UNIX "mail" program to read it. Incoming mail is received in the background with a "Mail Notification Feature" which displays a dialog box including **Subject**: and the **New mail from:** line when you receive new mail.

/etc/passwd /etc/group

Any user in the AppleTalk network who requires access to the EtherShare File Server must be entered as a UNIX user in the "/etc/passwd" file. The user must also be assigned a group in the "/etc/group" file. Note that the administrator can specify whether an AppleTalk user is permitted direct access to the UNIX host or not, in addition to EtherShare access. The EtherShare Admin updates these files automatically whenever you change users or groups.

passwd program

The UNIX "passwd" program is used to assign passwords to users. The administrator can allocate new passwords, which are then automatically stored in the "/etc/passwd" file following encryption. The EtherShare Admin updates this file automatically whenever you change user passwords.

/etc/rc.local or /etc/inittab/

This file contains the commands that are automatically executed when starting (booting) the UNIX system (rc = run commands). The EtherShare installation program optionally inserts commands in this file to automatically start all of the EtherShare servers when UNIX is booted.

mkdir and rmdir

The UNIX program "mkdir" can be used to create new subdirectories in the UNIX file system. "mkdir" can also be used by the administrator to create new folders for the Macintosh. Please refer, however, to the notes contained in chapter 9.3 "Directory and file formats". Folders are best created or deleted by using the Finder from a Macintosh workstation. "rmdir" (remove directory) can be used to remove directories/folders when they are no longer needed.

chmod

The UNIX system program “chmod” (change mode) can be used to change user privileges for files and directories in the UNIX file system. You can also use “chmod” to change access privileges for Hierarchical File System (HFS) volumes created for Macintosh computers on the EtherShare File Server, although you should normally use the Macintosh program **Sharing...** (in the **File** menu) for this purpose. Please refer to chapters 9.3 “Directory and file formats” and 9.7 “Access privileges”.

Important: You should never change the privileges of files in the EtherShare program directories, or in spool directories used by the EtherShare Print Server.

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chown
chgrp

The UNIX programs “chown” and “chgrp” can be used to change the owner (creator) or group of a file or directory, although you should normally use the Macintosh program **Sharing...** (in the **File** menu) for this purpose. Only the system administrator can change the owner of a file or change the file’s group to one in which the owner is not a member.

Important: For all of the commands mentioned above, we recommend to use the HELIOS Desktop utilities that belong to EtherShare 2.6. These utilities mimic the functionality of the UNIX commands “mkdir”, “rmdir”, “chmod”, “chown”, “chgrp”, etc., while maintaining the integrity of the desktop database. The Desktop utlities are described in appendix A 9 “The Desktop utilities”.

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cron

The UNIX program “cron” *(cronos <Greek>= time)*, which runs continuously within UNIX, can be configured to start and stop specified programs at predetermined times. An appropriate entry in the cron configuration table

(crontab) can be used to start and stop a particular server at a specified time of day. “cron” can also be used to automate data backup procedures.

ufsdump, restore

“ufsdump” is a data archiving program available on BSD UNIX systems. It is the recommended program for making backup (security) copies of network volumes to a tape streamer or other removable storage media attached to the UNIX host. You can read in the archive again with “restore”. See chapter 9.8 “Data backup” and appendix A 6: “Data backup with “dump” and “restore””.

portmap, rpcbind

Either “portmap” or “rpcbind” are needed by the Desktop Server.

3.4 Network hardware

There are several different ways of connecting workstations and printers together to build a network. If you want to build e.g. an Ethernet or FDDI network you may have to install appropriate interface cards in some or all of the workstations and servers.

AppleTalk

AppleTalk is a generic name used by Apple for all types of Apple-compliant network connections. EtherTalk is the name Apple gives to the AppleTalk protocol when it is used on an Ethernet network. TokenTalk is the name Apple gives to the AppleTalk protocol when it is used on an IBM Token Ring network. AppleTalk is not “compatible” with TCP/IP, but can co-exist with TCP/IP (and other network protocols) on the same network cable without mutual interference. Under EtherShare, the same host network card is often used for TCP/IP and AppleTalk simultaneously.

AppleShare IP

AppleShare IP stands for AFP over a TCP/IP connection.

Ethernet

Ethernet is a hardware and network protocol standard which has found worldwide acceptance by a large number of computer manufacturers. Ethernet (EtherTalk) interface cards are available for most Macintosh computers, high-end Apple printers, and all UNIX hosts. Many UNIX hosts and some newer Macintosh computers have an Ethernet interface already built in.

Ethernet networks are capable of simultaneously supporting several network protocols such as TCP/IP and AppleTalk.

IBM Token Ring

IBM Token Ring is a hardware and network protocol standard which is supported by many types of IBM computers including IBM mainframes and the RS/6000 workstation. Token Ring (TokenTalk) interface cards are available for most Macintosh computers. A Token Ring card can be plugged into the IBM RS/6000 workstation to allow it to be used as an EtherShare host.

AppleTalk Router

If you have two or more different network types in the same building (e.g. Ethernet and FDDI) you may already have installed an AppleTalk router box to interconnect them. Alternatively, you may be using a software router (e.g. the AppleTalk Internet Router), which operates in the background in one of the Macintosh workstations.

EtherShare has automatic built-in routing functions. Whereas the EtherShare routing system can co-exist quite happily with other routers in the network, it might be worthwhile re-arranging your network to route with EtherShare instead, since this will give you significantly better performance than software routers.

3.5 Network topology

The various junctions, routers, bridges and devices in the network are called nodes, and the way that they are physically connected together is called the topology of the network. On the one hand, the topology is dependent on usage requirements (the required position of the workstations within an office building). On the other hand, it is also necessary to take account of physical limitations imposed by the chosen hardware (e.g. maximum cable lengths) and by network standards.

Ethernet is logically characterized by a linear bus topology. However, nowadays the 10Base-T Ethernet and 100Base-T Ethernet – also called *Fast Ethernet* – have, from the physical point of view, a star-shaped topology. This means that all workstations and printers etc. connected to the network are attached to a hub in the logical center of the “star”. Token Ring is, physically seen, also star system, with active hubs (“amplifiers”) at the center of each star. The “ring” is only virtual – the “token” packet is passed in a pre-defined sequence from one workstation to the next.

Network cabling

When installing the network cable, it is important to make sure that it is not installed with sharp bends or under tension. It should be laid in such a way that it cannot be damaged, and it should be routed as far away as possible from powerful electrical fields. Please observe the exact specifications of the hardware manufacturer. The manufacturer’s documentation contains all required information on admissible cable lengths, types of connectors to be used and other points to be noted.

Zones, Phase II

The AppleTalk protocol allows a number of physically separated networks to be linked together. The separate networks can use either the same or different hardware standards. The connection between two networks is implemented with so-called routers. The special software that runs in routers is called router software.

Each separate network is assigned a unique network number. A zone is a group of one or more logical networks with the same symbolic (logical) name. A device in the network is a member of a particular zone. However, a router between two networks (e.g. between FDDI and EtherTalk) is a member of at least two logical networks. Furthermore, in some cases two logical networks can co-exist on the same hardware cable (provided, of course, that they use the same hardware standard).

Under AppleTalk Phase II – in contrast to the outdated AppleTalk Phase I – one cable can support several logical networks, and a zone can contain more than one network, provided that the set of network numbers constitutes a continuous range (e.g. 101-108). Furthermore, several zones can co-exist on the same cable. There is a limit of 254 nodes per sub-network (section), but it is possible to have a larger number of devices per network. This became necessary when very large Ethernet networks started to appear.

3.6 New features of program version 2.6

Note that some new features were not included in the first release of EtherShare 2.6, but have been added by means of an update. Updates are published on our Web server **www.helios.de** and on our distribution CD-ROMs. They are released to make fixes or new features available.

New MachID

The MachID is now a 8-2 digit hexadecimal string with the last two digits representing the make and model of your host computer. The MachID is required to request the software activation key.

Base product for powerful extensions

EtherShare 2.6 is the base software for our powerful extensions EtherShare OPI 2.1, PDF Handshake, and Print Preview. Note that EtherShare 2.6 does not support our old EtherShare OPI 1.2.

New Macintosh Installer

The EtherShare Macintosh applications for client computers – e.g. EtherShare Admin and HELIOS Mail – can now be installed more easily, using the new “EtherShare Client Installer”.

IP access support

EtherShare considerably speeds up with AppleShare IP accelerated clients. EtherShare 2.6 supports AppleShare IP.

AFP servers were traditionally only available in local area networks. The new AFP over IP transport allows connections to the AFP server from anywhere in the Internet. To protect your site, you might want to create an IP access list to restrict access to your server. You can create such a list on your UNIX server, but it is much easier to use the EtherShare Admin program instead. It offers all options that are required for a standard access control.

"Fast" Finder copy

EtherShare 2.6 contains a "Fast" Finder copy as available in AppleShare Workstation 3.6. This Finder is able to create and handle large data packages and thus is much faster than previous Finder copies.

Improved "Find File by Name"

You may now search files by name on the server within a reasonable period of time, namely within a few seconds. With former software versions "Find File by Name" sometimes took a few minutes or even longer.

File locking

File locking has been improved for AFP volumes. For details, please refer to the explanations **File and record locking** in chapter 9.3 "Directory and file formats".

Client messages

With EtherShare 2.6 you can send short "AFP" messages to any connected client provided that EtherShare is running. These messages can be sent from the UNIX server using the UNIX "afpmsg" program, or from a Macintosh client using the EtherShare Admin program.

Enhanced "netconf" program

The new "netconf" program has been improved considerably as far as the automation of processes is concerned. The program also comes with an enhanced user interface.

New "vpoll" utility

Our new "vpoll" UNIX program follows the former "poll" program. The program serves to list and check network devices and entities. "vpoll" is an interactive program. It behaves similar to the Apple program "InterPoll".

EtherShare Admin via TCP/IP

The new EtherShare 2.6 supports administration over AppleTalk and TCP/IP. This allows to manage multiple servers remotely via TCP/IP connection, and additionally supports concurrent TCP/IP and AppleTalk connections.

New Admin user interface

The appearance of the Admin user interface has changed. We have built icons that characterize the different items in the **Lists** windows.

New Volume settings

We have added two checkboxes to the **Volumes** dialog (see chapter 5.8 “Volumes list”):

- the **Invisible** option
- and the **Unicode/UTF8** option with the **Charset** pull-down menu

Easy PPD file administration

We have implemented two new items in the Admin’s **Printer** menu. They allow to choose the desired PPD file for each printer queue, and to display the contents of the PPD file that is currently selected.

Convenient hold and error queues

You can define hold and/or error queues with the new Admin and automatically direct print jobs into one of these queues after they have been processed. The jobs are stored in the hold or error queue for a given period of time and can easily be restarted without the need to open the original application again.

Load balancing

With EtherShare 2.6, you can set up a group of printers for load balancing that is for shifting print jobs to a second or third printer in a group whenever the other printers are busy with a huge job.

Printing to disk

With the new **Print To Disk** connection you can induce the print server to print to a file.

New printer administration groups

There are now two different printer administration groups, namely “PrnAdm” and “QueueAdm”. One group is only allowed to manipulate print jobs, the other one (the “QueueAdm” group) is allowed to change the configuration of printer queues.

Enhanced log files

The organization of log files has changed. They are now arranged by date and deleted automatically after seven days. Furthermore, EtherShare 2.6 log files contain extended information. Printer log files e.g. state the total number of bytes printed and indicate whether you have printed composite or separations.

Extended information about versions and configuration

The **Versions** window provides several information about the program versions of the various Macintosh and UNIX programs that are installed on your system. With EtherShare 2.6 this window additionally contains information about your EtherShare, interface, and syslog configuration.

New features for HELIOS Mail

The new features are:

- New user interface with icons that characterize the specific items (e.g. large mail or unread mail)
- More preferences available, new user interface of the **Preferences...** dialog
- Different reply options (e.g. **Reply including Letter**)
- **Wrap** and **Find...** options in the **Edit** menu
- Possibility of sorting incoming mails by type, date, name of sender, or subject (you just have to click on the respective headline, e.g. From or Date)
- Possibility of creating templates (using **File> New> New Template**)
- **Save as Signature** option
- **Vacation** option
- POP3 Server

New features for HELIOS Terminal

The new features are e.g.:

- **Open on Key Press** option
- **Close Window on Connection Close** option

New Time Server

With the Time Server you can make sure that the time on your Macintosh clients is always synchronized to the time on the server you have chosen.

New LanTest version

The EtherShare 2.6 software package contains the HELIOS LanTest version 2.5. This LanTest software is able to measure transfer rates during printing and lets you switch between two different file sizes, namely 3 MB (recommended for testing standard Ethernet networks) and 30 MB (recommended for testing FastEthernet or FDDI networks).

Desktop utilities

The HELIOS Desktop utilities allow to manipulate Macintosh files under Unix in a way that Macintosh resource information are left intact. The main UNIX commands for handling files incl. “rm”, “mv”, “cp”, “ls”, “mkdir”, “touch”, “chmod”, “chown”, and “chgrp” are enhanced by these utilities. Thus, the utilities will turn out to be a helpful tool for system integrators, experienced EtherShare users, and developers. See appendix A 9: “The Desktop utilities” for more details.

4 Installation

4.1 System requirements

The following list gives details about the hardware and software you need for successfully working with EtherShare 2.6 as released on HELIOS CD 015.

Network

- Ethernet, Fast Ethernet, Token Ring, or FDDI (dependent on the system platform)

Server computer

- One of the following UNIX systems:
  - SunSPARC Solaris 2.x (SunOS 5.5.1 to 5.7)
  - IBM RS/6000 AIX 4.1.5 to 4.3
  - HP-UX 11.0
  - Silicon Graphics Irix 5.3 & 6.5
  - DG AViiON 5.4.11 Intel
  - Digital Alpha UNIX 3.2d & 4
  - Linux for Intel
  - Mac OS X Server
- CD-ROM drive (or possibility of using a tape instead)
- 6 MB in the "/usr" file system, in addition to the individual disk storage requirements of each of the users (This value is valid for pure EtherShare. It becomes considerably higher if you install any add-ons such as EtherShare OPI or PDF Handshake.)
- about 1 MB RAM per active user
- about 1 MB RAM per printer queue that receives a job
- about 1 MB RAM per print process
- at least 64 MB RAM on the server
- at least one supported network adapter installed and activated
- RPC (UNIX) and TCP/IP must be installed and running

Note: For installing EtherShare, you have to be able to log in as “root” on your host.

Network client

❍ Recommended: computer running Mac OS version 7.5 or higher
- alternatively: UNIX workstation or DOS/Windows workstation (with PCShare running on the server together with EtherShare 2.6)

Printer

❍ PostScript compatible printer
- alternatively: Apple ImageWriter II or Apple ImageWriter LQ

❍ Network printers are usually connected to the network via Ethernet (EtherTalk)

The Print Server also supports “TCP/IP streams”, “Remote LPR”, “Shared Memory”, and “Print To Disk” connections. And – it also allows PostScript printers to be connected to the UNIX host via a serial port on the File Server. However, you may get problems with applications that send images as binary bitmap data, since serially connected PostScript printers interpret certain binary codes as control signals. (Please refer to chapter 11.6 “Configuring printers manually” for more information.) Accordingly, we recommend Ethernet, because it is transparent to 8-bit data and much faster than a serial connection – which is an important factor for images. See chapter 11 “The Print Server” for more information.

4.2 General remarks

About this chapter

This chapter describes the steps that are indispensable for a standard installation, and gives short explanations if necessary. Please remember that all activities *you* have to perform are marked by an “instruction” arrow in the left margin. For a quick installation, you may proceed directly from one instruction to the other and skip the explanations in between.

The disk we provide

Our EtherShare 2.6 software is delivered on an ISO-9660 CD-ROM. For convenience, the CD-ROM also includes a script which allows you to copy each of the products to a standard installation tape. The procedure is described in chapter 4.4 below.

The installation program(s)

The installation is executed by two separated programs. The first program (“install.sh”) must be started from the CD-ROM. It lets you select the product you want to install and copies all related files and the product specific installation program to the local disk of your UNIX computer. Then, the product specific installation program (here: “install”) is started automatically by the “install.sh” program and guides you through the installation procedure. If required, “install” can be started again at any time from the local disk.

Updates

HELIOS issues EtherShare updates every now and then to enhance the product. These updates are distributed via the HELIOS Web server **www.helios.de**, and they are included on every HELIOS CD-ROM. The installation procedure for software updates is described in chapter 4.8 “Installing updates using the HELIOS update installer”.

4.3 Preparing the installation

4.3.1 Have your activation key at hand?

You cannot start the EtherShare software without a software activation key (kind of password). The key has to be entered during the installation procedure on your host computer. In case you have no activation key at hand, please follow the instructions given in paragraphs **License information** and **What you have to do** in the chapter “Welcome to EtherShare 2.6” at the beginning of this manual.

Note:	If you do not enter any Activation Key the HELIOS product you have installed will run in a 3 hour demo mode only.

Under certain conditions, HELIOS issues so-called demo licenses. If you are entitled to get a demo license, you will receive an activation key for demonstration purposes that expires after a given period of time.

Important:	The old EtherShare 2.2 activation key will not activate program version 2.6!

4.3.2 Preparing the UNIX host

The UNIX host must be provided with a fully installed and fully configured operating system. You should have the rights to boot the host yourself, in case a reboot is necessary during installation. You must also be able to log in as the

superuser (“root”), in order to allow the installation program to create subdirectories and make the required system modifications.

Since it may be necessary to reconfigure the operating system, no other users should be logged-in during the installation.

Important: Before starting the installation, you should create a backup copy of the system disk of your host computer.

If you have a network without routers you can use the EtherShare “Automatic configuration” option for network configuration. This also applies to networks with different zones and an existing AppleTalk router. For more information and manual EtherShare network configuration, see appendices A 3.3 “Network automatic configuration option” and A 3.5 “Manual network configuration”.

The host’s “/etc/hosts” file must contain the following loopback entry in addition to the host’s own entry (and optional entries for other hosts):

```
127.0.0.1  localhost
```

EtherShare usually cannot co-exist on the same host with AppleTalk software, such as file servers, from other manufacturers (with the exception of Mac OS X Server and Linux). You must uninstall all other AppleTalk software on the host before installing EtherShare, and stop all related host processes.

Depending on your hardware which affects the installation procedure the C compiler and the linkable operating system may need to be installed.

Printers may need to be configured. Depending on the printer, this is done for example with DIP switches, front panel settings, or with Apple's "LaserWriter Utilities" program. With some printers, it is first necessary to unplug the serial interface cable before the printer's AppleTalk interface will operate (see the printer's documentation). For serial printers, please also refer to chapter 11.6 "Configuring printers manually".

Notes about installing other HELIOS products

If you want to install additional HELIOS products, e.g. PCShare or EtherShare OPI, we recommend to install the programs on the server in a fixed order, namely the order that is suggested by the installation menu on your current product CD-ROM. The following order is valid for the HELIOS products as delivered on CD-ROM 015:

- install EtherShare 2.6 first
- install PCShare 3.0 second
- install EtherShare OPI 2.1 and/or PDF Handshake third

4.3.3 Driver (AppleTalk)

EtherShare's AppleTalk modules, which form the backbone of the EtherShare system, are either contained in a UNIX loadable module, which is designed to be added to the operating system during runtime, or in a driver which is built into the UNIX kernel during EtherShare installation. Kernel modifications require a system reboot. The behavior

depends on the type of server: DG/UX e.g. does not support loadable modules. On some architectures dynamic loading is supported, whereas unloading requires a reboot.

4.3.4 Preparing Macintosh workstations

If a Macintosh computer is to be connected via Ethernet or FDDI, it may need to have an appropriate network card installed. Please install the network card according to the manufacturer's instructions before installing EtherShare.

No changes are required to the Apple system software in order to use EtherShare. However, please make sure that each workstation has the option "AppleShare" in the **Chooser**. This option appears automatically if the "AppleShare" file is present in the "Extensions" subfolder of the System Folder when booting the Macintosh. If necessary, use the system program "Installer" to install the AppleShare client software. AppleShare is responsible for making the logical connection to all network devices of type "AFPServer". It allows users to log on to the EtherShare File Server and select file server volumes. Please refer to the Apple documentation for more details about AppleShare. Please note that Mac OS 8 contains the AppleShare client software by default. Installation is not required.

If you are using an Apple LaserWriter, Apple LaserWriter Plus or a compatible PostScript printer, the "LaserWriter" printer driver is required in the "Extensions" subfolder of the Macintosh's System Folder. "LaserWriter" is responsible for making the logical connection to all network devices of type "LaserWriter". Note that the Apple Laser Writer GX driver is not compatible to EtherShare and has to be uninstalled.

If you are using an ImageWriter II or ImageWriter LQ, appropriate printer drivers (such as “AppleTalk ImageWriter” for the ImageWriter II printer) must be present in the “Extensions” subfolder of the System Folder. “AppleTalk ImageWriter” is responsible for making the logical connection to all network devices of type “ImageWriter”.

“AppleShare” and printer drivers such as “LaserWriter” are accessed through the **Chooser** to allow you to select network zones, file servers and printers. On some systems, the AppleTalk Zones: scroll box is only visible if you have any zones. Refer to the Apple Macintosh user manual for more details.

The AppleShare and AppleTalk files, and printer drivers such as “LaserWriter”, are included in the standard Apple system software. If the AppleTalk connection is being made via Ethernet, FDDI, or Token Ring, the EtherTalk, FDDITalk, or TokenTalk file must also be available.

EtherShare is also provided with several Macintosh utility programs. One of these programs, Helios Mail, uses the UNIX “mail” program, which must be installed and working for Helios Mail to work. To test this, make a UNIX login and try to send a mail between two UNIX users. If necessary, refer to your UNIX documentation for details.

4.3.5 Preparing DOS/Windows workstations

DOS/Windows PCs can also be connected to EtherShare, provided that appropriate software is installed on the server. A very convenient and fast way of connecting IBM-PC-compatible computers to your network is to use HELIOS PCShare 2.5 or higher which smoothly co-operates with EtherShare 2.6.

4.3.6 Preparing upgrade installations

Stop PCShare

Please note that installing EtherShare 2.6 will require a stop of all EtherShare services, that is file access as well as spooling and printing. On some architectures even a reboot of the UNIX server is required. If EtherShare volumes are shared with PCShare 2.x on the same server, make sure to stop PCShare prior to the EtherShare 2.6 installation, otherwise the PCShare 2.x clients will encounter loss of write access to the shared volumes. Only after successful installation of EtherShare 2.6, PCShare server processes can be started again.

Updating to 2.6

Before you install the new EtherShare 2.6 version you should make sure that all Macintosh users are logged-out from the EtherShare server and that there are no active print jobs. The installation script will stop all EtherShare services in order to install the new software version successfully.

You should keep all existing files in your old EtherShare directory. The EtherShare 2.2 configuration files in "$ESDIR/conf" are re-used by EtherShare 2.6 if the new version is installed on top of the old version in the same directory.

The EtherShare 2.6 distribution differs slightly from the earlier EtherShare 2.2 version; some data and program files became obsolete and will be moved to a directory "$ESDIR/obsolete" after a successful installation.

If you have changed any of the UNIX script files in the "$ESDIR" directory for your old EtherShare installation, you should make a copy of these files to integrate your changes into the new version.

In case you implemented your own scripts or adjusted some of EtherShare's, please verify these scripts immediately in order to assure proper operation of your scripts.

Updating from v. 1.x to 2.6

Due to major differences between EtherShare 1.x and EtherShare 2.6, EtherShare 1.x has to be removed prior to the EtherShare 2.6 installation. Therefore, you must run the "$ESDIR/stop-atalk" script to stop the EtherShare processes. You then need to run the "$ESDIR/etc/uninstall" script to uninstall any kernel extensions which may have been applied by an EtherShare installation script.

After you have written down the EtherShare 1.x configuration you must remove the complete contents of the EtherShare 1.x directory before you begin the installation of EtherShare 2.6. After the installation you can setup the new configuration according to your notes from the EtherShare 1.x configuration. After successful installation, a reboot of the UNIX server is required.

4.4 The UNIX installation procedure

At first, we will describe the installation from CD-ROM. Instructions on how to install EtherShare from a tape are given at the end of this chapter.

During the installation, you are guided by menu-driven programs. Most questions in these programs have a default answer which is given in brackets. You can accept this default by simply pressing ENTER or type an alternative answer. If there is nothing within the brackets, the system will expect an entry from you.

Important: Please note that if you quit the installation before having finished the complete procedure, you will have to start with step 1 again when you install EtherShare anew. Do not skip any steps you think you have already taken.

Important: The following installation example describes the steps that are to be taken on an IBM RS/6000 computer under AIX 4. Slight deviations may occur — depending on your system type and configuration.

➢ To start the installation, log in as “root” on your host.

➢ *For upgraders only:* Please follow the instructions given in chapter 4.3.6 “Preparing upgrade installations” before proceeding.

➢ Then place the CD-ROM in the CD drive of your UNIX computer and enter the mount and install commands which may be different for different UNIX systems. The correct

commands for your specific computer are stated in the booklet we enclose to our CD-ROM.

Example for an IBM/RS 6000 computer under AIX 4:

```
mount -r -v cdrfs /dev/cd0 /cdrom

cd /cdrom

sh install.sh
```

As soon as you have entered the last command, the “Networking Products Installer CD-ROM” menu will appear (see figure 1).

```
Networking Products Installer CD-ROM
------------------------------------

The machine ID of this computer is "00205420-63"

1)  EtherShare
2)  PCShare
3)  EtherShare OPI
4)  PDF Handshake
5)  Print Preview
6)  Install Updates
7)  Display readme.txt
8)  Quit

* Your choice [] 1
```

Fig. 1: The “Networking Products Installer CD-ROM” menu

- ➢ Select EtherShare by entering the number of the respective menu item (here: 1) and press ENTER.
- ➢ Read the information about update installations that is displayed now, and type `y` (for “yes”) to continue.

➢ Select the version you want to install. (This prompt is skipped automatically, if there is only one program version available on that CD-ROM.)

```
Available product versions:

...

* Select a version? []
```

The program will then display a list of the currently available disk space. This list can help you find an adequate directory for EtherShare.

➢ Select the directory you want to install EtherShare in (the default directory is `/usr/local/es`) and then start the installation procedure.

```
* Select a directory to install the product in?

[/usr/local/es]

* Ok to start installation? [y]
```

The installation program (“install.sh”) now stops EtherShare, in case an older version is running on the server. Then, the program removes old updates – if there are any – and copies the EtherShare program files to the directory you have selected.

➢ At this stage, you can induce the installation program to automatically start the HELIOS update installer and install all updates that are available on the CD-ROM. If there are no updates, this step is skipped. Otherwise, you will see a prompt similar to the following:

```
The following updates are available for the newly
installed product:
u0101: (subject line)
u0104: (subject line)
.
.
u0125: (subject line)
u0128: (subject line)
* Do you want to install these ? [y]
```

If you decide to install the updates now (which is convenient and thus recommended), the update installer will start and perform the installation automatically. Else, you can start the update installer manually at a later date and install the updates you want to use.

After update installation, the script will call the product specific installation program for EtherShare.

```
Calling product installation script
/usr/local/es/install
```

```
EtherShare Installation Menu
------------------------------------

The machine ID of this computer is "00205420-63"

1)  Install programs and configuration files
2)  Install and configure AppleTalk kernel modules
3)  Enter activation key to license HELIOS programs
4)  Create a demo user
5)  Configure AppleTalk network numbers
6)  Display README file
7)  Quit

* Your choice? [1] 1
```

Fig. 2: The “EtherShare Installation Menu”

The EtherShare installation menu

The product specific installation menu is shown in figure 2. Items 1 to 5 of this menu deal with the installation and `Display README file` should be selected if you want to check the latest information which has not done it into the manual yet.

Important: Items 1–3 *must* always be executed, even if you are upgrading from an earlier version.

➢ Select `Install programs and configuration files` from the “EtherShare Installation Menu”.

The “install” program automatically creates a suitable shell script to start the EtherShare server programs. The script includes a command to set the UNIX environment variable “$ESDIR” to the EtherShare home directory (by default `/usr/local/es`).

```
Setting up configuration files ...
Changing ESDIR variable in various shell scripts ...
Performing symlinks from files in /usr/local/es/lib to
/usr/lib ...
Arranging for EtherShare to start automatically after the
next reboot ...

To install a shared volume, we recommend that you choose
the local partition from the following list with the
biggest available free space. Then use that partition's
mount point (the rightmost column) as the prefix to the
ethershare directory to be created. Please make sure that
volumes do not overlap, e.g. do not make /home a volume
if you want to access your home directory under
/home/username.

Filesystem ...

* Directory for shared volume ? [/usr/ethershare]

Creating EtherShare configuration file
/usr/local/es/conf/atalk.conf.
```

```
The crontab entry to periodically clean up EtherShare log
files does not exist. This entry will make sure that the
server.acct and printer.acct files will not grow without
bounds.

* Ok to create the crontab entry ? [y]
```

Please note that `Ok to create the crontab entry ?` may fail on hosts on which "root" privileges have been manipulated. In case of failure, please refer to the `crontab` manual pages.

➢ Select item `Install and configure AppleTalk kernel modules` from the "EtherShare Installation Menu".

```
EtherShare Installation Menu
------------------------------------

The machine ID of this computer is "00205420-63"

1)  Install programs and configuration files
2)  Install and configure AppleTalk kernel modules
3)  Enter activation key to license HELIOS programs
4)  Create a demo user
5)  Configure AppleTalk network numbers
6)  Display README file
7)  Quit

* Your choice? [2] 2
```

```
No kernel generation necessary on this system.
```

Important: You must select item [2], even though a kernel rebuild may not be required on all platforms. The script will verify this and will behave accordingly.

The script will have to perform configuration and administrative tasks for a successful installation. So this part of the installation may be different for different platforms.

In case the installation program installs a new kernel it will inform you about the steps it will take. The program will finally come up with the prompt:

```
* Ok to install new kernel ? [y]
```

If your answer to this question is `n` (for “no”), you will have to copy the kernel manually to the directory “/”.

Please note that after a kernel rebuild you will have to reboot the system after installation. The installation script will inform you about this as well.

➢ Now, you have to license your HELIOS product. Select `Enter activation key to license Helios programs` from the “EtherShare Installation Menu”.

```
EtherShare Installation Menu
------------------------------------

The machine ID of this computer is "00205420-63"

1)  Install programs and configuration files
2)  Install and configure AppleTalk kernel modules
3)  Enter activation key to license HELIOS programs
4)  Create a demo user
5)  Configure AppleTalk network numbers
6)  Display README file
7)  Quit

* Your choice? [3] 3
```

The installation program displays a brief explanation about the HELIOS licensing scheme. This information is also included in chapter "Welcome to EtherShare 2.6" at the beginning of this manual. After providing the license information the installation program will prompt:

```
* Press return to continue ? []
```

➢ Press RETURN and then select item [1] or [2] – depending on whether you want to install a new base license or expand an existing license – from the "EtherShare License Menu" that is shown below.

```
EtherShare License Menu
-----------------------------------

The machine ID of this computer is "00205420-63"

1)  Enter a EtherShare base license
2)  Enter an user expansion license
3)  Display licenses
4)  Delete a license
5)  Return to main menu

* Your choice? [1] 1
```

➢ Enter your 8-digit software serial number.

```
* Software serial number (8 digits, q to quit)? []
54080022
```

➢ Enter an expiration date if you have a demo license.

```
If you have a full license, leave the next field blank.

* Expiration date (eg.1-Oct-1991,q to quit)? []
```

➢ Enter the number of users allowed to work with this license.

```
* Number of users (units, one or more decimal digits, q
to quit) ? [20]
```

➢ Enter the checksum that is stated on your "Activation Key Reply" form.

```
* Checksum (eg. abcd-defg-hjkl-mnop, q to quit) ? []
qwer-asdf-yxcv-abcd

License is valid and has been entered into the license
database.
```

Important: If you get any error messages instead of the `License is valid ...` prompt, you may check your entry again and repeat the licensing procedure if necessary. Make sure you have used the correct key reply form values.

When all procedures to enter the Activation Key fail, direct to your HELIOS distributor, or – if you received the key from HELIOS directly – to HELIOS.

➢ You have successfully licensed your EtherShare copy and may now choose from the "EtherShare License Menu" either item [3] to display all license information again, or item [5] to return to the "EtherShare Installation Menu".

➢ Proceed to item [4] in the “EtherShare Installation Menu” and create a demo user to allow Macintosh users to log on to the server without further configuration.

```
EtherShare Installation Menu
------------------------------------

The machine ID of this computer is "00205420-63"

1)  Install programs and configuration files
2)  Install and configure AppleTalk kernel modules
3)  Enter activation key to license HELIOS programs
4)  Create a demo user
5)  Configure AppleTalk network numbers
6)  Display README file
7)  Quit

* Your choice? [4] 4
```

```
* Ok to add a demo user named “macuser” and a demo group
“macusers” ? [y]
```

➢ Select a home directory for the demo user as shown below.

```
Please select the home directory for the demo user.

* Home directory for user macuser ? [/data/macuser]
Created group “macusers” for Macintosh users.

The test user “macuser” has now been created. This user
has no password at present. This user should be deleted
as soon as you have created real users, for example by
using the EtherShare Admin program.
```

➢ When you see the “EtherShare Installation Menu” again, choose [5] to configure the network connections by setting up the “atalkd” entry in the main EtherShare configuration file “atalk.conf”.

If your EtherShare host has a single network interface only, you will get the following message when you select

```
Configure AppleTalk network numbers:

This system has only one network interface installed, thus
there is no need to configure any network numbers.
```

Else, if your host has more than one network interface, the AppleTalk Network Setup Program “netconf” will be started automatically. It will, by default, show “Automatic configuration” for every network interface. You can – at this stage – press ENTER and then quit “netconf”. In some cases, however, it will be necessary to configure your network manually. The usage of the “netconf” program is described later in this manual: See A 3.3 “Network automatic configuration option” for a technical explanation of automatic configuration, and the other paragraphs of the appendix for details about manual configuration of network interfaces and zones.

➢ Unless you opt for manual network configuration, the EtherShare base system is now fully installed and is ready for testing. Press ENTER to reach the “EtherShare Installation Menu” again and choose [6] to check the information given in the README file and then item [7] to quit the “install” program:

```
* Your choice ? [7]

The EtherShare configuration is now finished. If you want
to add printers, users, groups or volumes, read the book
first and use vi, or use our EtherShare Admin application
from one of the Macs. The latter is much easier, even if
you are experienced with vi (the famous UNIX editor).
```

➢ For `No kernel generation necessary` only: If loadable modules are supported and enabled, you will not be asked

to reboot. Instead, the installation program will start EtherShare automatically and you will see the “Networking Products Installer CD-ROM” menu again. Select `Quit` to finish the installation procedure on the host and go on with the verification and client installation (chapters 4.5, 4.6).

```
Networking Products Installer CD-ROM
------------------------------------

The machine ID of this computer is "00205420-63"

1)  EtherShare
2)  PCShare
3)  EtherShare OPI
4)  PDF Handshake
5)  Print Preview
6)  Install Updates
7)  Display readme.txt
8)  Quit

* Your choice [] 8
```

➢ For systems with kernel rebuild only: If a kernel rebuild was necessary on your host you have to reboot now.

```
The EtherShare configuration is now finished.

Because we have now built a new kernel, it is time to halt
the system and reboot with the modified kernel.

If you want to add printers, users, groups or volumes,
read the book first and use vi, or use our EtherShare Ad-
min application from one of the Macs. The latter is much
easier, even if you are experienced with vi (the famous
Unix editor).

* Do you want to reboot now ? [y] y
```

After rebooting, EtherShare will be started automatically.

Note: If it was necessary for the installation process to modify your UNIX kernel, the old kernel version is preserved as a copy with the same file name but a different extension (e.g. ".noatalk"). The dialog of the "install" program will tell you whether this was necessary or not, and which file name was chosen for the old copy.

Installation from tape

The files MKTAPE.SH and README.TXT on our CD-ROM give a full description of how to make an EtherShare tape. When installing EtherShare from tape you have to be logged-in as "root" and enter the following commands:

```
cd /usr/local
mkdir es
cd es
umask 0
```

insert tape here

```
tar xvf /dev/<device>
```

where `<device>` is:

`rmt0` for IBM RS/6000 computers

`rmt0h` for Digital computers

`tape` for SGI computers

`rmt/0` for System V.4 computers, e.g. (Sun computers under Solaris 2.x)

Please do not forget the command “umask 0”. It influences the permissions which are set for the EtherShare program modules and directories. Incorrect permissions can cause serious malfunction of the EtherShare system.

Finally, you have to start the product specific installation program manually – using `/usr/local/es/install` – and then follow the instructions given in paragraph The EtherShare installation menu above.

4.5 Verifying the UNIX installation

Changes made by the installation

All EtherShare programs are contained in the EtherShare home directory "$ESDIR" specified during the installation (default `/usr/local/es`), and in several sub-directories. For example, "$ESDIR" contains EtherShare system and utility programs, "$ESDIR/etc" contains sub-programs of the "install" program and example configuration templates, "$ESDIR/conf" contains EtherShare configuration files and "$ESDIR/macapps" contains Macintosh programs for use with EtherShare.

"$ESDIR/psfonts" and "$ESDIR/dicts" are for manually installed printer fonts and PostScript "dicts", respectively. The former directory is initially empty and the latter contains several special "dict" files. The Print Server automatically captures more "dict" files there when you use EtherShare.

Please see appendix A 2: "Files in the EtherShare directory" for more details about the files that make up EtherShare.

After installing printers, the EtherShare Admin adds new entries to the UNIX file `/etc/printcap`.

In some cases, the "install" program needs to rebuild the hosts's kernel. A copy of the old kernel is retained (under the name "vmunix.noatalk") to allow you to boot if the new kernel does not work successfully.

The "install" program also adds the following command to the file "/etc/rc.local" or "/etc/inittab":

```
if [ -f /usr/local/es/start-atalk ]; then
/usr/local/es/start-atalk
fi
```

This command is necessary to automatically start the EtherShare server programs when booting UNIX.

The “install” program automatically sets up the EtherShare main configuration file (“atalk.conf”) with default values for the parameters. The values can be changed if necessary by using an editor such as vi, but we strongly recommend that you do this with the EtherShare Admin program and the network configuration option of the “install” program instead.

Checking the process list

The first thing to do after starting EtherShare for the first time is to check the process list with the `ps` command.

➢ Enter the `ps` command (“ps -ef”, “ps -e”, or “ps ax” – depending on your UNIX system) to prompt a listing of all the processes currently running on your server (the following example shows a listing on Solaris 2.x).

```
helios$ ps -e
    PID    TTY      TIME   CMD
      0    ?        0:01   sched
      1    ?        0:28   init
      2    ?        0:01   pageout
      3    ?        55:56  fsflush
    333    console  0:01   ksh
.
.
   6885    ?        0:00   in.rlogin
   6890    ?        0:00   atalkd
   9181    ?        0:08   admsrv
   9209    ?        0:00   afpsrv
   9671    ?        0:08   mailsrv
   9704    ?        0:01   termsrv
   9772    ?        0:01   desksrv
   9782    ?        0:25   timesrv
  9845ß    ?        0:00   lpd
    362    console  0:00   fbconsol
    355    console  0:00   xinit
.
.
```

If one of the EtherShare processes is missing, something is wrong. You should then inspect the system message file which will contain an error message from the program in question. The name and location of the system message file is dependent on the operating system, it is e.g.:

`/var/adm/messages` for SunOS, AIX and DG/UX

The File Server (“afpsrv”), Terminal Server (“termsrv”), Administration Server (“admsrv”), and Mail Server (“mailsrv”) each spawn an additional process for each user login, so you may see these entries more than once if someone is already logged-in. The Print Server (“papsrv”) spawns an additional process for each printer queue and each print job. You should see only one Desktop Server (“desksrv”) process. See also the discussion of the process list in the description of the **“swho” command** in chapter 8.5 “AppleTalk stack utility programs”.

Checking the RPC list

The EtherShare Desktop Server requires RPC (remote procedure call) to be configured on your host. First make sure that the “portmap (UNIX)” or “rpcbind (UNIX)” process is running. Then check all RPC registered processes with the command `rpcinfo -p`. The following shows a typical RPC list:

```
rpcinfo -p
 program   vers     proto  port
  100000   2 tcp    111    portmapper
  100000   2 udp    111    portmapper
  100007   2 tcp    1027   ypbind
  100007   2 udp    1027   ypbind
  100007   1 tcp    1027   ypbind
  100007   1 udp    1027   ypbind
  100024   1 udp    892    status
  100024   1 tcp    894    status
  100021   1 udp    902    nlockmgr
  100021   3 udp    905    nlockmgr
  100021   4 udp    908    nlockmgr
  100021   2 tcp    911    nlockmgr
```

```
   395572    602 udp  837
   395572    602 tcp  839
   100005    1 udp    624    mountd
   100005    2 udp    624    mountd
   100005    3 udp    624    mountd
   100005    1 tcp    628    mountd
   100005    2 tcp    628    mountd
   100005    3 tcp    628    mountd
   100003    2 udp    2049   nfs
   100003    3 udp    2049   nfs
   100026    1 udp    1032   bootparam
   150001    1 udp    1033   pcnfsd
   100017    1 tcp    1032   rexd
   100001    1 udp    1034   rstatd
   100001    2 udp    1034   rstatd
   100001    3 udp    1034   rstatd
   100002    1 udp    1035   rusersd
   100002    2 udp    1035   rusersd
   100012    1 udp    1036   sprayd
   100008    1 udp    1037   walld
 33554441    1 tcp    898
 33554441    1 udp    900
   395572    1 tcp    904
   395572    1 udp    907
   395572    2 tcp    912
   395572    2 udp    915
   395572    3 tcp    918
   395572    3 udp    920
   390113    1 tcp    7937
   390103    2 tcp    936
   390109    2 tcp    936
   390110    1 tcp    936
   390103    2 udp    940
   390109    2 udp    940
   390110    1 udp    940
   390107    2 tcp    948
   390107    3 tcp    948
   390107    4 tcp    948
   390107    5 tcp    948
   300261    1 udp    985    desksrv
   300619    1 tcp    984    afpsrv
   300619    1 udp    987    afpsrv
   300430    1 tcp    644    pcshare
   300430    1 udp    646    pcshare
#
```

The EtherShare Desktop Server has the official allocated program number 300261; the AFP Server has number 300619. You have to add suitable entries to “/etc/rpc” to

make sure that the strings “desksrv” and “afpsrv” are displayed alongside the “desksrv” and “afpsrv” processes as shown above. Use the following command to check for example whether “desksrv” is running and responding:

```
rpcinfo -u localhost 300261

program 300261 version 1 ready and waiting
```

atechoping

The next thing you should do is use the AppleTalk echo diagnosis program “$ESDIR/atechoping” to test the network for services, and thus see if the EtherShare base system is communicating with other AppleShare nodes. When you run this program on the host, you should get one response line for the host’s loopback channel and one for each Macintosh which is switched on and connected to the same network segment. If no Macintosh computers are connected you should get a single response line for the host’s loopback channel.

➢ When you enter the `atechoping` command, you will see something like the following:

```
# cd /usr/local/es
# ./atechoping
got packet from 21.27, skt 4, type 4
got packet from 29.216, skt 4, type 4
got packet from 20.168, skt 4, type 4
got packet from 20.128, skt 4, type 4
got packet from 20.218, skt 4, type 4
got packet from 20.229, skt 4, type 4
got packet from 25.62, skt 4, type 4
got packet from 26.143, skt 4, type 4
got packet from 24.30, skt 4, type 4
got packet from 21.214, skt 4, type 4
got packet from 20.143, skt 4, type 4
got packet from 21.39, skt 4, type 4
```

```
got packet from 29.116, skt 4, type 4
got packet from 20.230, skt 4, type 4
got packet from 28.175, skt 4, type 4
got packet from 25.174, skt 4, type 4
got packet from 20.251, skt 4, type 4
got packet from 27.54, skt 4, type 4
got packet from 20.207, skt 4, type 4
got packet from 20.249, skt 4, type 4
got packet from 20.144, skt 4, type 4
#
```

Each line shows the net node, socket, and echo type.

You can also enter `atechoping <nn>`, where `<nn>` is the network number, to echo test other networks. Other EtherShare hosts also return a one-line message.

The HELIOS vpoll program

Our UNIX application “vpoll” can be used to get a more detailed view of the available devices in the network. The program is comparable to the former Macintosh application “Inter•Poll”. However, it is a very sophisticated program that can be used on different occasions – not only for verifying the installation. “vpoll” is an interactive program that lets you set several parameters before starting the network check, and it lets you observe how fast the different devices in your network respond to the network check.

➢ After installation “vpoll” is available in the “$ESDIR” directory. To start the program, just enter:

```
cd /usr/local/es
./vpoll
```

Figure 3 shows the startup screen of the program with the default settings.

Note that “vpoll” provides the information online, but also allows to save the data in a file. Use Ctrl-W for that purpose. If you press CTRL-W, e.g. in the “Device-List” win-

dow, you will be queried for a “Logfile Name” where current settings and lists should be saved as ASCII. Subsequent saves will be appended to the logfile. After finishing and restarting “vpoll”, the first CTRL-W you enter will induce the program to query for a “Logfile Name” again.

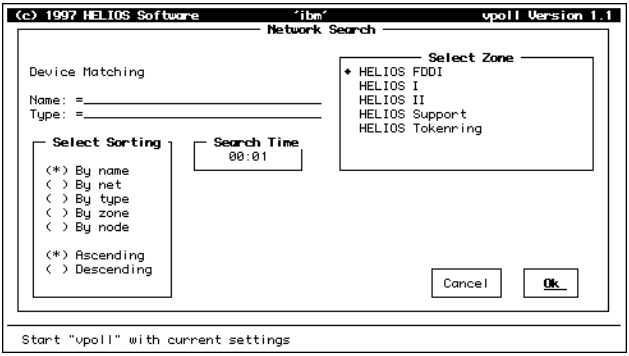

Fig. 3: User interface of the “vpoll” program

The following keys are relevant for using “vpoll”:

- TAB key: navigate within a “vpoll” dialog
- “+” and “-”: (un)select items from a list
- ARROW keys: navigate within a list of items
- ESC key: quit the current dialog

Whenever a user changes any parameters (as shown in figure 4), the new settings will be saved for this specific user. You can use the `Name` and `Type` lines to limit the network check to specific devices. The “=” is used as a wildcard.

Please note that the bottom line gives short descriptions of the currently selected item (compare figure 4 again).

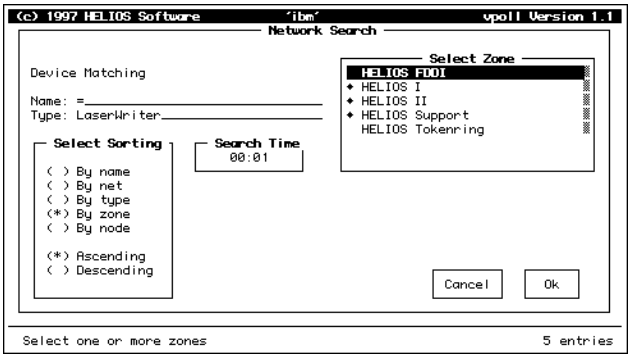

Fig. 4: Setting new parameters for “vpoll”

In figure 5, we have set up a network check for all devices in zone “HELIOS II”.

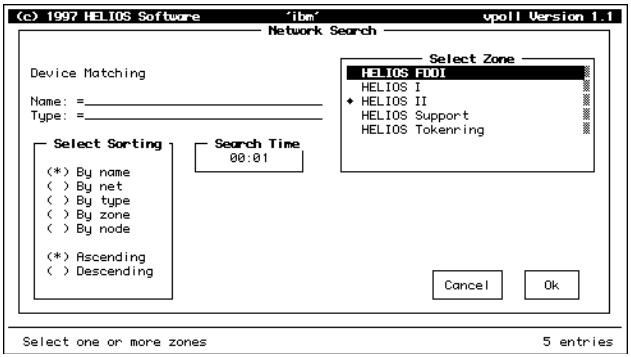

Fig. 5: Settings for a network check that includes all devices

➢ To start the network search, proceed to the `Ok` button (using the TAB key) and then press ENTER.

You will get a device list like that shown in figure 6. All devices of the zone “HELIOS II” are listed – they are sorted by name. The device list includes the network number (`Net`), the node number (`Node`), the socket number (`Sckt.`) and the `Name`, `Type`, and `Zone` of the respective device. Usually, any combination of `Net`, `Node` and `Sckt.` should be unique. It is possible, however, that a combination appears several times; in that case the zones are different.

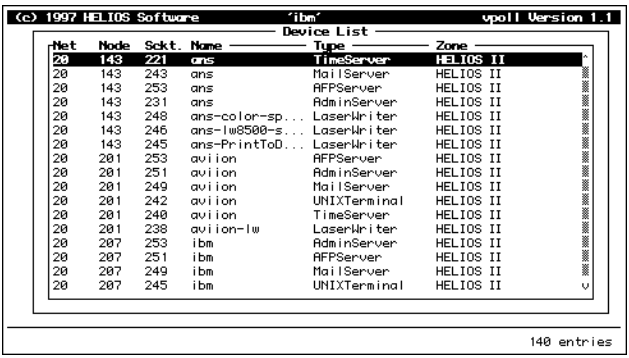

Fig. 6: Device list provided by the “vpoll” program

➢ You can scroll through the device list and press ENTER to open the “Device Ping” dialog for a specific device.

In the “Device Ping” dialog you can – again – set individual parameters for a device check, namely: the number of packets, the packet size, the poll interval and a value for timeout.

➢ The device check will start the moment you select the `Ok` button in the “Device Ping” dialog (see figures 7 and 8).

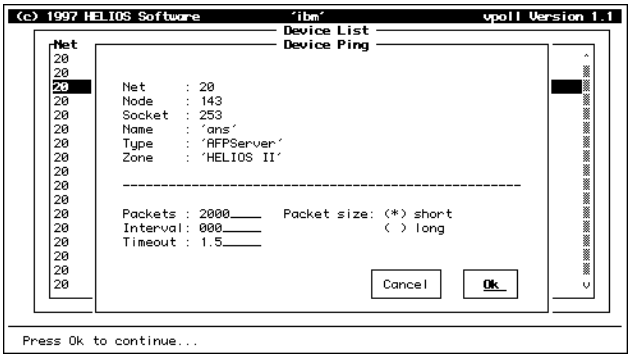

Fig. 7: Setting up the “Device Ping” dialog

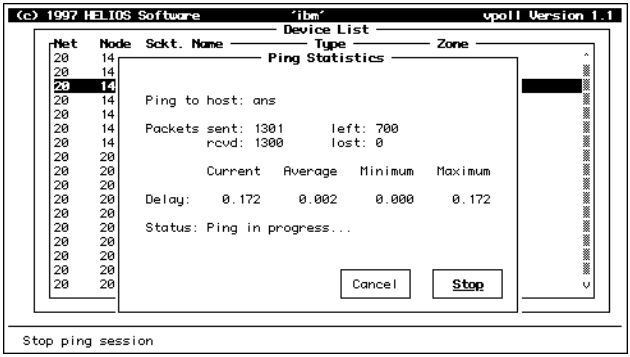

Fig. 8: Watching the ping statistics (device response)

You can stop and restart the ping statistics at any time; the behavior of the respective button (the `Stop` button in figure 8) will change, depending on the status.

➢ Use the `Cancel` button (or the ESC key) to close the current dialog. The `Cancel` button in the "Network Search" dialog (see figure 3) will quit the "vpoll" program.

The HELIOS poll program

The HELIOS "poll" program is older than "vpoll", and in contrast to the latter one, it is a command line utility for network checks. It can be executed automatically in the background, e.g. if you include the `poll` command into a batch program. "poll" returns one message line for each AppleTalk service (entity) on any network, that can be found within 1 second response time. This includes one response line for the EtherShare servers "atalkd", "afpsrv", "papsrv", "admsrv", "termsrv", "timesrv" and "mailsrv" for each EtherShare host that can be found and for each registration (if the services are registered in several zones).

Each line shows the network number, node number, socket number, object name, object type and zone name. The network number is the `netno` parameter in the main configuration file "atalk.conf".

Please note that:

❍ "desksrv" does not appear in this list.

❍ "poll" can be specified with command line parameters as follows:
`poll "name:type@zone"`
You can use "=" as a wildcard for "name", "type", and "zone".

- "poll" has a limited buffer – only 3 to 4 pages of information can be displayed at a time – for large networks, you may need to use wildcards to limit the range of services which are polled. For example:
  `poll "=:Laser=@*"`
  lists all services whose type starts with "Laser". The "*" represents "this zone"; the zone you are currently a member of.

"poll" may display entities multiple times – depending on the route an "echo" took; this is normal.

The following example shows the responses you may get when using the "poll" program:

```
# cd /usr/local/es
# ./poll
   20 168   2 690c0d3e        EtherShare      *
   20 143 253 ans             AFPServer       *
   20 143 238 printpreview-SpoolerLaserWriter     *
   20 143 245 ans-PrintToDisk-SpoolerLaserWriter     *
   20 143 246 ans-lw8500-spoolerLaserWriter     *
   20 143 248 ans-color-spoolerLaserWriter     *
   20 143 243 ans             MailServer      *
   20 143   2 0025f98a        EtherShare      *
   20 143 221 ans             TimeServer      *
   20 143 221 ans             TimeServer      *
   20 128   2 DEMO_002614cb   EtherShare      *
   20 251   2 DEMO_00205420   EtherShare      *
   41 142 251 HELIOS EtherShare PublicAFPServer       *
   41 142 253 proxy           AdminServer     *
   20 143 229 ans             UNIXTerminal    *
   20 143 231 ans             AdminServer     *
   20 196   2 6906eae9        EtherShare      *
   20 241   2 807de1b8        EtherShare      *
   20 145   2 807de1ad        EtherShare      *
   20 211   2 2bbf260c        EtherShare      *
   20 230   2 7758302e        EtherShare      *
   20 144   2 726041aa        EtherShare      *
   20 249   2 80024a74        EtherShare      *
   20 250   2 56010ee6        EtherShare      *
   20 229   2 2be5ffb7        EtherShare      *
   20 141   2 0c027a2f        EtherShare      *
#
```

The zones program

The “zones” program can be used to list the names of all zones that can be found and to quickly find out which zone is the current default zone. You should get the same zone list as that shown in the **Chooser** of Macintosh computers connected to the same network segment. If given an “-l” argument, only local zones are shown.

Since the “zones” program uses the EtherShare AppleTalk protocol modules, which reference “atalk.conf” for configuration details, mistakes in the latter file will cause you to see less zones than those shown on the Macintosh clients. For example, if you get the zone name(s) wrong for a router, “zones” will not show any zones which exist on the other side of the router.

Mistakes in “atalk.conf” will affect “vpoll”, “poll” and “atechoping”, too, for the same reason.

In the following example, you see all zones and a “*” in front of the current default zone “HELIOS I”:

```
# cd /usr/local/es
# ./zones
* HELIOS I
  HELIOS II
  HELIOS Support
  HELIOS FDDI
  HELIOS Tokenring
#
```

4.6 The client installation procedure

Several Macintosh applications were copied to the directory “$ESDIR/macapps” and its subdirectories when installing EtherShare. They are available to all Macintosh computers on the network in the “EtherShare Applications” volume and can be installed using the “EtherShare Client Installer” which is described below.

➢ You should save your work and quit all applications before using the installer because you will have to restart your Macintosh after successful installation.

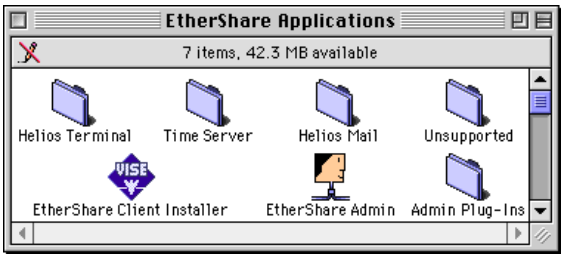

Fig. 9: Items on the “EtherShare Applications” volume

➢ To install our Macintosh applications, mount the “EtherShare Applications” volume and double-click the “EtherShare Client Installer” (compare figure 9).

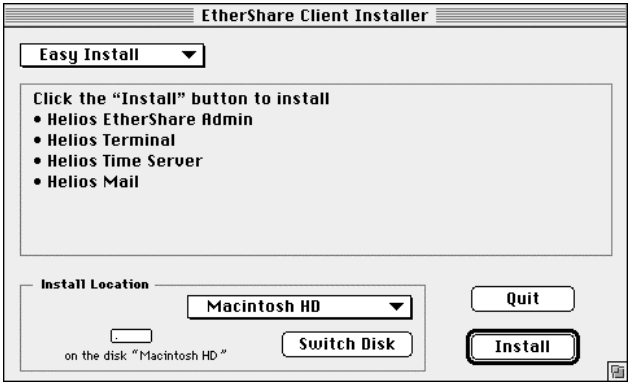

Fig. 10: Installing the EtherShare Macintosh applications

With the **Easy Install** option (see figure 10) the installer program copies the EtherShare Admin program, the terminal emulation (Helios Terminal), and the mail program (Helios Mail) to the Apple folder (🍎) of your client computer. If older versions of these applications exist in the Apple folder, they will be overwritten. The Helios Time Server will be added to the **Chooser**. The result of **Easy Install** is shown in figure 11 below.

If you use **Custom Install** (instead of **Easy Install**) you can install two additional items, namely the OPI Tools "touch" and "Tagger". Both programs are only meant for EtherShare OPI 2.1 users and thus are described in the EtherShare OPI documentation.

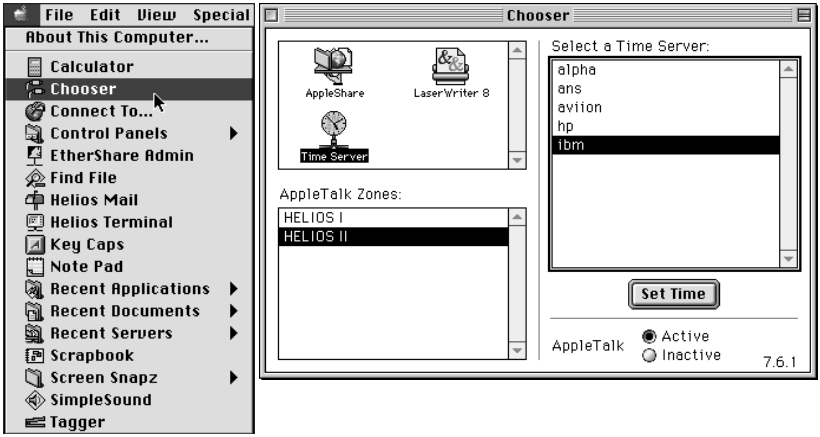

Fig. 11: The client Apple menu and the Time Server utility

In order to work properly, Helios Terminal and Helios Mail both need to access the ADSP driver. Helios Terminal also needs to access the Macintosh Communications Toolbox, the communication tool “AppleTalk ADSP Tool”, and the emulation tool “VT320 Tool”. The Helios Mail program requires the “Mail Notification Program” (“Helios Mail Init”). All these drivers or tools are either available with the system software or installed automatically by the “EtherShare Client Installer”:

Mac OS 7.5 and higher already includes the Macintosh Communications Toolbox and the ADSP driver in the operating system. The “AppleTalk ADSP Tool”, the “VT320 Tool”, and the “Helios Mail Init” are copied automatically from the “EtherShare Applications” volume to the “Extensions” subfolder of your local System Folder.

- You have to restart your Macintosh after successful installation.

- Repeat this procedure for each Macintosh that needs to use the client applications and then proceed to chapters 5 “EtherShare Admin” and 6 “HELIOS Mail” in order to set up users, groups, printers, and volumes, and in order to configure the Helios Mail program. Helios Terminal and the Time Server are described in the chapters 7 “HELIOS Terminal” and 16 “The Time Server”.

4.7 Uninstalling EtherShare

4.7.1 Deleting the Macintosh utilities

If you want to uninstall EtherShare completely, please, first of all, open the EtherShare Admin program to delete all printers which are registered for use with EtherShare. This is indispensable for removing EtherShare from the server (see chapter 4.7.2 “Deleting the EtherShare UNIX software”). Furthermore, you should delete all data files from the EtherShare volumes and the volumes themselves.

➢ The Macintosh utilities can be deleted by simply putting them into the trash. You have to remove the following items:

- Helios Terminal and any connection documents it has created
- EtherShare Admin
- Helios Mail
- the “Mail Preferences”, “Terminal Prefs” and “EtherShare Prep” (from the “Preferences” subfolder of the System Folder)
- the “AppleTalk ADSP Tool”, “VT320 Tool”, “Helios Mail Init”, and “Time Server” (from the “Extensions” subfolder of the System Folder).

4.7.2 Deleting the EtherShare UNIX software

Two steps are necessary to delete the EtherShare UNIX software.

- First of all, you have to use the EtherShare Admin to delete all printers which are registered for use with EtherShare. Delete all jobs and spool directories under UNIX. Additionally, delete all EtherShare volume directories under UNIX.

- After this, you can delete the EtherShare software itself by entering a command similar to the following:

```
cd /usr/local/es
./stop-atalk now
./etc/uninstall
cd ..
rm -r es
```

  Replace “/usr/local/es” in the above command with your “$ESDIR” path if you did not use the default directory.

  The “uninstall” script disables any kernel modifications made by the EtherShare installation. The kernel changes will be removed completely the next time you do a rebuild of the kernel. Some systems also need to be rebooted. If your system did not need any kernel modifications for EtherShare, “uninstall” is a dummy script.

4.8 Installing updates using the HELIOS update installer

If EtherShare is already running on your server you can use the EtherShare Admin on a Macintosh client to get information about the current update level of the EtherShare modules. Log in as “root” or “SysAdm” and open the **Versions** window as described in chapter 5.13.6 “Versions”. This window lists all modules of EtherShare and the respective update level. For example, the entry “afpsrv 2.5.0u0117” indicates that the HELIOS *update u0117* is already installed.

The **Versions** window, however, is sorted by module names and does not give an overview about updates. Thus, it is more reliable to insert the HELIOS CD-ROM and use the update installer (options `List Updates` and `List History`) for precise information about the update level on your server. The update installer is described below.

Availability of updates

New HELIOS updates are available on every new distribution CD-ROM and can also be downloaded from our Web server. If you receive a new CD-ROM and want to add the updates on this CD-ROM to your EtherShare installation you should check the `/updates` directory for the update program files and the `/support/techinfo` directory for detailed descriptions of the updates.

The HELIOS update installer

For update installations, we strongly recommend to use our update installer. The tool is able to find and install all updates that are required for a particular product and to check interdependencies of certain updates. The installer is easy to handle and can also be used to retrieve information about updates or to uninstall a particular update, if required.

➢ To start the update installer, mount the CD-ROM, open the “Networking Products Installer CD-ROM” menu as described in chapter 4.4 “The UNIX installation procedure”, and select item `Install Updates` (compare figure 12).

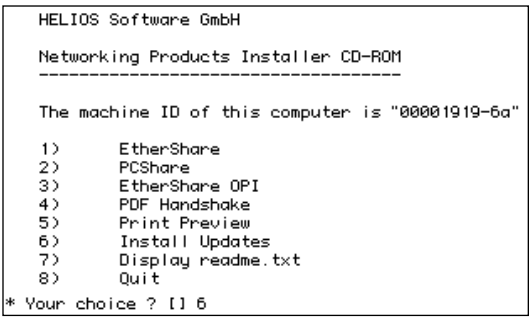

Fig. 12: Starting the HELIOS update installer

The update installer offers seven different options in its main menu (see figure 13):

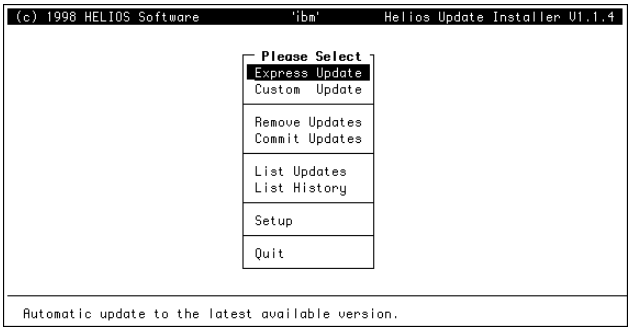

Fig. 13: Menu of the update installer

- `Express Update` will induce the installer to automatically perform the installation of all available updates for the chosen product.
- `Custom Update` lets you select the updates you want to install.
- `Remove Updates` allows you to uninstall certain updates.
- `Commit Updates` removes backup files and makes updates permanent. Usually, if you install an update, the system stores a backup file of your old EtherShare version. This allows you to uninstall the update in case of problems and to return to your initial installation. If new updates work as expected you may want to remove the backup files. This can be achieved by using the `Commit Updates` option.
- `List Updates` lets you list all available updates, and can also be used to display the update info texts that describe the purpose of the respective updates.
- `List History` gives information about the date of previous update installations. The list tells you who did what, and when he did it.
- `Setup` allows you to set preferences, e.g. change the search path. This can be necessary if you move the update files to another directory, or if you have the CD-ROM and additional update repositories.

Precautions

Note that the update installer does not automatically stop EtherShare, because this is usually not required. However, to avoid problems, we recommend to stop all printer queues before starting to install updates and to stop and restart EtherShare (commands `stop-atalk` and `start-atalk`, respectively), some time after update installation to make the newly installed modules available. You *must* stop EtherShare before you select the update installer's `Commit` option. Otherwise, serious problems can arise.

Important: We recommend to install the programs on the server in a fixed order, namely the order that is suggested by the installation menu on your current product CD-ROM. The following order is valid for the HELIOS products as delivered on CD-ROM 015:

– install EtherShare 2.6 first
– install PCShare 3.0 second
– install extensions or add-ons (EtherShare OPI, PDF Handshake, Print Preview) third.

Skip those modules which are not installed.

Navigating the update installer

The items in the main menu can be selected by typing the first letter. Typing `s`, e.g., will highlight the `Setup` item.

You can also use the ARROW keys for up and down navigation within a list of items.

Press ENTER to open a pop-up menu – in case there is one available. The ENTER key also activates the item that is currently highlighted.

Use the TAB key to proceed from one option in a dialog window to the next one, e.g. from the `Cancel` to the `Ok` button.

The ESC key always lets you return to the start-up window and the main menu which is shown in figure 13.

The Setup window

To install new updates, you should always open the `Setup` dialog first and check whether the update search path is correct (compare figure 14).

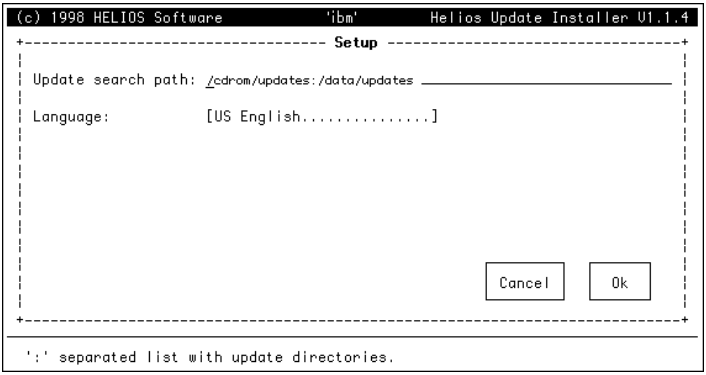

Fig. 14: The “Setup” dialog window

If you have to replace the path entry use the BACKSPACE key to delete the old one. You can enter several search paths at a time, in case you have different updates repositories. In figure 14, e.g., we have defined two search paths. They are separated by a “:”.

The Express Update window

The easiest way of installing updates is to use the `Express Update` option. In the “Express Update” window (see figure 15), you only have to select the product you want to update. The correct `Install path` is detected automatically

by the update installer. However, it is possible to overwrite the path entry. The installation will be performed automatically when you click the `Ok` button.

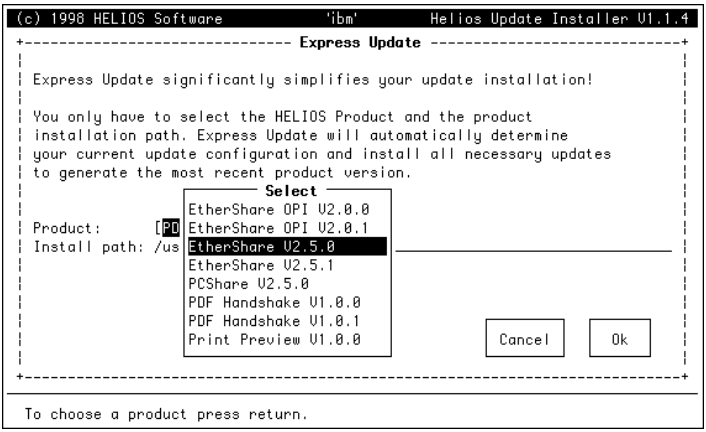

Fig. 15: The “Express Update” dialog window

The List Updates window

The “List Updates” window is for information purposes. It lists all updates that are related to a certain product and indicates the state of each update. This means, you can see e.g. whether an update is applied, already superseded, or

not installed (compare figure 16). If you select an update from the list and press ENTER the update installer will display the corresponding update info text.

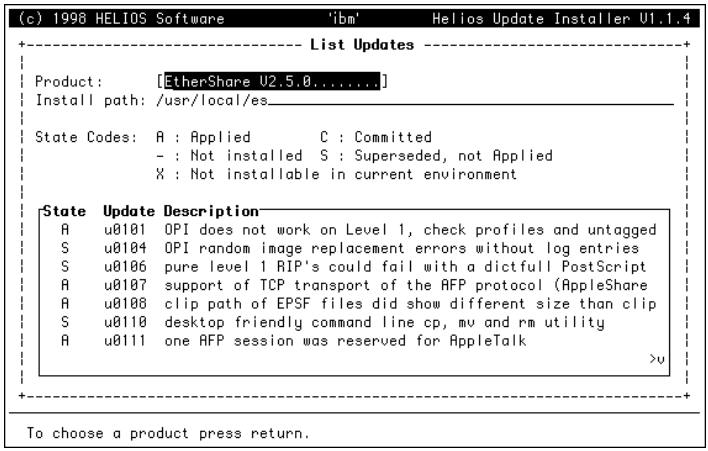

Fig. 16: The “List Updates” dialog window

The Remove Update window

Some updates change the behavior of certain product modules. To uninstall updates you do not want to work with, use the `Remove Update` option. The respective dialog window is shown in figure 17.

Note that there may be interdependencies between several updates. This means that certain updates cannot be removed as long as they are required by other updates that are still installed. You can display in the dialog window either all removable, or all not removable updates. Remember that updates you have already committed can no longer be removed.

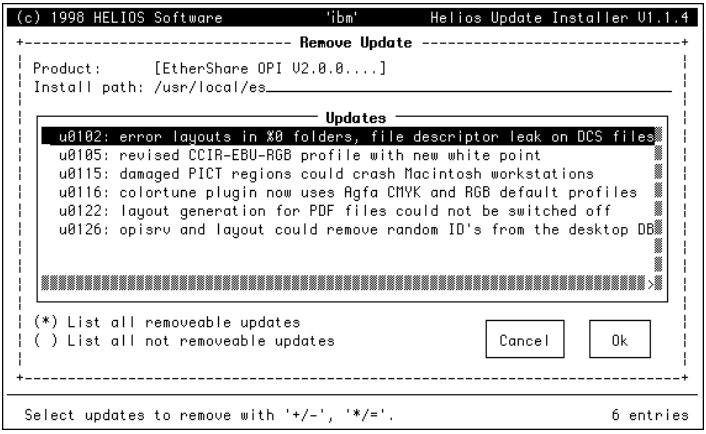

Fig. 17: The “Remove Update” dialog window

The following keys are available to select updates to remove:

- + select one item
- - unselect one item
- * select all items
- = unselect all items

Commit updates

Please remember that you have to stop EtherShare before committing any updates. Otherwise, the `Commit` command could “kill” certain processes.

Updates for Macintosh applications

If a certain update contains a new, revised Macintosh application, e.g. a new EtherShare Admin, this application will be copied to the “EtherShare Applications” volume by the update installer. You have to mount the volume on your Macintosh clients and replace any old local copies of the respective application.

5 EtherShare Admin

5.1 General remarks

This chapter describes the use of the Macintosh application EtherShare Admin by the system administrator or other designated persons in order to configure the EtherShare system from any Macintosh workstation in a convenient and secure way. It can also be used to set up regular users, groups, and printers on the server. In a multi-host environment, you can make several EtherShare Admin connections simultaneously to copy certain configuration data between two or more hosts.

EtherShare Admin is also available to other, regular EtherShare users, to allow them to inspect the current EtherShare configuration and printer queues, but only designated persons can make changes (see **Security – who can use the EtherShare Admin?** below).

In order to use the EtherShare Admin, the Administration Server must already be running on the host you want to configure. EtherShare is configured to start this server automatically when the system is booted. The Administration Server communicates with the EtherShare Admin through a custom protocol derived from the AppleTalk Filing Protocol (AFP), which was especially developed by HELIOS for this purpose and is transparent to other AppleTalk devices, or via a TCP/IP connection which allows for managing multiple servers remotely and supporting concurrent AppleTalk and TCP/IP connections.

Important: With the EtherShare Admin, version 2.6, you cannot configure a version 2.2 (or older) EtherShare. The other way round, a version 2.2 Admin cannot be used for setting up EtherShare 2.6 on the server.

Other chapters in this manual describe how administrative work, which is required to configure and maintain the EtherShare System, can be carried out directly on the host, e.g. with the help of a standard editor program such as vi. Most of these tasks can be carried out much easier by using the Macintosh application EtherShare Admin from one of the Macintosh workstations.

The EtherShare Admin application offers a high degree of convenience to the system administrator. The user environment of the Macintosh allows the host configuration to be represented graphically with lists and windows. The EtherShare Admin allows users, groups, volumes, and printers to be installed, configured and deleted from one of the workstations. You can also interrogate each PostScript printer for available resident fonts and install download fonts to the print server.

The EtherShare Admin accesses and modifies various system configuration files, just as if the changes had been made with an editor. However, the EtherShare Admin and the Administration Server have built-in safety checks to ensure that conflicting or invalid configuration settings are not possible.

Changes to the configuration files “afpvolumes” and “suffixes” will be recognized immediately by all “afpsrv” processes.

Any changes applied directly to the configuration files “suffixes” and “afpvolumes” with EtherShare Admin do not require a new login. However, changes that have been applied manually or without using EtherShare Admin at all, still require that AppleShare clients unmount all volumes from the EtherShare server and login anew.

Benefits:

- Any new suffix mappings or changes to existing ones will be available immediately.
- Any new EtherShare volumes will be available immediately.
- Any changes to EtherShare volumes, e.g. setting "Groups" membership, will be available immediately.

Potential drawbacks:

- Any changes to EtherShare volumes, e.g. removing volumes, changing volume mount points, switching volume characteristics to "Read Only", "Invisible", or changes in "Groups" membership may result in side effects for AppleShare clients. This may range from write errors to volumes getting dismounted (!), etc.
- Especially removing access to volumes for clients that still have documents open on that volumes might cause damaged or only partially saved documents.

Make it a habit to use EtherShare Admin's feature of sending messages to connected Macintosh clients to notify these in advance of potential damaging chances. You can verify with **Lists/Active Users** which user does have certain volumes in access. Just open this menu before you save any settings to volumes and it will list the currently logged-in AppleShare clients. The **Lists/Active Users** will be updated automatically every 15 seconds.

Security – who can use the EtherShare Admin?

The EtherShare Admin is available to all EtherShare users, to allow them to inspect the current EtherShare configuration and printer queues, but only the system administrator and members of three special groups are allowed to make

any configuration changes or delete and re-schedule print jobs.

Members of the System Administrator group (default group name “SysAdm”) can do all tasks that the system administrator can do with the exception of changing user data for any users with a user ID less than 100 (note: the system administrator has a user ID of 0).

Members of the Printer Administrator group (default group name “PrnAdm”) can perform print job related tasks.

The additional Queue Administrator group (default group name “QueueAdm”) can change queue settings, i.e. perform all tasks which are related to printer queue configuration and printer queue management.

“PrnAdm” is allowed to:

- delete a job
- move a job to another queue
- change a job’s priority
- set a queue to **Spool only** / **Spool and Print**
- restart a printer queue (with **Lists/Printers/Printer/Restart Printer**)

“QueueAdm” is allowed to:

- perform any task “PrnAdm” is allowed to do
- create/change/remove printer queues
- update fonts for queues
- download fonts to the EtherShare server
- adjust **PDF Settings**
- adjust **OPI/ICC Settings**
- adjust **Edit Initialization** settings
- specify PPDs for queues

5.2 Starting the EtherShare Admin

During the installation of EtherShare, the “install” program automatically creates a public Macintosh volume called “EtherShare Applications”. This volume is used to store Macintosh applications such as Helios Terminal, Helios Mail and EtherShare Admin.

➢ You can start the EtherShare Admin from any of the Macintosh workstations on the network by opening the network volume “EtherShare Applications” and clicking twice on the EtherShare Admin icon. Alternatively – if you have installed the Macintosh applications on your local Macintosh as described in chapter 4.6 – you can start the EtherShare Admin program from the menu.

After loading, the EtherShare Admin normally shows a copyright notice (compare figure 18), unless you have changed your preferences (see chapter 5.4 “Setting Admin preferences”).

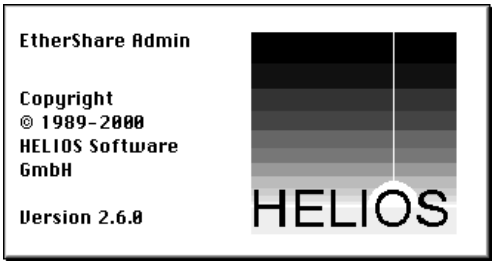

Fig. 18: EtherShare Admin Copyright Notice

5.3 Logging on to the Administration Server

➢ Log on to the Administration Server (AppleTalk or TCP/IP) by choosing **Login...** from the **File** menu (figure 19).

Fig. 19: Choosing **Login...** from the **File** menu

via AppleTalk

When you choose **Login...** for the first time, the EtherShare Admin opens a window to let you choose the EtherShare host you want to connect to (compare figure 20).

Use the list on the left to choose the zone where the EtherShare host is located. The list shows all known zones. Unless you have external routers in your network, only the zones from internal EtherShare routers will be visible. If you only have one zone (because you only have one hardware interface, or because other zones are not available for some reason), you will see an asterisk "*" (representing the current zone) instead of a zone name. After choosing the zone, the list on the right shows all hosts in the chosen zone you can connect to (i.e. all hosts that are running the Administration Server). If you click the **Server IP Address...** button, the TCP/IP login window (figure 22) appears instead and you can log in as described below in **via TCP/IP**.

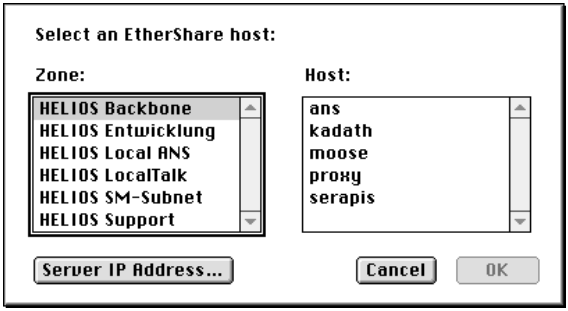

Fig. 20: Selecting an Administration Server via AppleTalk

➢ Choose the host you want to connect to and click **OK**.

The EtherShare Admin then opens a window to allow you to log on to the Administration Server by entering your EtherShare user name, or full name, and password (see figure 21):

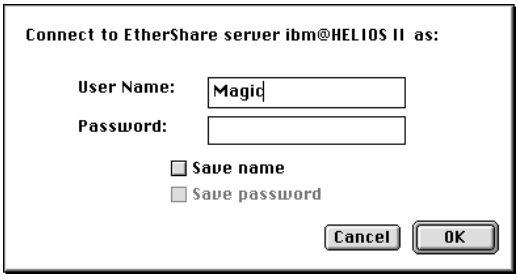

Fig. 21: Dialog for **User Name** and **Password** (AppleTalk)

via TCP/IP

Likewise, logging on to the Administration Server via a TCP/IP connection is also possible by choosing **Login...** from the **File** menu (see figure 19).

When you choose **Login...** for the first time, the EtherShare Admin opens a window to let you enter the EtherShare host name you want to connect to (compare figure 22). Clicking the **Server via AppleTalk...** button lets you log on to the Administration Server via AppleTalk as described above in **via AppleTalk** (compare figure 20).

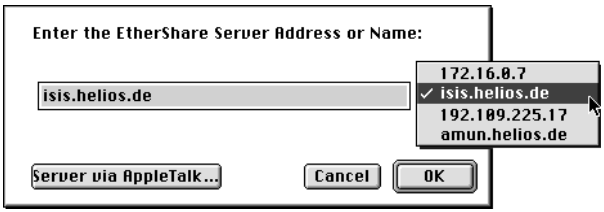

Fig. 22: Selecting an Administration Server via TCP/IP

➢ Enter the EtherShare host name, or the IP-address, you want to connect to and click **OK**.

The EtherShare Admin then opens a window to allow you to log on to the Administration Server by entering your EtherShare user name, or full name, and password (see figure 23):

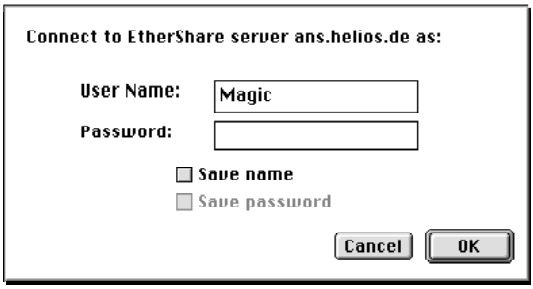

Fig. 23: Dialog for **User Name** and **Password** (TCP/IP)

Logging in via AppleTalk or TCP/IP

The **User Name** default entry is the one that is specified in the **File Sharing** dialog on the Macintosh. If an individual user name is not yet configured you have to log in as “root” which usually is the name of the system administrator on a UNIX system. To log in as “root”, you have to know the “root” password.

When you log in for the first time, you have the option of choosing **Save name** and/or **Save password**. If you check both you will not have to log in manually the next time you start the EtherShare Admin. The name and password are stored in a hidden file on your local hard disk.

Important: For maximum security do not use the **Save password** option.

If you have checked **Save name**, the EtherShare Admin makes a note of your name, and the zone and name (or IP-address, respectively) of the Administration Server you want to use. The next time you start the EtherShare Admin, you only have to enter your password.

If necessary, you can log on to more than one host at the same time – see chapter 5.15 “Multiple EtherShare hosts”.

➢ Click **OK** when all inputs have been made.

The EtherShare Admin then attempts to make the connection to the chosen server. If your inputs were correct, one or more **Lists** windows should now appear automatically (unless you have changed your preferences as described later).

Figure 24 shows the EtherShare Admin menu and four of the available **Lists** windows.

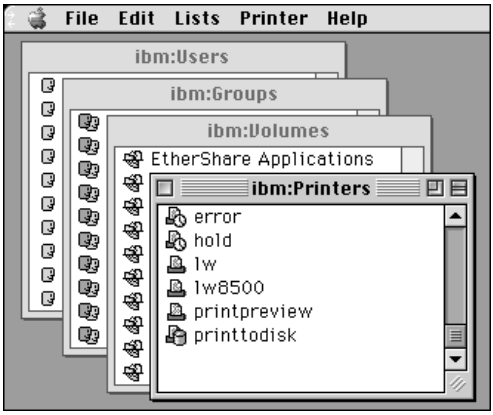

Fig. 24: Four of the **Lists** windows for host “ibm”

Note: By default, only a maximum number of clients (i.e. users) are permitted to work with the EtherShare Admin concurrently. See also **sessions** in chapter 9.4 “Parameters of the “afpsrv” program”

5.4 Setting Admin preferences

➢ Choosing **Preferences...** from the **Edit** menu opens a window that allows various standard settings for the EtherShare Admin to be changed according to your individual taste (see figure 25).

The settings are stored in the Admin preferences file “EtherShare Prep” on your local hard disk, whenever you click **OK** in the “Preferences” window. This allows EtherShare Admin to be configured individually for each workstation.

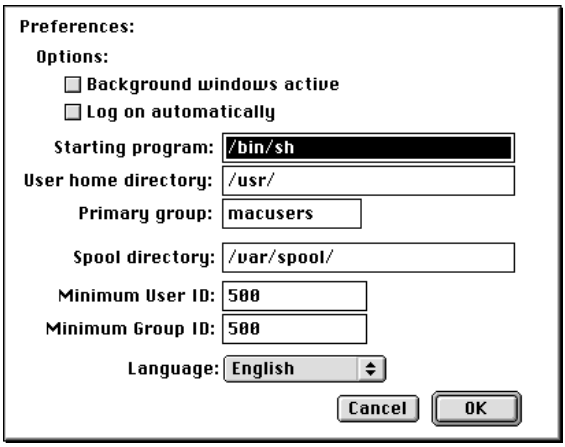

Fig. 25: The “Preferences” window

Technical note for system integrators: The default spool directory is “/var/spool”. Depending on the operating system and configuration “/var/spool” may reside on root “/”, “/var”, or on another file system. You should always verify the free space in the spool directory you choose, because

the space requirements may be high during printing. To verify the free space available, go to "/var/spool" (`cd /var/spool`) and issue the "`df .`" command. Compare the free space value to other file systems by using the "`df`" command. If necessary, establish a separate file system for spooling.

Window positions

Information about which windows are open (and about their positions and sizes) are stored in the Admin preferences file "EtherShare Prep". This allows you to arrange windows according to your individual taste, and have the arrangement retained between sessions. However, this only works if you have checked **Save name** in the Login dialog.

Background windows active

Background windows active specifies whether a background (i.e. non-active) window should react immediately to a mouse click, or whether the mouse click should initially swap the window into the foreground (activate it). When carrying out comprehensive work with a number of lists, an active background window can save much time by allowing rapid selection.

Log on automatically

Log on automatically specifies whether the EtherShare Admin should immediately start with the Login dialog, or if you want to choose **Login...** from the **File** menu manually.

Save name also causes auto-login. The **Log on automatically** checkbox is ignored if **Save name** is checked, and EtherShare Admin will immediately open the windows last specified with your preferences after you have entered your password. If you have also checked **Save password**, the Login dialog will be skipped, too.

Important: For maximum security do not use the **Save password** option.

Starting program, User home directory, Primary group

Three of the default parameters which are prompted when creating a new user can be specified here: the user's **Starting program** (login), the **User home directory,** and the **Primary group**. Setting appropriate defaults can save time when creating new users, since these three fields are generally configured with similar entries. The entry in the **User home directory** field should be terminated with a "/" character.

Spool directory

Use this field to configure the default spool directory to be used when creating a new printer. Setting an appropriate default can save time when setting up new printers, since this field is generally the same for all printers. The entry in the **Spool directory** field should be terminated with a "/" character. If required, the spool directory can be set to swap out the spool files to other file systems (hard disks), but you should avoid NFS-mounted spool directories because of the performance loss.

Important: When setting up a new printer in the **Spool directory** field make sure the directory already exists!

Minimum User ID, Minimum Group ID

Minimum User ID and **Minimum Group ID** specify the lowest number allowed for user numbers (user IDs) and group numbers (group IDs). This parameter is provided as an additional security feature.

Language

The pop-up menu **Language** is used to select the desired dialog language for menus, messages and screen prompts. The default for this field is the language setting of your Macintosh system file or English if the local language is not supported. If you change **Language**, you must close and reopen each window before the new language will take effect.

EtherShare Admin also supports plug-in modules that define new languages. This feature allows additional language localizations without the need to release an update to EtherShare Admin. The first *external* module supports Japanese.

To be able to access the new Japanese language module, you have to mount the “EtherShare Applications” volume. The “Admin Plug-Ins” folder contains the external language module (see figure 26) and once you have mounted the volume, Japanese will automatically appear in the **Language** pop-up menu.

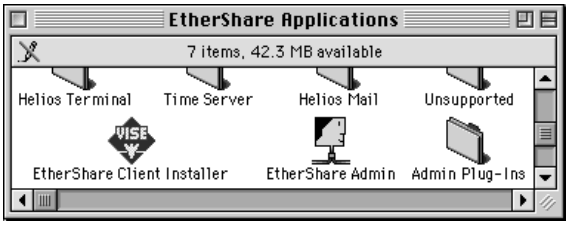

Fig. 26: “Admin Plug-Ins” folder on the “EtherShare Applications” volume

Note that the languages that are included in the EtherShare Admin binary, cannot be overwritten by a plug-in module.

Saving your preferences

If you make any changes in the “Preferences” window, they are only valid after clicking **OK**. Click **Cancel** to close the **Preferences** window without saving changes.

5.5 About list windows

Window titles always show the name of the chosen Administration Server (normally the host name) and the function of the window. List windows have a scroll bar on the right hand side to enable the list to be scrolled up and down. Lists are available for users, groups, volumes, printer queues, Print Server fonts, active users, log and message files, versions, extension mappings, and IP access (compare figure 27). The items **OPI Server Settings...** and **PDF Settings...** in the **Lists** menu are only active if you have purchased and installed HELIOS EtherShare OPI, or HELIOS PDF Handshake, respectively. Otherwise they are grayed out.

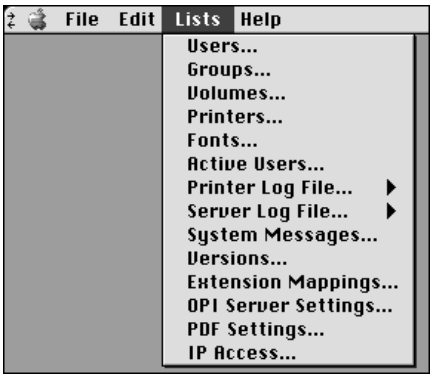

Fig. 27: EtherShare Admin **Lists** menu

If the required list windows do not appear immediately after logging on, use the **Lists** menu to open the required lists manually. Information on which windows are open (and on their positions and sizes) is stored in the Admin preferences file “EtherShare Prep”. This allows you to arrange windows according to your individual taste, and have the arrange-

ment retained between sessions. However, this only works if you have checked **Save name** in the Login dialog.

List limits

The number of entries a list (users, groups, fonts, etc.) can hold, is limited. The current limit (independent of adjusted memory in the Macintosh Finder info field) is 8192 entries, and it is, due to a limitation of the Macintosh list manager, used to display these lists. Usually, only very large sites with more than 8000 users or more than 8000 fonts stored on the EtherShare Print Server may encounter this problem. The lists will be displayed but may not sort or hold all entries.

Selecting multiple entries from a list

The EtherShare Admin is generally compliant with standard Macintosh conventions (e.g. keyboard shortcuts) for selecting multiple entries (such as users) from list boxes. This saves time if you want to open multiple windows, for example.

Use **Shift**-click to select a range of entries and use **Command**-click to select/deselect individual entries from a list. Go to the top of a list and type a letter to jump to the first entry that starts with that letter.

EtherShare Admin also issues warning messages before some operations. You can suppress the warnings by pressing and holding the **Option** key when choosing the operation.

5.6 Users list

The **Users** list shows all users known to the host. The Administration Server automatically creates this list by inspecting the host's system file "/etc/passwd" (or the appropriate yellow pages file, see chapter 13.5 "Configuration with Yellow Pages").

➢ If the **Users** list is not already open, choose **Users...** from the **Lists** menu (see figure 28).

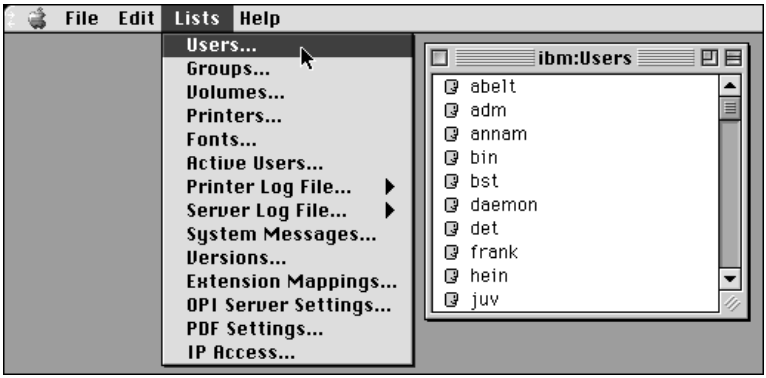

Fig. 28: **Users** list on host "ibm"

Changing user data

In order to change the parameters for a particular user, you have to open the user's window that displays all available information about him/her (see figure 29).

➢ Select the required user and choose **Open** from the **File** menu (or double-click on the user name).

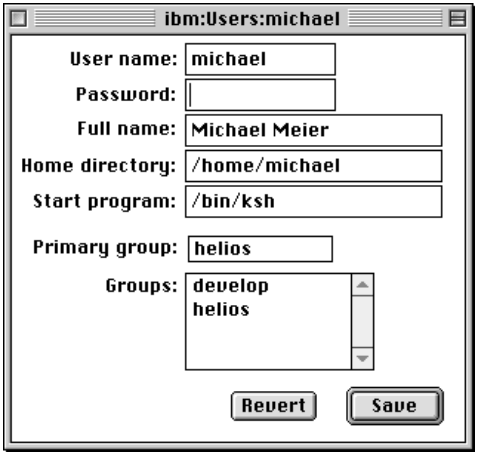

Fig. 29: User data for user “michael” on host “ibm”

The window title shows the name of the Administration Server, the window type **Users**, and the user name.

The window shows the **User name** (case sensitive!), the user **Password** field (case sensitive!), the **Full name** of the user, the **Home directory** of the user, the **Start program**, the **Primary group** and the list of **Groups** to which the user belongs. Note that the latter also includes the user’s primary group.

The **Password** field is always displayed empty – this field is only used when the system administrator needs to change or define a user’s password. Note that users can also change their own passwords themselves, with the **Change password...** button in the Macintosh **Chooser**.

Important: You must not use accented characters (umlauts) in the **User name**, **Home directory** or **Start program** fields. It is best not to use them in the **Password** and **Full name** fields either; otherwise, your UNIX login will be different from your Macintosh login. Moreover, to be on the safe side, your **User name** and **Password** should not exceed eight characters.

The Administration Server gets the user information from the file "/etc/passwd", with the exception of the list of groups to which the user belongs, which is obtained from the file "/etc/group". If yellow pages (NIS) is installed, the information is obtained from the appropriate yellow pages files instead.

It is now possible to change any of the fields as required; editing is carried out "as usual" in a regular Macintosh environment. Note that the user **Home directory** field can be left blank, but a starting program and a primary group are obligatory. If the user should not receive the rights to access the UNIX shell, "/bin/date" can be entered in the **Start program** field. If the user **Home directory** field is left empty, a private user volume will not be provided by the File Server. Otherwise, it is provided automatically by EtherShare (see also **homedir** in chapter 9.4 "Parameters of the "afpsrv" program").

Note: "/" as EtherShare volume is not allowed at all. Use another directory if "root" needs a private volume.

In order to assign an additional group to the user, activate the **Groups** list and click on one of the group names. Without releasing the mouse button, drag the name away from the list – a dotted frame is drawn around the selection – and

release the mouse button over the user's list of groups (compare figure 30). The list will appear bold when the cursor is positioned correctly.

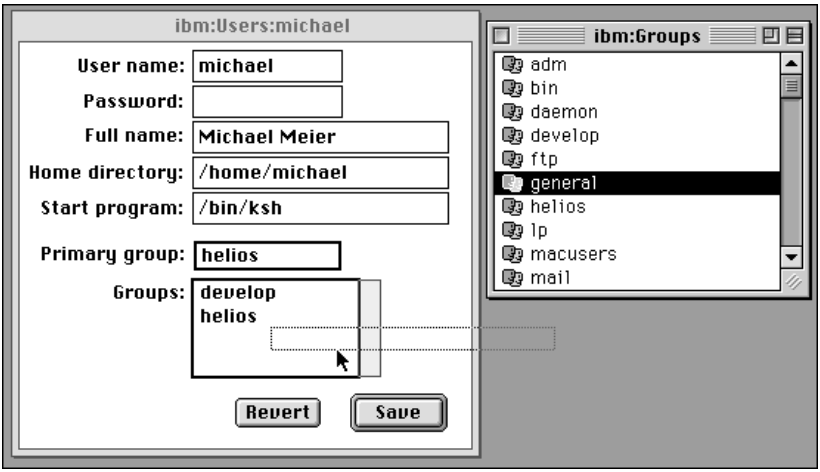

Fig. 30: Assigning group "general" to user "michael" on host "ibm"

Provided that the user is not already a member of this group, the group is assigned to the user and the user is now a member of the group. Most UNIX hosts only allow up to 8 or 16 groups per user.

Please note that this procedure is only possible between user lists and group lists on the same host (see also chapter 5.15 "Multiple EtherShare hosts").

In order to delete a group from the user's assignments, select the group and choose **Clear** from the **Edit** menu. This operation should not be confused with deleting a group from the **Groups** list. Solely the membership of the user in

the group is deleted, which is not the same as deleting the group from the system.

Any user must be a member of at least one group. So, if you delete all entries from the user's list of groups, the user will automatically become a member of the group "nogroup" (though the entry "nogroup" is invisible in the user's list of groups).

➢ If you make any changes in the user data window, they are only valid after clicking **Save** and only take effect with the next user login. Provided that the changes have not been saved, the **Revert** button can be used to recall the original data. If an attempt is made to close the window without saving or reverting changes, the EtherShare Admin prompts whether saving should be carried out or not.

Changing user passwords

When amending and saving user data, the password is only changed if an entry has been made in the **Password** field. Note that the **Password** field is always shown empty, even if the user has already been allocated a password. On changing the password, the EtherShare Admin prompts for the new password to be entered once again, to ensure that no typing mistakes have been made (see figure 31).

Fig. 31: Re-typing the new user password

The changed password is entered in the file “/etc/passwd” and in the optional AFP user list (“$ESDIR/conf/afppasswd”). It is immediately valid, but only takes effect with the next user login. If yellow pages (NIS) is installed, the information is changed in the appropriate yellow pages files instead.

Note that users can also change their own passwords themselves, with the **Change Password...** button in the Macintosh **Chooser**.

Creating users

A new user can be created by filling in a new user data window.

➢ Activate the **Users** list and choose **New** from the **File** menu (see figure 32).

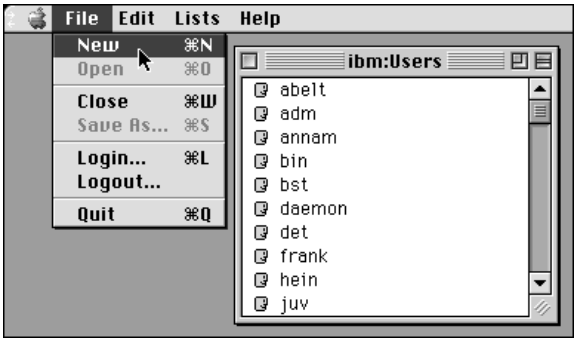

Fig. 32: Creating a new user entry

The EtherShare Admin then opens a user data window which already contains some default values from the “Preferences” window. Fill in or change the fields as required (compare figure 29 above).

When typing in the user name, a suggested home directory is automatically filled into the corresponding field. The default suggestion can be changed if required.

➢ A new user is entered in the server's **Users** list as soon as you click on **Save**. If the user data window is closed without saving, the new user entry is discarded.

On saving the new user, a new entry with the corresponding user data is made in the "/etc/passwd" file. The user ID will be assigned automatically. If groups were specified, these are entered in "/etc/group". If yellow pages (NIS) is installed, the information are changed in the appropriate yellow pages files instead. Note that if NIS+ is installed on your system, user and group data cannot be configured with the EtherShare Admin application.

Note:	EtherShare (with the exception of Helios Terminal) will allow you to log in either with your user name or with your full name.

Note:	The AIX operating system e.g. does not "like" user and group names longer than 8 characters, but the EtherShare Admin does not check for this. If you use longer names, you will receive various UNIX error messages. You may not be able to make a UNIX shell login if your login name is too long, or one of your group names is too long, but you can still log on to the File Server. We recommend to use user and group names of up to 8 characters only.

Deleting users

A user can be deleted from the host as follows:

➢ Highlight the user name in the **Users** list and select **Clear** from the **Edit** menu (see figure 33).

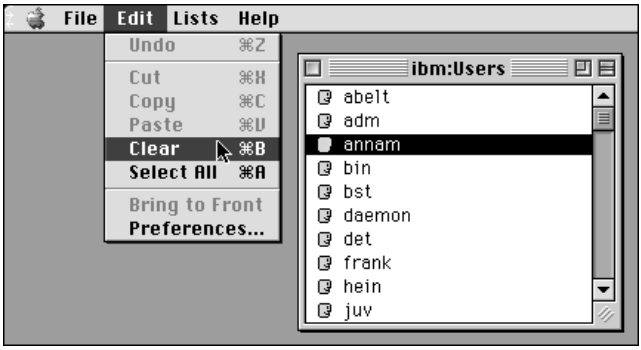

Fig. 33: Deleting a user entry

The Admin then prompts for acknowledgment of deletion, to allow it to be aborted if required (see figure 34).

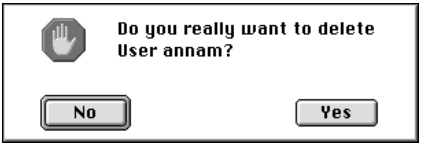

Fig. 34: Confirming deletion of a user entry

If deletion is confirmed, the entry is removed from the window and the corresponding entries are deleted from the files “/etc/passwd” and “/etc/group”. Files in the user’s home directory are not deleted. They must be removed by the system administrator.

Important: Do never delete UNIX users like bin, daemon, etc. This may cause serious problems.

5.7 Groups list

The **Groups** list shows all groups known to the host (see figure 35). The Administration Server automatically creates this list by inspecting the UNIX system file "/etc/group" (or the appropriate yellow pages file).

➢ If the **Groups** list is not already open, choose **Groups...** from the **Lists** menu.

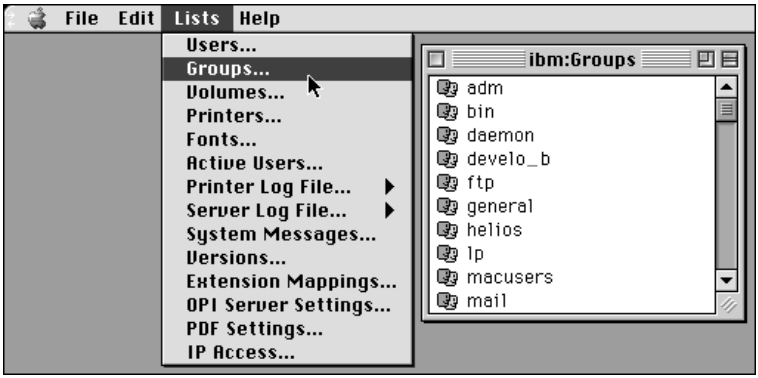

Fig. 35: Groups list on host "ibm"

Changing group data

In order to change the parameters for a particular group, you have to open the data window that displays all available information about the selected group (see figure 36).

➢ Select the required group and choose **Open** from the **File** menu (or double-click on the group name).

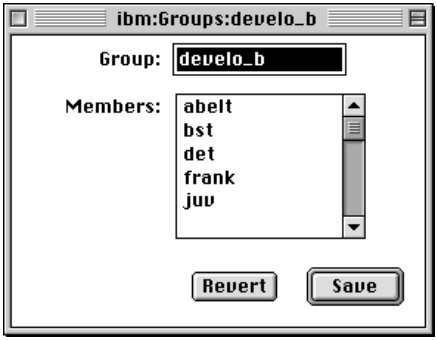

Fig. 36: Group data for group “develo_b” on host “ibm”

The window title shows the name of the Administration Server, the window type **Groups** and the group name. The window shows the **Group** name and the list of the **Members** of the group. The Administration Server gets the group information from the files “/etc/group” and “/etc/passwd” (or from the appropriate yellow pages files).

It is now possible to change the group name and the members of the group.

In order to assign an additional user to the group, activate the **Users** list and select one of the user names. Without releasing the mouse button, drag the name away from the **Users** list – a dotted frame is drawn around the selection – and release the mouse button over the group’s list of members (compare figure 37). The list will appear bold when the cursor is positioned correctly.

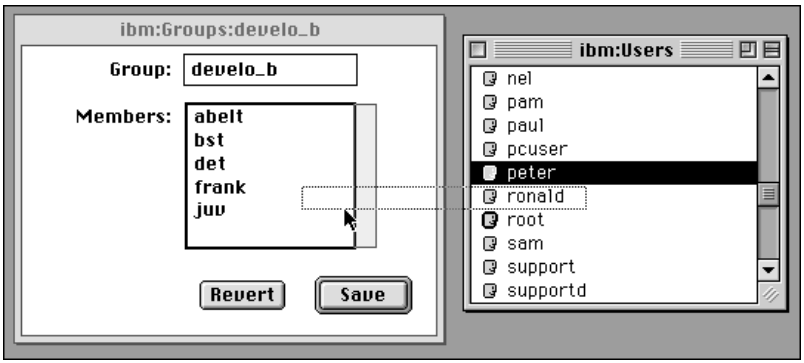

Fig. 37: Assigning user “peter” to group “develo_b” on host “ibm”

Provided that the user is not already a member of this group, he/she will be added to the list of members now. Please note that this procedure is only possible between user lists and group lists on the same host (see also chapter 5.15 “Multiple EtherShare hosts”).

In order to delete a user from the group’s list of members, select the user name and choose **Clear** from the **Edit** menu. This operation should not be confused with deleting a user from the user list. Solely the membership of the user in the group is deleted, which is not the same as deleting the user from the system.

➢ If you make any changes in the group data window, they are only valid after clicking **Save** and only take effect with the next user login. Provided that the changes have not been saved, the **Revert** button can be used to recall the original data. If an attempt is made to close the window without sav-

ing or reverting changes, the EtherShare Admin prompts whether saving should be carried out or not.

Creating groups

A new group can be created as follows:

➢ Activate the **Groups** list and choose **New** from the **File** menu (compare figure 38).

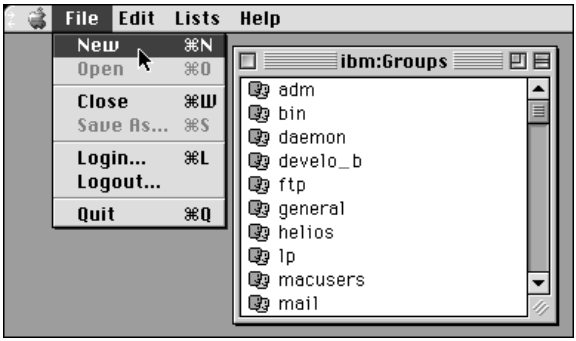

Fig. 38: Creating a new group entry

The EtherShare Admin then opens a new group data window. Fill in the group name and add members to the group as required (compare figure 36 above).

➢ A new group is entered in the server's **Groups** list as soon as you click **Save**. If the group data window is closed without saving, the new group entry is discarded.

On saving the new group, a new entry with the corresponding group data and member list is made in the "/etc/group" file (or the appropriate yellow pages files). The "group id" will be assigned automatically.

Note: The AIX operating system e.g. does not “like” user and group names longer than 8 characters, but the EtherShare Admin does not check for this. If you use longer names, you will receive various UNIX error messages. You may not be able to make a UNIX shell login if your login name is too long, or one of your group name is too long, but you can still log on to the File Server. We recommend to use user and group names of up to 8 characters only.

Deleting groups

A group can be deleted from the host as follows:

➢ Highlight the group name in the **Groups** list and select **Clear** from the **Edit** menu (see figure 39).

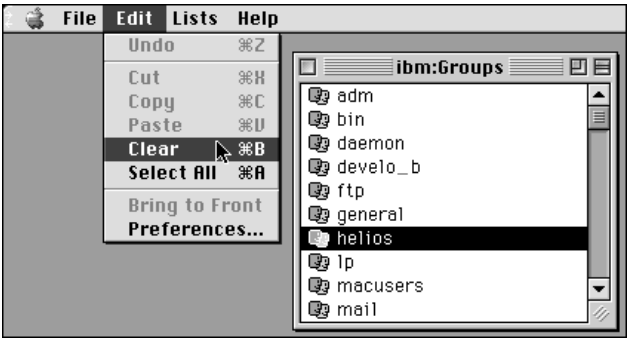

Fig. 39: Deleting a group entry

EtherShare Admin then prompts for acknowledgment of deletion to allow it to be aborted if required (see figure 40).

Fig. 40: Confirming deletion of a group entry

If deletion is confirmed, the entry is removed from the window and the corresponding entry is deleted from the file "/etc/group". The file "/etc/passwd" is checked for users who were assigned that group as their primary group; if any are found, the ID for the primary group in the user's entry in the "passwd" file is changed by convention to the group ID of the group "nogroup". The user must then be assigned a new primary group before he/she can log on again. Also, make sure that the group is not used for the volume **Groups** list of any of the volumes.

If yellow pages (NIS) is installed, the information are changed in the appropriate yellow pages files instead. Note that if NIS+ is installed on your system, user and group data cannot be configured with the EtherShare Admin application.

Important: Do never delete UNIX groups like bin, daemon, lp, or mail. This may cause serious problems.

5.8 Volumes list

The **Volumes** list shows all public AppleShare volumes known to EtherShare (see figure 41). The Administration Server automatically creates this list by inspecting the EtherShare public volume list “$ESDIR/conf/afpvolumes”.

➢ If the **Volumes** list is not already open, choose **Volumes...** from the **Lists** menu.

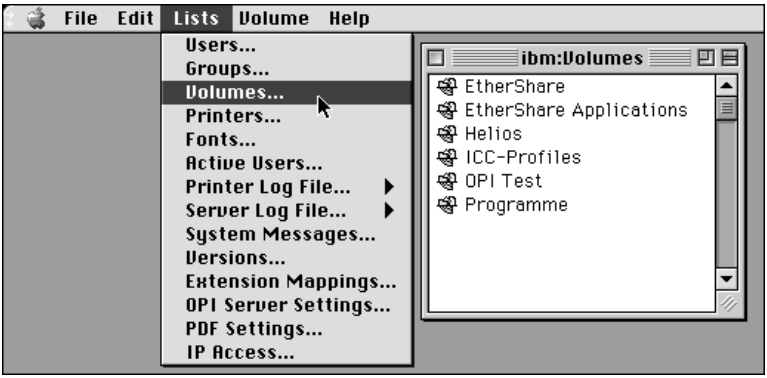

Fig. 41: **Volumes** list on host “ibm”

Changing volume data

Before changing 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, e.g. if you set a volume to “Read Only”.

In order to change the parameters for a particular volume, you have to open the data window that displays all available information about the selected volume.

➢ Open the **Volumes** list, select the volume name, and choose **Open** from the **File** menu (or double-click on the volume name).

Figure 42 shows volume data for a removable magneto-optical disk. In figure 43 a directory of a remote Digital Equipment VAX computer has been mounted through NFS at the local directory "/vax" and made available to EtherShare as the volume "VAX NFS-AFP Gateway".

Note: The options **Create Layouts** and **PC Layouts** in the volume data window are grayed out unless you have purchased and installed HELIOS EtherShare OPI 2.1.

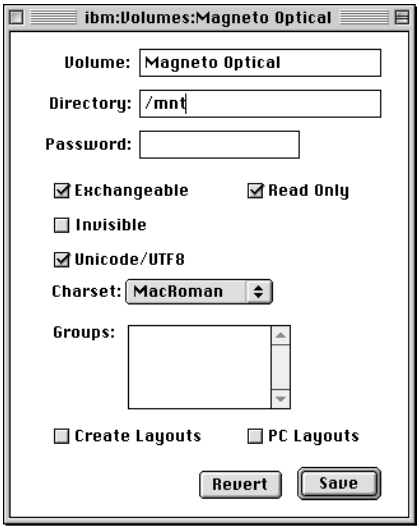

Fig. 42: Volume "Magneto Optical" on host "ibm"

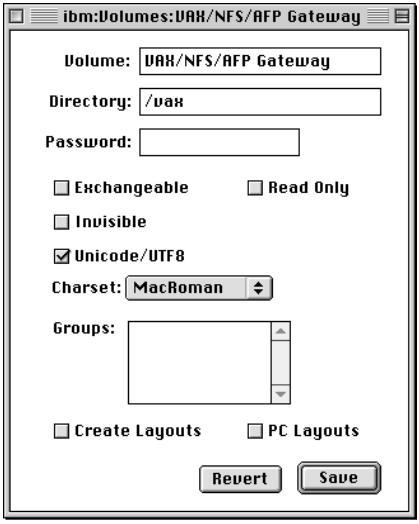

Fig. 43: Remote NFS volume from a digital VAX computer

The window title shows the name of the Administration Server (usually the host name), the window type **Volumes** and the volume name. The window shows the **Volume** name, the name of the UNIX **Directory** where the volume is mounted, the optional **Password** for the volume, and the volume **Groups** list. Note that the password is only displayed (as a matching number of dots) to the system administrator and members of the “SysAdm” group.

The Administration Server finds this information by inspecting the public volume list (“$ESDIR/conf/afpvolumes”).

It is now possible to change the volume name, the UNIX directory of the volume, the volume password, and the checkboxes for **Exchangeable**, **Read Only**, **Invisible**, and **Unicode**. The volume **Groups** list is described later in this chapter.

If you change the **Directory** entry keep in mind that EtherShare does only create one new subdirectory. Parent directories must already exist.

Only check **Exchangeable** for removable media attached to the UNIX host which are normally changed while the host is running (e.g. magneto-optical drives). Do not check **Exchangeable** for local volumes and for storage mounted remotely (e.g. through NFS). The latter is usually mounted automatically on booting UNIX.

Removable media such as magneto-optical disks and CD-ROMs must be mounted with a UNIX command or (preferably) by using the EtherShare Admin, before they can be mounted on the desktop with the **Chooser**.

To mount a removable volume, select the volume in the **Volumes** list of the EtherShare Admin and choose **Mount** from the **Volume** menu.

Removable media must be formatted with a UNIX (UFS) file system which is compatible to your host. They will be unreadable if they are formatted with the Macintosh (HFS) file system.

Make sure the **Read Only** checkbox status reflects the `readonly` flag set under UNIX. This must be checked for exchangeable media which are write-protected with a write-protect tab. Otherwise you will not be able to mount them.

Invisible is used to create, on a specific server, a volume that will not be displayed by the **Chooser** and thus cannot be mounted. This may be useful e.g. if you are working with EtherShare OPI and want to separate your File Server from your Print Server, in order to prevent users from working on the Print Server – which is only needed for storing high-resolution images and replacing images during printing. The specific volume (e.g. /hmac) must be available on both servers but users have to work on the File Server only in order to avoid too much traffic on the network. In that case, you have to activate **Invisible** for the specific volume on the Print Server (compare the illustration in figure 44).

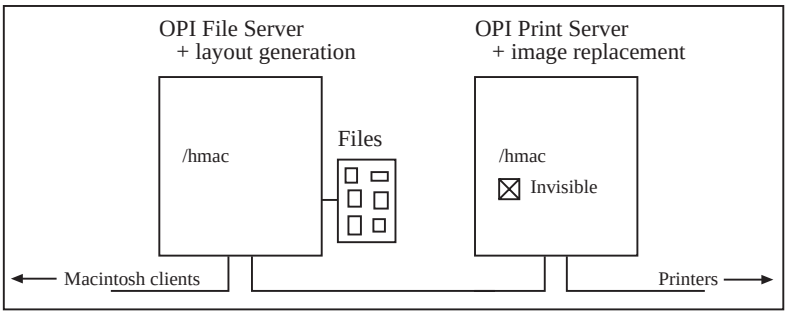

Fig. 44: Applying the **Invisible** option to a specific volume

With the checkbox **Unicode/UTF8** ticked, the character set encoding for the specific volume is set to Unicode. This provides a correct cross-platform file name transfer (particularly if the names contain special characters such as Umlauts) between Macintosh clients, PC clients (provided that HELIOS PCShare is installed), and UNIX servers; on all machines the file names are displayed in the same way.

The pull-down menu **Charset** lets you select the character set which is appropriate for your workstation's setup. You can select **MacRoman** or the Japanese **SJIS** encoding, depending on which OS you are running or what language kit is installed on your Macintosh client. More character sets will be available as plug-ins.

The pull-down menu **Charset** appears grayed-out if the **Unicode/UTF8** checkbox remains unticked since in this case the character encoding is automatically set to the old EtherShare character set (compare **Calling "rebuild"** in 10.2 "The Desktop Server Program").

➢ If you make any changes in the volume data window, they are only valid after clicking **Save** and only take effect with the next user login. Provided that the changes have not been saved, the **Revert** button can be used to recall the original data. If an attempt is made to close the window without saving or reverting changes, EtherShare Admin prompts whether saving should be carried out or not.

Creating volumes

A new volume can be created as follows:

➢ Activate the **Volumes** list and choose **New** from the **File** menu (compare figure 45).

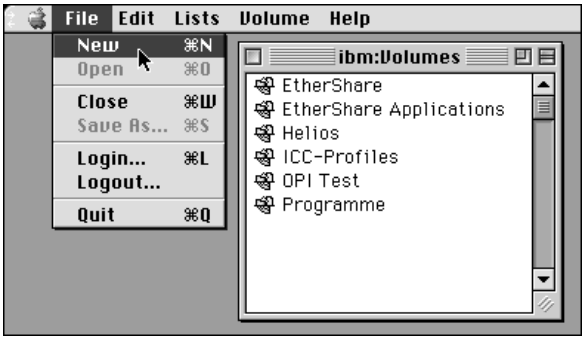

Fig. 45: Creating a new volume

The EtherShare Admin then opens a new volume data window. Fill in the volume name, UNIX directory (volume mount point) and password fields as required. The entire directory path to the mount point must already exist, with the exception of the bottom-most directory, which will be created by the EtherShare Admin, if required. The volume **Groups** list is described later in this chapter.

The volume's directories must not overlap or include the directories of other EtherShare volumes. You should choose the volume mount point carefully to make sure this does not happen. Furthermore, although EtherShare can utilize file systems which are mounted remotely through NFS, the directory tree of each Macintosh volume should not be split among more than one file system. Otherwise, the values for used and free space would not reflect the correct status, and trashing of files would only be possible immediately.

Important:	Note that symbolic links pointing to directories would confuse the File Server. For example two directories in one volume might have the same directory ID and a "Double-click" on one of the folders then could open the other. To prevent this, EtherShare does not follow symbolic links on folders. If you need links, use the Macintosh "Make Alias" function instead. If EtherShare detects overlapping volumes it will not mount them and issues an error message instead.

Finally, the volume's directories should not be "cross-mounted" through NFS, since Ether Share will not allow you to mount the same volume twice from two different servers (hosts). As soon as the volume is mounted by a user from one host, it will be grayed out in the **Chooser** for all users of other hosts. The volume will be released again automatically when it is unmounted. You can always mount the volume by logging on to the host from which it is already mounted, of course.

➢ A new volume is entered in the server **Volumes** list as soon as **Save** has been clicked. If the volume data window is closed without saving, the new volume entry is discarded.

On saving the new volume, a new entry with the corresponding volume data is made in the public volume list ("$ESDIR/conf/afpvolumes"). See **Volume size limits** in chapter 9.6 "Public and private volumes", and **Available storage space on volumes** in chapter 9.10 "EtherShare versus AppleShare" for related information.

Volume Groups list

Especially if you store a large number of files on your EtherShare server, or if the server is used by several different departments in your company, you probably want to subdivide the hard disk(s) of your EtherShare host into several different logical AppleShare volumes. You can then set access permissions on each volume (and on individual folders in the volume) with the **Sharing...** option in the **File** menu of the Finder. To provide additional security, you can also make specified EtherShare volumes completely invisible to selected user groups, by using the volume **Groups** feature.

➢ In order to assign a group to a volume, open the volume data window and the **Groups** list and select one of the group names. Without releasing the mouse button, drag the name away from the **Groups** list – a dotted frame is drawn around the selection – and release the mouse button over the volume's list of groups (see figure 46). The list will appear bold when the cursor is positioned correctly.

In the following example, the "EtherShare" volume will only be visible to members of the groups "helios" and "general". You can assign more than one group to each volume, but if you do not assign any groups at all, then the volume will by default be visible to all groups and thus to all EtherShare users (unless you have checked **Invisible** in the volume data window).

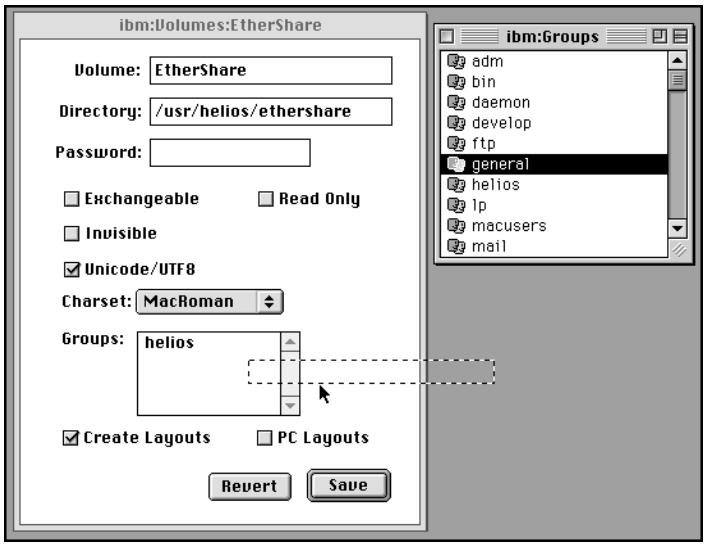

Fig. 46: Assigning group “general” to volume “EtherShare” on host “ibm”

Deleting volumes

A volume can be deleted from the host as follows:

➢ Highlight the volume name in the **Volumes** list and select **Clear** from the **Edit** menu (see figure 47).

The EtherShare Admin then prompts for acknowledgment of deletion, to allow deletion to be aborted, if required (see figure 48).

If deletion is confirmed, the entry is removed from the window and the corresponding entry is deleted from the public volume list (“$ESDIR/conf/afpvolumes”). Note that if the

volume still contains files and folders, they are not deleted. However, they are no longer accessible to Macintosh users.

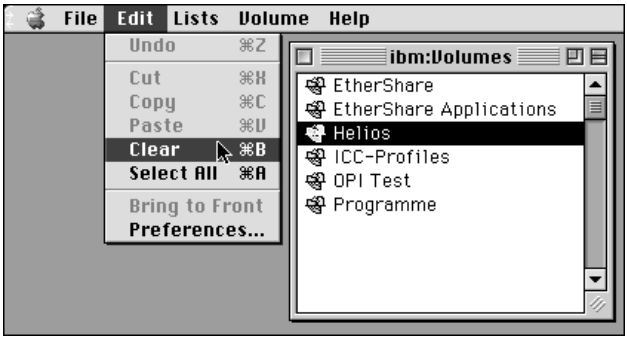

Fig. 47: Deleting a volume entry

Fig. 48: Confirming deletion of a volume entry

5.9 Volume menu

If you have selected a volume in the **Volumes** list window, or if the foreground (active) window is a window containing volume data, an additional menu item **Volume** is available in the menu bar at the top of the screen (see figure 49). The functions in the **Volume** menu only apply to the volume you have selected.

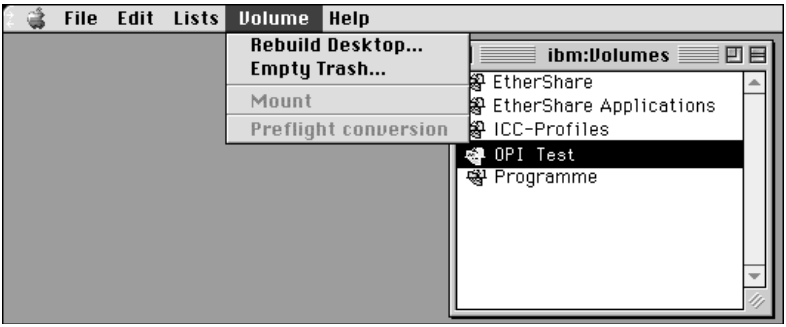

Fig. 49: The **Volume** menu item

Rebuild Desktop

AppleShare volumes contain a special, invisible file called the volume “desktop”, which is used internally by EtherShare. It contains organizational information such as the icons you see in the Finder. See chapter 10 “The Desktop Server” for details.

After a period of time, each volume desktop tends to collect a number of icons which are no longer needed, since the corresponding application has been removed from the volume. For this reason, Apple recommends to rebuild your desktop from time to time – a process which scans the entire

volume for applications and makes sure that the desktop only contains icons for existing files.

You can rebuild your desktop for local Macintosh volumes (built-in hard disk) by restarting your Macintosh while holding down the **Option** and **Command** keys. However, starting with System 7, it is no longer possible to rebuild network volumes in this way.

➢ To rebuild the desktop of an EtherShare volume, make sure that all users unmount the respective volume. Then, select the volume in the **Volumes** list of the EtherShare Admin and choose **Rebuild Desktop...** from the **Volume** menu (see figure 50). You will be asked for confirmation before the process is started (see figure 51).

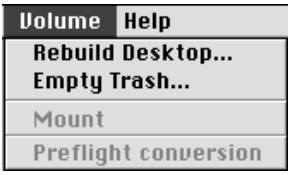

Fig. 50: Rebuilding a volume desktop

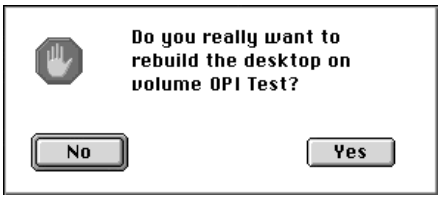

Fig. 51: Confirming the **Rebuild Desktop** process

Important:	You cannot rebuild read-only volumes – in this case **Rebuild Desktop...** in the **Volume** menu will be grayed out. The **Read Only** option can be temporarily unchecked for hard drives and magneto-optic cartridges to allow the desktop to be rebuilt. See chapter 10.2 “The Desktop Server Program” for related information.

Note:	You can optionally select several volumes and thus rebuild several desktops at the same time.

During an EtherShare desktop rebuild, missing resources for directories and files are automatically created for all directories in the EtherShare volume, and file IDs are created (or verified if a matching resource file already exists).

Empty Trash

AppleShare volumes with “readwrite” access – this includes both local Macintosh hard disks and EtherShare server volumes – contain a special, invisible folder called the trash folder which is used internally by the operating system. It is used to store files that you have deleted, until you choose to empty the trash and thus delete the files physically. In the case of network (shared) volumes, the trash folder actually contains multiple trash cans which are maintained separately for each user connection.

Unlike local volumes, if you unmount network volumes, the trash is usually emptied by AppleShare automatically, and its contents is no longer available to you the next time you log on. Thus, make sure you have not trashed something by mistake before you unmount a network volume.

However, this auto-clearing mechanism fails in case you shut down the Macintosh without first unmounting the network volumes. This can cause problems because of the way

AppleShare allocates trash cans. Users do not have the same trash can every time they log in, but they receive a trash can number that corresponds to the number of user connections currently established. The first user who mounts a volume receives trash can number 1, the second one receives trash can number 2, and so on. Now, if user number 20 leaves his trash unemptied, and if this trash can is not allocated again (because there are always less than 20 users who mount the respective volume simultaneously), the trash will never be emptied.

If you notice that there is a lot less free space on the volume than you expected (knowing the total size of the files stored there), this may be because one of the users switched off the workstation without emptying a very full trash can. Your system administrator can check this easily with a UNIX login by looking at the total size of the network trash folder. The Finder's **Get Info** dialog on a Macintosh only shows the trash can size of the current user.

➢ To empty the trash of an EtherShare volume completely, select the required volume in the **Volumes** list of the EtherShare Admin and choose **Empty Trash...** from the **Volume** menu (compare figure 52). There is no need anymore to unmount the volume before emptying the trash:

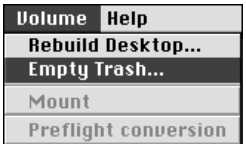

Fig. 52: Empty volume trash

This operation empties all trash for the volume, including the trash of those who are currently using the volume. Accordingly, you should warn logged-on users before calling this function (use the **Active Users...** option to see who uses a specific volume).

Important:	You cannot empty the trash of read-only volumes – in this case **Empty Trash...** in the **Volume** menu will be grayed out.

Note:	You can optionally select several volumes and thus empty several volume trash cans at the same time.

Mounting removable volumes

Removable media such as magneto-optical disks and CD-ROMs must be mounted with a UNIX command or (preferably) by using the EtherShare Admin, before they can be mounted on the desktop with the **Chooser**.

➢ To mount a removable volume, select the volume in the **Volumes** list of the EtherShare Admin and choose **Mount** from the **Volume** menu.

Removable media must be formatted with a UNIX (UFS) file system which is compatible to your host. They will be unreadable if they are formatted with the Macintosh (HFS) file system.

Mounting causes the Administration Server to carry out a UNIX mount by calling the script “$ESDIR/etc/mount-afp”. The script accesses the host’s file system table (e.g. “/etc/fstab”) for mounting information. After the UNIX mount, the volume can be mounted on the desktop with the **Chooser**. You will only see the correct Macintosh icons if the medium contains Macintosh files and has a desktop file

in valid EtherShare format. Otherwise you will see generic UNIX icons only, or alternatively, the icons that have been defined in your extension mappings table (see chapter 5.13.7 “Extension Mappings”).

A tick mark shows that the volume is currently mounted (compare figure 53).

Unmounting removable volumes

Before you can eject the medium from the drive again, all users of the volume must first unmount it by trashing the volume’s desktop icon (use the **Lists/Active Users...** option to see who uses a specific volume). You must then do a UNIX unmount by selecting the volume in the **Volumes** list and choosing **Mount** from the **Volume** menu a second time, so that the tick mark disappears. You will get an error message from the EtherShare Admin if you try to unmount a drive which is still in use.

Note: A removable “read only” volume , e.g. a CD-ROM, has no “.Desktop” file. You can unmount it without getting any error message, as long as no file is still in use.

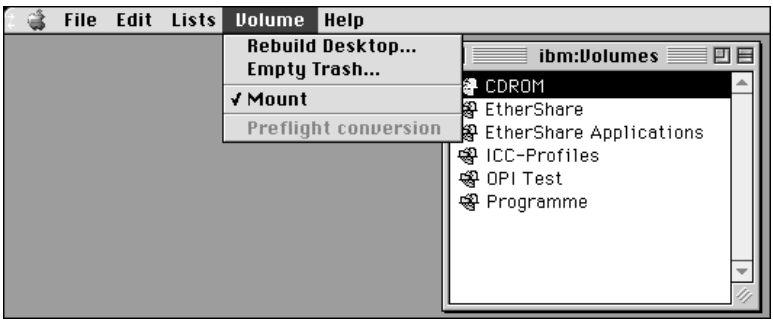

Fig. 53: Mounting a CD-ROM

Preflight conversion

A volume's character set encoding may be converted according to the procedure described in 5.8 "Volumes list", **Changing volume data**. Before saving the changes, you can have a preview by choosing **Preflight conversion** from the **Volume** menu. Then a "convert.log" file (see figure 54) will be displayed showing the directories/files which will be renamed.

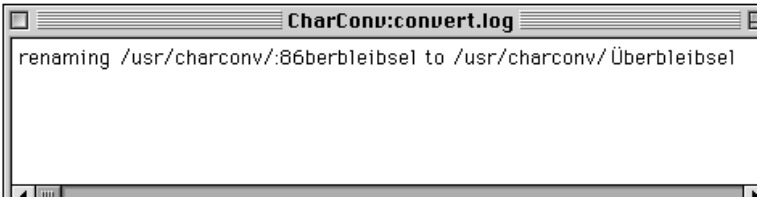

Fig. 54: "convert.log" file

5.10 Printers list

The **Printers** list shows all printer queues known to EtherShare (see figure 55). The Administration Server automatically creates this list by inspecting the contents of the "printcap" file and the EtherShare main configuration file "atalk.conf".

➢ If the **Printers** list is not already open, choose **Printers...** from the **Lists** menu.

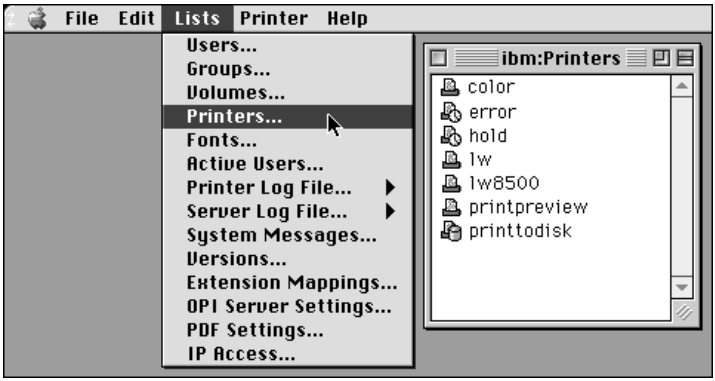

Fig. 55: **Printers** list on host "ibm"

Each printer (i.e. printer queue) is shown in the list under its own unique logical (UNIX) name as specified in "/etc/printcap". Each queue also has an AppleTalk name, which is usually not the same as the UNIX name. The AppleTalk name is the one that appears in the **Chooser** under "LaserWriter", "ImageWriter" etc. alongside the names of any physical printers that might also be present in the same zone. We recommend that you name your printer queues by adding "spooler" to the AppleTalk name of the

physical printer. Thus, you can easily distinguish between queues and printers in the **Chooser** (see figure 56).

Important: You should always select the printer queue (the spooler) rather than selecting the old entry (the physical printer) in the **Chooser** for printing. Due to print job spooling, it is not only much more efficient to access printers through the printer queues, but it also avoids the problem of long waiting periods that may occur if you try to access a printer both directly and through the spooler.

Select the correct spooler in the **Chooser** list and press the **Create** and **Auto Setup** buttons to configure the printer.

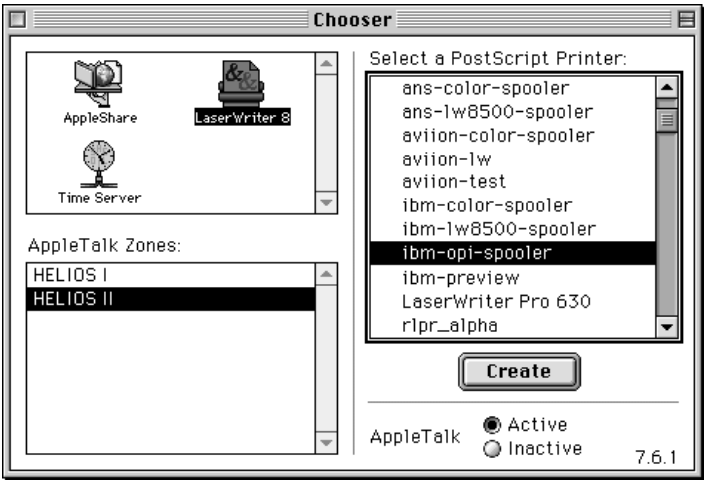

Fig. 56: Choosing a printer queue in a multi-zone network

Usually, each printer queue is associated with a single physical printer. However, you may want to allocate more

than one printer queue to a printer, for example to be able to select different printer initialization strings for the same printer (see later). In this case, you will have several **Chooser** names for the same physical printer. However, each printer queue is always associated with its own unique logical (UNIX) printer name and “/etc/printcap” entry.

Note: In the following, the term “printer” is meant to encompass all aspects of setting up a particular printer, not only the configuration of the printer’s network connection but also the configuration of the associated printer queues.

Changes in the printer configuration affect the files “atalk.conf”, “/etc/printcap”, and in some cases the “$ESDIR” directory (for the purpose of linking the interface program, such as “papif”).

Changing printer data

In order to change the parameters for a particular printer queue, you have to open the data window that displays all available information about the selected printer (see figure 57):

➢ Open the **Printers** list, select the printer name from the list and choose **Settings** from the **Printer** menu item (which appears automatically in the main menu bar whenever the **Printers** list is active).

As an aid to printer configuration, pop-up windows let you choose from a list of valid choices (compare figure 58).

The window title shows the name of the Administration Server, the window type **Printers** and the logical printer name.

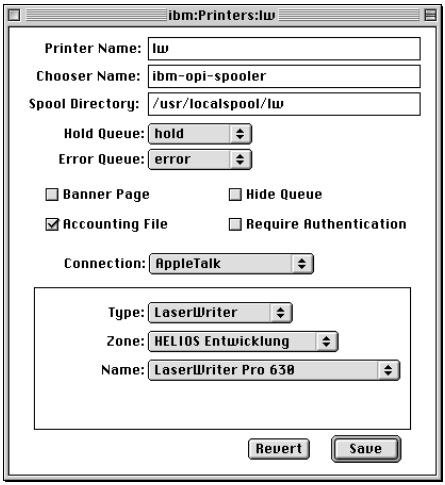

Fig. 57: Printer data for AppleTalk printer “ibm-opi-spooler”

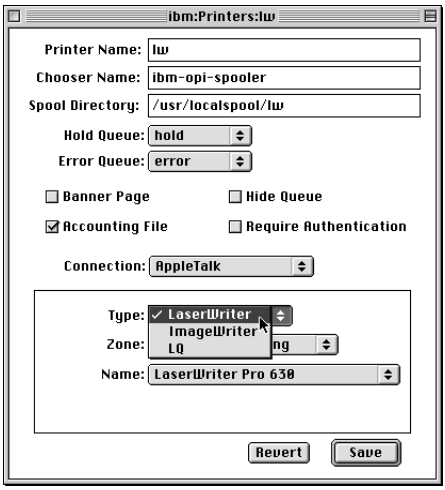

Fig. 58: Pop-up windows help you when configuring printers

The appearance of the printer data window may differ, depending on the connection type. Please refer to paragraph Creating printers below for details about the fields and possible entries.

The Administration Server gets most of the printer information from the files “atalk.conf” and “/etc/printcap”.

➢ If you make any changes in the printer data window, they are only valid after clicking **Save**. Provided that the changes have not been saved, the **Revert** button can be used to recall the original data. If an attempt is made to close the window without saving or reverting changes, EtherShare Admin prompts whether saving should be carried out or not.

Creating printers

A new printer can be set up as follows:

➢ Activate the **Printers** list and choose **New** from the **File** menu (compare figure 59).

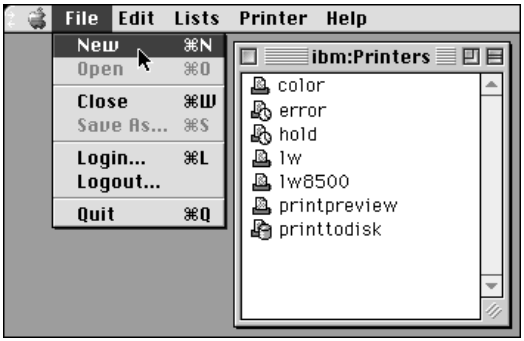

Fig. 59: Creating a new printer entry

The EtherShare Admin then opens a new printer data window, which has already been partly filled in with default values from the “Preferences” window.

For all printer types, the window shows the logical (UNIX) **Printer Name** for the printer queue, the AppleTalk (NVE) name and the printer’s **Spool Directory**. The NVE name is the name by which the printer queue is known to the AppleTalk network (the **Chooser Name**).

➢ First type in the required logical UNIX name for the printer queue (**Printer Name**), and also the associated AppleTalk name (**Chooser Name**).

➢ When typing in the **Printer Name**, a suggested **Spool Directory** is automatically filled into the corresponding field. The default suggestion can be changed if required.

The **Spool Directory** field specifies the directory in the UNIX file system where print jobs are to be temporarily stored before they are sent to the printer. If required, the spool directory can be set to swap out the spool files to other file systems (hard disks), but you should avoid NFS-mounted spool directories because of the performance loss. Note that the spool directory must be unique for each printer and that it is recommended to check whether there is enough free space in the directory you choose.

Note: Make sure a directory path already exists since the EtherShare Admin will only create the last subdirectory, e.g. “PrintToDisk”.

➢ You can then define a **Hold Queue** and/or an **Error Queue** for your current printer queue.

Usually, print jobs vanish after they have been sent to the output device. Hold and error queues act as a kind of archive. All print jobs that have been sent to this specific printer queue are printed and stored for a given period of time in the connected hold/error queue. They can be restarted even if the application that has initially launched the job has already been closed. All “correct” print jobs automatically proceed to the hold queue after printing. Whenever a mistake has occurred during printing, however, the print job will be shifted to the error queue (as long as hold and error queues have been specified in the pull-down menus). This holds true for technical mistakes (e.g. if the connection to the printer has been interrupted) and for errors that are

due to a specific configuration (e.g. if you have defined "Check Images" for an OPI printer queue and the print server cannot find a particular image file that has been placed in the document by reference).

The setting up of hold and error queues is described later in this chapter.

Banner page

The **Banner Page** switch determines whether the printer will print a title (banner) page before outputting the print job. The banner page contains information about the print job such as the user name, the time and the document name. It is useful when sorting out a pile of pages if a number of users have been printing at the same time. The banner page is generated automatically. If a file named "BANNER" exists in the printer's spool directory, this file will be used. See **psof** in chapter 11.3 "The Print Server Programs" for more information.

Accounting File

The **Accounting File** switch determines whether the print server will write print job details such as the user name and the number of printed pages to the host's printer log file. The user name assigned to the job is the one specified in the Macintosh **File Sharing** control panel. The job will be assigned to "root" if no name is specified in **File Sharing**, or if the name specified is unknown to EtherShare. See **User and document names in print jobs** in appendix A 7.1 "EtherShare log files" for more information.

Hide Queue

The **Hide Queue** option is used to create a printer queue that is invisible to the Macintosh EtherShare users. This may be useful, e.g., if you want to set up a queue for UNIX and PC users only. With **Hide Queue** active, this queue will be invisible in the Macintosh **Chooser**.

Require Authentication

Printing to LaserWriter queues is password-protected if the **Require Authentication** option is activated. Thus, print jobs can only be processed on LaserWriter-queues after correct authentication. This option affects all LaserWriter printer queues on the same server. Please note that this feature is only supported by Mac OS 8.6 or later.

➢ Now, choose the desired **Connection** type for the printer queue. The different types are explained below:

AppleTalk connection

Choose **AppleTalk** in the **Connection** box (figure 60) for printers that are connected to the network via AppleTalk (i.e. LocalTalk, EtherTalk etc.). The AppleTalk (NVE) name, type and zone of the printer must now be specified. First choose the printer **Type**. You only need to change the type from the default of **LaserWriter** if printers of other types are available, such as AppleTalk ImageWriter printers. Now choose the **Zone**: if more than one zone is available, pop up the **Zone** list and select the one you want. Now click on the **Name** field to pop up a list of all devices of the specified type which are available in the selected zone, and choose the one required. The list is determined by interrogating the network for all printers. Accordingly, the printer you want to configure must be connected and online.

Important: Be careful to choose a physical printer from the list, and not another queue.

The **Hide Printer** option may be checked if you want to prevent the printer from being displayed in the **Chooser**. Thus, users cannot choose this printer – and cannot print directly to the output device. This is sensible, because printing to an output device, both directly and through a spool queue, may lead to long waiting periods on the Macintosh – in case the

printer is executing a large job from a queue and the job that has been sent directly is not accepted immediately.

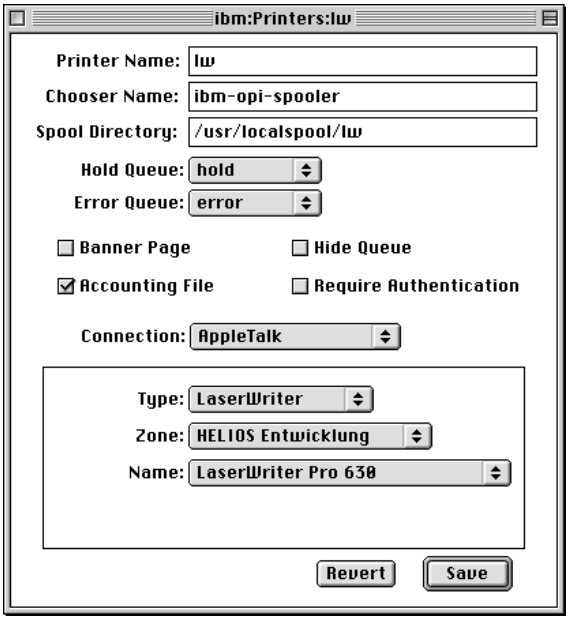

Fig. 60: Data for AppleTalk-connected printer “lw” on host “ibm”

If any of the entries in **Zone/Name** is displayed in italics, this indicates that this zone or device is currently not reachable. You should make sure that the desired printer is connected and online.

Serial connection

Choose **Serial** from the **Connection** box (figure 61) for PostScript printers that are connected directly to the UNIX host via a serial interface.

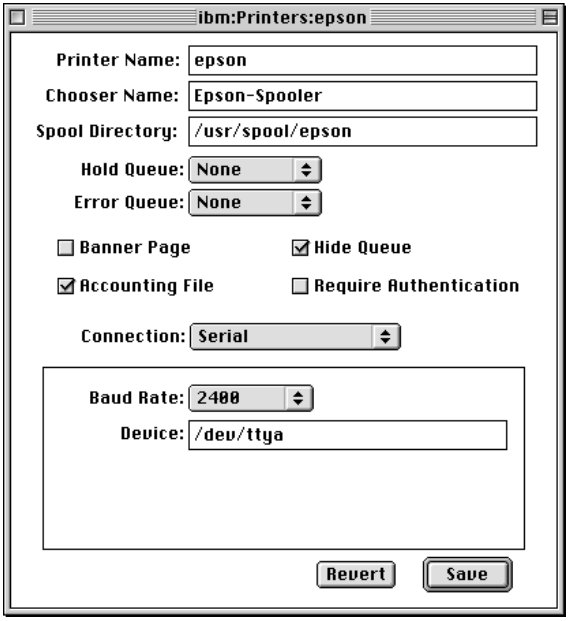

Fig. 61: Data for serially-connected printer “epson” on host “ibm”

In this case, it is necessary to specify the correct **Baud Rate** for data transfer to the printer. The **Device** field is used to enter the designation of the host serial port to which the printer is connected (e.g. “/dev/ttya”). The device must already exist on the host – the EtherShare Admin checks for a valid character device at this address.

EtherShare uses **8-bit**, **no parity** and **hardware handshake**. See **8-bit transparency** and **nobinmode** in chapter 11.6 “Configuring printers manually” for more information about serial connections.

Note: If **Connection** is shown as **Serial** and **Baud rate** is shown as **-1**, this means that the EtherShare Admin is unable to decode the syntax of the entry in "/etc/printcap". If the printer was previously configured correctly, this usually indicates that the "/etc/printcap" entry has been subsequently modified manually, without using the EtherShare Admin.

TCP connection

Choose **TCP** from the **Connection** box (figure 62) for PostScript printers that are connected to the network via the TCP/IP stream protocol.

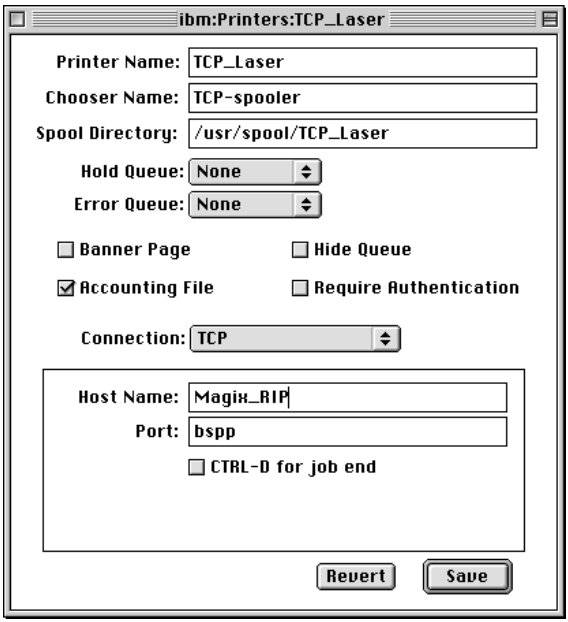

Fig. 62: Data for TCP/IP stream printer "TCP_Laser" on host "ibm"

Enter the name (or internet number) of the TCP/IP printer (or terminal server) in the **Host Name** field. Enter the service port name (or service number) in the **Port** field. There should be a PostScript interpreter listening at this address. TCP/IP stream printers must be compatible with the EtherShare TCP/IP stream implementation – contact your printer manufacturer or HELIOS supplier (see the HELIOS Web site: **http://www.helios.de**) if you are not sure about this. The **CTRL-D** switch causes a Ctrl-D character to be sent to the printer at the end of each job. This is only necessary if the TCP/IP printer is connected to a TCP/IP terminal server via a serial interface. See **TCP/IP PostScript connections** in chapter 11.6 “Configuring printers manually” for details.

Remote LPR connection

Note that “Remote LPR” is another TCP connection type, but it is not identical to TCP/IP stream. Choose **Remote LPR** from the **Connection** box (figure 63) for PostScript printers that are connected to another remote host on the network via TCP/IP. Enter the name (or internet number) of the remote host to which the printer is attached in the **Remote Host** field. Enter the remote printer’s logical (UNIX) name in the **Remote Printer** field. The service port name is set to “printer” (service number 515) by default. The entry can be checked in the UNIX file “/etc/services”.

Remote LPR printers require more spooling space (the size of the resolved job) on the local host than TCP/IP stream printers, and they do not return status messages or answer font queries (see **TCP/IP PostScript connections** in chapter 11.6 “Configuring printers manually” for more details).

EtherShare’s “remote lpr” specification in “/etc/printcap” differs somewhat from standard conventions, and thus the EtherShare Admin will not list other Remote LPR printers which have been manually configured for other purposes.

However, EtherShare Admin will not modify other "/etc/printcap" entries unless you inadvertently choose an already existing logical (UNIX) printer name.

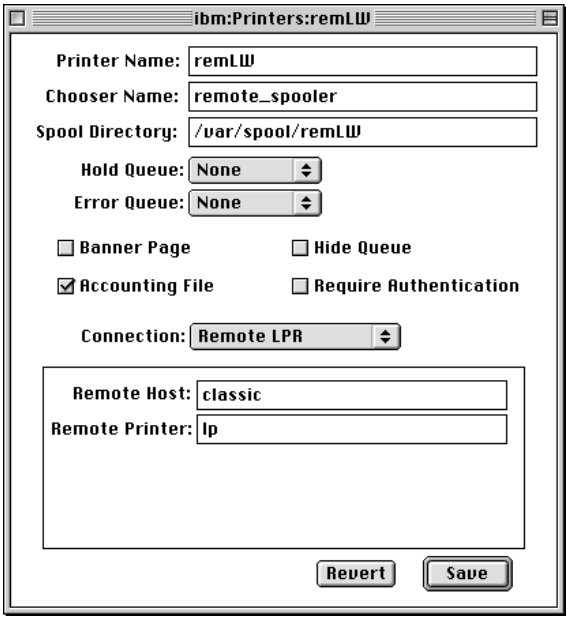

Fig. 63: Data for Remote LPR printer "remLW" on host "ibm"

EtherShare's Print Server is based on the BSD printing system. If your host uses another system (as e.g. System V, the printing system Sun Solaris 2.x uses), the Print Server automatically uses its own BSD-style "lpr" program, which is provided in the "$ESDIR" directory. Manual pages for the BSD-style "lpr" are provided in PDF-format on the CD-ROM in the "manuals" directory (see file "LPRMAN.PDF").

You can specify a TCP/IP stream printer either with host internet number and service port number, or with host name and service port name. The latter method requires corresponding entries in the local host's "/etc/hosts" and "/etc/services" files. For **Remote LPR**, the local host must be defined on the remote host, in the "/etc/hosts" and "hosts.equiv" (or "hosts.lpd") files. Both connection types require you to configure your host for TCP/IP, of course.

Shared Memory connection

Choose **Shared Memory** from the **Connection** box (figure 64) for PostScript interpreters (software RIPs) running on the same host which are able to communicate through a "Shared Memory" interface.

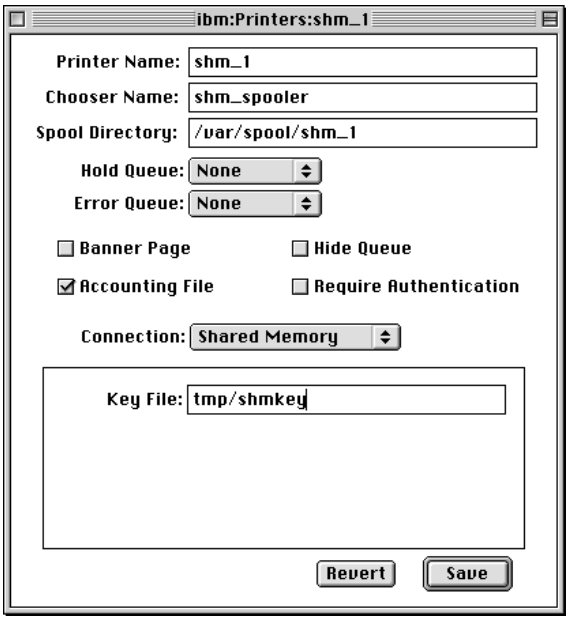

Fig. 64: Data for "Shared Memory" RIP "shm_1" on host "ibm"

Enter the path of the Shared Memory “key” file in the **Key File** field. The key file must already exist on the host. See the **key** parameter in chapter 11.6 for more information. The RIP must be compatible with the EtherShare “Shared Memory” interface specification – contact your RIP manufacturer or HELIOS supplier (see the HELIOS Web site: **www.helios.de**) if you are not sure about this.

Print To Disk connection

With the **Print To Disk** connection (figure 65) you induce the Print Server to print to a file.

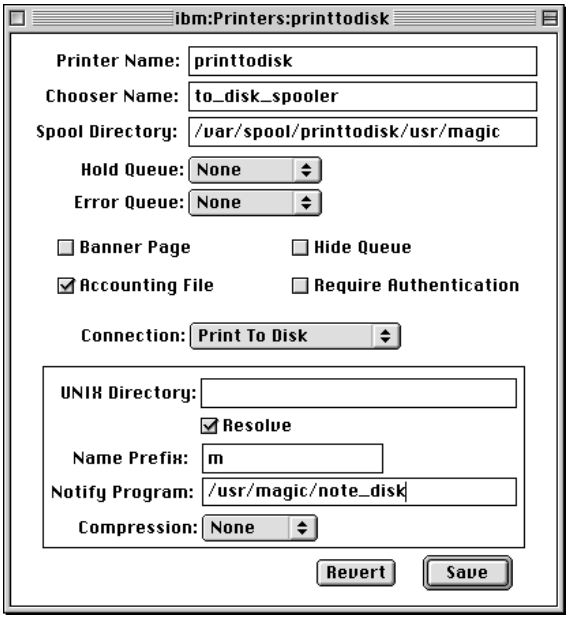

Fig. 65: Data for “printtodisk” queue on host “ibm”

You have to specify a destination for the file (**UNIX Directory**) and you can enter a **Name Prefix** and a **Notify Pro-**

gram, if desired. The prefix serves to identify the files that are coming from this specific printer queue (in case you have several **Print To Disk** queues that print to the same destination). The **Notify Program** option lets you enter a path that leads to a specific UNIX program. This program will be started automatically after printing has been finished successfully. Furthermore, you can select a mode of **Compression** for the destination file and you can decide whether or not your print job has to be resolved the same way it would be resolved when printing to an output device. If the **Resolve** option is switched off the job will be written to the file "as is"; things that are usually accomplished during printing, as e.g. font inclusion or image replacement (for OPI only), will be skipped.

The **Print To Disk** option may e.g. be used for automatic generation of PDF files. You can print to files in a specific UNIX directory and induce the Acrobat Distiller software to scan this directory regularly and convert incoming files to PDF.

Balance Group connection

Choose the connection **Balance Group** (figure 66) in the printer data window to set up a group of printers for load balancing – that is for shifting print jobs to a second or third printer in a group whenever the first printer is busy with a huge job.

To specify a group of printers you just have to drag and drop the desired printers from the **Printers** window to the respective field in the printer data window (see figure 66).

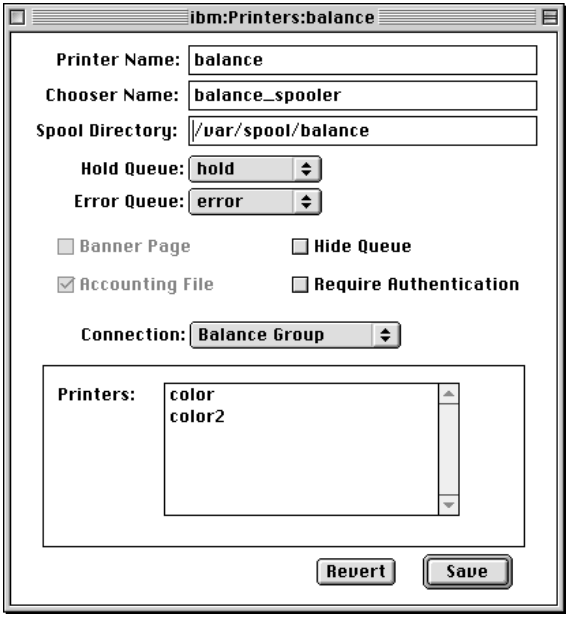

Fig. 66: Data for a load balancing queue on host “ibm”

Hold Queue connection

Hold and error queues can be defined using the **Hold Queue** connection as shown in figure 67.

The **Hide Queue** option will be set automatically for this type of queues, because – usually – users should not be allowed to print directly to a hold or error queue; see paragraph **Creating printers** above for the purpose of hold and error queues.

The dialog lets you specify an individual **Hold Time**. The default value is 3 hours. If you set the hold time to 0 days

and 0 hours this would mean “on hold forever”. Print jobs in such a hold or error queue will be stored until you move them to another queue or delete them manually.

Important: Note that you may enter non-negative integer values only. Floating point or negative integer values may lead the Print Server to unexpected behavior.

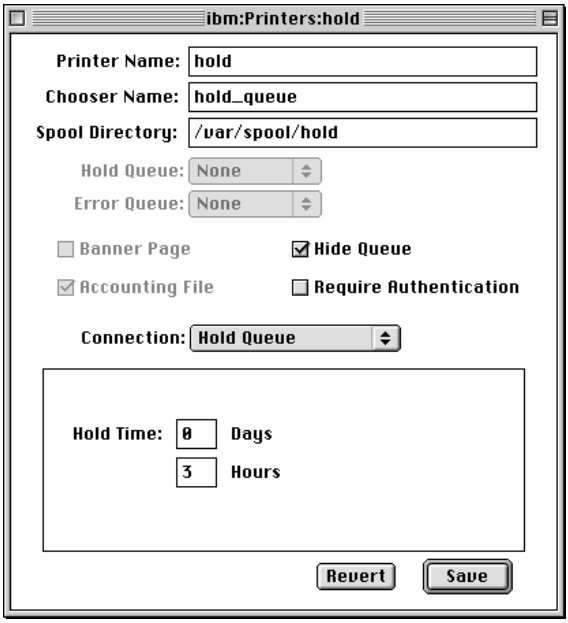

Fig. 67: Data for a hold queue on host “ibm”

Print Preview connection

Print Preview in the **Connection** pop-up menu will only be active if you have purchased and installed the HELIOS Print Preview product. This connection type is described in your Print Preview manual.

➢ Click **Save** to finally install a new printer queue.

Important: Once you click on **Save** the Admin prompts to select a PPD file for the new printer queue. A Macintosh dialog window is opened automatically for that purpose. You can cancel the process and select the PPD file later (using the **Select PPD** item from the **Printer** menu). You will get a warning message on every login if there are printer queues on the server that have not yet been assigned a PPD file. (Remember that you have to select the same PPD file later when you select the queue in the Apple **Chooser**.)

The Print Server needs to have a list of resident fonts for each installed printer. The printer's resident font list (the "FONTS" file in the printer's spool directory) is created automatically by the Administration Server by interrogating the printer when you first set it up. The printer must be connected and online for this to work. A warning is displayed if the Administration Server is not able to make the font list for some reason, for example because the printer is offline or busy with another job at the time (see figure 68).

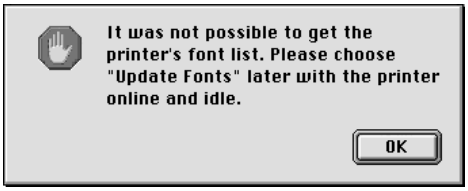

Fig. 68: Message box: No font list

For all output devices where no fonts can be queried, for example Remote LPR, Print To Disk or Balance queues, EtherShare will rely on the font information provided in the

PPD files specified for these printer queues. Make sure to select proper PPD files which contain current information for your output device. If there is no PPD file, EtherShare will fill in the default 34 LaserWriter Plus fonts. Another possible cause for this error is an incorrectly configured EtherShare network connection in “atalk.conf”.

If the font list is missing, you should connect the printer, put it online, and select **Update Fonts** in the **Printer** menu manually (see later).

Changes made when you create a printer

When you create a printer queue with the EtherShare Admin, the following changes are made on your host:

- A new entry is made in “/etc/printcap”. And new entries are made in “$ESDIR/atalk.conf”:
  papsrv: section... (for the Print Server)
  name: section... (for the interface program)
- A link is created from “$ESDIR/if/name” to the interface program.
- The lockfile is created in “$ESDIR/lprdevdir/name”.
- The printer’s spool directory is created and the printer’s “FONTS” file and its PPD file are placed there. The Admin can only create the bottom-most directory. Parent directories have to exist. Privileges are defined by the Admin in case a new directory is created. Else, the privileges that have already been defined, are used. They have to be set up properly, otherwise it may happen e.g. that jobs are not deleted after printing and remain stuck in the spool directory.

More information about changes on the server are given in chapter 11 “The Print Server”.

Deleting printers

The spool directory and its contents are not removed when deleting a printer queue. We recommend to clear any existing print jobs and wait until the printer is idle before deleting the queue.

➢ For deletion, activate the **Printers** list, select the printer name, and choose **Clear** from the **Edit** menu (see figure 69).

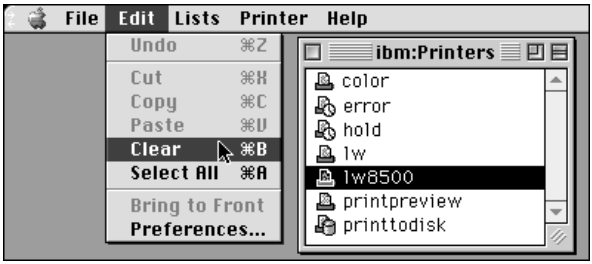

Fig. 69: Deleting a printer entry

The Admin then prompts for acknowledgment of deletion, to allow it to be aborted, if required (see figure 70).

Fig. 70: Confirming deletion of a printer entry

On confirmation, the entry is removed from the window and the queue on the host is stopped. The Admin deletes the configuration entries in the main configuration file “atalk.conf” and in “/etc/printcap”, and the corresponding link for the interface program will be removed (if present).

5.11 Printer menu

If you have selected a printer in the **Printers** list window, or if the foreground (active) window is a window containing printer data, an additional menu item **Printer** is available in the menu bar at the top of the screen (see figure 71). The functions in the **Printer** menu only apply to the printer you have selected. The item **OPI/ICC Settings** in the **Printer** menu is grayed out, unless you have purchased and installed HELIOS EtherShare OPI 2.1 and/or HELIOS PDF Handshake.

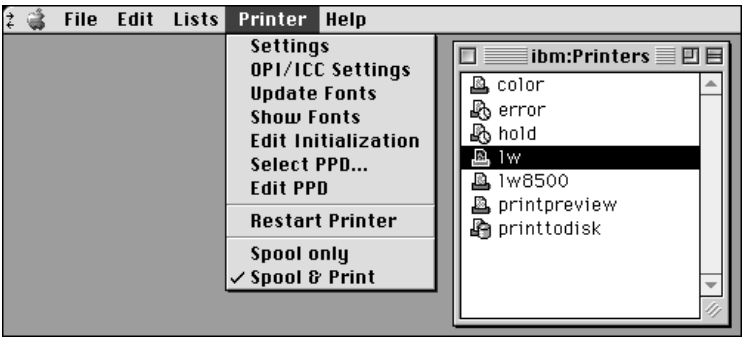

Fig. 71: The **Printer** menu items

Settings

The **Settings** menu item is used to open the printer data window of a specific printer and then change its configuration. You have to highlight the printer you want to set up before choosing the item (compare figure 71).

Update Fonts

Update Fonts is used to update the Print Server's resident font list for the selected printer. Since this takes place through printer interrogation, the printer must be connected and online for this to work. You need to do this if new fonts

have been installed in the printer, through font cartridges, printer cache disks etc.

Do not confuse the resident font list with download fonts which have been installed by EtherShare in the Print Server, and are available to all printers on that host. The latter can be seen by clicking **Fonts...** in the **Lists** menu.

The printer's resident font list is created automatically by the Administration Server when you set it up for the first time. The list is stored in the "FONTS" file in the printer's spool directory.

Show Fonts

The option **Show Fonts** shows the resident fonts of the selected printer. The Administration Server gets this information from the "FONTS" file in the printer's spool directory. The window title shows the host name, **Fonts**, and the printer name (see figure 72).

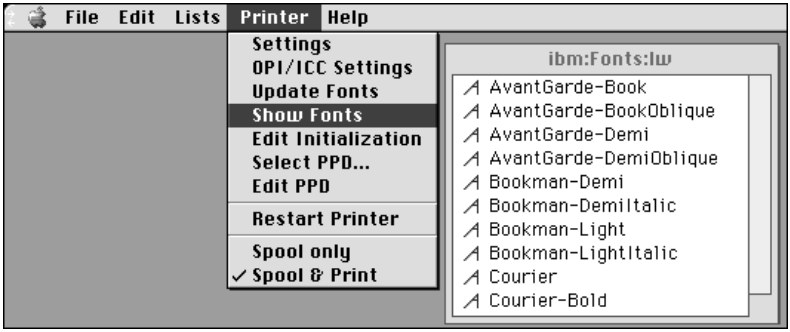

Fig. 72: Resident font list for printer "lw"

Edit Initialization

Edit Initialization is used to create or change a PostScript printer initialization sequence (“INIT”) for the selected printer. For example, you can use this to define a PostScript filter sequence to remove unwanted single and double “Ctrl-D” codes generated by some MS-Windows applications. A suitable filter for this is shown in the example in figure 73.

Usually, each physical printer is associated with a single printer queue. However, you can allocate more than one printer queue to a printer, which allows you to have different printer initialization strings for the same printer and to select between them in the **Chooser**.

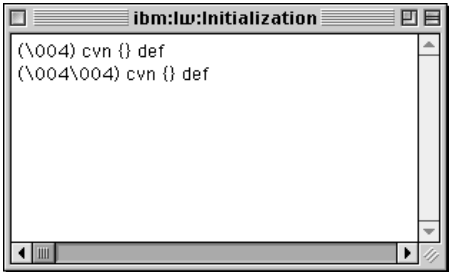

Fig. 73: Printer initialization string

Note that writing INITs requires some knowledge of the PostScript language. PostScript INITs must not contain the “exitserver” operator, because the following print job will not execute properly (see appendix A 7.2 “PostScript RIP INITs in the EtherShare Admin”).

The EtherShare Admin can be extended with custom PostScript calibration tools, which appear automatically in the **Edit Initialization** menu. On request, HELIOS will pro-

vide programming guides for developing such tools to typesetter manufacturers.

The “init” sequence is stored in the “SETUP” file in the printer’s spool directory.

Another way of defining a specific behavior during printing, is to edit the queue’s PPD file. This is described in paragraph Edit PPD below.

Edit Trailer

The menu item **Edit Initialization** can also be used to edit a queue’s trailer, i.e. to define a PostScript sequence that is appended to the print job. If you press the **Option** key when selecting **Edit Initialization** the “Trailer” window will open automatically. An example of a trailer file is shown in figure 74. Note that editing a trailer file also requires some PostScript knowledge.

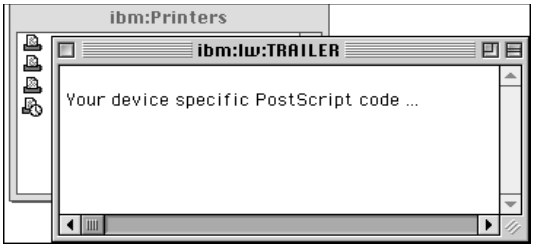

Fig. 74: Editing the trailer of a specific printer queue

The trailer sequence is stored in the “TRAILER” file in the printer’s spool directory.

Select PPD

The PostScript printer description (PPD) file contains a complete description of the output device as for example paper margins, resolution, and PostScript Level compatibility.

Assigning the correct PPD file to a printer guarantees the best possible output results (provided that you assign the same PPD file later, when you set up the printer with the **Chooser** on your Macintosh client). Usually, the EtherShare Admin will prompt for assigning a PPD file the moment you create a new printer queue. If you cancel the dialog box then, you will get a warning when you log in the next time. Highlight the printer name in the **Printers** window and choose **Select PPD** from the **Printer** menu to finally define – or if necessary change – the PPD file for a specific queue.

Edit PPD

Once you have selected a PPD file for a queue, you can display the contents of that file in a text window, and root and members of the SysAdm or QueueAdm group can even edit the file, if necessary. For that purpose, highlight the printer name in the **Printers** window and choose **Edit PPD** from the **Printer** menu. You can use this feature for information purposes at any time, e.g. to find out which PPD file is currently valid on a specific queue. However, you should be very careful as far as the "edit" functionality is concerned. Editing a PPD file requires some knowledge about the structure and syntax of PPD files. Also, your changes may have different effects when printing with different applications. Moreover, there is currently little safeguard against different PPDs selected for an EtherShare printer queue and selected for the LaserWriter driver on a Macintosh. With LaserWriter 8, you can "Create" or "Setup" a PPD for an entry in the **Chooser** and as long as you choose **Auto Setup**, the selected PPD on the Macintosh will at least be a PPD with the same "*NickName" entry as the PPD specified for the EtherShare printer queue. Nevertheless, in case you edited the PPD on the server, there is no mechanism to retrieve this new PPD information. You would have to adjust the PPD file on the Macintosh manually to reflect all changes of the printer queue's PPD.

Restart Printer

The option **Restart Printer** is used to stop and restart printing on the job queue and to re-initialize the UNIX “lpd” program for the selected printer. This may be necessary if a fatal error or network connection fault occurs while printing. You will be asked for confirmation (compare figure 75):

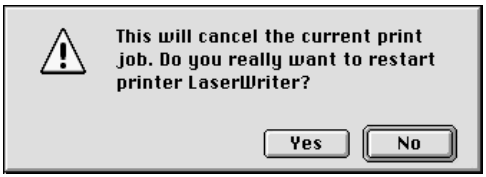

Fig. 75: Restarting printer “LaserWriter”

Spool only
Spool & Print

The option **Spool only** (see figure 76) causes following print jobs for the selected printer to be spooled to disk but not sent to the printer. This can be useful if it is required to hold back some jobs, e.g. for processing during the night shift rather than during daytime. Printing is restarted with the **Spool & Print** option (see below). If you switch back from **Spool & Print** to **Spool only**, the current print job will be finished on the output device, and the printing will then be stopped again.

Fig. 76: Choosing **Spool only**

5.12 Printer job windows – moving, restarting, and deleting jobs

Showing printer jobs

Printer job windows display the current job queue for the selected printer. The windows are updated about twice a minute. The list shows the document name, the user name, the job size in the spool queue, the job sequence number, and the starting time, and includes both Macintosh and UNIX print jobs (compare figures 77 and 78). For related information, see also the chapter 5.13.3 “Printer Log File”.

➢ A printer job window for a specific printer queue is opened with a double-click on the queue name in the **Printers** window (or by highlighting the queue name and choosing **Open** from the **File** menu).

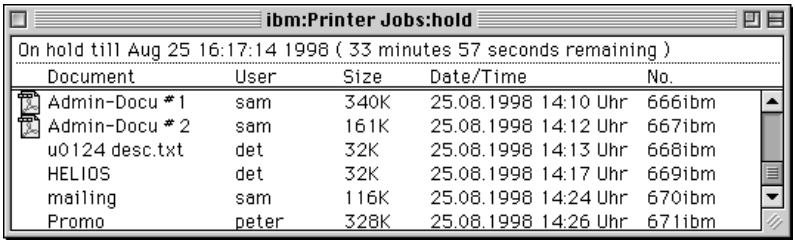

Fig. 77: List of jobs for printer “hold” (hold queue on host “ibm”)

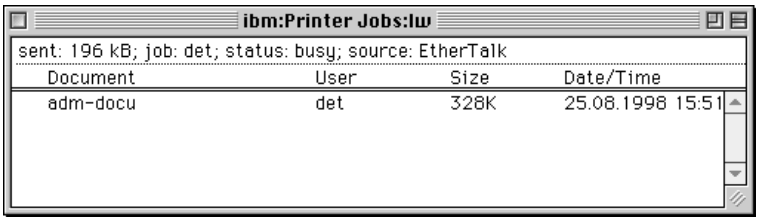

Fig. 78: Printer job window for printer “lw” on host “ibm”

The list window also contains a status line showing printer status and the quantity of data in kByte already sent to the printer for the job which is currently printing (compare figure 78). The status line is also updated about twice a minute. Due to inclusion of fonts etc., the quantity of data sent to the printer can be larger than the job size in the spool queue; if EtherShare OPI is also installed, due to image inclusion it may be considerably larger than this.

The user name assigned to the job is the one specified in the Macintosh **File Sharing** control panel. The job will be assigned to "root" if no name is specified in **File Sharing**, or if the name specified is unknown to EtherShare. See **User and document names in print jobs** in appendix A 7.1 "EtherShare log files" for more information.

Print jobs with a PDF icon in front of them – like those shown in figure 77 – are jobs that have run through a preview queue. To get these PDF previews of a print job, you have to purchase and install HELIOS Print Preview.

The option **Bring to Front** in the **Edit** menu can be used to move one or more selected print jobs to the 2nd top position of the queue (since the "top position" print job is considered as being processed, and therefore "untouchable").

You may also want to move print jobs manually inside the queue. Select one or more (Use **Shift**-click to select a range of entries and use **Command**-click to select/deselect individual entries from a list) print jobs by clicking with the mouse and dragging.

If you have several printer queues, you can simultaneously open printer job windows for each of them; non-active (background) windows are also updated.

Note that the "admsrv" does interpret octal backslash escape sequences in PostScript %%Title comments. This means that e.g. Japanese job titles can be displayed in a job window, provided that you use a local operating system or the "Japanese Language Kit" on your Macintosh.

Deleting printer jobs

To delete a job, you have to proceed as follows:

➢ Select the job in the printer job window and choose **Clear** from the **Edit** menu.

You can choose multiple jobs for deletion using standard Macintosh keyboard shortcuts (see **Selecting multiple entries from a list** in chapter 5.5 "About list windows"). You are only allowed to delete your own jobs, unless you are "root" or a member of the "SysAdm", "QueueAdm", or "PrnAdm" groups.

The EtherShare Admin will prompt for acknowledgment of deletion, to allow deletion to be aborted if required. You can suppress the warning by holding the **Option** key when choosing **Clear**. This can be useful when deleting a number of entries at the same time.

Moving jobs and restarting hold queues

If you have more than one printer queue running *on the same host*, you can open two or more printer job windows simultaneously and move jobs between queues (printers) by clicking with the mouse and dragging. You might want to do this if one of the queues is too long, or a printer needs to be stopped for cleaning. You can do this without stopping the printers.

Hold and error queues are usually not connected to a physical printer. Thus, in order to restart a job from a hold or error queue, you have to drag it to the printer job window of

a queue that will execute the job. An example is shown in figure 79, where a job from a hold queue is moved to the “real printing” queue “lw”.

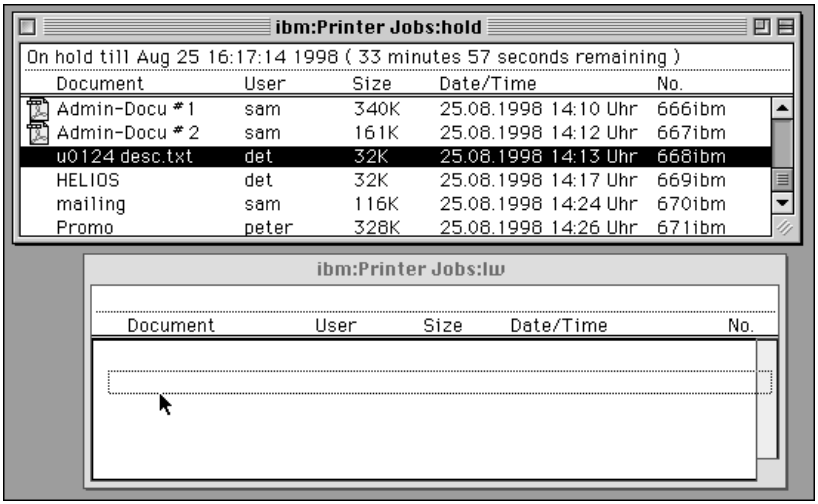

Fig. 79: Moving jobs between printers “hold” and “lw”

Interpreting the hold time in a hold queue’s job window

Hold queues are updated according to the “watchtime” parameter in the configuration file “atalk.conf”. By default, this is every 30 seconds. However, the remaining hold time, which is displayed in the headline of the printer job window is not updated that regularly. The list below shows when and how often the counter in a hold queue is changed:

Remaining hold time:Counter changes every...

1 day	60 minutes
1 hour	10 minutes

5.13 Other lists and accounting files

5.13.1 Fonts list

Fonts... in the **Lists** menu shows PostScript printer fonts which have been installed on the host with the EtherShare Admin. They are available to all printer queues on that host. The EtherShare Admin gets the print server's fonts list from the file "$ESDIR/psfonts/FontDirectory".

The window title shows the host name and **Fonts** (see figure 80). Do not confuse this window with **Show Fonts** in the **Printer** menu, which displays the list of resident fonts for the selected printer.

You can double-click on the font name to inspect the manufacturer's coded font header (see figure 80).

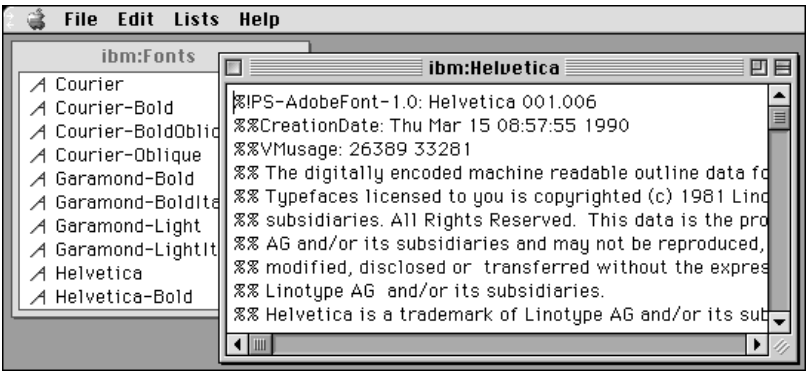

Fig. 80: Fonts list for host "ibm" showing font header information

EtherShare Admin can install Adobe “Type 1” and “Type 3” printer fonts (not Screen fonts or TrueType fonts) onto the Print Server, directly from the font manufacturer’s original font disks or another depository:

➢ Open the **Fonts...** window in the **Lists** menu and choose **New** in the **File** menu. Then select the drive and folder. Select individual fonts for copying or choose **Load all Fonts:** (compare figure 81) to load all fonts from the folder that is currently opened.

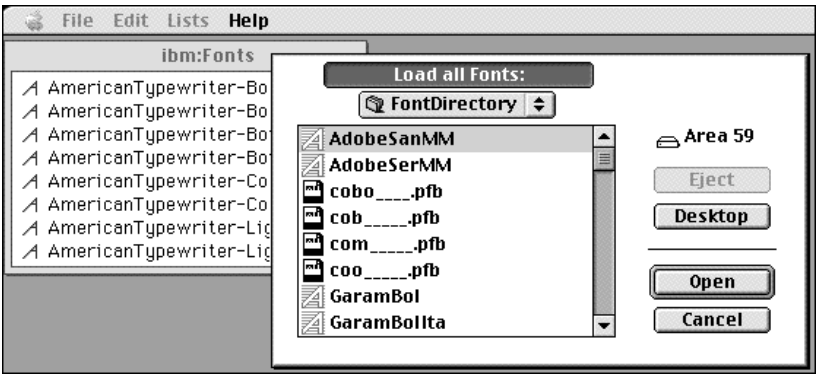

Fig. 81: Installing fonts on the print server

Storing printer fonts on the server reduces the network load caused by font downloading from the Macintosh client. You can copy the printer fonts from one host to another, by opening both fonts lists and selecting and dragging the fonts (see chapter 5.15 “Multiple EtherShare hosts”). Of course, you cannot do this with the printer’s resident fonts.

Note: The PostScript fonts that come with the HELIOS PDF Handshake product cannot be copied between different servers.

5.13.2 Active Users list and sending messages with the EtherShare Admin

Active Users shows all users currently logged-on to EtherShare. Spool jobs and other connections, e.g. PCShare users, are also listed (see figure 82).

➢ Open the **Active Users** window by selecting the respective item from the **Lists** menu.

Selecting one or more users and then choosing **Clear** from the **Edit** menu will kill their current server connection. This is not the same as **Users...** in the **Lists** window, which shows all users with a valid account. Note that only the user him/herself, the SysAdmin or "root" are allowed to clear a connection. The **Active Users...** option gets its information from the file "$ESDIR/stmp". See **"swho" command** in

chapter 8.5 “AppleTalk stack utility programs” for related information.

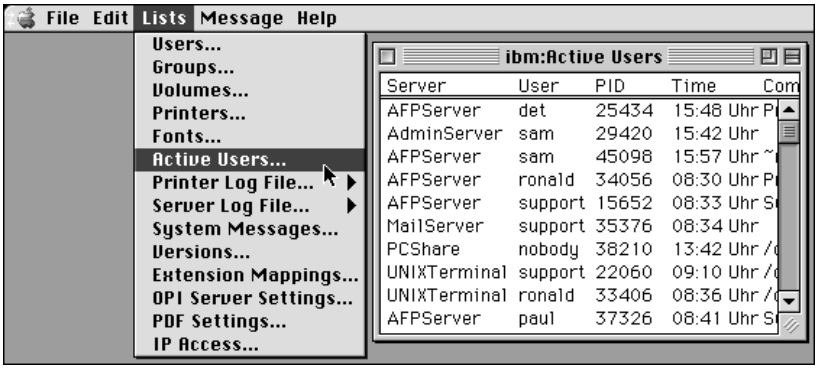

Fig. 82: **Active Users** window on host “ibm”

You can send short “AFP” messages to any client connected via AFP server or PCShare server. This can be done using the **Message** menu item that automatically appears in the menu bar whenever the **Active Users** window is open and brought to the foreground.

➢ To send a message, highlight the users you want to address, select **Message** and **Send Message...** from the menu and enter your individual message in the dialog as shown in figure 83. This feature is available to AFP server clients only!

“AFP” messages are displayed automatically in a message window on the addressees’ monitors. They are not saved in

a file; the addressees delete them on closing the respective message window by clicking the **OK** button.

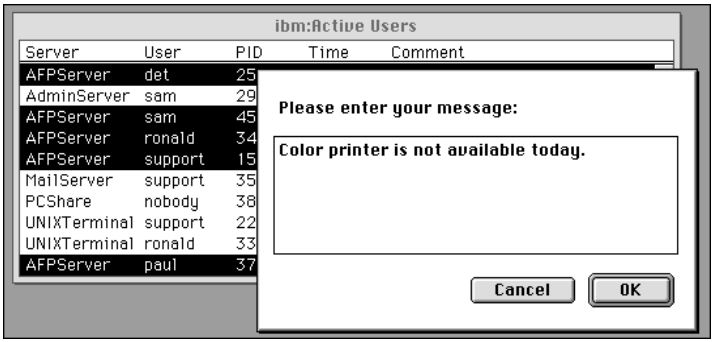

Fig. 83: Sending a message to several EtherShare users

Important: The **Message To All...** option in the **Message** menu lets you send a message to all current users. It is, however, available to “root” and members of the “SysAdm” group only.

Such messages can also be sent from the UNIX server using the UNIX “afpmsg” program. For more information read the “afpmsg” chapter in your UNIX manual.

5.13.3 Printer Log File

The printer log file shows print job accounting details for the selected host, such as job status, printer name, user name, document name, starting date/time, duration of job, number of printed pages, and printer fonts used. The job status can be √ = no info and ok, ◊ = extended info and ok, or • = extended info and error.

The messages file, that belongs to each entry in the log file, contains even more information, e.g. the total number of bytes printed and whether you have printed composite or separations. If you are working with EtherShare OPI 2.1 the printer log messages file also provides information about image replacement. This information is especially useful for print jobs in an error queue because you will get details about the mistakes that have occurred.

To open a specific log file, select **Printer Log File...** from the **Lists** menu and specify the required day (see figure 84).

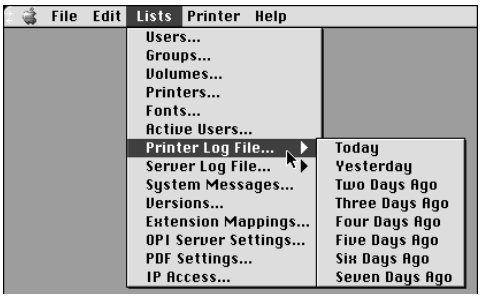

Fig. 84: Opening a printer log file

Printer log files are arranged by date. Every night at midnight the (UNIX) “cron” program starts automatically in the background and renames the log file information of the last seven days. The file “Today” becomes the file “Yesterday”, “Yesterday” is renamed into “Two Days Ago”, and so on. You can then select e.g. the printer log file of “Three Days Ago”. Log files which are older than seven days are deleted automatically.

➢ From the printer log file you can open the related messages files with a double-click on the respective items (compare

figure 85). This is especially helpful when errors have occurred (error status = •).

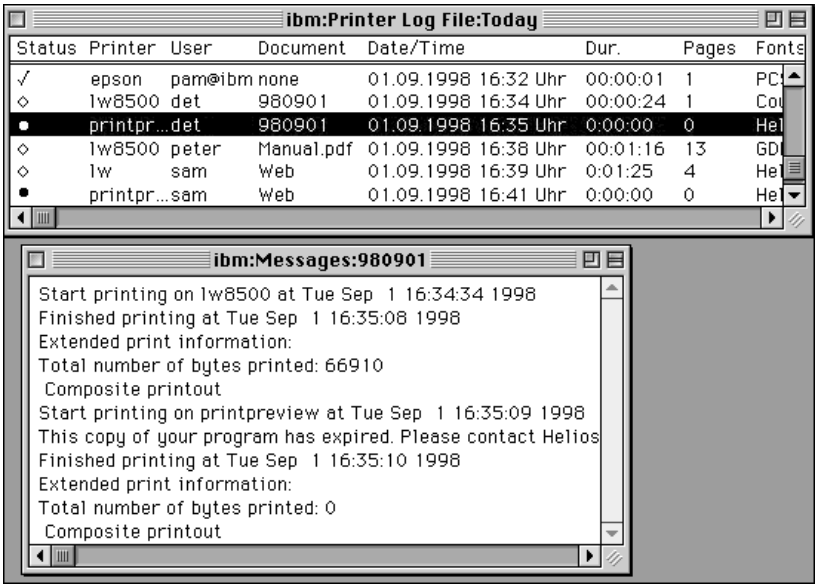

Fig. 85: Printer log file and corresponding messages file

➢ Choose **Save as...** from the **File** menu to save the printer log file as a text file. You can then read this information into a word processor or spreadsheet program for billing purposes, or to prepare job statistics. The messages files can also be saved as text files.

Users are also sent a message via UNIX mail and an additional AFP message if a printer error occurs, including “paper out”. Users who have installed Helios Mail will receive the message directly on their Macintosh.

Note: The user name assigned to the job is the one specified in the Macintosh **File Sharing** control panel. The job will be assigned to "root" if no name is specified in **File Sharing**, or if the name specified is unknown to EtherShare. See **User and document names in print jobs** in appendix A 7.1 "EtherShare log files" for more information.

The EtherShare Admin gets its information from the files "$ESDIR/printer.acct." (which contains the data of "Today") to "$ESDIR/printer.acct.6" ("Seven Days Ago"). See **Printer log file structure** and **User and document names in print jobs** in appendix A 7.1 for related information.

Please see also the description of **mail** in chapter 11.6 "Configuring printers manually" for details about which printer messages are recorded in the printer log file and which ones are recorded in the system messages file.

5.13.4 Server Log File

The server log file contents depend on the operating system. Usually, the log file shows messages from all the EtherShare servers such as status (√ = OK, • = unsuccessful or illegal login), server name, AppleTalk (NVE) address, user name, starting date/time, duration of execution, CPU time, and memory (see figure 86).

Server log files are arranged by date. Every night at midnight the (UNIX) "cron" program starts automatically in the background and renames the log file information of the last seven days. The file "Today" becomes the file "Yesterday", "Yesterday" is renamed into "Two Days Ago", and so on. You can then select e.g. the server log file of "Three

Days Ago". Log files which are older than seven days are deleted automatically.

➢ To open a specific log file, select **Server Log File...** from the **Lists** menu and specify the day you want.

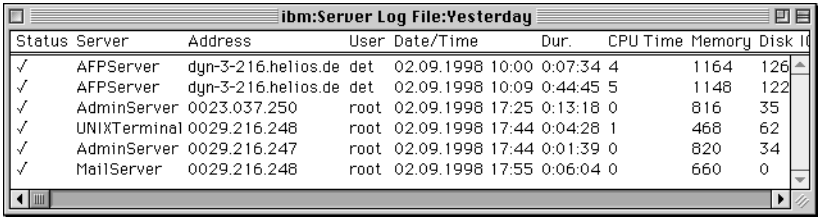

Fig. 86: Example of a server log file

➢ Choose **Save as...** from the **File** menu to save the server log file as a text file. You can then read this information into a word processor for further use.

The EtherShare Admin gets its information from the files "$ESDIR/server.acct." (which contains the data of "Today") to "$ESDIR/server.acct.6" ("Seven Days Ago"). See **Server log file structure** in appendix A 7.1 "EtherShare log files" for details.

5.13.5 System Messages

The system messages file shows messages from the UNIX host in standard UNIX format (see figure 87).

➢ Open the system messages file by choosing **System Messages...** from the **Lists** menu.

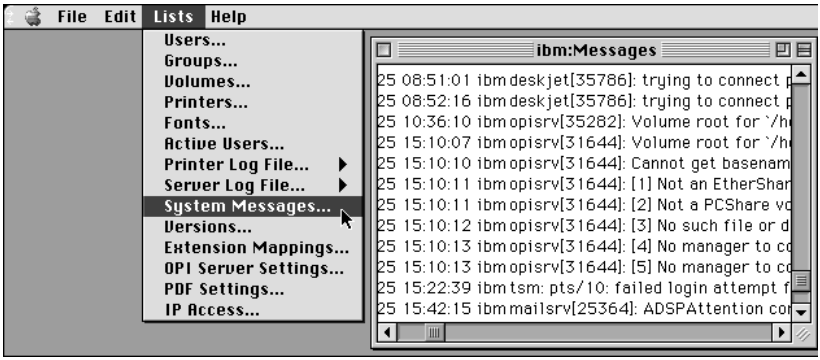

Fig. 87: System messages file on host “ibm”

Note: If the **Messages** window opens blank (or with an error message), the system message file may be too large to open with the memory allocated. In this case exit EtherShare Admin, and increase the memory in the Finder’s **Get Info** dialog.

➢ Choose **Save as...** in the **File** menu to save the system messages file as a text file. You can then read this information into a word processor, or fax it e.g. to your UNIX manufacturer in case you have a system problem.

The Admin gets its information from your host’s system message file. The location of this file is specified in “/etc/syslog.conf” and depends on the UNIX system. It is e.g. “/var/adm/messages” for Solaris 2 and DG-UX.

The system message file can grow quite large. It cannot be cleared using the EtherShare Admin – the UNIX operating system usually is responsible for keeping it at a manageable size. See the description of the “cron” program in your UNIX documentation for details.

5.13.6 Versions

HELIOS continuously improves all its software products, and improved versions are released now and then. The standard EtherShare package offers a wide range of facilities and includes a number of separate Macintosh and UNIX program modules and utilities. If you ever need to contact our support department, they will want to know the software versions installed on your host (see chapter 17.1 “Support options”).

➢ With **Versions...** from the **Lists** menu you can list the versions of all major EtherShare server modules and Macintosh programs (see figure 88).

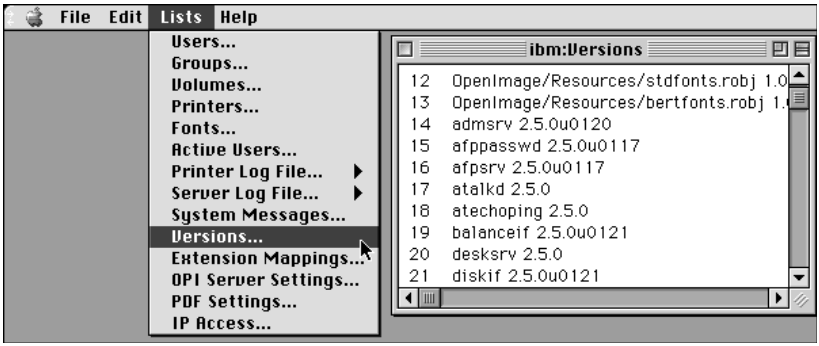

Fig. 88: Program versions

Important: For “root” and members of the “SysAdm” group, the **Versions** window will be updated on call. Therefore, it may take a few seconds to open the window. Regular users will get the information that was valid on the last start of EtherShare. This information may be outdated!

Besides the program versions, the **Versions** window also provides information about your EtherShare, interface, and syslog configuration (compare figure 89).

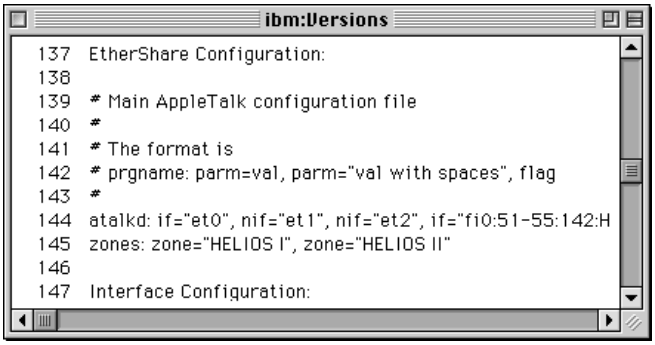

Fig. 89: Extended information in the **Versions** window

The information comes from the file “$ESDIR/Versions”.

5.13.7 Extension Mappings

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

non-Macintosh files (see **Generic icons** in chapter 9.3 “Directory and file formats”).

In the case of files created by DOS/Windows applications, the file type is typically indicated by adding a suffix to the file name, the so-called file name “extension”.
Under EtherShare, appropriate icons can be displayed for such files by specifying the extensions in the so-called “extension mapping table” (the default file name is “$ESDIR/conf/suffixes”). See the **suffixes** parameter in chapter 9.4 “Parameters of the “afpsrv” program” and **Automatic extension mapping** in chapter 9.6 “Public and private volumes” for related information.

➢ Select **Extension Mappings...** from the **Lists** menu to view the extension mapping table (see figure 90).

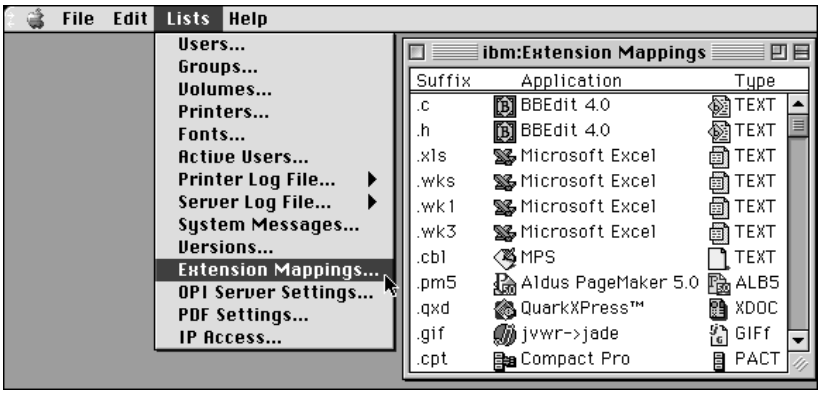

Fig. 90: Extension mapping table

For each entry in the “suffixes” file, **Extension Mappings** lists the configured file name extension alongside the cho-

sen Macintosh application (with its mini-icon) and chosen document type (with the document mini-icon).

➢ Double-click on an entry to edit the mapping, or choose **File** and **New** to create a new mapping (see figure 91).

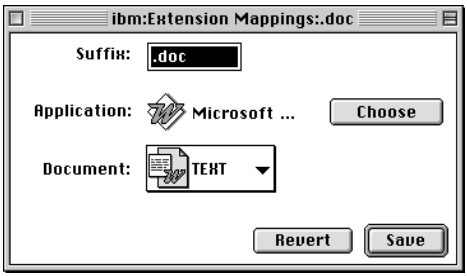

Fig. 91: Editing the extension mapping table

➢ Specify the required extension in the **Suffix:** field. Then click on **Choose** to select an existing application. The **Document:** pop-up menu will list all document types for the chosen application, select the one you want. Click on **Save** when you are finished.

Important: This feature allows you to allocate file name extensions to icons of applications or documents which already reside on the File Server or on the client computer, but it does not allow you to create new icons.

The mapping specified in the mapping table will only be applied to files that do not yet include resource information.

5.13.8 IP Access

AFP servers were traditionally only available on local area networks. The AFP over IP transport allows connections to the AFP server from anywhere in the Internet. To protect your site, you might want to create an IP access list to restrict access to your server. You can create such a list on your UNIX server (see appendix A 8: “IP configuration – Reference Part”), but it is much easier to use the EtherShare Admin instead. It offers all options that are required for a standard access control configuration. Some additional parameters are available under UNIX only. By default, access is restricted to the local network.

System requirements

To make use of IP access control, you have to install/run:

- Open Transport 1.1.2 or later
- System Software 7.6 or later for Macintosh clients
- New AppleShare client for Macintosh clients. This new client is available from Apple:

  `http://www.apple.com/appleshareip`

  Look for file `AppleShare Client 3.8.1` or later

Note: System Software 8 includes the AppleShare IP client software.

About defaults

If no access list is available, any AppleShare client in the Internet will be able to access your server. The EtherShare installation program, therefore, automatically creates an access list. This list will allow all locally connected AppleShare clients to access the server (clients on the same network segment), and it will deny access to the server to any other computer outside.

Description of the access list

Figure 92 shows an example of an IP access list. The list is sorted. At first, it contains all addresses of computers/networks to which access is explicitly denied. Then, it lists those to which access is allowed. At the end, it contains a **Deny any other** entry that denies server access to all computers/networks that do not appear in the list before. The representation of "any other" is 0.0.0.0 (for **Address**) and 0.0.0.0 (for **Mask**). If the **Deny any other** entry was missing, access would – by default – be granted to anybody in the Internet whose address had not been entered in the "Deny" section. Please note that the **Deny any other** entry cannot be deleted.

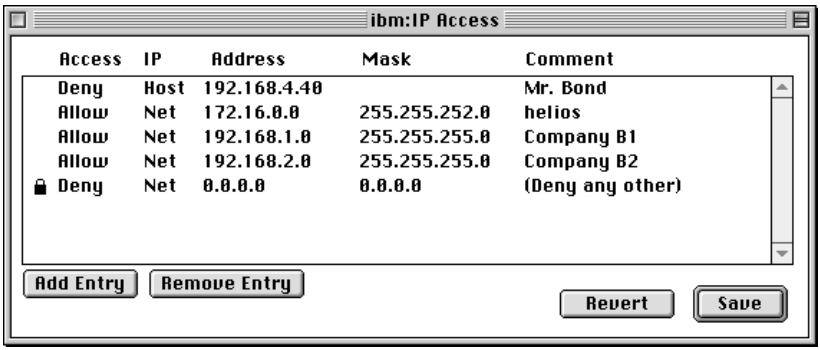

Fig. 92: Example of an IP access list

The access list will always be sorted that way automatically. This allows the program to go through the list from top to bottom and react very quickly. E.g. if an IP address is denied, the program can send the respective message after going through the "Deny" section only – it does not have to check the whole list. The checking mechanism is illustrated in figure 93 below.

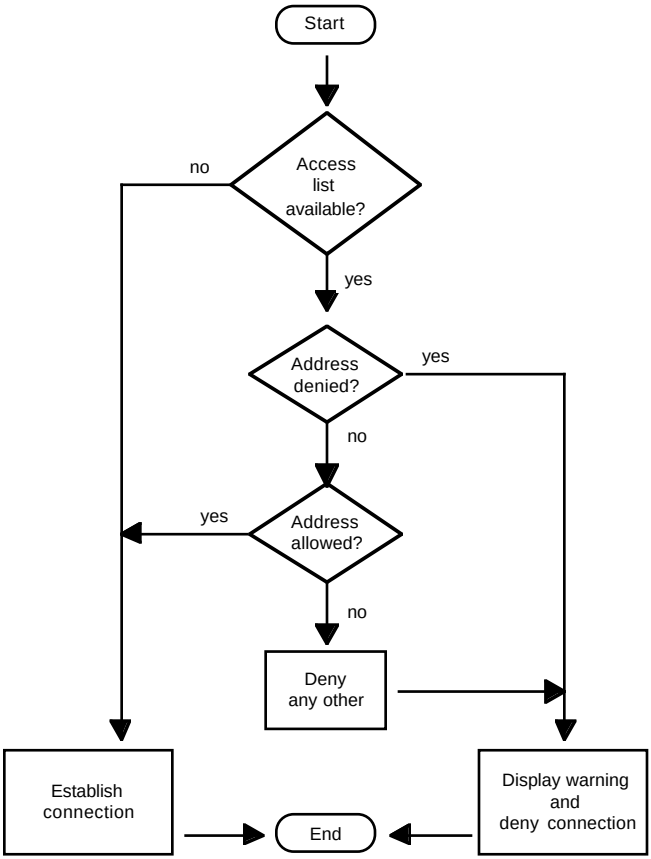

Fig. 93: How the program deals with access requests

The columns in the access list contain the following information (see figure 92 again):

Access specifies whether access is denied or allowed.

IP specifies whether the entry is meant for a single computer (**Host**) or a network (**Net**).

Address contains the IP address of the host/network. An IP address consists of 32 bits (4 groups of 8 bits). This number of bits allows well over 2 billion unique numbers to be used to identify a node on a network. When specifying an IP address, it is common to use a dotted decimal representation of four numbers between 0 and 255 divided by a period (e.g. 192.168.4.40).

Mask is only meaningful for network entries. The mask is structured like an IP address and specifies the number of bits that are relevant to the network identification. It filters out the logical network address. The mask 255.255.255.0 for example specifies that 24 bits are to be compared with the IP number. The remaining 8 bits (that identify the individual computers of a given network) are not relevant.

Comment contains a description or name that may help you remember to whom the respective computer or network belongs.

Defining access rights

In order to set up or change the access list for your individual server, you have to select **Lists** and **IP Access** from the Admin menu and then click the **Add Entry** button in the access list to open the dialog that lets you set up new definitions (compare figure 94):

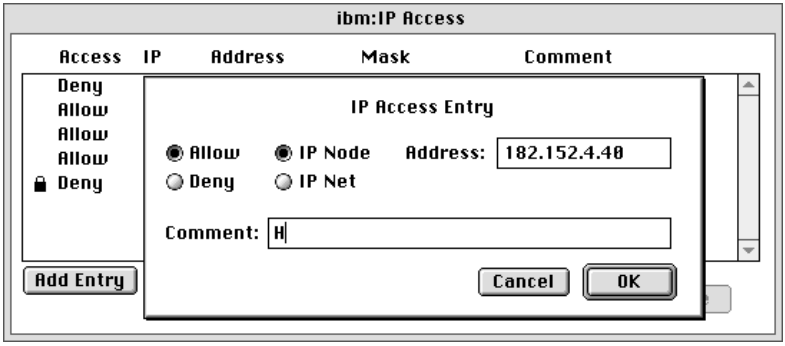

Fig. 94: Setting up the IP access list

First of all, you just have to click the respective radio button to specify whether you want to **Allow** or **Deny** either a host (**IP Node**) or a network (**IP Net**). For **IP Node** entries you only have to enter the correct IP **Address**. For **IP Net** entries you have to enter both, an **Address** and a **Mask** (see figure 95). The **Comment** field is restricted to 32 characters. The access list will automatically be re-sorted after adding a new entry.

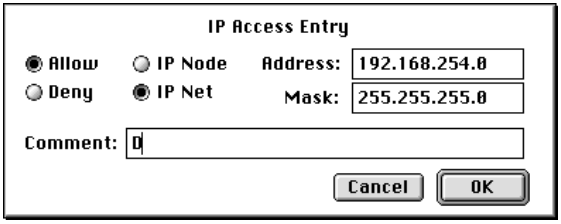

Fig. 95: Setting up an entry for a network

You can edit an existing entry directly if you want to change it. Just double-click the entry in the access list.

The **Deny any other** entry cannot be removed. For security reasons, it is always kept at the end of the list.

There will be rudimentary consistency checks, so you will have to be familiar with IP net/mask structuring and conventions. See your TCP documentation if you have questions.

Additional volume settings (e.g. `ipaccess=...`) are described in chapter 9.6 “Public and private volumes”.

Please note that under UNIX, there are additional parameters available (`allowdomain`, `denydomain`). They are described in appendix A 8: “IP configuration – Reference Part”. If someone edited the access list under UNIX and used these parameters, you would get a warning on opening the list with the Admin program again, because the Admin cannot display the “domain” entry. Editing the list with the Admin will replace all settings that have been defined under UNIX.

5.14 Editing “atalk.conf” (and other configuration files) manually

We strongly recommend to use the EtherShare Admin to carry out the majority of configuration tasks required by your EtherShare installation. Particularly in the case of printer setup, the EtherShare Admin only accepts meaningful parameter values and always generates syntactically correct entries in the EtherShare main configuration file “atalk.conf”. However, certain seldom used parameters and switches in “atalk.conf” can only be configured manually. System administrators with UNIX experience can edit “atalk.conf” using a UNIX editor such as vi.

Macintosh users can use the EtherShare Admin to load, view, or edit “atalk.conf” – and several other configuration files, namely “/etc/printcap”, “ethershare.license”, and “afpvolumes”.

Important: Before opening one of the configuration files with the EtherShare Admin you should make it a habit to close all open Admin windows. Otherwise, the changes you make could collide with the definitions specified in an open dialog window, and thus will never take effect.

➢ To open the window that contains the desired configuration file, press the **Option** key and then select the respective item from the **Lists** menu (compare figure 96).

You need sufficient permissions to save the changes you make (and, depending on what you change, you may need to stop and restart EtherShare for the changes to take effect), but regular users can also use this option in order to

inspect the respective files and thus check the current configuration.

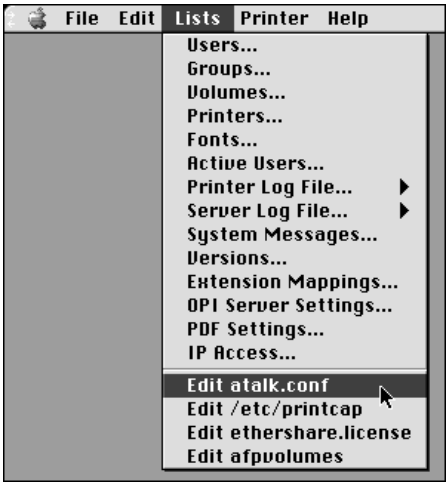

Fig. 96: Opening the **Lists** menu while pressing the **Option** key

More information about parameters of the “atalk.conf” file and about syntax conventions are given in chapter 8.2 “System configuration”.

5.15 Multiple EtherShare hosts

In networks with more than one EtherShare host, the EtherShare Admin can access several of them at the same time, for example to allow configuration data and print server download fonts to be copied from one host to another. Printer jobs cannot be copied between hosts.

➢ To make multiple connections, choose **Login...** from the **File** menu as often as you need it.

Multiple lists

The presence of additional Administration Servers (i.e. hosts) is shown graphically in the **Lists** menu by appending "**...**" to all entries – e.g. **Users...** rather than **Users** – (compare figure 97).

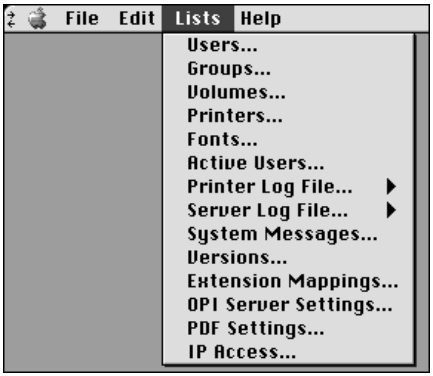

Fig. 97: **Lists** menu when logged-on to more than one host

If you are logged-on to more than one host, on selecting any of the **Lists** items (**Users...**, **Groups...**, **Volumes...**, etc.), a new window will open to allow you to choose the host whose window you want. In figure 98, **Volumes...** has been

chosen in the **Lists** menu, and three Administration Servers are active. To open the required data window, highlight the respective host and click on the **Volumes** button.

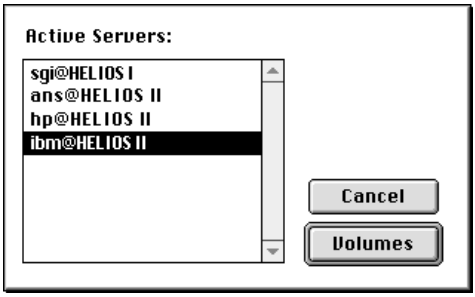

Fig. 98: Choosing the host whose volume list you want

Copying configuration data from one host to another

Furthermore, you can copy the configurations for users, groups, volumes, extension mappings and printers from one host to another. Print server download fonts can also be copied between two hosts. Print jobs in a printer job queue, however, can only be moved between printers on the same host, and you cannot copy resident printer fonts, of course.

➢ To copy items, select one or more of them in the list of one of the hosts with the mouse. You can choose multiple entries using standard Macintosh keyboard shortcuts (see **Selecting multiple entries from a list** in chapter 5.5). Without releasing the mouse button, drag the item away from the list – a dotted frame is drawn around the selection – and release the mouse button over the corresponding list for the other host (see figure 99).

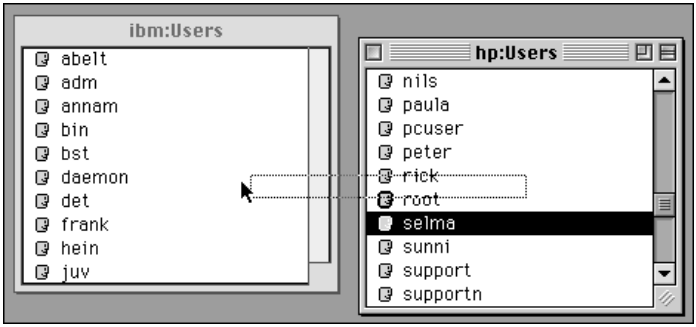

Fig. 99: Copying the user entry “selma” from host “hp” to host “ibm”

A new data window is automatically opened for the item on the target host. Please note that the default values entered in the fields of the new data window are those of the copied object, and are not the default values from the target host’s EtherShare Admin application. Then click **Save** in order to save the new entry for the target host.

When copying a user to another host, only the user name is copied, but not the list of groups that the user belongs to. When the new entry is saved, the EtherShare Admin tries to preserve the old user ID if it is not already assigned to another user.

When copying a group to another host, only the group name is copied, but not the list of members of the group. In contrast, when copying volumes and printers, all parameters of the object are copied. Note that in case you copy printer queues or volumes to another host, the spool directories or

volume directories that are specified for the queue/volume must exist on the target host as well.

Please note that it is not possible to assign a user to a group of another host. Similarly, you are not allowed to assign a group to a user of another host. Furthermore, it is not recommended (and normally not necessary) to copy user and group data to another host if your installation uses yellow pages (NIS).

If you copy items between servers that have different software products installed you will possibly not be able to save the items on the target server. For example, if you have set up a Print Preview queue on a server and want to copy this queue to a second server on which the Print Preview product is not installed, the **Save** button in the queue's **Settings** window will be disabled on the target server.

5.16 Logging off from the Administration Server

➢ In order to log off from an Administration Server, choose **Logout...** from the **File** menu. If more than one Administration Server is active, a dialog box will appear allowing you to choose the one you want to log off from (see figure 100).

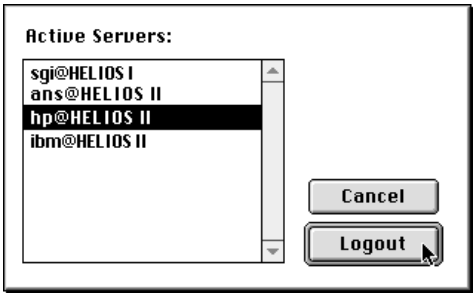

Fig. 100: Logging off from an Administration Server

➢ Select the server you want to log off from. Click **Logout** to confirm your selection.

EtherShare Admin then closes the connection to the Administration Server of the selected host, and closes all associated windows on the screen.

➢ Choosing **Quit** from the **File** menu will terminate the Admin program and will – at the same time – close all connections.

5.17 Retrieving information about your EtherShare copy

In some situations – e.g. if you contact your dealer for administrative or support matters – you may need information about your EtherShare copy, such as serial number, machine ID, or activation key. There are different ways of retrieving these information.

You can display the complete machine ID for example by using the HELIOS product installer which is described in chapter 4 “Installation”.

Or you may **Option**-click in the **Logout...** window of the EtherShare Admin after having selected the server in question. Then the serial number in *digits* and the machine ID in *hexadecimal* notation will be appearing (see figure 101).

Another possibility of retrieving product information, is to use the Admin’s **Versions** option. This feature is described in chapter 5.13.6.

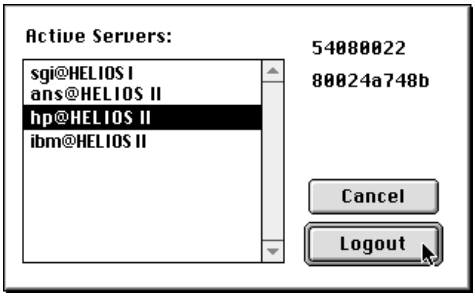

Fig. 101: Getting serial number and machine ID

6 HELIOS Mail

6.1 General remarks

This chapter describes the configuration and use of the Macintosh program HELIOS Mail, which allows to send and receive electronic mail messages and files from other Macintosh or UNIX users on the network.

If you have a modem attached to the UNIX host and configured for UNIX mail (uucp) or Internet mail (SMTP) you can use HELIOS Mail to communicate with several million users of this worldwide e-mail system. You also receive EtherShare Print Server messages (“paper out” etc.) via electronic mail.

HELIOS Mail contains an integrated editor and an address book function.

HELIOS Mail is also provided with a “Mail Notification Feature”, which displays a flashing mail icon and a notification message and outputs a configurable sound if you receive new mail, regardless of which Macintosh program you happen to be using at the time. The installation of the “Mail Notification Feature” is described in chapter 4.6 “The client installation procedure”. Its activation and use are described at the end of this chapter.

In order to use HELIOS Mail, the Mail Server must already be running on the host you want to connect to. EtherShare is configured to start the Mail Server automatically when UNIX is booted. The Mail Server communicates with HELIOS Mail through the Apple Data Stream Protocol (ADSP); the protocol is transparent to other AppleTalk devices.

HELIOS Mail needs to access Apple's ADSP driver (see chapter 4.6 "The client installation procedure" for details).

Important: HELIOS Mail also uses the UNIX "mail" program, which must be installed and working. To test this, make a UNIX login and try to send a mail between two UNIX users. See your UNIX documentation for more details.

The POP3 Server

EtherShare 2.6 includes a POP3 Server so that it is possible to use a client workstation other than Macintosh and/or a mail application other than HELIOS Mail with the Mail Server on the UNIX host. See chapter 14.4 "The POP3 Server" for details about this.

6.2 Starting HELIOS Mail

During the installation of EtherShare, the “install” program automatically creates a public Macintosh volume with the name “EtherShare Applications”. This volume is used to store Macintosh applications such as HELIOS Terminal, HELIOS Mail and the EtherShare Admin.

➢ You can start HELIOS Mail from any of the Macintosh workstations on the network by choosing and opening the network volume “EtherShare Applications”, opening the HELIOS Mail folder and clicking twice on the HELIOS Mail icon. Alternatively – if you have installed the Macintosh applications on your local Macintosh – you can start HELIOS Mail from the menu.

After loading, HELIOS Mail usually shows a copyright notice (see figure 102) – unless you have changed your Preferences (see later) – and a new menu bar.

Fig. 102: HELIOS Mail copyright notice

6.3 Setting Mail preferences

➢ When you start HELIOS Mail for the first time, you should initially choose **Preferences...** from the **Edit** menu in order to specify your standard settings (see figure 103):

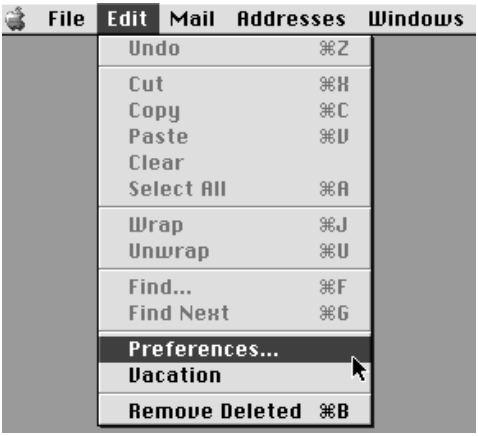

Fig. 103: Selecting **Preferences...** from the **Edit** menu

The **Preferences...** dialog is divided into several sections – in the left column of the dialog window you can select different types of preferences and thereby change the contents of the window respectively.

➢ Click the **OK** button in the dialog only after having set up all the different sections. The settings will then be valid. They will be ignored, however, if you click **Cancel**.

6.3.1 General preferences

The dialog that lets you define **General** preferences is shown in figure 104. It contains the following options:

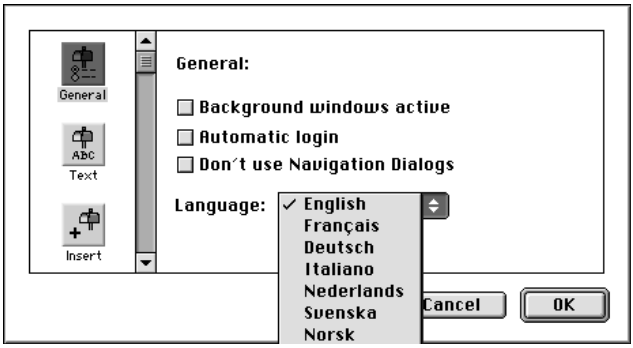

Fig. 104: Dialog box for **General** preferences

Background windows active

Background windows active specifies whether a background (i.e. non-active) window should react immediately to a mouse click, or whether the mouse click should initially swap the window into the foreground.

Automatic login

The **Automatic login** option specifies whether HELIOS Mail should immediately start with the login dialog, or whether it should first display the “About HELIOS Mail” dialog. In the latter case, you will have to choose **Login** in the **File** menu manually. HELIOS Mail can also be configured to complete the connection to the Mail Server automatically. **Save name** in the **Login** dialog also causes autologin. The **Automatic login** checkbox is ignored anyway if **Save name** is ticked (compare chapter 6.4 “Configuring the connection”).

Don't use Navigation Dialogs

You may check the **Don't use Navigation Dialogs** option if you do not want to use Apple's Navigation Service dialogs (e.g. for faster performance). In this case you will get the conventional "Attach File" dialog without the possibility to select the file encoding format and without features like using shortcuts, bookmarks, or browsing recently used files. For detailed information on how to attach files to a mail see **Attaching a file** below in this chapter.

Language

The pop-up menu **Language** is used to select the desired dialog language for menus, messages and screen prompts. The default for this field is the language setting of your Macintosh system file. If you change **Language**, you must close and re-open each window before the new language will take effect.

6.3.2 Text preferences

The dialog that lets you define **Text** preferences is shown in figure 105. It contains the following options:

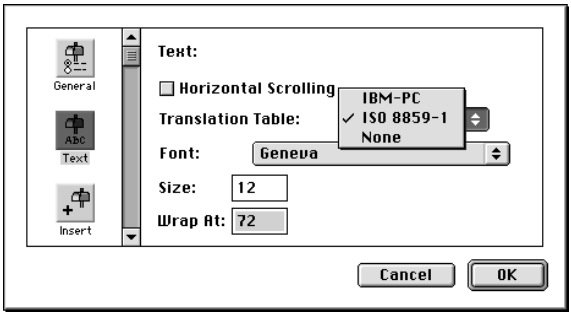

Fig. 105: Dialog box for **Text** preferences

Horizontal Scrolling

The **Horizontal Scrolling** option specifies whether each new “Untitled” mail window scrolls horizontally, to allow you to enter up to about 80 “M” characters (“M” is the widest proportional character) on each line, before wrapping. Otherwise, the text will wrap after the right-hand edge of the window that is currently open has been reached.

Translation Table

Translation Table: specifies the character conversion table to be used if you send mail containing national accented characters such as “umlauts”. This allows you to send mail containing umlauts to UNIX users, too. You can choose “ISO 8859-1” to specify the extended character set used by almost any e-mail program.

Font, Size

Font: and **Size:** specify the font and font size of characters to be used when you edit or print mail.

Wrap At

Usually, the number of characters in one line depends on the dimensions of your text window. Here, you can enter a value that specifies a given number of characters for text wrap. If you enter e.g. “72” for **Wrap At:**, and later choose **Wrap** from the **Edit** menu for a selected text in an outgoing mail, all selected text lines will end after the 72nd character – no matter how large the text window might be. The addressee will see the wrap effect, too.

6.3.3 Insert preferences

The dialog that lets you define **Insert** preferences is shown in figure 106. It contains the following options:

Insert Cc: line Bcc: line Signature

Insert Cc: line specifies whether each new “Untitled” mail window should automatically include a “Cc:” (carbon copy to...) line in the header. This saves you typing it manually if you regularly carbon copy mail items to additional recipi-

ents. The **Insert Bcc: line** checkbox would insert a “Bcc:” (blind copy to...) line in the header of each new mail document. This “Bcc:” line lets you enter addresses of people to whom you want to send a copy “secretly”. All recipients will see in the header of the mail the name of the addressee and of those who have received a copy – they will *not* see, however, if anybody has received a blind copy.

Signature specifies whether your individual signature should be added automatically to each new mail you write. How you can set up or change your signature is described later in this chapter.

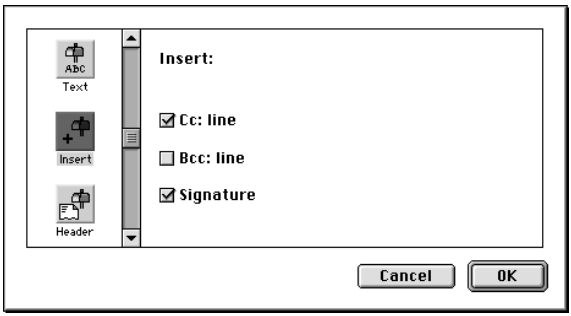

Fig. 106: Dialog box for **Insert** preferences

6.3.4 Header preferences

The dialog for **Header** preferences is shown in figure 107. It lets you specify what kind of header you prefer:

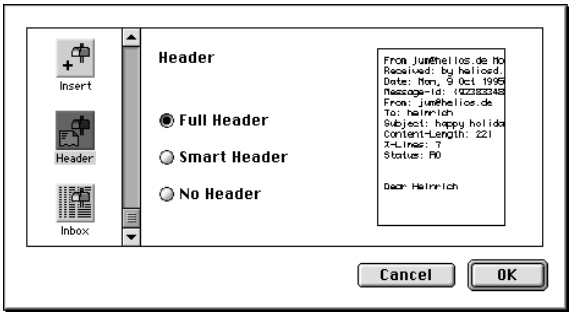

Fig. 107: Dialog box for **Header** preferences

Important: If you need to save an e-mail message for use on a different e-mail client or unpacking utility the **Full Header** option must be turned-on.

Full/Smart/No Header

If **Full Header** is specified for your incoming mail, the documents will contain all available information about origin, size, and status of the mail. **Smart Header** will only display the date, the names of the sender and addressee, and the subject line. With **No Header** you can suppress the header information completely.

6.3.5 Inbox preferences

The dialog that lets you define **Inbox** preferences is shown in figure 108. It contains the following options:

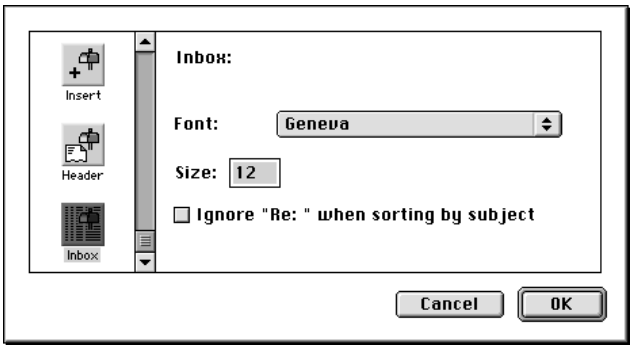

Fig. 108: Dialog box for **Inbox** preferences

Font
Size

Font: and **Size:** specify the font and font size that will be applied to your “Incoming” mail window (compare chapter 6.5 “Incoming mail”).

Ignore “Re:”...

Mails in the “Incoming” mail window can be sorted – e.g. by subject (see also chapter 6.5 “Incoming mail”). If you check **Ignore “Re:” when sorting by subject**, the “Re:” – that precedes every reply mail – will be ignored.

6.4 Configuring the connection

When you choose **Login** in the **File** menu for the first time, HELIOS Mail opens a window to let you choose the EtherShare host that you want to connect to (see figure 109).

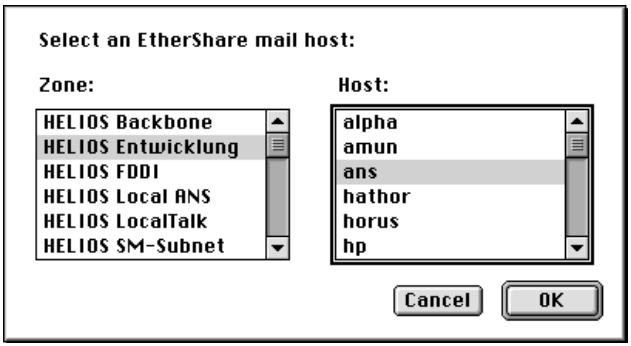

Fig. 109: Choosing the zone and host

Use the list in the box on the left to choose the zone where the EtherShare host is located. The list shows all known zones. Unless you have other, external routers in your network, only the zones from internal EtherShare routers (e.g. Ethernet) will be visible. If you have no zones (because you have no router, or because zones are not available for some reason), you will see an asterisk “*” as a substitute for zone names.

After choosing the zone, the list in the box on the right shows all UNIX hosts in the chosen zone with which you are able to establish a connection (i.e. all hosts that are running the Mail Server).

➢ Please choose the host you want and click **OK**.

HELIOS Mail then opens a window to allow you to log on to the Mail Server by entering your EtherShare user name (or full name) and password (see figure 110).

Fig. 110: HELIOS Mail login box

When you log in for the first time, you have the option of choosing **Save name** and/or **Save password**. If you check both you do not have to log in manually the next time you start HELIOS Mail. The name and password are stored in a hidden file on your local hard disk. For maximum security, do not use the **Save password** option.

If you have checked **Save name**, HELIOS Mail makes a note of your name, and the zone and name of the Mail Server you want to use. Next time you start HELIOS Mail, you only need to enter your password. Furthermore, if you log on to the EtherShare File Server on the same host first, you do not have to enter your name and password for either the Mail Server or the “HELIOS Mail Init” anymore. See the **autologin** parameter in chapter 14.3 “Parameters of the “mailsrv” program” for related information.

➢ Click the **OK** button when all inputs have been made. HELIOS Mail then attempts to make the connection to the chosen server. If your inputs were correct, the “Incoming” mail window should appear (see figure 112 in chapter 6.5 “Incoming mail”).

Temporary users

If other users want to temporarily use your workstation to send and receive their mail, they should first close the connection to the Mail Server by closing all HELIOS Mail windows, and log in again with **Login** in the **File** menu. Guest users should uncheck **Save name** in the login box, since otherwise the original owner of the workstation will receive new mail notifications for the temporary user rather than for him/herself. If guest users uncheck **Save name**, no notifications will be received until the next login, which is less confusing.

HELIOS Mail also allows you to log on to more than one Mail Server at the same time and it allows several users to log in simultaneously. You may not log on twice to the same Mail Server with the same user name (not even with different mail programs). This could seriously confuse the Mail Server.

If you just want to see who is currently logged-in from this Macintosh, choose **Login** from the **File** menu without closing the connection to the Mail Server (leave at least the “Incoming” mail window open). Information about the current session will then be displayed in a login confirmation box (compare figure 111).

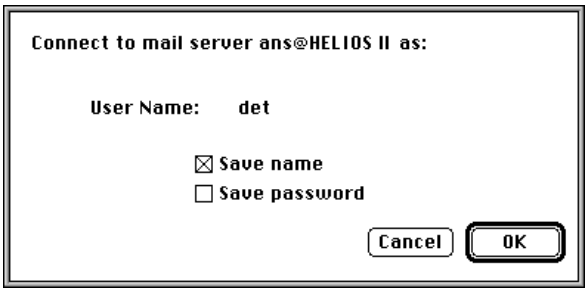

Fig. 111: Login confirmation box

6.5 Incoming mail

As soon as you log in, HELIOS Mail opens the “Incoming” mail window, which lists all mails in your in-basket (see figure 112). The window title shows the host name, “Incoming” and your user name. The icons in the left column illustrate status information – i.e. they show whether the mail is large, already read or still unopened. If there is no mail, the “Incoming” mail list will be empty.

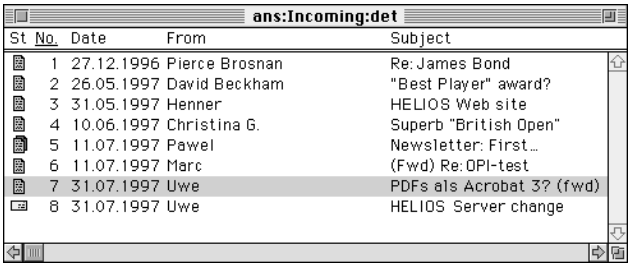

Fig. 112: ”Incoming” mail window

About the “Incoming” mail window

If you have a large amount of mails (more than 50 items), there might be a slight time delay before you can scroll through the whole list, but you can start using HELIOS Mail immediately because the list is processed in the background.

Use the mouse (or the **Windows** menu – which is described later in this chapter) to bring one of the items to the foreground if it is hidden behind other windows.

If necessary, you can double-click anywhere in the column titles row (the row starting with “St”, “No.”, etc.) to force an update of the “Incoming” mail window. The time that is

needed for automatic updating depends on the system and configuration of your host computer.

You may click on a column title to sort the contents of the window. In figure 112, e.g., the window is sorted by No.; this is indicated by the column title being underlined. You can select any of the column titles for sorting (and reverse sorting, holding down the **Option** key when clicking).

Reading, saving, and printing mails

If you want to read one or more mail items, you have to proceed as follows:

➢ Double-click on the item you want to read. Use **Shift**-click to select several entries at a time and use **Command**-click to select/deselect individual entries from the list. If you press the **Option** key while double-clicking the item, the original unfiltered message is loaded into the text window and can be saved to a file.

Note: This complete e-mail may contain large attachments which are loaded into memory. You may need to increase the HELIOS Mail memory partition (**File** > **Get Info** > **Memory**) to work with unfiltered e-mails in a text window.

➢ When you are finished, and while the mail item is still open, you can save the item with **Save** from the **File** menu or print it with **Print...** from the same menu. Adjust the window width to the column width of the printout.

You can re-open saved mails at a later date, e.g. in order to re-read them, print them, send replies, or forward them. Use the menu items **File** and **Open...** for that purpose.

Please note that

- ❍ if you double-click on a saved mail with the Finder, HELIOS Mail will be started automatically.
- ❍ a saved mail can be edited using any Macintosh word processing application.

Saving an attachment

If the message contains an attached text or binary (program) file you will see a document icon at the top of the “Incoming” mail window, just below the title bar (compare figure 113). You will also see the name of the attached file(s), the size, and the type of encoding.

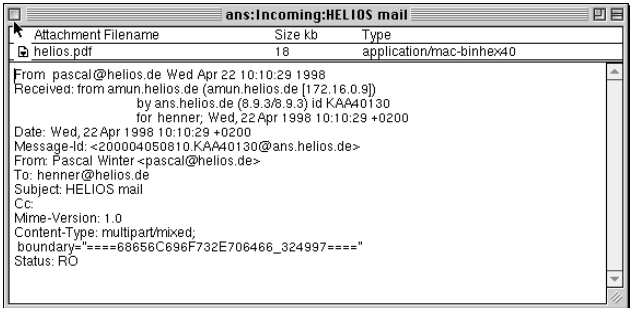

Fig. 113: Incoming mail (here: with attached file)

➢ Double-click on the document icon below the title bar to save the attached file. You will get a file dialog box that allows you to choose a new name and folder. (See also the paragraph **Attaching a file** in chapter 6.6 “Sending mail” for information on how to send attached files.)

The Find option

You can search for specific expressions in incoming mails. For that purpose, open the desired mail and select **Edit** and

Find... from the menu. Then enter the word you are looking for (see figure 114).

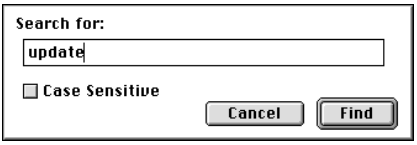

Fig. 114: Using the **Find...** option in HELIOS Mail

Deleting mails

In order to delete one or more mail items from the in-basket, you have to proceed as follows:

➢ Activate the “Incoming” mail window and choose the items to delete. Use **Shift**-click to select a range of entries and use **Command**-click to select/deselect individual entries from the list.

➢ Then choose **Clear** from the **Edit** menu.

A “Trash” icon will appear in front of every mail you have deleted. You can choose **Edit/Clear** a second time to undo deletion, if required.

➢ At last, close the “Incoming” mail window to have the deleted items removed. Alternatively, you can select **Remove Deleted** from the **Edit** menu to remove deleted items without closing the window (see figure 115).

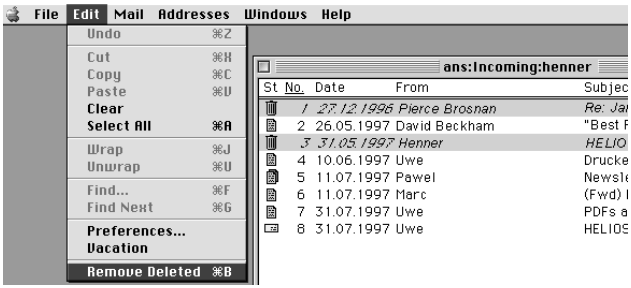

Fig. 115: Deleting mail items

HELIOS Mail then prompts for acknowledgment of deletion, to allow it to be aborted if required (see figure 116).

Fig. 116: Confirming deletion of mails

You do not have to delete items immediately if you want to deal with them again at a later date.

6.6 Sending mail

New mail

To open a new mail document, you have to proceed as follows:

➢ Open the **File** menu and choose **New** and **New Mail** as shown in figure 117 (**New Template** will be described later in this chapter).

An editor window “Untitled” will open, containing a header consisting of a blank “To:” line and a “Subject:” line. Further lines (e.g. a “Cc:” line) in the header are optional – their appearance depends on your settings in the **Preferences...** dialog (see chapter 6.3.3 “Insert preferences”).

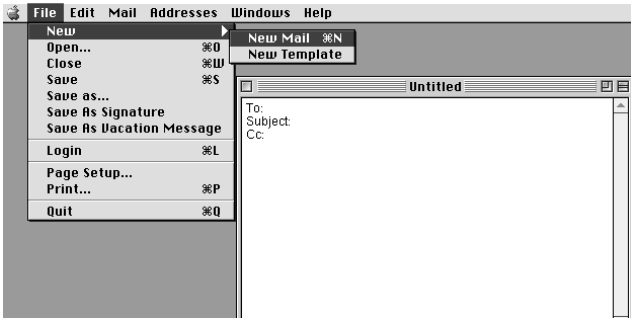

Fig. 117: Writing a new mail message

➢ Enter the e-mail address of the addressee in the “To:” line. Alternatively, you can choose **To...** (and optionally **Copy to...** or **Blind Copy to...**) from the **Mail** menu to automatically paste the recipient’s mail address from the address book into the header of your message (see figures 118 and 119). You can do this before, during, or after writing the message itself. (For a comprehensive description of the ad-

dress book, please see chapter 6.7 “Using/editing the address book”.)

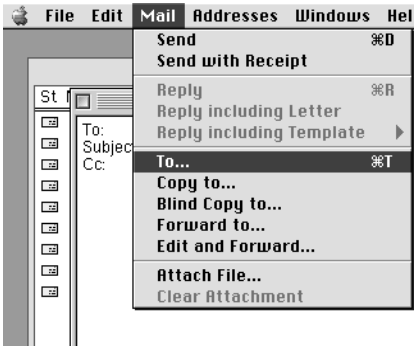

Fig. 118: Selecting an addressee

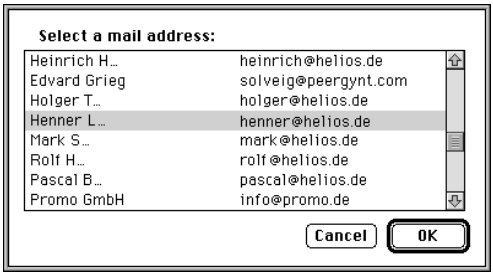

Fig. 119: Address book

Note: You can enter several addressees at a time in the “To”, “Cc:”, and “Bcc:” line. The addresses have to be separated by a comma. Each line is limited to 255 characters.

➢ You can enter a subject in the “Subject:” line to allow the addressee to quickly find out what the mail is about.

Use **Option-Tab** to toggle between the “To:” and “Subject:” line – and further lines in the header.

➢ Write your message using the normal Macintosh editing keys. If you change the current window size, the text will automatically re-wrap to the new size.

The Macintosh does not save Line Feed characters at the end of each line of your message. If you want to preserve the layout of messages sent to UNIX users, choose a suitable current window size and press the **Return**-key at the end of each line, or use the **Edit > Wrap** option instead. This option makes the text lines end after a given number of characters (the number that has been specified in the “Preferences” dialog). You can thereby influence the layout of the entire text or of individual lines you have highlighted before. The wrap option does not hyphenate text. If a word does not fit it is moved to the next line completely. See chapter 6.3.2 “Text preferences” for wrap preferences.

Attaching a file

You can add one text or binary (program) file to your message. Please note that if you attach a very large file, you and the addressee may have to change the “Memory Requirements” (**File > Get Info > Memory**) for the HELIOS Mail program in order to allow proper handling of the attached file.

Choose **Attach File...** from the **Mail** menu to send one text or binary (program) file with your message. You will get a file dialog to allow you to choose the file (see figure 120). Then, you may select the type of file encoding from the **Format** pull-down menu.

Note:	If you use the Navigation Dialog consider that this may slightly slow down the performance of HELIOS Mail.

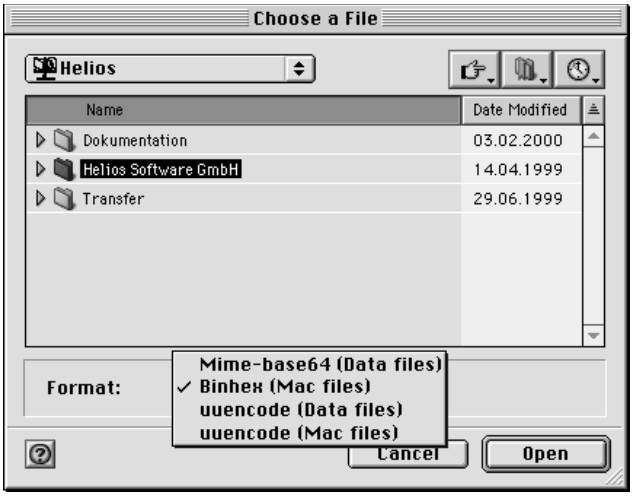

Fig. 120: Mail file encoding types

Furthermore, the Navigation Dialog offers three more features which can be reached through the buttons:

Shortcuts button

Provides quick access to the desktop, your AppleTalk network, AppleShare IP servers, and your mounted volumes.

Favorites button

Displays a list of items that you have selected as favorite places to visit. These items are also available in the Favorites folder in the Apple menu.

Recent button Displays a list of documents you have recently chosen.

For the different types of file encoding and their compatibility with different operating systems see Table 1.

	Mac	Windows	UNIX
Mime-base64 (Data files)	√	√	√
Binhex (Mac files)	√	–	–
uuencode (Data files)	√	√	√
uuencode (Mac files)	√	–	–

Table 1: File encoding formats

Note: "Data files", e.g. ".doc" or ".pdf", contain plain data information. "Mac files", on the other hand, additionally contain a resource fork beneath the data fork (e.g. given an ".eps" file, the data fork contains the PostScript information whereas the resource fork holds a "PICT" preview of the file).

E-mail attachments without "Type" and "Creator" info are automatically classified according to their file name suffix:

`FileSuffix`	`pdf`	`FileSuffix`	`tif`
`MacCreator`	`CARO`	`MacCreator`	`ogle`
`MacType`	`PDF`	`MacType`	`TIFF`

FileSuffix	tiff	FileSuffix	jpg
MacCreator	ogle	MacCreator	ogle
MacType	TIFF	MacType	JPEG
FileSuffix	jpeg	FileSuffix	pict
MacCreator	ogle	MacCreator	ogle
MacType	JPEG	MacType	PICT
FileSuffix	doc	FileSuffix	xls
MacCreator	MSWD	MacCreator	XCEL
MacType	W8BN	MacType	XLS4
FileSuffix	htm	FileSuffix	html
MacCreator	MSIE	MacCreator	MSIE
MacType	HTML	MacType	HTML
FileSuffix	rtd	FileSuffix	rtt
MacCreator	C#+A	MacCreator	C#+A
MacType	C#+D	MacType	C#+D
FileSuffix	sit	FileSuffix	hqx
MacCreator	SITx	MacCreator	SITx
MacType	SITD	MacType	SITD
FileSuffix	wav	FileSuffix	qt
MacCreator	WAVE	MacCreator	MooV
MacType	TVOD	MacType	TVOD

FileSuffix	mov	FileSuffix	ppt
MacCreator	MooV	MacCreator	PPT3
MacType	TVOD	MacType	SLD8

After choosing the file, you will see a document icon at the top of the “Untitled” window, just below the title bar (see figure 121). You will see the name of the attached file, its size, and the type of encoding.

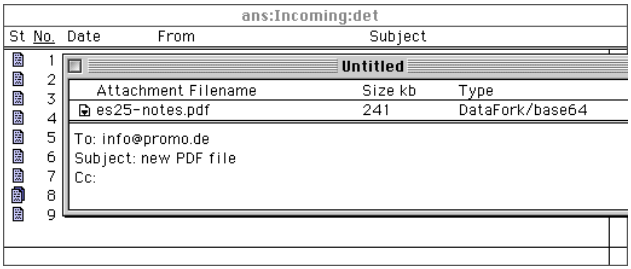

Fig. 121: Outgoing mail message with attached file

If the receiving mail host does not have the EtherShare Mail Server installed and running, you can still unpack attachments by using HELIOS Mail stand-alone, as follows: copy the mail including attachment as a plain text file from the UNIX host to a Macintosh, start HELIOS Mail, open the file with **Open...** in the **File** menu and save the attachment as described above in **Saving an attachment**.

Note: If your Macintosh client runs Mac OS < 8.5, Helios Mail will start up with the **Don't use Navigation Dialogs** checkbox (in **Edit** > **Preferences...** > **General**) ticked. This means that – by default – files are attached in "Mime-base64" format or, if you press the **Option** key while attaching a file to the mail, in "Mac-binhex40".

If you want to send several files to another Macintosh user, use an archiving program such as Stuffit to create a single compressed file to attach since HELIOS mail can only attach one file at a time although it is capable of receiving more than one attached file at a time (see **Saving an attachment** above).

New template

HELIOS Mail allows to create and use templates. You may create a template if you have to send a certain text several times to different people on different occasions.

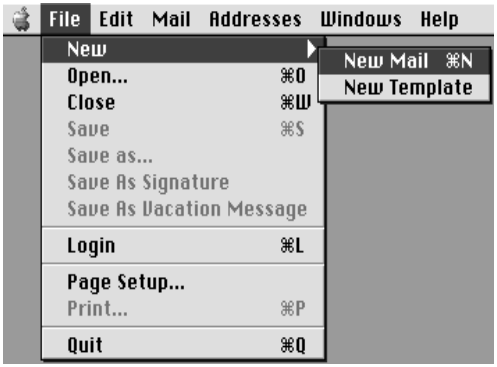

Fig. 122: Creating and using templates

➢ For creating a template, use the items **File**/**New**, and **New Template** from the HELIOS Mail menu (see figure 122).

Once you have edited the text you can save the template (favorably to the same folder where HELIOS Mail is located) using **Save as...**.

All templates that are stored in the same folder than HELIOS Mail will be added to the submenu as shown in figure 122 and can be opened by selecting the respective item. You can also create text files with a word processing application and use them as templates. They will also be available in the submenu after you have moved them to the folder where HELIOS Mail resides.

Setting up a reply mail

If you want to send a mail to a specific person, you can open a new mail or reply to a mail you have received from him/her. In that case, sending a reply mail is much more comfortable, because the new editing window already includes the correct address as well as a complete “Subject:” line that starts with “Re:”, indicating the reply mail status.

➢ To send a reply mail, highlight the mail you have received in the “Incoming” mail window (or open it) and then select **Reply** from the **Mail** menu. See figure 123 as an example for a reply mail.

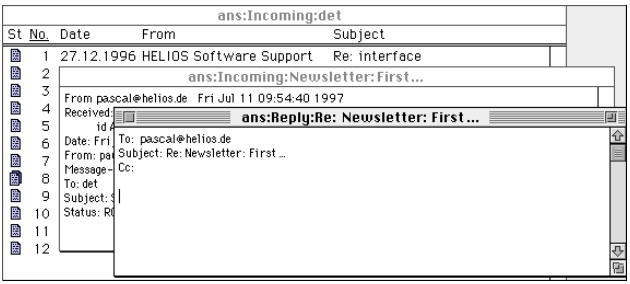

Fig. 123: Sending a reply mail

Please note that

- if you have opened several mail items simultaneously, **Reply** opens a new window to reply to the currently active (foreground) item.
- if you have selected several items in the "Incoming" mail window but not opened them, **Reply** opens new windows to reply to all of them.
- you may select **Reply including Letter** from the **Mail** menu instead of **Reply**. This will include the letter you have received (without its header) into your reply mail. It allows you to refer to specific sentences without having to re-type them.
- you may select **Reply including Template** from the **Mail** menu. This lets you send a reply to a letter you have received with your personal template. This might be quite reasonable if you want to reply to a few mails of the same kind.

➢ You can now start to write your reply. The "Subject:" line can be kept as is, or changed, if required.

For editing a mail, see also the paragraphs **New mail** and **Attaching a file** above.

Setting up a group reply mail

Instead of replying to just one addressee you can reply to a previously defined group of addressees with all the features **Reply** offers. Just hold down the **Option** key when clicking into **Mail** in the menu bar. Now, you can do a **Group Reply**, **Group Reply including Letter**, and **Group Reply including Template**.

Sending/ forwarding mail

When you have finished your mail document, you can now send it to the addressee.

Important: The “Incoming” mail window has to be open, i.e. you have to be logged-in, if you want to send a mail. Otherwise, the send command will not do anything.

There are several possibilities of sending a mail:

➢ Choose **Send** from the **Mail** menu to simply send the mail.

Mails that have not been written, but *received* can be sent to further addressees using the “Forward” option. When making use of this feature, you should select **Full Header** in the “Preferences” dialog to allow the complete header of the original mail to be forwarded. Otherwise, it may happen that the addressee will only see your e-mail address in the “From:” line, but has no chance of seeing the address of the person who sent the original mail.

➢ To forward a received mail, highlight the mail you have received in the “Incoming” mail window (or open it) and then select **Forward to...** or **Edit and Forward...** (first edit – then forward) from the **Mail** menu.

The address book pops up automatically, allowing you to select the addressee(s). See also chapter 6.7 “Using/editing the address book”.

6.7 Using/editing the address book

The address book is a file containing a global list of e-mail addresses (see figure 124). User specific address books are not supported.

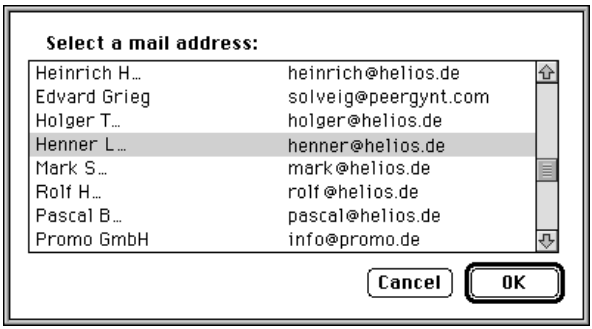

Fig. 124: Addresses in the address book

You can use this list to save time when you often send mail to the same people. When sending new mail, carbon copying mail or forwarding mail, choose **To...**, **Copy to...**/ **BlindCopy to...** or **Forward to.../Edit and Forward** from the **Mail** menu to automatically open the address book and paste the user's address into your message header.

➢ In the address book, use **Shift**-click to select a range of entries and use **Command**-click to select/deselect individual entries from the list. Press the first letter of a name to jump forward to the first name which starts with that letter (backward searching is not supported). Click **OK** when you have made your selection.

When you installed EtherShare, a new address book was automatically created as the empty UNIX text file “addressbook” in “$ESDIR/conf”.

➢ Choose **New Address...** in the **Addresses** menu to add a new address to the list (see figure 125).

Fig. 125: The **Address** menu

➢ Enter the recipient’s first name or a nickname in the **Real name:** field and the users’s e-mail address in the **Electronic address:** field (see figure 126).

Fig. 126: Entering a new address in the address book

When you use the address book, you will also see all users of your UNIX host, including “root”, in addition to users you have included manually with the **New Address...** func-

tion. See the **passwd** parameter in chapter 14.3 “Parameters of the “mailsrv” program” for related information.

Addresses of users reachable via “uucp” on other hosts are specified according to standard uucp conventions as “username@hostname. domain_name”. Sometimes you need to specify them as “hostname!hostname!...!username”. If you have already received mail from someone, his mail header will usually show the correct address format to use – provided that it has been set up properly.

➢ You may choose **Delete Address...** from the **Addresses** menu to open the address book for deletion. Highlight the address you want to remove and click the **OK** button.

6.8 Defining a signature/a vacation message

Signature

You can save your personal signature in a file and configure the mail program to add the signature automatically to every mail you write.

➢ To create a signature, open a new mail using **File**/**New**/**New Mail**. Then enter your signature, and select from the **File** menu **Save As Signature** (see figure 127).

Your signature will be stored on the server and automatically added to any mail you send – provided that the **Signature** checkbox is activated in the **Preferences... - Insert:** window (compare with figure 106 in chapter 6.3 “Setting Mail preferences”).

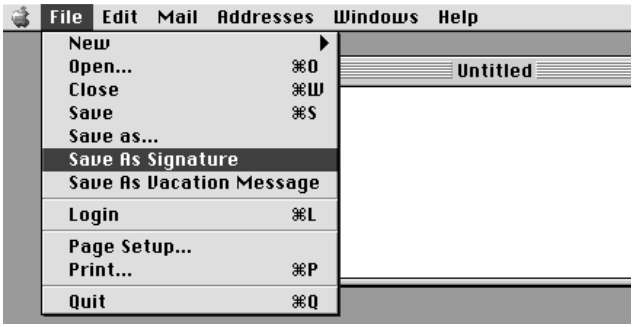

Fig. 127: Defining an individual signature

Figure 128 shows an example of a new mail window with included signature.

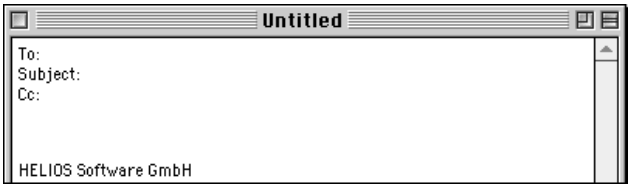

Fig. 128: New mail with signature

Vacation message

In addition to the “Signature” file, you can set up a vacation message. This message contains information about the time you will be on vacation. HELIOS Mail, or – to be precise – the “sendmail” program on the server, can be configured to automatically send the vacation message as a reply mail to all the people who try to contact you during your holidays.

➢ Write your message into a new mail window and select **Save As Vacation Message** from the **File** menu to store your note on the server.

➢ You can activate or de-activate automatic sending of the message by selecting **Edit** > **Vacation** (see figure 129).

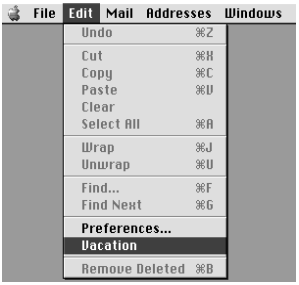

Fig. 129: Activating automatic sending of vacation message

6.9 The Windows menu

If you have opened several windows and you are looking for a specific one, use the **Windows** menu to see a list of all open windows and to bring the desired one to the foreground. The current foreground window is marked by a √ (see figure 130).

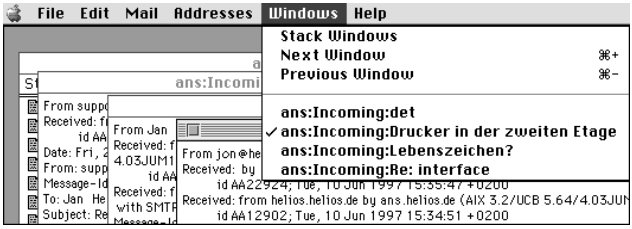

Fig. 130: The **Windows** menu

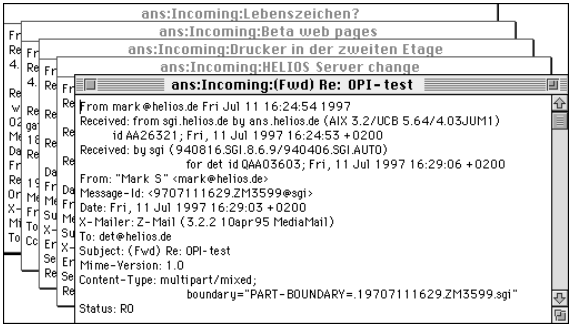

Fig. 131: Stacked windows

The option **Stack Windows** neatly re-arranges all the windows on the screen (see figure 131). The options **Next Window** and **Previous Window** let you switch back and forth.

6.10 Mail Notification Feature

When you installed the Macintosh utilities for EtherShare, you copied the “HELIOS Mail Init” into your system folder. After the “init” has been activated as described below, it will inform you immediately if any new mail arrives, regardless of which Macintosh program you happen to be using at the time. It notifies you with a flashing mail icon, a notification message, and a sound (see figure 132).

Fig. 132: Notification of a new mail

In order to read the mail, you have to start the HELIOS Mail program.

The “init” does not need to poll the network to do its job. This minimizes network loading, a factor which can become significant in large networks.

Activating the Mail Notification Feature

In order to work, the “Mail Notification Feature”, activated by the “HELIOS Mail Init” in the **Extensions Manager** folder, has to know for whom a particular mail item is destined, i.e. your user name. The “init” you receive on your HELIOS CD-ROM must be activated before it will work.

➢ You activate the “init” by logging on to the Mail Server with HELIOS Mail as described earlier, and checking the

Save name box (and optionally, the **Save password** box) in the login window (see figure 133).

The “init” will then be active the next time you start your Macintosh. If you only checked **Save name**, the “init” will always show a login box when starting the system, to let you enter your password (see figure 133 again).

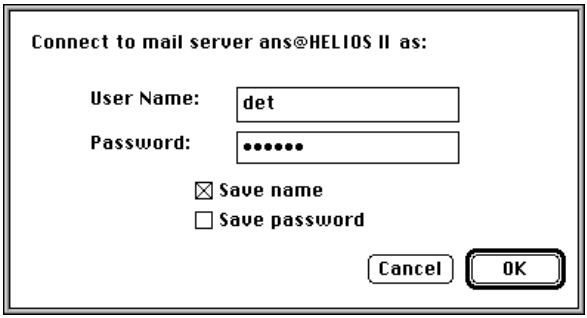

Fig. 133: Login box of “Mail Notification Feature”

If you have checked **Save password**, too, the “init” will make the connection to the Mail Server automatically, and no login box will appear.

In either case, having logged-in with the “init” you will not have to log in a second time when you start HELIOS Mail. See also the **autologin** parameter in chapter 14.3 “Parameters of the “mailsrv” program” for related information.

Please note that

- if you have not initialized the “Mail Notification Feature” in this way, no login box will appear and the “init” will not be active. This does not stop you from using HELIOS Mail. You just will not get any automatic notification.
- both the “Mail Notification Feature” and HELIOS Mail notice automatically if you have already mounted EtherShare volumes on the desktop with the **Chooser** from the host where the Mail Server is installed. In this case, you do not have to log in a second time.

However, if you want to suppress automatic notification of incoming mail, do the following steps:

➢ Choose **Control Panels** from the Apple menu and then select the **Extensions Manager**. In the “Extensions” folder, uncheck the “Helios Mail Init” icon and click the **Restart** button.

The next time you start your Macintosh – as long as the HELIOS Mail program is not running – no notification of incoming mail will occur.

7 HELIOS Terminal

7.1 General remarks

This chapter describes the configuration and use of the Macintosh program HELIOS Terminal, which allows to make simultaneous terminal connections to one or more UNIX hosts from any Macintosh computer in the AppleTalk network (multiple session capability).

In order to use HELIOS Terminal, the Terminal Server must already be running on the host you want to connect to. EtherShare is configured to start the Terminal Server automatically when UNIX is booted. It communicates with HELIOS Terminal through the Apple Data Stream Protocol (ADSP); the protocol is transparent to other AppleTalk devices.

HELIOS Terminal uses Apple's "Communications Toolbox" utility with its ADSP driver, the communication tool "AppleTalk ADSP" and the emulation tool "VT320" (they are shown in figure 134). See also chapter 4.6 "The client installation procedure".

Fig. 134: Tools in the "Extensions" subfolder of the local "System Folder")

7.2 Starting HELIOS Terminal

During the installation of EtherShare, the installation program automatically creates a public Macintosh volume with the name “EtherShare Applications”. This volume is used to store Macintosh applications such as HELIOS Terminal, HELIOS Mail and EtherShare Admin.

You can start HELIOS Terminal from any of the Macintosh workstations on the network by choosing and opening the network volume “EtherShare Applications”, opening the HELIOS Terminal folder and clicking twice on the HELIOS Terminal icon. After loading, HELIOS Terminal usually shows a copyright notice (compare figure 135) – unless you have changed your preferences; see later.

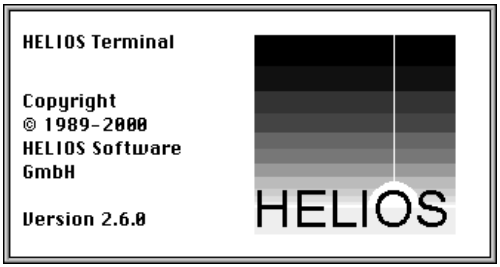

Fig. 135: HELIOS Terminal Copyright Notice

7.3 Setting Terminal preferences

When you start HELIOS Terminal for the first time, you should initially choose **Preferences** in the **Edit** menu in order to specify your standard settings (see figure 136):

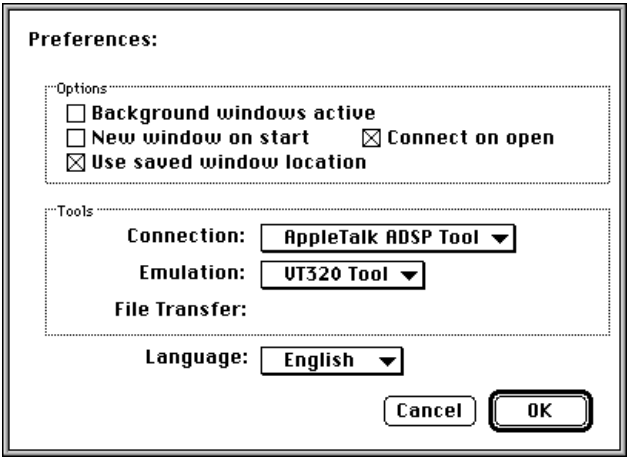

Fig. 136: Dialog box for preferences

The dialog box “Preferences” is used to specify various standard settings which do not relate to an individual connection.

Background windows active

Background windows active specifies whether a background (i.e. non-active) window should react immediately to a mouse click, or whether the mouse click should initially swap the window into the foreground.

New window on start

New window on start specifies whether HELIOS Terminal should immediately open a new session window on

starting, or whether it should first display the "About HELIOS Terminal" dialog box. In the latter case, you will then have to choose **New** in the **File** menu each time manually.

Use saved window location

Use saved window location automatically stores the position of each session window when you save the connection settings as a connection "document" (see later).

Connect on open

Connect on open specifies whether or not a connection attempt should be made as soon as a window is opened. If this box is not checked, you will have to choose **Open Connection** in the **Session** menu each time manually.

If **Connect on open** and **New window on start** are both active when you start HELIOS Terminal, you will get an automatic connection to the first host that replies. If you have more than one host, an easy way to make connections is to use connection "documents" (see later).

Connection, Emulation

Please specify the **ADSP Tool** and the **VT320 Tool** in the pop-up menus **Connection:** and **Emulation:** respectively. Note that the standard UNIX VT100 emulation is a subset of VT320. Refer to the appropriate documentation from Apple for more information on the VT320 Tool.

Language

The pop-up menu **Language** is used to select the desired dialog language for menus, messages and screen prompts. The default for this field is the language setting of your Macintosh system file. If you change **Language**, you must close and re-open each window before the new language will take effect.

Saving your preferences

If you apply any changes to the **Preferences** window, they are only valid after clicking **OK**. Click **Cancel** to close the window without saving changes.

7.4 Configuring the connection

When you choose **New** from the **File** menu, HELIOS Terminal opens a new window with the chosen tools. If you have chosen **Connect on open**, you will also get an automatic connection to the first host that replies.

Assuming that **Connect on open** is not specified, you must configure the connection settings before you can make a connection to a particular host. To do this, choose **Connection...** in the **Settings** menu (see figure 137).

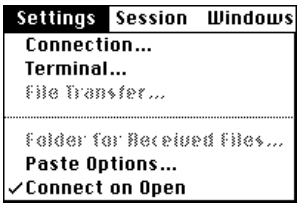

Fig. 137: **Settings** menu

First of all, make sure that **AppleTalk ADSP Tool** is specified as **Method:** in the “Connection Settings” dialog (compare figure 138). This tool is the one you need to communicate with the Terminal Server. If you have installed other communications tools such as the “Modem Tool”, they will also be visible in this pop-up menu.

Then check whether UNIXTerminal is specified in the **Connection Type:** field. This must be the same AppleTalk (NVE) type as that of the Terminal Server on the host.

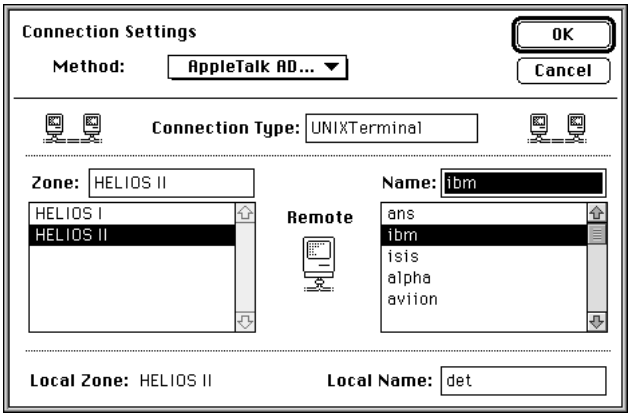

Fig. 138: Choosing the **AppleTalk ADSP Tool**

Then use the list in the box on the left to choose the zone of the UNIX host that you want to connect to. The list shows all known zones. Unless you have other, external routers in your network, only the zones from internal EtherShare routers (e.g. Ethernet) will be visible. If you only have one zone (because you only have one hardware interface, or because other zones are not available for some reason), you will see an asterisk "*" (this represents the current zone) rather than a zone name.

After choosing the zone, the list in the box on the right shows all UNIX hosts in the chosen zone with which you are able to make a connection (i.e. all hosts that are running

the Terminal Server). Please choose the desired host and click **OK**.

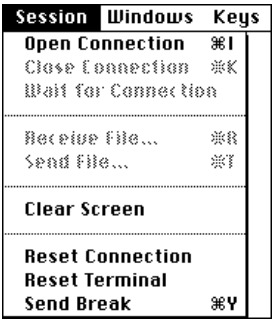

Fig. 139: **Session** menu

Now choose the option **Open Connection** from the **Session** menu (see figure 139). The UNIX host should reply in the emulation window (see figure 140).

Fig. 140: Emulation window

Please enter your UNIX login name and password, which are both to be entered with respect to case sensivity!) in order to complete the connection to the selected host.

To avoid having to make the above entries for zone, host name, etc. each time you make a connection, you can save the connection settings as a connection “document” by choosing the option **Save As...** in the **File** menu. Choose an easy-to-remember file name for the document, e.g. the name of the UNIX host with which you have made the connection, and save the document in the folder containing the HELIOS Terminal application. The next time you start HELIOS Terminal, you can make the same host connection again by choosing the previously saved connection document in the **Documents** submenu of the **Windows** menu. This saves time, particularly if you want to connect to several different hosts. Alternatively, if you double-click on a particular connection document with the Finder, HELIOS Terminal and the selected connection will be started.

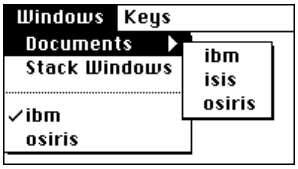

Fig. 141: **Windows** menu

If you have opened several sessions and you are not sure which is which, use the **Windows** menu to see a list of all open windows and to bring one of them to the foreground. The current foreground window is marked with a √ (compare figure 141). If you open more than one session on the same host, the window names will be numbered automatically (e.g. isis-1, isis-2 etc.). The option **Stack Windows** neatly re-arranges all the windows (see figure 142).

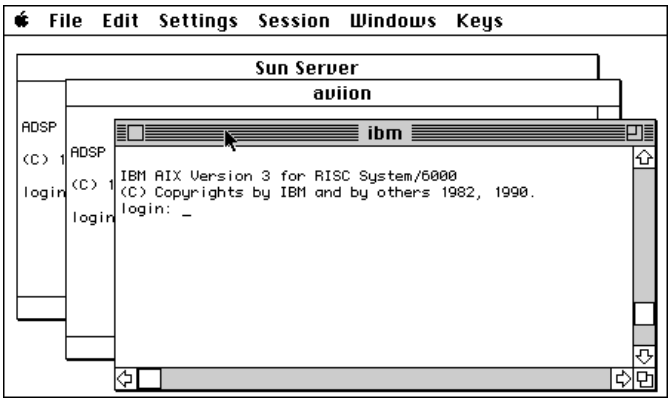

Fig. 142: Multiple sessions showing stacked windows

7.5 Copy and paste

The **Edit** menu contains the typical Macintosh options for processing selected blocks of text (see figure 143).

Fig. 143: **Edit** menu

The special option **Copy Table** is a variant of the **Copy** option, which automatically replaces one or more blanks by a "Tab" character. This makes it easy to copy tabular information from the UNIX host into a spreadsheet program on the Macintosh.

Particularly for tables, it is useful to be able to mark a rectangular block for copying rather than using the normal Macintosh way of highlighting a block of text. You can select a rectangular area by pressing the **Command** key while you are marking the area with the mouse. In figure 144, this option has been used to omit the first three screen columns on the left.

This is especially helpful in conjunction with the **Copy Table** option: after selecting the rectangle you want, choose

Copy Table, switch to your spreadsheet program, and choose **Paste** (see figure 145).

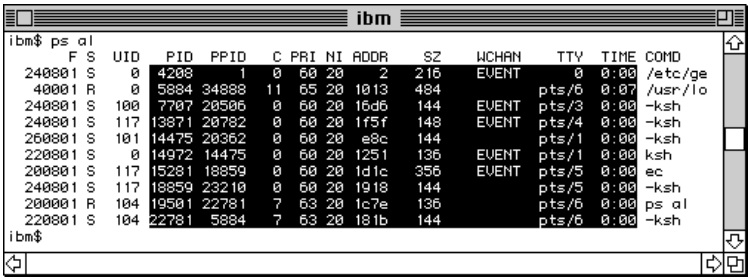

Fig. 144: Using “select rectangle” with the **Copy Table** option

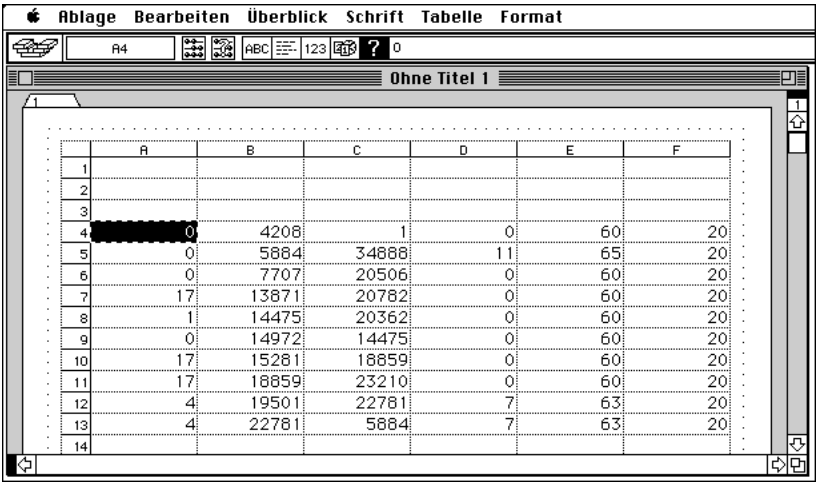

Fig. 145: Pasting the table into a spreadsheet program

7.6 Function keys

The various Macintosh computer models have several different keyboard layouts, whereby only the “Apple Extended Keyboard” is provided with function keys. Choose the **Function Keys** submenu in the **Keys** menu to see a picture of the function keys of the VT320 terminal (see figure 146). Select the required function key with the mouse.

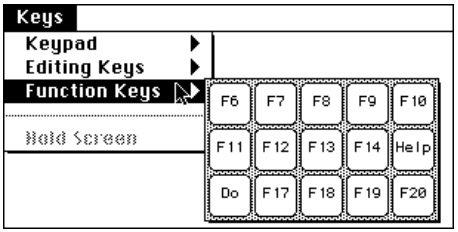

Fig. 146: Function keys

A similar feature is available for the keypad and for the editing keys.

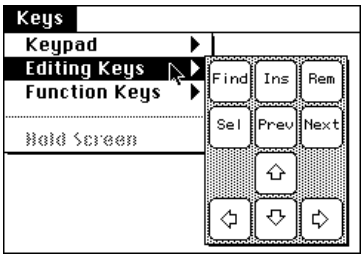

Fig. 147: Editing keys

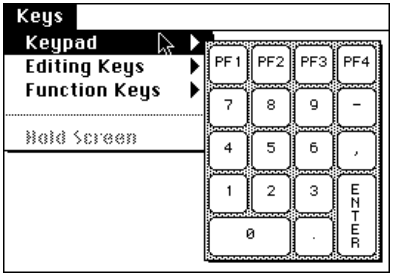

Fig. 148: Keypad keys

If you want to use applications on the UNIX host which regularly use function keys, and you do not have an “Apple Extended Keyboard”, you can use a program like Macromaker to redefine the function keys to your own choice of Macintosh keyboard shortcuts.

8 The EtherShare System

8.1 General remarks

The EtherShare software can be subdivided into eight functional modules:

- The AppleTalk protocol stack with network routing
- File Server with Desktop Server (+ Desktop Utilities)
- Print Server with Font Server
- Text-to-PostScript converter “pstext”
- Terminal Server with the HELIOS Terminal program
- Administration Server with the EtherShare Admin program
- Mail Server with the HELIOS Mail program and “HELIOS Mail Init”
- Time Server

The AppleTalk protocol stack forms the central core of the EtherShare system. It provides elementary services for AppleTalk networks and is the backbone for the various EtherShare server programs. The Font Server is implemented as part of the Print Server – see **Font including** in chapter 11.4 “The Print Server in operation” for information on this feature.

8.2 System configuration

The main configuration file “$ESDIR/conf/atalk.conf” – the most important configuration file within the EtherShare system – contains configuration parameters for all of the EtherShare programs. They all access this file when first starting in order to determine their configuration.

The “install” program automatically sets up this file with default values for the parameters. The values can be changed if necessary by using an editor such as vi, but we strongly recommend that you do this with the EtherShare Admin program and the network configuration option of the “install” program instead.

A valid entry in “atalk.conf” has the following structure:

```
program:parameter {, parameter}
```

`program` is the name of the program, or a special “wild card” section, e.g. “zones” or “if”, for which the configuration is destined, and `parameter` defines various configuration options, which vary from program to program (see later). Note that the parameters for each program can all be specified on a single line. To improve clarity, however, long lines should be split after commas, and continued on the next line, optionally indented with space characters, e.g.:

```
program: parm1,
         parm2, parm3
```

Do not repeat the program name in multi-line commands (except for “papsrv”, all other program names are only allowed to show up once).

The syntax for `parameter` has two forms:

```
parametername=value
parametername
```

The first form assigns a value to a parameter variable. The value can be optionally contained in quotation marks (“ ”) to allow the inclusion of space characters. The second form is called a “switch”. It is used to enable or disable specific features of a program. Accordingly, each switch usually exists in both, positive and negative pendants. Negative pendants have the same name, but are preceded by “no”. For example, the negative form of the switch “clientmessages” is “noclientmessages” (see **clientmessages** in chapter 11.6 “Configuring printers manually”).

The configuration file can also contain comments by starting an entry line with the “# ” character. This can be used to add additional information, e.g. explanatory remarks.

8.3 The AppleTalk protocol stack

atalkd

EtherShare's AppleTalk protocol stack is either contained in a UNIX loadable module, which is designed to be added to the operating system during runtime, or in a driver which is built into the UNIX kernel during EtherShare installation.

Note: Under Mac OS X Server there is no "atalkd". All parameters are set in the **Network** panel.

The AppleTalk protocol stack is closely connected to the "atalkd" (AppleTalk Daemon) program. The protocol stack and "atalkd" provide important basic functions for AppleTalk networks. The EtherShare servers (Print Server, Terminal Server, etc.) are constructed around this base system.

The "atalkd" program implements permanent services on the AppleTalk network which are required to operate the EtherShare system. For example, all EtherShare servers are dependent on the functions of this program in order to be able to communicate with the network. None of the servers will start until "atalkd" is running (you will get a "cannot register..." error message). The host is normally configured to start "atalkd" automatically when UNIX is booted.

"atalkd" is also responsible for making known to the AppleTalk network the names of all AppleTalk services which are available on the UNIX host (i.e. the EtherShare File Server, Print Server, Administration Server, Terminal Server, Mail Server, and Time Server).

When an EtherShare server is started, the chosen AppleTalk name for the server (defined in the main configuration file "atalk.conf") is passed to "atalkd", which also receives

a corresponding message from the server when it is shut down. “atalkd” automatically checks whether the chosen name is unique to the network zone. If the name is already in use, the server is immediately aborted with the error message “Duplicate name exists already”, and it is necessary to change the name in the main configuration file.

“atalkd” is also responsible for ApplTalk routing table maintenance, to allow the kernel modules to route between all active network interfaces.

Network administration

Another task of “atalkd” is to manage all information about connected AppleTalk networks. Under AppleTalk, different logical networks are grouped into zones. “atalkd” automatically maintains an internal routing table to keep track of changes in the network configuration. The routing table allows services and information to be routed through different segments of the network if required.

Changes in the routing table are also passed on to the AppleTalk protocol modules to allow data packets to be routed between different network segments.

8.4 Parameters of the “atalkd” program

When it starts, the AppleTalk Daemon program “atalkd” first accesses the main configuration file “atalk.conf” to determine its configuration. The “install” program automatically sets up this file with default values. The values can be changed if necessary by using an editor such as vi, but we strongly recommend that you do this with the network configuration option of the “install” program or the “netconf” utility instead.

The parameters described below can be defined for “atalkd” in “atalk.conf” (note that the parameter list is preceded by the program name “atalkd:”):

interface `atalkd: interface=ifname:netno:snode:zonename`

If required, `interface` can be abbreviated here to “if”. The parameters after the “=” sign can optionally be surrounded by quotes: `"ifname:netno:snode:zonename"`. This is obligatory if `zonename` includes space characters.

An entry of this type is required for each hardware interface (e.g. Ethernet). `ifname` is the name of the interface as known to the kernel. `netno` is the network number in the AppleTalk network. The network number must be specified as a range with a dash (e.g. 10-15); the interface will then automatically be configured by “atalkd” as a Phase II network with this number range.

`snode` is the starting node number at which “atalkd” starts to look for a free node for the EtherShare host on the AppleTalk network (dynamic node number allocation). By convention, servers in an AppleTalk network have node

numbers greater or equal to 128 (EtherShare usually starts at 140). `zonename` is the name (or a list of names delimited by colon) of the AppleTalk zone for this interface.

The simplest configuration for “atalkd” contains only one interface entry in the parameter list, which describes the first (here the only) hardware interface between the UNIX host and the AppleTalk network (note: all EtherShare servers will be registered in the zone of the first “atalkd” entry). See appendix A 3.3 “Network automatic configuration option”.

Phase II

A typical “atalkd” entry with a parameter list for a Phase II network with three hardware interfaces is as follows:

```
atalkd:  if=“le0:30-35:128:EtherTalk”,
         if=“le1:10-10:128:Zone1”,
         if=“le2:20-20:128:Zone2”
```

The “le0” interface has been allocated the network number range 30-35. Compared to an outdated Phase I network, the maximum number of AppleTalk devices allowed on the network here increases from 254 to (35-30+1) * 254. You must not use the same network number range for more than one hardware interface (see example above).

The network configuration option of the “install” program automatically sets up parameter values for “atalkd” in the main configuration file “atalk.conf”.

Note that if you see an “atalkd” entry like
`nif=“le2:20-20:128:Zone2” (instead of if=...)`
this indicates that the configuration has been edited by means of the “netconf” program, and that the interface stated here, has been set to inactive.

8.5 AppleTalk stack utility programs

The following programs are created automatically in the "$ESDIR" directory during EtherShare installation:

start-atalk

"start-atalk" is a shell script that contains all the necessary commands to start the entire EtherShare system ("atalkd" and all EtherShare servers). Specifically, it starts all servers listed in the file "$ESDIR/conf/servers". During installation, start-atalk is included in the UNIX file "/etc/rc.local" or "/etc/inittab", in order to automatically start all EtherShare servers (Desktop, File, Print, Mail, Admin, Terminal, and Time) as soon as UNIX is booted.

"servers" file

The file "$ESDIR/conf/servers" contains a list of all EtherShare server modules which should be started when EtherShare is started. It is referenced by the "start-atalk" script as described above.

```
desksrv
afpsrv
opisrv          (optional)
papsrv
mailsrv
admsrv
termsrv
timesrv
lpd             (optional)
```

stop-atalk

"stop-atalk" is a shell-script which closes down the entire EtherShare system ("atalkd" and all EtherShare servers) after a delay of five minutes, ensuring that all active processes have been correctly terminated. All logged-in users receive a warning message on their workstations before the system is finally closed down.

If the "stop-atalk" command line includes the parameter "now" ("$ESDIR/stop-atalk now"), EtherShare is stopped immediately. Instead of "now", you can specify

"-g grace period" and thereby change the number of seconds to wait before stopping atalk. Additionally, you can specify "-m message" with the "stop-atalk" command.

Important: Only the superuser ("root") can run "stop-atalk". Use the "swho" command (or choose **Active Users** in the **Lists** menu of EtherShare Admin) to make sure that no other users are using the File Server before running this script (use "afpmsg" to inform connected users). Additionally, make sure that there are no active print jobs and/or OPI layout generation processes. "stop-atalk" will interrupt all of them.

Note: "stop-atalk" does not unload the AppleTalk kernel modules.

"swho" command

The "swho" command can be used to list all currently active EtherShare and PCShare child server processes, together with the process ID (PID), the network address (EtherShare: AppleTalk/IP address; PCShare: internet address or client name), user name and process starting time:

```
$ swho
Server       PID   Address           User      When
PCShare      15984 deskjetpc.helios  nobody    Thu  8:35
AFPServer    56438 0029.062.249      support   Thu  8:37
MailServer   26744 0029.062.248      support   Thu  8:37
AFPServer    16812 dyn-3-234.helios  sam       Thu  8:47
AFPServer    27866 dyn-3-233.helios  paul      Thu  8:50
AFPServer    46534 dyn-3-227.helios  michael   Thu 13:12
UNIXTerminal 24730 0026.072.249      michael   Thu 12:56
UNIXTerminal 23084 0029.216.249      <unknown> Thu 15:26
PCShare      29610 dyn-3-248.helios  nobody    Thu 10:31
$
```

PCShare is another networking product from HELIOS. It is described briefly in the glossary.

Use the “-c” switch to include an optional comment field, which shows more information on the session. EtherShare file servers (“AFPServer”) show the names of the currently mounted Macintosh volumes, PCShare servers show the name of the corresponding mounted UNIX directory or print command:

```
$ swho
Server        PID  Address  User   When   Comment
AdminServer   9692    ...    root   Wed...
AFPServer     9715    ...    sam    Wed... EtherShare Appl
```

“swho” gets its information from the file “$ESDIR/stmp”, which is updated by each of the EtherShare servers. The EtherShare environment variable “$ESDIR” needs to be set correctly for the “swho” command to work.

Use the “-f” switch to specify an alternative input file for the “swho” command. The default file is “$ESDIR/stmp”.

Related information is available from the host’s process list. In the following example, we have used “grep” to limit the otherwise extensive list to “/es” only:

```
ramses$ ps ax | grep /es
   410     ?    S   0:52  /usr/local/es/atalkd
   418     ?    S   0:00  /usr/local/es/admsrv
   421     ?    S   0:00  /usr/local/es/afpsrv
   424     ?    S   0:00  /usr/local/es/desksrv
   427     ?    S   0:00  /usr/local/es/mailsrv
   437     ?    S   0:00  /usr/local/es/papsrv
   442     ?    S   0:00  /usr/local/es/papsrv
   443     ?    S   0:00  /usr/local/es/papsrv
   444     ?    S   0:00  /usr/local/es/papsrv
   445     ?    S   0:00  /usr/local/es/termsrv
   448     ?    S   0:00  /usr/local/es/timesrv
   461     ?    S   0:00  /usr/local/es/lpd
   5555    ?    S   0:00  /usr/local/es/termsrv
   5615    p1   S   0:00  grep /es
```

The EtherShare File Server (“afpsrv”), Administration Server (“admsrv”), Mail Server (“mailsrv”), Terminal Server (“termsrv”), and Time Server (“timesrv”) each spawn a child process for each user login, so you may see these entries more than once if someone is using them. The master processes are always allocated to user “root” and the child processes show the name of the corresponding user. You will see a Print Server entry (“papsrv”) for each configured printer queue, and an additional “papsrv” child process for each active print job currently being spooled. All “papsrv” processes are allocated to user “root”.

PCShare file server, terminal server and print server functionality is all implemented in a single “pcshare” master process, which spawns a child for each mounted DOS virtual drive, terminal session, and active print job. All children are also called “pcshare”.

9 The EtherShare File Server

9.1 General remarks

This chapter is devoted to the EtherShare File Server. The function, the configuration and the operation of the file server is described. Information is included to allow the administrator to install users, groups, and volumes, create folders, and define access privileges. Finally, methods are described with which data on the file server volumes can be archived to mass storage (e.g. a tape streamer).

9.2 The File Server programs

The EtherShare File Server system is contained in the two programs “afpsrv” and “afppasswd”. They are copied to the “$ESDIR” directory during installation. The server is normally configured to start “afpsrv” automatically when UNIX is booted.

afpsrv

“afpsrv” is the program that implements the AppleTalk Filing Protocol (AFP) file server functions. It waits for filing requests from the AppleTalk or TCP/IP network, which are then immediately processed. Each new logon 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.

The number of concurrent connections to the AFP server via AppleTalk is limited to 250. To establish more than 250 connections at the same time use AppleShare IP, instead. See also **sessions** in 9.4 “Parameters of the “afpsrv” program”

afppasswd program

“afppasswd” is used to create and amend entries in the AFP user list: “$ESDIR/conf/afppasswd” and all related UNIX files like “/etc/passwd”. The program “afppasswd” is called automatically by “afpsrv” whenever you click the **Change password** button in the **Chooser**. It is necessary to separate this functionality from the “afpsrv” program, in order to give the system permission to modify the password database online.

You can call “afppasswd” from UNIX manually, to change passwords from a shell login. If you are having problems with yellow pages, for example, “afppasswd” will return error messages which you will not see in the **Chooser**.

9.3 Directory and file formats

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

The structure of volumes and files

Under 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 the EtherShare Admin.

In contrast to files under DOS and UNIX, all Macintosh 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, 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 Macintosh user; the "Finder info" in the file's directory is also invisible.

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 normally 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 chapter 10.2 “The Desktop Server Program” for more information.

Under 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” sub-directory of the folder’s directory.

The first 512 bytes of the resource file are used for the Finder info (bytes 0-511), and the files resource data start at byte 512. Files created by UNIX applications have no resource fork, and the EtherShare resource file (if present) may then be shorter than 512 bytes, this is normal. A description of the resource file structure is available on the HELIOS Web site **www.helios.de**.

Macintosh file names which are invalid for UNIX are converted according to a specified algorithm.

When you create a folder under EtherShare, which you do with the Finder in the normal way, a UNIX directory is created with the same name as the folder. Folders, too, have Finder info, which stores among other things the folder’s window position and size and the viewing style. 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 **Creating new folders under UNIX** in chapter 9.7 “Access privileges” for related information.

Suppose you have a file “Test” in folder “Demo” which is in “dave’s” home volume. Under 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 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 chapter 10 “The Desktop Server” for related information.

The file names “.Desktop”, “.Desksrv”, and the “.rsrc” folder are protected by EtherShare, and cannot be copied or accessed from a Macintosh client.

Inside an EtherShare 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 Macintosh in case a “.rsrc” directory is available in the volume root directory of the EtherShare volume. This applies to files as well; if “.rsrc” folders are available, resources inside the “.rsrc” folder will be created automatically.

UTF-8 encoded file names

Provided the `utf8` flag is set in the "afpvolumes" list, special characters such as "ä" can be used on different platforms (Macintosh and PC clients) since under "Unicode/ UTF-8" they are 8-bit encoded. Exceptions are the "/"-character, which is translated into a particular sequence which consists of caret (^) and two following characters representing the hexadecimal value of the character (^2F), and all control characters (hexadecimal code < 20).

Non-UTF-8 encoded file names

On a non-UTF-8 volume (`utf8` flag not set; compare **UTF-8 encoded file names** above), Macintosh 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".

However, accented characters (Umlauts) are not recommended for user names and passwords (otherwise you will need to remember different passwords for Macintosh and UNIX logins). Your UNIX host name must never include a slash character (for example "my_rs/6000"). See **hostname, uname, arp** in appendix A 5: "Standard UNIX utility programs" for related information.

Generic icons

Finder infos for UNIX files (which do not have and do not need resource files) are simulated automatically as "generic icons" by EtherShare. EtherShare automatically recognizes about 20 UNIX file types (e.g. shell script, socket etc.), and simulates the Macintosh file type and creator even if the folder has no resource directory. If the resource directory is already present, EtherShare will create a suitable resource file, too, 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 (the type and creator codes are shown in parentheses):

- 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:

- 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)
- Huffman 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/CARO); (TEXT/CARO)
- EPSF file (EPSF/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. Accordingly, the following two file types should be added to the above list:

- text file (TEXT/UNIX)
- binary data file (DATA/UNIX)

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

- no permission (NOPE/UNIX)

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

- unreadable file (????/UNIX)

After determining the type, each UNIX file is assigned one of about 20 different icons by EtherShare (see figure 149). This allows Macintosh users to easily differentiate between files created under UNIX (all icons include the name “UNIX”) and normal Macintosh files.

You can also create or modify the file type or creator manually, with a program such as the shareware program FileTyper, or you can use the MakeAuto Typer tool to create an “Auto Typer” document (System 7 only). The latter converts type/creator information according to a specified scheme automatically. See **Automatic extension mapping** in 9.6 “Public and private volumes” for related information.

Note: If a file type is assigned the code “UNKN/UNIX” (using e.g. the MakeAuto Typer tool), the File Server automatically enforces a file type conversion.

If necessary, the generic icons feature can be disabled (see the “afpsrv” switch **nobinonly**). In that case all UNIX files are classified as binary data files (DATA/UNIX).

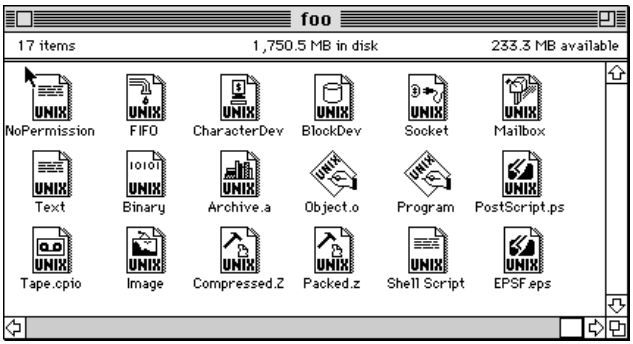

Fig. 149: Generic icons for UNIX files under EtherShare

You can also assign suitable icons to non-Macintosh files by using the **Extension Mappings** feature in the EtherShare Admin. This option is particularly useful if you are also using MS-DOS networking software, such as HELIOS PCShare, on your server, since under MS-DOS the file name extension is typically used to indicate the file type.

UNIX file types such as: Mailbox, Text, and Shell Script can be edited using e.g. TeachText (Macintosh).

The File Server will recognize EPSF files and will apply the type “EPSF” and creator “UNIX” to these files (for more

information regarding the recognition of PC-created "*.eps" files, see 5.13.7 "Extension Mappings"). The icon is the same as used for plain PostScript files. In older EtherShare versions, these files were recognized as PostScript only and were classified type "TEXT" with creator "UXPS". Since these resources were already created, the creator/type combination will not be changed for existing files. This applies only to files stored on the server by UNIX or DOS applications, Macintosh files supply their own type and creator.

An automatic recognition feature for Adobe Acrobat PDF files allows easy access to HELIOS documentation provided in PDF format, e.g. on the HELIOS distribution CDs. You can mount our distribution CD on a UNIX server, on a Macintosh, or on a DOS/Windows PC, and open the contained PDF files with Acrobat Reader/Acrobat Exchange on any of these platforms.

File and record locking

The EtherShare File Server supports file and record locking between Macintosh 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 resides in the directories "$ESDIR" and "$PCDIR", respectively.

The "UNIX Sharing" option has to be switched on, however, if you want to share an EtherShare volume with UNIX applications.

"afpsrv" supports UNIX (advisory) locking in addition to the built-in Apple AFP-compatible (mandatory) locking.

Check with your supplier of UNIX applications whether these do also support and use advisory locking before you use Macintosh/PC-based applications accessing files concurrently with UNIX based applications.

If you use NFS-imported file systems for EtherShare or PCShare volumes the “lockd” and “statd” daemons must be configured and running. See your NFS documentation for further details.

In the following, there is an example of “$ESDIR/conf/afpvolumes” where the shared volume “ES-PS shared volume” resides in “/data/shared/images”, is writable, with option `unixlocks` activated and accessible by group “dtp” only. Below that, you see the default parameter settings for a volume “EtherShare”:

```
$ cat $ESDIR/conf/afpvolumes
/data/shared/images:ES-PS shared volume::fixed:
readwrite,unixlocks:dtp
/usr/ethershare:EtherShare::fixed:readwrite
```

This option is only active after the Macintosh client unmounted and remounted all volumes from an EtherShare Server.

Symbolic links

Please note that symbolic links pointing to directories in- or outside the current volume would confuse the File Server, and are therefore not displayed. For example two directories in one volume might have the same directory ID.

A double-click on one of the folders then could open the other. If you need links, use the Macintosh **Make Alias** function instead.

9.4 Parameters of the “afpsrv” program

When it starts, the File Server program “afpsrv” first accesses the main configuration file “atalk.conf” to determine its configuration. The associated program “afppasswd” does not require an entry in the configuration file. The “install” program automatically sets up “atalk.conf” with initial values. The values can be changed if necessary by using an editor such as vi. See also chapter 5.14 “Editing “atalk.conf” (and other configuration files) manually”.

The parameters described below can be defined for “afpsrv” in “atalk.conf” (note that the program name “afpsrv” precedes the parameter list):

name

`name=netname`

`netname` is the AppleTalk (NVE) name of the File Server. This is the name with which it is known to the network. It is the name you see in the workstation’s **Chooser** under “AppleShare”.

The default for `netname` is the name of the UNIX server.

Important: It is not possible to run more than one EtherShare File Server on the same UNIX server.

---

zone

`zone=zonename`

`zonename` is the name of the AppleTalk zone to which the file server should be allocated. This parameter determines the zone in which the file server can be seen in the **Chooser**. The chosen zone must be one of the local zones that the server is connected to. You can test this with the “zones -l”

command (see chapter 4.5 “Verifying the UNIX installation”).

The default for `zonename` is “*”, i.e. the zone of the first interface entry in “atalk.conf”.

“afpsrv” will accept multiple `zone=` and `name=` specifications. It is possible to have the file server services being displayed in all local zones.

The following example will display the EtherShare Server “FileServer” in the two zones “EtherTalk 1” and “EtherTalk 2”, but not in the TokenTalk or FDDITalk zones.

```
atalkd:  if=“et0:30-35:140:EtherTalk 1”,
         if=“et1:36-40:140:EtherTalk 2”,
         if=“tr0:41-44:140:TokenTalk 1”,
         if=“fi0:45-49:140:FDDITalk 1”
afpsrv: name=“FileServer”,
zone=“EtherTalk 1”,zone=“EtherTalk 2”
```

The following example will display the EtherShare Servers with the two names “FileServer-1” and “FileServer-2” each in the two zones “EtherTalk 1” and “EtherTalk 2”, but not in the TokenTalk or FDDITalk zones.

```
atalkd:  if=“et0:30-35:140:EtherTalk 1”,
         if=“et1:36-40:140:EtherTalk 2”,
         if=“tr0:41-44:140:TokenTalk 1”,
         if=“fi0:45-49:140:FDDITalk 1”
afpsrv: name=“FileServer-1”,name=“FileServer-2”
zone=“EtherTalk 1”,zone=“EtherTalk 2”
```

EtherShare’s “afpsrv” will recognize if you are already connected to the same EtherShare Server and automatically log in to the already existing connection.

localwinsize `localwinsize=maxlpackets`
`maxlpackets` specifies the maximum number of AppleTalk data packets that are passed from “afpsrv” to workstations through the network during a transaction. The number of packets may need to be limited if the buffer size in the workstations is too small. `maxlpackets` can be varied to optimize the data transfer rate.

The default (and maximum) for `maxlpackets` is 8.

remotewinsize `remotewinsize=maxrpackets`
`maxrpackets` specifies the maximum number of AppleTalk data packets that are passed from workstations to “afpsrv” through the network during a transaction. The number of packets may need to be limited if the buffer size in the UNIX server is too small. `maxrpackets` can be varied to optimize the data transfer rate.

The default (and maximum) for `maxrpackets` is 8.

dsiblocksize `dsiblocksize=maxbytes`
`maxbites` specifies the maximum size of AppleShare/IP data packets that are passed via TCP/IP from “afpsrv” to workstations through the network during a transaction.

The default for `maxbytes` is 131 072 (128 blocks x 1024).

dsitickletime

`dsitickletime=timeinterval`
`timeinterval` specifies the time interval in seconds after which “afpsrv” sends a tickle packet to signal that the server is still running.

The default for `timeinterval` is 30.

volstatinterval

`volstatinterval=timevolstat`
`timevolstat` specifies the time interval in seconds how often “afpsrv” checks the amount of free space on the server.

The default for `timevolstat` is 10.

volcheckinterval

`volcheckinterval=timevolcheck`
`timevolcheck` specifies how often `volstatinterval` is communicated to the Macintosh client.

The default for `timevolcheck` is 10.

ipaddress

`ipaddress=numberstring`
`numberstring` specifies the IP-address the “afpsrv” program offers to the Macintosh clients for logging in via IP-protocol.

The default for `numberstring` is the number of all configured IP-addresses of all network cards installed in the server.

ipaddresses

`ipaddresses` (see `ipaddress`) is applied for handling more than one IP-address, and is given out in a string in which the addresses appear comma-separated.

ip `[no]ip`
Switches the AppleShare IP **on** or **off**, depending on the setting.

The default (if this switch is omitted) is `ip`.

nosortdirs `[no]sortdirs`
This parameter sorts the directories coming from the server to the Macintosh clients by name.

The default (if this switch is omitted) is `nosortdirs`.

connectlimit `connectlimit=connecttime`
`connecttime` specifies the time in seconds a Macintosh client is allowed to stay logged-on to “afpsrv”.

The default for `connecttime` is 0 (i.e. ∞).

afpport `afpport=portnumb`
`portnumb` specifies the port number for the AppleShare IP.

Apple’s default for `portnumb` is 548.

ipaccess `ipaccess=ipaccessname`
`ipaccessname` is the name of the file containing the access list with the IP-addresses which are permitted to log on to “afpsrv”.

The `ipaccessname` default is “$ESDIR/conf/afpipaccess”.

logdenied `[no]logdenied`
This parameter 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.

The default (if the switch is omitted) is `logdenied`.

xferlog `xferlog=xferlogname`

If `xferlogname` is specified, the file names of all edited (written, read, saved, etc.) files on the server are recorded and stored sequentially in an “xferlog” file. Use this option with care since it considerably causes load on the server.

Note: Make sure that an empty “xferlog” file exists at the specified location and set file permissions sufficiently so that “owner”/“group” and “others” can write to that file.

homeipaccess `homeipaccess=homeipaccessname`

`homeipaccessname` is the name of the file which contains the IP-access list, and makes the home directory visible to the respective user.

homevolname `homevolname=homevolmacname`

`homevolmacname` is the Macintosh volume name for user home directories. The following “%” escapes are valid:

- “%u” UNIX user name
- “%f” full user name
- “%p” UNIX home directory path
- “%h” server name

Make sure that the volume name length does not exceed 27 characters. The default for `homevolname` is “~%u”.

idletime `idletime=time`

`time` is the time in minutes which a user has at his/her disposal, idling on the File Server before he/she gets logged-out by “afpsrv”.

The default for `time` is 0 (i.e. ∞).

idlewarntime `idlewarntime=warntime`
`warntime` is the time in minutes after which the “afpsrv” program gives the user a warning before he/she is logged-out by the “afpsrv” `idletime` parameter.

The default for `warntime`, if no value is specified, is automatically set to half the value of `time` (see **idletime**).

sessions `sessions=maxclients`
`maxclients` 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 Macintosh workstations that are connected to the AppleShare 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 is dependent on the type of Macintosh applications you mostly use (whether they are file-intensive or client-server applications), on the configuration of your UNIX system, and on its expansion stage.

The default for `maxclients` is the number of sessions allowed by your software license.

locks `locks=maxlocks`
`maxlocks` specifies the maximum number of record locks that are permitted on the File Server simultaneously.

The default for `maxlocks` is `maxclients` multiplied by 10.

files `files=maxfiles`
`maxfiles` specifies the maximum number of files that can be opened by the File Server simultaneously. The achievable maximum may be limited by the maximum number of open files for the “afpsrv” process allowed by the server. This limit is normally set by “afpsrv” for itself automatical-

ly. In case of problems, refer to “limit” and “ulimit” in your UNIX documentation for details about how to increase the limit manually for your server. To conserve system resources, do not set this value higher than necessary.

The default for `maxfiles` is 256.

findercache

`findercache=cachesize`
The File Server caches Finder information in RAM memory to optimize performance. `cachesize` 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.

The default for `cachesize` is 2048 entries. 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.

afppasswd

`afppasswd=exename`
`exename` specifies the complete path name of the “afppasswd” program, which is used by “afpsrv” to change passwords in the AFP user list. This parameter only needs to be changed if, for administrative reasons, it is necessary to modify EtherShare’s default directory system on the UNIX server.

Or, in order to protect the password against changes by unauthorized users, `exename` can be left blank. This would e.g. disable the “afppasswd” program.

The default for `exename` is “$ESDIR/afppasswd”.

savepasswd `[no]savepasswd`

As a time-saving feature when logging on, the AppleShare selection in the **Chooser** on the Macintosh lets you save your File Server user name and/or user password on the Macintosh’s local hard disk.

To improve security, specify the `nosavepasswd` switch 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: you can still change your File Server password in the **Chooser** in the normal way (with **Change Password**).

The default (if this switch is omitted) is `savepasswd`.

Note: The `[no]savepasswd` setting only works for Mac OS Version 7.0 and above.

---

minpwlen `minpwlen=length`

The AppleShare selection in the **Chooser** on the Macintosh 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 `length` as a numeric value between 0 and 8.

To improve security, a meaningful minimum value for this parameter is 5.

minuid `minuid=minuidlimit`

`minuidlimit` specifies the lowest number allowed for user numbers (user IDs). All users defined in “/etc/passwd” which have a lower user number than that specified by `minuidlimit` are not recognized as valid users of Ether-

Share. This parameter is provided as an additional security feature.

The default for `minuidlimit` is 0.

maxuid

`maxuid=maxuidlimit`
`maxuidlimit` specifies the highest number allowed for user numbers (user IDs). All users defined in “/etc/passwd” which have a higher user number than that specified by maxuidlimit are not recognized as valid users of EtherShare. This parameter is provided as an additional security feature.

The default for `maxuidlimit` is infinity.

guestid

`guestid=logname`
`logname` specifies the user name which is automatically allocated to guest users. The name is invisible to the guest users themselves, it is solely used to assign an entry for guests in the user list. If this parameter is specified, the file server automatically supports guest access to available volumes. Otherwise, guest access to available volumes is not possible.

homedir

`[no]homedir`
The switch `nohomedir` specifies that all users are prevented from seeing their home volume, which stops them from being able to store Macintosh files there. Their UNIX home directory still exists, and can still be used from the UNIX shell.

The default (if this switch is omitted) is `homedir`.

Note: If the home directory of user “root” is “/”, it will not be displayed.

---

suffixes `suffixes=suffixfile`

“afpsrv” normally simulates Finder info (such as file type and creator) automatically for files without Macintosh resource. The type of file is determined by inspecting the file’s contents. This allows about 20 different icons to be shown for non-Macintosh files (see **Generic icons** in chapter 9.3 “Directory and file formats” for more information).

In the case of files created by MS-DOS applications, the file type is typically indicated by adding a suffix to the file name, the so-called the 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 so-called extension mapping table. This is particularly useful in the case of applications such as FrameMaker for Macintosh which are able to directly read documents created by the MS-DOS version without prior conversion. The suffixes parameter allows you to specify the location and name of the extension mapping table.

The default for `suffixfile` is “$ESDIR/conf/suffixes”.

See **Automatic extension mapping** in chapter 9.6 “Public and private volumes” for an example of this file. We recommend that you specify extension mapping with the **Extension Mappings** option in the EtherShare Admin, and not by editing the above file manually.

nobinonly `[no]binonly`

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

shown for non-Macintosh files (see **Generic icons** in chapter 9.3 “Directory and file formats”). Specify the `binonly` switch if this feature is not required, in which case all non-Macintosh files will be treated as type DATA/UNIX, which means that UNIX text files will then become invisible to most Macintosh text editors.

The default (if this switch is omitted) is `nobinonly`.

nofiledatesync `[no]filedatesync`

Whenever you modify a Macintosh 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. Accordingly, “afpsrv” is designed to always update (“touch”) the modification date of the data file, even if only the resource fork has been modified.

However, “afpsrv” does not normally 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` switch to cause “afpsrv” to always synchronize the modification date of the resource and data files, even if only the data fork has been modified.

The default (if this switch is omitted) is `nofiledatesync`.

fakeoffspring

`[no]fakeoffspring`
“afpsrv” will return, by default, the number of offsprings (entries in a subdirectory) as 9999 while enumerating a directory. This option can be turned off by using the switch `nofakeoffspring`. Then, the AFP-call “GetFileDirParms” on a directory gives the real number of entries.

This feature is especially useful when folders containing many subfolders, which on their part may contain many files, are in use. The Macintosh Finder, or application program, will request information not only on files in the current folder, but in addition 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 Macintosh applications which rely on the exact offspring count. For those, disabling of this parameter may be required.

The default (if this switch is omitted) is `fakeoffspring`.

nogroup-writeisowner

`[no]groupwriteisowner`
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, icons placement and label settings. This feature has been added to allow workgroups, e.g. users who are all member of the same group, to change layout settings as labels according to the organization of their work.

For the folder or volume the checkbox “Make changes” for group must be activated. See also chapter 9.7 “Access privileges”.

The default for this switch is `nogroupwriteisowner`.

notranslateany

`[no]translateany`
This option has been added to “afpsrv” in order to translate any file which is regarded as type “TEXT”.

The default (if this switch is omitted) is `notranslateany`.

nohidedotfiles

`[no]hidedotfiles`
This option has been added to “afpsrv” in order to hide files starting with a dot (“.”).

The default (if this switch is omitted) is `nohidedotfiles`.

welcome message and shutdown message

You can specify a welcome message to output on Macintosh workstations when they log on to EtherShare, and a shutdown message. There are no parameters to specify in “atalk.conf” for this feature. Instead, create two text files “login.msg” and “shutdown.msg” with a UNIX editor (or with TeachText on a Macintosh), and store them in “$ESDIR/macapps” (the root of the Macintosh volume “EtherShare Applications”). The messages will then be used automatically by the File Server during login and shutdown. Normally, 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 a demo copy of EtherShare on your server you cannot alter the default welcome message.

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, use TeachText to write them: since the Umlaut codes are stored here in Macintosh binary format, it is a lot of work to enter the right codes with a UNIX editor.

notexttran

The option “notexttran” has been added to “afpsrv” in order to turn off the newline translation for all types of text files. “notexttran” will disable line end translation for all files of type ‘TEXT’, without regard to creator.

This feature may be helpful in case Macintosh applications do write binary data into text files. For further reading on CR/LF conversion see also the paragraph **Generic icons** in chapter 9.3 “Directory and file formats”.

This flag is set by default.

nodotafpvolumes

This option, if set, rules out the possibility of defining additional private volumes in a user’s home directory.

The default (if this switch is omitted) is `nodotafpvolumes`.

Note: The “.afpvolumes” file is still supported, although deprecated. It is turned off by default and must be explicitly turned on using an option in “atalk.conf”. This flag will disappear in the next major revision.

9.5 Users and groups

Before a user can access the File Server, it is necessary for him/her to be registered by the administrator, and be allocated a user name and password, which both are needed during the logon procedure. The user name has a maximum length of 31 characters, and the password has a maximum length of 8 characters.

Note: The AIX operating system handles user and group names only up to 8 characters.

Though users and groups can be set up by using an editor such as vi, we strongly recommend that you do this with the EtherShare Admin instead.

The “install” program optionally installs a demo user “macuser”, with no password, and a demo group “macusers”, by defining them in the appropriate configuration files.

In theory, the user name and password can contain any character in the Macintosh character set. However, it is recommended not to use accented characters (ä, ü, é, etc.) and punctuation characters such as colon and comma, in order to avoid conflicts with the UNIX system files “/etc/passwd” and “/etc/group”. Since some of the Macintosh special characters appear differently on the UNIX server, the names might be difficult to recognize.

User names and passwords for users that want to access the UNIX server in addition to the AppleTalk network must follow UNIX conventions anyway, in order to ensure acceptance by UNIX system programs such as “login”.

UNIX user list /etc/passwd

The UNIX system file "/etc/passwd" contains a list of all users known to the system. An entry line in this file specifies for each user the user name, his/her password in encrypted form, the user number (user id), the group number (group id) of the user's primary group, comments (generally the full name of the user), the user's home directory, and the program (or shell) which should be started when the user logs on to the UNIX system.

If a particular user should be prevented from directly accessing the UNIX server, it is necessary to assign him/her a starting program which permits no (or very limited) UNIX system access.

The EtherShare File Server also uses the UNIX system file "/etc/passwd" for user administration. Each user that needs to access volumes on the File Server must have an entry in this file. The entry specifies the user number and thus the assigned access privileges. The field for home directory can be left empty if the user does not require his/her own home volume.

UNIX group list /etc/group

Users can be assigned to one or more groups, whereby assignment to at least one group – the primary group – is compulsory. The user's primary group is specified (as the group id number) in the "/etc/passwd" file.

The file "/etc/group" contains a list of all groups known to the system. The primary groups, too, must be included in this list. An entry line in this file specifies the name of the group, a group password (which is only significant when accessing directly through the UNIX system), the group id number, and a list of members (user names) that have been

assigned to the group. The group id number is used as a link between the group list "/etc/group" and the user list "/etc/passwd".

AFP user list and passwords

Each time a user logs on to the server, user name and password are requested. Although the UNIX standard password file "/etc/passwd" contains passwords in encrypted form, the password typed in by the user at the workstation is normally transmitted via the network cables to the server in unencrypted form. The UNIX login program then encrypts the password before checking it against the "/etc/passwd" file.

The passwords in the "/etc/passwd" file are stored encrypted to prevent users with direct access to the UNIX system from finding out passwords of other users.

To provide additional AFP security, EtherShare supports an optional AFP user list ("$ESDIR/conf/afppasswd"), which prevents transmission of unencrypted passwords via the network cables when logging on to EtherShare. The AFP user list contains the same passwords, but encrypted with a different method to that used by UNIX itself, as follows:

During the logon procedure, the File Server generates a random number which is sent to the Macintosh. The random number is then encrypted using the password that the user types in, and sent back to the File Server. At the same time the File Server encrypts the same random number with the password in the AFP user list before carrying out the comparison.

Even when this added security does not at first appear necessary, we still recommend it. For example, the danger exists that a particular "system" user entry in "/etc/passwd" (such as "bin") also has access privileges to the EtherShare

volumes. In such cases, the parameters `minuid` and `maxuid` can be used to configure “afpsrv” to only accept users which have IDs within a specified range. This problem is avoided if an AFP user list is used, since then only those users with entries in the list are allowed access to the EtherShare volumes.

If the AFP user list is active, you will see the message **2-way Encrypted Password** beneath the **Password** field in the **Chooser**; otherwise, you will see **Clear Text Password**.

afppasswd file

The optional EtherShare AFP user list, which specifies all UNIX users who are also EtherShare users, together with their encrypted passwords, is contained in the UNIX text file “$ESDIR/conf/afppasswd”.

Important: The “$ESDIR/conf/afppasswd” file is indispensable for running PCShare 3 on the same server.

The AFP user list improves network security by preventing passwords from being sent through the network cabling in unencrypted form during the logon procedure. If the AFP user list is active, Macintosh passwords are only transmitted over the network in encrypted form.

If you want the additional security, you can create the AFP user list by calling the “$ESDIR/etc/mkafppasswd” program from UNIX. “mkafppasswd” then copies user entries for the user id 0 (“root”) and all users with user numbers greater than or equal to 100 to the afppasswd file. It gets this information from the “/etc/passwd” file. Initially, all passwords are blank.

Note:	On creation, the AFP user list initially contains blank passwords but for “root”, you are requested by the “afppasswd” program to enter a (new) password.

If you want to disable the added security feature again, simply delete the file “$ESDIR/conf/afppasswd”. No other changes are necessary. EtherShare will then fall back to using the UNIX system file “/etc/passwd” only, and Macintosh passwords will be passed unencrypted over the network when logging on.

If you have any “real” UNIX users with ID numbers below 100, as distinct from “system” users such as “bin”, you must manually add a corresponding entry with blank password to the AFP user list, as follows:

```
username:
```

You should then set up initial passwords immediately. Please note that on creation, the AFP user list initially contains blank passwords. The “afppasswd” program then asks for the “root” password. Other EtherShare users can set up their own passwords (which here even could be blanks – though this is not recommended), or the system administrator can allocate initial passwords for them. Change passwords by calling the password program “$ESDIR/afppasswd” from UNIX, or with the **Change password** button in the **Chooser**.

For the following reasons, it is better to set up passwords with the **Chooser** (or with the “$ESDIR/afppasswd” program) rather than with the “/usr/bin/passwd” program:

- "$ESDIR/afppasswd" automatically sets up the same password in both password files ("/etc/passwd" and the optional "$ESDIR/conf/afppasswd"). If you use "/usr/bin/passwd" instead, a particular user might end up with a different password for UNIX server access and EtherShare access (which is inconvenient).
- "$ESDIR/afppasswd" automatically maintains "Yellow Pages" entries (if used).

The EtherShare Admin offers a convenient way of adding new users, including UNIX host users, with the advantage that "Yellow Pages" entries (if used) are also maintained automatically.

Creating users

As discussed, each new user needs an entry in the system file "/etc/passwd". The user must be assigned a name that is not yet known to the system. Following this, a unique user number must be specified, and the user's primary group must be chosen. If the user requires access to private volumes, the user's home directory must also be specified. Specification of the "start program" depends on whether the user should also be granted direct access to the UNIX system, or not. If the user should solely have access to EtherShare, the starting program should automatically reject the user with a corresponding message if he/she attempts to log on directly to the UNIX system. For example, you can write a shell script called "nologin" for this purpose. Such a shell script can automatically write a history report of logon attempts with user name, date and time to a file, to allow the administrator to see which non-authorized users have tried to obtain direct access to the UNIX server.

The following shows a typical entry for "/etc/passwd":

```
David::152:16:David Smith:/usr/home/David:/bin/sh
```

In this example, the username is "David" and the user number is 152. His password has not yet been allocated. His primary group is group number 16 (the group must already exist in the file "/etc/group"). The comment to this entry is "David Smith", the user's full name. The user's home directory is "/usr/home/David", which is automatically allocated to him as a private volume. The starting program is "/bin/sh", which is the standard UNIX Bourne shell – in this example the user is permitted direct access to the UNIX server. The empty field following the user name ("::") will later contain the encrypted user password. On inserting the above line into "/etc/passwd" with an editor program, the administrator should initially leave this password field empty. The password is allocated with the system program "/bin/passwd" or with the **Chooser** on the workstation, whereupon the password will be inserted in encrypted form at this position automatically. To avoid a temporary security risk, the administrator should use the **Chooser** to assign an initial password to each user, which the user can change afterwards by himself.

A typical entry for a user who only has access to public volumes (i.e. a user who does not need private volumes), and should not be permitted direct access to the UNIX system, is as follows:

```
Rita::201:18:Rita Lovely::/bin/date
```

Note that the field for private volumes has been left empty, and that the starting program is the program "/bin/date",

which displays the date but does not allow UNIX server access.

If the administrator decides to use the AFP user list ("$ESDIR/conf/afppasswd"), it must also contain an entry for each user. For the above example, the AFP user list should initially contain the following two entries:

```
David:

Rita:
```

The encrypted passwords will be added later automatically by the File Server, when you select **Change password** in the **Chooser** or use the "$ESDIR/afppasswd" program.

Creating groups

Groups are listed centrally in the UNIX system file "/etc/group". A group entry includes the group name, group password (obsolete), the group number (group id) and a list of group members (specified as user names, not user numbers!).

As already mentioned, each user must be a member of at least one group, his/her so-called primary group.

The use of a password for groups is only meaningful if users are allowed to access the UNIX server directly since, in this case, the user may be permitted to dynamically change groups after logging on, and/or add a new group to the list of assigned groups. These features are not available for the EtherShare File Server, since AFP does not currently allow such dynamic group changes: A user is only a member of those groups which were assigned in the file "/etc/group" when he/she last logged-in.

As an example, a team of users who jointly work in a project group could have the following entry in "/etc/group":

```
Projects:*:21:David,Tim,Rita
```

The entry line specifies the group name "Projects" and assigns the group number 21. The asterisk ("*") in the password field specifies that it is not possible to switch to this group dynamically after logging on. The group number is followed by a list of the group members. One of the members is already known to us: David. Note that, since David's entry in "/etc/passwd" specified a primary group for him with the number 16, group 16 also needs to be included in "/etc/group", as follows:

```
Projects:*:21:David,Tim,Rita

MacUsers:*:16:
```

The user name "David" does not need specifying here, since the group has already been clearly assigned to him in "/etc/passwd".

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 either 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 volumes.

Although guest users do not need to enter a user name, guest access must still be allocated a dummy user name in "/etc/passwd" and declared in the main configuration file "atalk.conf" (under "`guestid=`..."), in order to allow guests to be members of groups.

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 users or members. Folders and files are protected against access by guests as long as access for the user category "Everyone" has been explicitly disabled.

Since user volumes are only available for registered users, a home directory entry for guests in "/etc/passwd" is ignored by the File Server.

Deleting users

A user is removed from the system by deleting the corresponding entry line in "/etc/passwd". The administrator should also check whether files in the user's home directory should be deleted or archived at this stage.

If the AFP user list is being used, users that have been removed from the "/etc/passwd" file should also be removed from the AFP user list. This is done automatically if you use the EtherShare Admin to delete users.

If it is only required to prevent access of a particular user to the system for a short period, or if removal is being considered but not yet decided, the user can be disabled temporarily by inserting an asterisk (or any other character) to the beginning of the encrypted password in "/etc/passwd" (or in "$ESDIR/conf/afppasswd"). This causes password validation to fail, preventing the user from logging in. Note that direct UNIX access is still possible if only

"$ESDIR/conf/afppasswd" has been corrupted in this way – the UNIX logon procedure only checks the "/etc/passwd" file. On deleting the additional character, the user is enabled again.

Deleting groups

Groups are deleted by removing the corresponding entry line from "/etc/group". Before deleting the group, make sure that no users have been assigned this group as their primary group. Otherwise it will no longer be possible for them to log on to the system, since the primary group is no longer available. Also, make sure that the group is not used for the Volume groups list of any of the volumes.

9.6 Public and private volumes

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

The UNIX File System (UFS) is able to use storage capacity which is available through the network remotely in another computer (NFS-mounted volume = Network File System). Such remote storage can also be used by EtherShare. This allows any computer which supports UFS (e.g. many computers running a UNIX variant) to store volumes for an AppleTalk network.

Under 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 an editor such as vi, but we strongly recommend that you do this with the EtherShare Admin instead.

Note: Please see **Creating volumes** in chapter 5.8 “Volumes list” for related information, especially if you are using file systems mounted remotely through NFS.

Public volumes

When a volume is created, it can be optionally made 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 be optionally protected with a password.

Volume list

Public AFP volumes are set up by including them in the public volume list, which is the UNIX text file "$ESDIR/conf/afpvolumes".

The "install" program automatically installs a public volume "EtherShare" (by default located in the UNIX directory with the most free space) by specifying it in the volume list. The "install" program also creates a volume "EtherShare Applications" in "$ESDIR/macapps". It is used for Macintosh programs such as Helios Terminal, Helios Mail and EtherShare Admin. A sample "afpvolumes" file is shown in the appendix on page A-5 **afpvolumes**.

If you only want access to user volumes, and not public volumes, just delete the public volume list. No other configuration changes are necessary.

An entry in the volume list has the following structure:

```
directory:volname:[passwd]:flags1:flags2:
[volume_groups]
```

`directory` is the directory in the UNIX file system (specifying the full path) which is the root directory of the volume; it is usually called the volume "mount point".

Important: The "mount point" name must not be the UNIX directory name "/".

`volname` is the name of the volume, and `passwd` contains an optional password. If a password is specified, all users attempting to access the volume are required to enter the password before access is allowed. Passwords are useful for public volumes if guest access is enabled. `flags1` and

`flags2` are either fixed (fixed media) or changeable (removable media like magneto-optical drives).

Entries in `flags` could be:
`noguest,unixlocks,unixshare,nopublish,readwrite,utf8,charset=MacRoman,ipaccess,` and `readonly`.

noguest If you select the `noguest` flag, the volume is invisible for guest login.

unixlocks Specify `unixlocks` if you want to use UNIX record locking in addition to the standard mandatory record locking used between EtherShare clients, to allow file and record locking between Macintosh applications and UNIX applications.

unixshare Compare to `unixlocks` above. Specify `unixshare` if you want to use UNIX file locking.

nopublish With `nopublish` set, the volume is invisible for all users.

readwrite This flag determines that you have both read and write access to the respective volume.

readonly This flag must be set when the underlying physical media is write protected (e.g. CD-ROM). Then, there is – for all users – only read access to the specific volume. A small "padlock" is displayed in the Finder then.

Note: Do not use the `readonly` flag for administering access privileges to a volume since this could prevent the "desksrv" from locking the volume correctly. For such purposes use **Sharing...** from the Finder's **File** menu instead.

---

ipaccess=... states the name of the file containing the access list with the IP-addresses which are permitted to log on to a specific volume.

utf8 If `utf8` is specified, the Unicode character set is used on the volume.

charset=MacRoman If `utf8` is active, the `charset=MacRoman` flag is used to translate and encode file names to MacRoman.

volume_groups `volume_groups` is, like `flags`, a comma-delimited list of groups. See **Volume Groups list** in chapter 5.8 “Volumes list” for details.

The volume list can also contain comments by starting an entry line with the “# ” character. This can be used to add more information, e.g. the installation date of the volume. A volume can thus be temporarily disabled by placing the “# ” character at the beginning of the corresponding entry.

Private volumes Under UNIX, each user must be assigned a home directory to be able to log in. This is not mandatory for EtherShare users – if you use EtherShare Admin to create a user you can leave the home directory field empty, in which case only EtherShare access, and not UNIX access, is possible. 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 Macintosh 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; with the exception of the administrator no other user has access to someone else’s home volume.

If a particular user should only be allowed access to public EtherShare volumes, and not be assigned a home volume,

when creating the user you can leave the home directory field empty in the EtherShare Admin (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 specifying `nohomedir` in "atalk.conf" (under "afpsrv..."), which simply makes the home volume invisible to (all) Macintosh users.

"afpsrv" checks very extensively for overlapping EtherShare volumes during each mount request. If an already mounted volume does include (or is included inside) a volume to be mounted, this will be grayed out in the **Chooser** volume list 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 public or private EtherShare volume overlaps any other EtherShare volume. We suggest to establish a set of EtherShare volumes which serve your workflow well and are administered by the EtherShare or UNIX system administrator.

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 logon is ignored, since 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.

If the administrator installs a new public volume and a user has already installed a private volume of the same name, the latter is no longer available in the **Chooser** when the user logs on to the File Server the next time. In such cases, the private volume must be renamed before it can be used again.

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 his/her home volume any more.

Maximum number of volumes

The maximum number of network volumes that can be opened by Macintosh users on the File Server simultaneously is normally 128. Each open volume is only counted once, even if it has been opened by more than one user. See **maxdesktop** in chapter 10.4 "Parameters of the "desksrv" program".

Note: The Macintosh System 7.1 (and earlier) cannot handle more than 20 volumes simultaneously, including local volumes (although the Finder allows you to mount much more).

Volume size limits

The maximum (network) volume size displayable in the Macintosh Finder depends on the EtherShare settings, the EtherShare update level, the AppleShare client version, and the used Mac OS (see fig.150).

Note: Up to AppleShare client 3.8, Macintosh workstations set allocation blocksize values dependent on the server's network volume size.
As of AppleShare client version 3.8, however, Macintosh workstations recognize the server's allocation blocksize value so that the "used" value in the Finder's **Get Info** states a more precise actual used space.

Mac OS 7.5 (or later) supports network file system sizes of up to 4.0 Gigabytes and EtherShare will do clipping at 4.0 GB instead of 2.0 GB for volume free/used space values. Independent of the chosen clipping value, there will be no difference in the amount of data that can be stored on that EtherShare volume (see fig150).

The older Mac OS 7.0/7.1 only supports network file system sizes of up to 2.0 Gigabytes (the exact Mac OS 7.0/7.1 file system limit is 2,080,373,760 bytes).

If Macintosh clients with these older versions are still in use, you have to adjust the "afpsrv" program's behavior with the option "clip2g" ("noclip2g" is default!). As long as no EtherShare volume with more than 2.0 GB is defined, the only penalty may be a wrong display for values of the free/used disk space. In case that EtherShare volumes larger than 2.0 GB are defined, these Mac OS clients may not be able to mount any of the EtherShare server volumes any more.

Important: The "noclip2g" option (default!) should only be set for sites with all Macintosh clients running Mac OS 7.5. Otherwise, Macintosh clients running Mac OS 7.0/7.1 will display wrong values for free/used space, or may have problems mounting volumes at all.

	clipping	*AppleShare client version*
Mac OS 7.1	2 GB	3.5
Mac OS 7.5	4 GB	3.6
Mac OS 7.6+	unlimited	3.7/3.8

Fig. 150: Volume size clipping

EtherShare limits the number of concurrently used public and private volumes to at most 450. By default, 128 are accessible. Please see chapter 10.4 “Parameters of the “desksrv” program” for more details.

Starting with Mac OS 7.5, local file systems can be larger than 2 GB, up to 1 TB (Terabyte). Since the AppleTalk Filing Protocol 2.1 is still limited to 32-bit values for volume sizes, AppleShare volumes are still limited to approx. 4 GB.

With AFP version 2.2 and AppleShare client 3.8 (or later), network file systems are displayed with their proper size.

Note: Generally, we recommend to use current AppleShare clients as released from Apple.

For Mac OS < 7.6 Apple suggests using AppleShare client 3.6.5

For Mac OS ≥ 7.6 Apple suggests using AppleShare client 3.8.x

Automatic extension mapping

The File Server supports automatic mapping of file name extensions. This works in a similar way to the extension mapping feature provided in products like DOS Mounter, Access PC or Apple's PC Exchange.

It simplifies sharing files between EtherShare, UNIX and UNIX-DOS networking products such as PCShare from HELIOS, by simulating an appropriate Macintosh type and creator, allowing Macintosh users to open files created under MS-DOS or UNIX with a double-click.

Note: This feature allows you to allocate specified file name extensions to icons of applications or documents which already reside on the File Server, but it does not allow you to create new icons.

The required mapping is specified in the file "$ESDIR/conf/suffixes", which has the following structure:

```
#type            creator   suffix
'TEXT'           'KAHL'    .c
'TEXT'           'KAHL'    .h
'TEXT'           'MSWD'    .txt
'TEXT'           'MSWD'    .doc
'TEXT'           'XCEL'    .wks
'TEXT'           'XCEL'    .wk1
'TEXT'           'XCEL'    .wk3
'TEXT'           'XCEL'    .xls
```

We recommend that you specify extension mapping with the **Extension Mappings** option of the EtherShare Admin, and not by editing the above file manually. See the **suffixes** parameter in chapter 9.4 "Parameters of the "afpsrv" program" for related information.

"afpsrv" does not translate the line endings in files of type TEXT and creator UXPS. This creator/type combination

could only be generated for files stored on the server by UNIX or DOS applications. Macintosh applications supply their own type and creator.

Now EtherShare also recognizes EPSF files and will generate type “EPSF” and creator “UNIX” although the icon will be the same as for UXPS/TEXT files. CR/LF conversion is not provided for UNIX/EPSF files.

Newline conversion

The Metrowerks CodeWarrior software will – by default – apply newline conversions to the following type ‘TEXT’ files:

Type	*Creator*
TEXT	CWIE
TEXT	MMCC
TEXT	MPCC
TEXT	MPS_
TEXT	UXMB
TEXT	UXSC

For more detailed information on newline conversions to “TEXT” files see **notexttran** in chapter 9.4 “Parameters of the “afpsrv” program”.

9.7 Access privileges

Access privileges – called “permissions” under UNIX – define which users are allowed to work with which folders and files. Access privileges are assigned by the administrator or the owner of a folder, and always relate to the whole folder or volume: if a user has privileges to read from and write to a particular folder, the same privileges are available for all files contained in the folder.

Under Apple’s Hierarchical File System (HFS), no access limitation mechanisms are available for individual files, since the concept of user authorization is not known. A file can solely 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 privileges mechanisms are necessary. Apple’s AFP specification for sharing files differentiates between four different types of privileges:

- “Read & Write”
- “Read only”
- “Write only” (Drop Box)
- “None”

“Read only” specifies whether a particular folder is visible to the user. If a particular file is visible, it can also be read. The attribute “Read & Write” additionally allows modifications applied to the files in the folder. “Write only” allows only files being “dropped” into a specific folder. “None”

means that any form of access to that folder is denied, i.e. neither reading the contained files, nor applying changes to them is possible. See fig. 151.

In contrast to UNIX, since under AFP the access privileges are assigned to a particular folder, it is not possible to specify different rights for individual files in the same folder. If it is necessary to be able to change a particular file, but not to change another file, the two files should normally be stored in separate folders. If this is not possible, your only choice is to use the UNIX “dt chmod” command to change the privileges for one file only.

The four types 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” under 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 set “Owner:” to “<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 contents 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 which are stored in the folders have always the same access privileges as the folders themselves.

EtherShare File Server	UNIX file system
Read & Write	(rwx) read write execute
Read only	(r-x) read execute
Write only (Drop Box)	(-wx) 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 **Creating new volumes under UNIX** in 9.7 “Access privileges” and the respective UNIX documentation.

The Finder’s **Sharing...** program (in the **File** menu) can be used to display and edit the access privileges. Figure 151 shows the privileges for a folder named “contracts”, and figure152 displays the corresponding directory listing for this folder, made with the UNIX program “ls”.

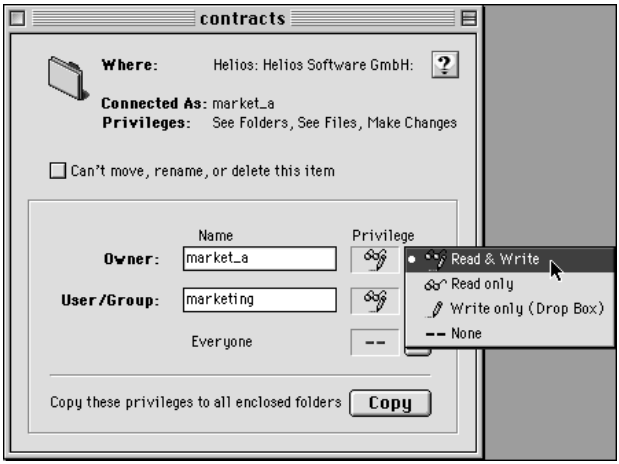

Fig. 151: Folder access privileges in the “Sharing” window

```
$ ls -ld contracts contracts/.rsrc
drwxrwsrwx 2 root wheel 1024 contracts
drwxrws--- 3 market_a marketing 1024 contracts
drwxrws--- 3 market_a marketing 1024 contracts
```

Fig. 152: Folder access privileges as seen from UNIX

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 (see figure153)

Fig. 153: Access privileges for user “dave”

Extreme care should be taken when changing access privileges of AFP files from the UNIX server directly (e.g. never forget the resource part) or, in order to avoid such problems, use the UNIX “dt” program. Incompatible combinations of privileges could lead to EtherShare access problems. For example, it may not be possible to read from or write to a file anymore, or it may no longer be possible to use a folder.

Creating new folders under 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 (normally invisible) resource directory. The EtherShare File Server uses the resource directory to store

the Macintosh'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. Use the "dt chmod" command to set the appropriate access privileges. Figure 154 shows how this could be done, figure 155 shows the resulting directory entries.

```
$ dt mkdir FolderName
```

Fig. 154: Creating a folder from UNIX

```
$ ls -ld FolderName FolderName/.rsrc
drwxrws--- 3 market_a marketing 1024 contracts
```

Fig. 155: Resulting directory entries (UNIX program "ls")

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 chapter A 9.5 "Command descriptions", respectively.

We recommend that network folders are always created by using the Finder on the Macintosh, in the same way as local folders, since this guarantees that all of the above considerations are handled automatically. The administrator should only use UNIX system programs for this purpose in an emergency. The exception is when you need to change the privileges for a single file within a folder – the Macintosh's "Permissions" program (called "Sharing" on System 7.x) can only set privileges at the folder level (compare **Correlation to UNIX access privileges** in this chapter).

Deleting 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.

Creating new volumes under 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. AppleShare users expect the BSD style, thus the EtherShare 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.

9.8 Data backup

As with all computer systems, it is highly advisable to make regular backups of network volumes to tape or disk. Although UNIX provides comprehensive safety mechanisms in case of system faults, it is never possible to fully exclude loss of data. For this reason, the administrator should regularly archive all volumes of the file server to mass storage.

Two methods are available for archiving volumes. Data backup can be carried out either from one of the workstations with a Macintosh archiving program, or directly from the UNIX server by using one of UNIX's system backup programs.

Archiving programs on a Macintosh workstation will back up HFS volumes to disk or tape. The disadvantages of this method are that all the files must first be transferred over the network before they can be stored on the backup medium, and that each volume must be separately archived; the latter can represent a considerable effort on a large file server with a large number of public and private volumes.

For this reason, workstation backup programs are generally only suitable for archiving single volumes (and not for the main system backup). Users should be encouraged to regularly archive their own private volumes and folders, in order to be able to access older versions of files at a later stage if required.

By accessing the UNIX server directly, the administrator can archive all volumes in a single process, and at the same time benefit from the high data transfer rates available through UNIX, since the files do not first need to be transferred via the network (provided that the hard disks and

tape systems are directly linked to the server, and not connected at another point in the network). Since UNIX computers are usually provided with some kind of built-in tape streamer, this method also has the advantage that no additional hardware needs to be purchased.

Various UNIX system programs allow convenient backup of directories and files; the most common programs used for this purpose are the programs “ufsdump”, “cpio” and “tar”.

Important: Make sure, while performing a data backup from a UNIX system, that the volume to be stored is not currently used by Macintosh clients or “opisrv” or “dt”. Otherwise, the result would be inconsistent file/.rsrc data.
The volume’s “.Desktop” and “.DeskServer” files may not be backed up because at times of restoring they would be different from the volume’s content.

---

cpio and tar

“cpio” and “tar” are not capable of storing path names longer than approximately 100 characters. This makes these programs unusable on Macintosh volumes, which support much longer path names.

ufsdump and restore

“ufsdump” is a backup program available on many UNIX systems which is characterized by high speed and by the fact that it is able to archive all file types. Furthermore, “ufsdump” only archives blocks in the file system that actually contain real data (sparse files). “ufsdump” is the recommended backup program for the EtherShare system. Please refer to appendix A 6: “Data backup with “dump” and “restore”” for an example of using “ufsdump” and its companion “restore”. See **nofiledatesync** in chapter 9.4 “Parameters of the “afpsrv” program” for related information.

Another possibility to perform data backups preserving a high grade of security, is to save both the data and the resource file to the same destination (e.g. streamer, tape etc.) and not to split them up to different storage media.

Automated backup

The UNIX system program “cron” allows data backup to be automated. Daily backup to tape can be carried out with minimum effort if the corresponding commands have been entered in the “cron” configuration table. It is only necessary to ensure that a tape with sufficient storage capacity is loaded in the appropriate tape drive.

9.9 File Server utility programs

The following programs are created automatically in the "$ESDIR/etc" directory during EtherShare installation:

stop-afp

"stop-afp" is a shell-script which closes down the File Server after a delay of five minutes, ensuring that all active processes have been correctly terminated. All logged-on users receive a warning message on their workstations before the system is finally closed down.

If the "stop-afp" command line includes the parameter "now" ("$ESDIR/etc/stop-afp now"), the File Server is stopped immediately.

Note: Only the superuser ("root") can run "stop-afp". Before running this script, use the "swho" command (or choose **Active Users** in the **Lists** menu of EtherShare Admin) to make sure that no other users are using the File Server, or use "afpmsg" to notify other users in advance.

mkafppasswd

"mkafppasswd" is a shell script that you can call in order to copy user entries for the user id 0 ("root") and all users with user numbers greater than or equal to 100 from the "/etc/passwd" file to "$ESDIR/conf/afppasswd". The output is sent to "$ESDIR/conf/afppasswd". You will get an error message if "afppasswd" already exists. After creating this file the command asks you for a new "root" password, because all entries are initially without any password. If you have any "real" UNIX users with ID numbers below 100, as distinct from "system" users such as "bin", you must manually add a corresponding entry (initially without password) to the "afppasswd" file as follows:

`username:`

Then set up initial passwords with **Change password** in the **Chooser**, or from UNIX with the password program "$ESDIR/afppasswd".

afpmsg

With "afpmsg" a UNIX user can send a display message to an AFP client – with a maximum of 199 characters, or to all users if logged-in as "root", see fig. 156. For detailed parameter information type `afpmsg -?`.

`afpmsg -f` makes references to a file containing the actual message. This may be required, e.g. if you want to send a multi-line message, which is not possible with the `message` parameter only.

`-p` is the parameter for sending a message to a particular process id #.

`-u` is the parameter for sending a message to another user.

Examp.: `afpmsg -u dave "Hi Dave, this is a test."`

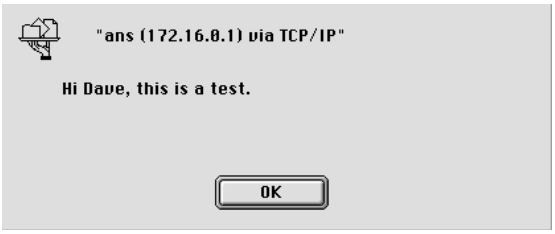

Fig. 156: Example of a display message

If neither `-p` is specified, nor `-u` and you are “superuser”, the message reaches all users logged-on to the respective server.

Note: In order to avoid “distorted” display messages, make sure the appropriate version of AppleShare client (min. 3.8) for the respective Mac OS (starting with 7.1 and above) is installed on your Macintosh workstation.

9.10 EtherShare versus AppleShare

When compared to the original AppleShare file server from Apple, 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 the different operating systems when it comes to the case of file names.

	case preserve	***case ignore***
Mac OS	✓	✓
UNIX	✓	–
MS-DOS	–	✓
W95/98/NT	✓	✓

Fig. 157: Operating systems and the case-sensitivity of file names

As figure 157 shows, there is no case preserving under MS-DOS, i.e. file names entered in lowercase will appear uppercase in the directory listing. In contrast to UNIX, the Macintosh (as well as Windows) operating system is not case-sensitive when it looks for files or creates or opens them – if your application looks for “Dave”, it will also find “dave”, and you cannot create a file “Dave” and a file “dave” in the same folder on a local volume. Due to its UNIX heritage, this is unfortunately not true for EtherShare volumes.

This distinction is normally not a problem – if an application has created a file called “Editor Prefs”, for example, and needs to open the file again, it usually tries to open it using the same name and not under the name “EDITOR PREFS”. If an application cannot find a file which it has created, and the file is visible under 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 Macintosh link (alias) or by renaming the file. Contact your application vendor for assistance.

ASCII “0”

You will get a file system error if you try to copy files whose names contain ASCII “0” (zero) to the server, or if application programs or tools try to create such files. This somewhat dubious technique is used by some INITs to force their name to the top of an alphabetic list of files. This restriction also applies to all AppleShare file server products (including those from Apple).

Private volumes

Private volumes are a particularly powerful feature of the EtherShare File Server which is not available on original AppleShare file servers. By automatically allocating a private “home” volume to each user, it is possible to keep his/her data separate and protected from other users without requiring any additional measures to be carried out. The home volume feature – which is implemented with the UNIX home directory concept – underlines the high degree of integration of the UNIX file system in the EtherShare File Server.

Private volumes are used to improve structuring and ordering of private files, but it is generally better to use the Volume groups feature for this purpose, because private volumes cannot be seen in the **Volumes** list of the Ether-

Share Admin, and thus cannot be readily managed or rebuilt (see **Rebuild Desktop** in chapter 5.9 “Volume menu”).

Note: Many private volumes may require an increase of the “maxdesktops” value in “desksrv” (EtherShare’s default value is 128).

Access privileges

Accordingly, when changing the access privileges of a folder/volume, file and folder attributes can only be set to the same value, and you will need to close and re-open the Finder’s “Sharing...” window (figure 151) before you can see this. If you need to change the privileges for a single file within a folder, you have to do it with the UNIX “dt chmod” command.

Available storage space on volumes

When determining the available free storage capacity of a volume, the AFP specification only permits interrogation of the root directory of a volume. This assumes that the entire volume is present on the same file system.

In contrast, under the UNIX file system, “volumes” can extend over several storage devices which are installed at different UNIX directories (mount points) and physically located at different points on the network. This mounted volumes feature is completely unknown to AFP – AFP does not recognize cases where a volume extends over several storage devices, with each of them having a different storage capacity.

Accordingly, in order to maintain control over the available storage capacity, it is not recommended to mount EtherShare volumes that extend over more than one file system. Otherwise, you may get problems with Macintosh applications that check the available storage capacity on the volume before writing files or documents. See also **Volume size**

limits in chapter 9.6 “Public and private volumes” for related information.

Note:	If you have more than one UNIX mount point on a Macintosh volume, do not move files or folders to the trash since this may fail.

Folders and volumes without groups

Original AppleShare file servers allow folders to be created which are not assigned to a group. This feature is not permitted on an EtherShare File Server due to limitations inherent in UFS. If it is required to create folders which are not assigned to a specific group, it is necessary to create a new special group (pseudo-group) which does not have any members. By convention, the group “nogroup” is often used for this purpose.

The same is true for volumes. Since the access privileges of HFS volumes are always the same as those of the corresponding UFS directories, if it is required to create HFS volumes which are not assigned to a specific group, they must also be assigned to the pseudo-group “nogroup”.

Users without primary group

In contrast to generic AppleShare file servers, EtherShare always requires each user to be assigned a primary group, since all files must be assigned to a specific group. A pseudo-group can be used in this case too, although the name of the pseudo-group should be different from the one used for groupless folders and volumes (e.g. “noprimary”).

Preventing password changes

Original AppleShare file servers allow the “Change password” feature to be disabled for individual users. In an EtherShare File Server, the rights to change passwords can only be enabled or disabled for all users at the same time, by marking the program “$ESDIR/afppasswd” as non-executable for categories “other” and “group”. In this case,

passwords can only be changed by the administrator, in the "User data" window in the EtherShare Admin (see chapter 5 "EtherShare Admin").

Search Desktop

"afpsrv" does conduct a search of file or folder names in the desktop database. Although this search is much faster than searching for file/folder names in the UNIX file system, it may fail to find files if the desktop database does not correspond to the files and folders on an EtherShare volume caused, for example, by overlapping EtherShare volumes (see **Private volumes** in 9.6 "Public and private volumes").

Note: Choose **Rebuild Desktop...** from the **Volume** list in the EtherShare Admin. Then, all files on that volume can be found again.
Under UNIX, type `rebuild -f` (in "$ESDIR").

---

10 The Desktop Server

10.1 General remarks

This chapter describes the function and configuration of the Desktop Server. The Desktop Server is responsible for storing icon and application data for the entire EtherShare Server, and for managing file and directory IDs for network volumes. The Desktop Server is usually invisible to users and has no associated Macintosh application. The exception is the **Rebuild Desktop...** option in the EtherShare Admin.

10.2 The Desktop Server Program

The EtherShare Desktop Server system consists of the program “desksrv”. It is created in the “$ESDIR” directory during installation. EtherShare is configured to start “desksrv” automatically when UNIX is booted.

desksrv

“desksrv” manages a database containing icon and application data for the entire EtherShare server, and file and directory ID information for network volumes. The database data are contained in the “.Desktop” file in the root directory of each HFS volume. The file name “.Desktop” is protected by EtherShare, and is normally invisible to Macintosh users.

Application data

The application data records in each “.Desktop” file contain the information required to assign documents to the Macintosh applications that created them. The Macintosh’s Finder uses this information to start the corresponding application when the user double-clicks on a particular document. Each time a new application is copied into an EtherShare volume, the desktop server creates a new entry in the corresponding desktop database file.

Icon data

The icon data records in each “.Desktop” file contain icons from all the applications in the volume, sorted by type and creator codes.

In order to let the Finder display icons for documents and applications, each application contains icon images (bitmaps) for its own icons in several sizes and styles, and icons for all the document types it can create. For example, Microsoft Word can create text, glossary, dictionary documents, etc., each with its own icon. Each icon is associated with unique file type and file creator codes. The applica-

tion's documents normally contain the file type and file creator codes only (stored in their resource forks), but no icons. See **The structure of volumes and files** in chapter 9.3 "Directory and file formats" for more information.

Each time a new application is copied into a local Macintosh volume, the Finder copies all of the icons it contains to the volume's desktop file. In the case of EtherShare, the Desktop Server stores them in the ".Desktop" database file, after checking that the same icons are not already stored there.

If you copy documents of an application to your Macintosh without ever having owned the corresponding application, then the icons may appear blank. This is because the icons you see in the Finder are taken from the desktop file and not from the documents, the latter simply supply the correct type/creator codes.

Files created by UNIX applications do not have a resource fork. In such cases, EtherShare normally assigns icons to them automatically. See **Generic icons** in chapter 9.3 "Directory and file formats" for more details.

Directory and file IDs

When the Finder or an application needs to open a file, in addition to looking for the specified file name in a named directory and volume, a system option is available to open the file by a reference number instead. This reference number is called the "file ID". The directory path, too, can be specified by its "directory ID". By using file and directory IDs, files can still be found after a user has renamed or moved them. This provides Macintosh users with a lot more flexibility than MS-DOS users, for example.

This principle is used in the "Alias" facility introduced with Macintosh System 7.

Each ".Desktop" file contains file and directory IDs for all the files and directories in the volume. The file ID is also stored in each file's resource file; the directory ID is also stored in each directory's resource file.

The file and directory IDs are allocated when the file or directory is first created, and never change even if the file is renamed or moved to another location. The IDs are normally invisible to the user.

Desktop rebuild

After a period of time, each volume desktop file tends to collect a number of icons which are no longer needed, since the corresponding application has been deleted from the volume. For this reason, you may rebuild your desktop from time to time, i.e. start a process which scans the entire volume for applications and makes sure that the desktop only contains icons for existing ones.

You can rebuild your desktop for local Macintosh volumes (built-in hard disk) by restarting your Macintosh while holding down the **Option** and **Command** keys. To rebuild the desktop of an EtherShare volume, you must make sure that the volume is not mounted (e.g. with the **Active Users...** option in 5.13.2 "Active Users list and sending messages with the EtherShare Admin") and then start the EtherShare Admin application on one of your Macintosh clients, select the volume in the volume list, and choose **Rebuild Desktop...** from the **Volume** menu (see **Rebuild Desktop** in chapter 5.9 "Volume menu").

The rebuild process will always add files to the desktop database in order to allow file name searches in the volume desktop database. This requires that a resource for every file/folder is available.

During an EtherShare desktop rebuild, missing resource directories and resource files are automatically created for all *directories* in the EtherShare volume (including the volume root directory); existing directory IDs are verified and missing ones are created.

With *files*, missing file IDs are created and existing file IDs are verified. Missing resource files are created as well. The file type in that case, is substituted by a dummy, e.g. “UNIX/UNKN”. The generic UNIX icons and extension-mapped icons are created later by the File Server, when the corresponding folder is first opened.

Note that a desktop rebuild with EtherShare 2.6 and the creation of missing resource files may cause difficulties if you try to access these files from an EtherShare 2.2 (or older) server via NFS. Old EtherShare versions cannot display such files properly; the icons are displayed blank. Therefore, you should make sure that in a multi-EtherShare-Server environment, all servers are updated to EtherShare 2.6.

By default, the rebuild program uses two passes to update the volume desktop database. The two pass approach does have the benefit that on volumes where duplicate file/folder-IDs exist (usually resulting from manipulations of files/folders by UNIX commands), files/folders will get an adjusted ID only after the complete desktop is verified, and all other objects will retain their original ID.

File and directory IDs are stored in both the ".Desktop" file and the file's (or directory's) resource file; if the verification detects differences, the IDs from the resource files are assumed to be the correct ones.

While a rebuild is running, it is possible to write to an EtherShare volume. As long as the desktop database is not yet complete, changes to files or folders may result in different file-/folder- IDs issued for objects not yet re-enumerated by rebuild.

To prevent inconsistencies between information stored in the desktop databases of an EtherShare volume and the files/folders on this volume, the rebuild process encountering an RPC timeout will exit immediately. Desktop information for this volume will be incomplete until a rebuild finished successfully.

In case "afpsrv" processes also encounter RPC timeouts, the volume will get secured against write access and will be grayed out in the Chooser's volume list. Opening folders and reading files will still be possible, but creating/renaming/moving files or folders will not be possible any longer. Not even trashing files/folders will be allowed.

RPC timeouts are symptoms which are usually caused by high server or I/O load, slow I/O devices, network or communication problems. Assure that the cause of this problem is solved before restarting EtherShare services. Depending on the severity of the problem, it may be necessary to stop and restart EtherShare services on the server by using the scripts "$ESDIR/stop-atalk now" followed by "$ESDIR/start-atalk".

In the case of files created by UNIX applications, the resource directories are unnecessary – although they do not affect UNIX applications which access the original files, they take up a certain amount of disk space. Accordingly, it may be better to organize your directories and volumes with separate file systems for UNIX-only and Macintosh files.

Important: We strongly recommend to use the "rebuild" option to put your desktop in order. Do never delete the desktop database under UNIX.

Desktop auto-rebuild

Each time you open an EtherShare volume with the **Chooser**, the desktop server checks the logical consistency of the desktop file and may trigger a desktop rebuild if it finds invalid information. This process takes place automatically and in the background. The same check is done, too, for each of the volumes in the volume list "$ESDIR/conf/afpvolumes" when EtherShare is first started.

Most computers such as the Sun SPARC and IBM RS/6000 use the so-called Motorola byte order, and others such as the DEC Alpha and IBM PC use the Intel byte order. An auto-rebuild also takes place if you mount a volume whose desktop was created by a computer with a different byte order.

Furthermore, the volume's directories must not overlap or include the directories of other EtherShare volumes. You should choose the volume mount point carefully to make sure this does not happen. To avoid problems, EtherShare 2.6 checks for overlapping volumes; volumes will be grayed out if they overlap a volume you have already mounted. You will receive an error message (see later). The EtherShare Admin will check for overlapping

volumes as well. Nevertheless, it may happen that existing volumes are not checked and that you are able to create a new volume that overlaps an existing one.

UNIX "rebuild" program

Instead of using the **Rebuild Desktop...** option in the EtherShare Admin, you can also call the "rebuild" program from a UNIX shell. There is one particular situation where this may be required:

- If you want to rebuild the ".Desktop" database for your home volume or a private volume. The Desktop Server will create a ".Desktop" database and resource directories the first time you access your home volume from the Chooser, and will rebuild it if it becomes corrupted, but you will not be able to rebuild it manually from EtherShare Admin, since it does not appear in the volume list.

Resource orphans

The rebuild program offers an option to clean (delete) resource orphans. As discussed earlier, the File Server creates resource files for files created by UNIX applications when the corresponding folder is opened. However, when you delete a file directly from the UNIX host, the matching resource remains untouched. (But when you delete a file from a Macintosh, the resource file is deleted, too).

So particularly if your EtherShare volume contains a mixture of Macintosh files and UNIX-only files, after a period of time the volume will tend to collect a number of unused resource "orphans", wasting space. Calling the "rebuild" program will automatically delete the resource orphans. You would have to specify the "not clean resource orphans" switch of the "rebuild" program to prevent the program from automatic deletion. Alternatively, you can specify the "nocleanorphans" switch for the "rebuild" program in

"atalk.conf", causing orphans to be maintained each time a desktop rebuild takes place (see chapter 10.3 "Parameters of the "rebuild" program").

Calling "rebuild"

Call the "rebuild" program from a UNIX shell as follows:

```
rebuild <switches> <path_of_volume_root>
```

The available switches are:

```
-n    output to system messages file instead of "stdout"
-o    open ".Desktop" file only, repair if corrupted
-f    force ".Desktop" file to be rebuilt
      (force create is off if you do not specify -f)
-c    do not clean resource orphans automatically
      (clean orphans is default if you do not specify -c)
-C    volume can be converted to another character set
-s    scan desktop only
      (scan only is off if you do not specify -s)
-v    verbose for diagnostics
      (verbose is off if you do not specify -v)
-2    2 ID check passes is active by default
      (two passes is disabled if you specify -2)
-x    volume is exclusively opened for rebuilder
```

Usually, you call "rebuild" with the "-f" switch, for example:

```
rebuild -f /usr/local/es/macapps
```

If you call "rebuild" with the "- C" option, you can specify a new character set, e.g. "MacRoman" or "SJIS":

```
rebuild - C macroman <path_of_volume_root>
```

If you want to convert from a new to the old EtherShare character set ("oldes"), call:

```
rebuild - C oldes <path_of_volume_root>
```

Readonly volumes

In the case of CD-ROM volumes, or volumes such as Magneto-Optic (MO) cartridges which have been mounted with the EtherShare Admin as "read-only", the desktop server

first checks to see if a valid ".Desktop" file is available on the volume's root. This can be the case, for example, for MO cartridges which were previously mounted under EtherShare as "read-write", allowing a valid desktop to be created.

If a valid ".Desktop" file cannot be found (this will almost always be the case for CD-ROMs), the desktop server creates a temporary desktop file in the host's "/tmp" directory using a unique file name starting with "desksrv...". Since the files on the CD-ROM almost certainly have no resource forks in this case, the Finder will use the information that are available in the extension mapping table or show one of the about 20 generic EtherShare icons.

10.3 Parameters of the “rebuild” program

When it starts, the “rebuild” program first accesses the main configuration file “atalk.conf” to determine its configuration. The “install” program automatically sets up this file with initial values for some of the EtherShare servers. The values can be changed if necessary by using an editor such as vi. See also chapter 5.14 “Editing “atalk.conf” (and other configuration files) manually”.

The parameter described below can be defined for “rebuild” in “atalk.conf” (note that the parameter list is preceded by the program name “rebuild:”):

cleanorphans

`[no]cleanorphans`
The `cleanorphans` switch for the “rebuild” program in “atalk.conf” causes resource orphans to be deleted each time a desktop rebuild takes place (see **Resource orphans** in chapter 10.2 “The Desktop Server Program”). This operation requires a certain amount of processing time.

The default for this switch is `cleanorphans`.

twopass

`[no]twopass`
The `twopass` parameter induces the “rebuild” program to run 2 times: in the first session, “rebuild” tries to restore all already-known IDs on the volume and makes records of all conflicts. In the second session, all those files which have caused conflicts are allocated a new ID.

The default for this switch is `twopass`.

10.3.1 “rebuild” error messages

The following error messages can be issued by the “rebuild” program:

compressed resources

This is a warning which indicates that some resource information, e.g. icon information, cannot be uncompressed. This could happen e.g. with fonts that have a custom icon:

```
rebuild[]: /apple2/FremdeSchriften/Fre:a7Schriften/
Helvetica Neu(L63-65,185)/HelveNeuLigCon:
unable to add to desktop, compressed resources
```

volume %s is currently in use, no exclusive access possible

Someone is already using the volume, i.e. you cannot access exclusively with the `rebuild -x` switch.

charset %s for volume %s not found (%s)

This error message leads to a fatal error; the “rebuild” program is stopped.

volume is already using the selected charset, nothing to convert

The current character set was selected anew.

volume %s is read-only

You cannot apply any changes since there is no write access to the volume, e.g. a CD-ROM volume.

10.4 Parameters of the “desksrv” program

When it starts, the Desktop Server program “desksrv” first accesses the main configuration file “atalk.conf” to determine its configuration. The “install” program automatically sets up this file with initial values for some of the EtherShare servers. The values can be changed if necessary by using an editor such as vi. See also chapter 5.14 “Editing “atalk.conf” (and other configuration files) manually”.

The parameter described below can be defined for “desksrv” in “atalk.conf” (note that the parameter list is preceded by the program name “desksrv:”):

maxdesktop

`maxdesktop=number`
`number` is the maximum number of network volumes that can be opened by Macintosh users on the File Server simultaneously.

The default for `number` is 128 volumes. Each open volume is only counted once, even if it has been opened by more than one user. The absolute maximum value is 450, but the achievable maximum may be limited by the maximum number of open files for the “desksrv” process allowed by the host. This limit is normally set by “desksrv” for itself automatically. In case of problems, refer to “limit” and “ulimit” in your UNIX documentation for details about how to increase the limit manually for your host.

10.4.1 “desksrv” error and status messages

Although there is a large number of possible messages from “desksrv”, we will only describe a few of the more common messages here because the majority of them are non-fatal

and simply result in an automatic desktop rebuild. Fatal errors result in “desksrv” stopping, in which case you will see the message “desksrv: stopped”.

All messages are written to the system messages file (which can be accessed via the **Lists** menu of the EtherShare Admin) and are preceded by the host name, time and date, and the string “desksrv:”. If the Desktop Server triggers a desktop rebuild, or if you call the rebuild program manually from a UNIX shell, the message will include the string “rebuild:” instead.

corrupt at open

The desktop file is corrupted and will be rebuilt automatically.

unknown file type on open (maybe wrong byte order)

The “.Desktop” file is not a valid desktop, e.g. the desktop file is in Intel byte order and should be in Motorola byte order, or vice versa; it will be rebuilt automatically.

read failed, or write failed

These messages are usually related to volumes mounted over NFS, and point to NFS communications errors.

creation error, too many open files on volume...

“desksrv” has attempted to open more files than the maximum number allowed by your host. The limit is normally set by “desksrv” for itself automatically. Refer to “limit” and “ulimit” in your UNIX documentation for details about how to increase the limit manually for your host.

too many desktops

Macintosh users have attempted to mount more volumes than the presently configured maximum number for the desktop server. Please refer to the description of the **maxdesktop** parameter in this chapter for more details. This message is usually associated with a Macintosh Finder error message similar to the following: “the connection could not be made to file server <name> - please contact your system administrator”.

no response from host <hostname>

If you access volumes on another EtherShare host through NFS, and the remote “.Desktop” file seems to be already in access, queries will be sent to the remote host’s File Server and Desktop Server to check whether they are really in use. The remote “.Desktop” file will not be accessed directly. You will get the “no response...” error message if the remote host does not respond to queries after a suitable timeout. In such cases, the local Desktop Server will take control of the remote “.Desktop” file and rebuild it if necessary.

nested desktops

A message like `desksrv [] : nested desktop [/data/opi/OPI1] in [/data/opi/.Desktop]` indicates that there are overlapping volumes. The message pops up when you try to mount a volume that has a “.Desktop” file in its parent directory.

Add ID - name too long

If you create a file with a too long file name under UNIX, using the Desktop Utilities, “opisrv”, or the EtherShare OPI “layout” program which will try to add this file to the desktop, you will receive an error message similar to those listed in the examples below:

```
desksrv[]: AddId - name too long
```

or

```
opisrv[]: Warning: /apple1/software/Wilhelm
Kaiser/Kaiser/R&R-Beilage 8 Seiten, 41 KW/Bilder
41 KW/8 S. Abb. 6 Gianna Nannini.eps.lay: Path too
long. This file may not be accessed from a Macin-
tosh workstation.
```

10.5 “afpsrv” and “desksrv” coordination

“afpsrv” will try 6 times for 5 seconds each to reach the desktop server to retrieve or store information from/to the desktop database of its volumes. Earlier versions of “afpsrv” tried 3 times for 5 seconds. Although even the older values were a very long time for network or RPC connections, we decided to even extend these values.

If “afpsrv” does not get a response from “desksrv” during this period, this indicates a severe problem with the underlying UNIX operating system, UNIX file system or RAID/HSM drivers, or a hardware problem related to SCSI or hard disks.

To prevent inconsistencies between information stored in the desktop databases of an EtherShare volume and the files/folders on this volume, the “afpsrv” client process encountering this timeout will secure this volume (all mounted volumes) against write access. Opening folders and reading files will still be possible, but creating/renaming/moving files or folders will not be possible any longer. Not even trashing files/folders will be allowed.

Apart from the usual messages issued in the UNIX system error log, “afpsrv” will issue an error message on the client if the communication to “desksrv” fails and inform users that the volume falls back to “read-only” access. The message is:

```
Volname: localhost: RPC: Timed out
Only readonly access possible
```

Under certain conditions, an additional error message is issued and the volume is unmounted automatically by the Finder.

Though this message is issued by one “afpsrv” client process only, it is likely that all other “afpsrv” processes may encounter the same problem and therefore, the UNIX system administrator should be notified immediately.

Since applications usually work with temporary files/folders, it may not be possible to save single files. If this problem was only temporary, unmounting all EtherShare volumes and remounting them will make these volumes writable again. If not, this was no temporary problem and is not solved in the meantime the Macintosh volume Chooser will list all volumes grayed out, and no volume will be mountable. Not even “root” will be able to mount any of these volumes.

Depending on the severity of the problem, it may be necessary to stop and restart EtherShare services on the server by using the scripts “$ESDIR/stop-atalk now” followed by “$ESDIR/start-atalk”.

Assure that the cause of this problem is solved before restarting EtherShare services.

11 The Print Server

11.1 General remarks

This chapter describes the Print Server and its function, configuration and operation. This is followed by notes on the installation, configuration and operation of printers.

11.2 The Print Server Interfaces

As described in detail in the following, the EtherShare Print Server supports 5 different output interface options, plus the possibility of spooling the resolved print job to disk. It can be considered as a kind of telephone exchange for printer connections, as shown in Table 2:

Input options Job comes from:	**Output options** Supported printer types:
	AppleTalk
AppleTalk	Serial
UNIX “lpr”	TCP/IP stream
remote “lpr” through TCP/IP	Remote LPR
	Shared Memory
	Resolve and print to disk

Table 2: Print Server input and output options

Suitable configuration allows any combination of input and output option to be used.

11.3 The Print Server Programs

The Print Server consists of the programs “papsrv”, “psof”, “papif”, “psif”, “tcpif”, “shmif”, “diskif”, “holdif”, “balanceif”, and “psresolve”. They are created in the “$ESDIR” directory during installation. In conjunction with the UNIX system programs “lpr”, “lpd” and “mail”, their purpose is to process and spool print jobs received via AppleTalk and pass them on to shared printers connected to the UNIX host either through Ethernet, TCP/IP, “Shared Memory” or via a serial interface. The host is normally configured to start “papsrv” automatically when UNIX is booted.

EtherShare’s Print Server is based on the BSD printing system. If your host uses the System V printing system (e.g. Sun Solaris 2.x), the Print Server automatically uses its own BSD-style “lpr” program, which is provided in the “$ESDIR” directory in such cases.

driver	description
papif	AppleTalk (Printer Access Protocol) printers interface program
psif	serially-connected printers interface program
tcpif	TCP/IP stream & Remote LPR printers interface program
shmif	Shared Memory interface program
diskif	Print To Disk interface program
holdif	hold queue interface program
balanceif	balance queue interface program
psresolve	pseudo-interface program for use without “lpd”

Table 3: Printer interface programs

papsrv "papsrv" is the program that implements Printer Access Protocol (PAP) functions for the Print Server. PAP is used in AppleTalk networks for communicating with most types of printers and print servers. Once started, "papsrv" continuously monitors the AppleTalk network for printing requests. When a print job is received, it is first stored in the UNIX file system before being passed to the UNIX system program "lpr", which transfers the job to "lpd". The latter calls the appropriate interface program ("papif", "psif", "tcpif", diskif", "holdif", "balanceif", or "shmif") and the optional output filter ("psof"). The interface program then passes the job to the printer (see "Table 3").

A separate "papsrv" process is started for each printer queue on your host.

psof "psof" is the so-called output filter program, which is responsible for generating the title page (or "banner") as a PostScript job (a banner is not generated for non-PostScript printers). The banner page contains information about the print job such as the user name, the time, and the document name. It is optionally output before the print job, and is useful when sorting out a pile of printed pages if a number of users have been printing at the same time. "psof" is automatically called by the UNIX program "lpd" at the start of each print job, and generates a banner if one was specified with the "banner" switch when configuring the printer (the "banner" switch sets the "sh" flag in "/etc/printcap"). The banner page is generated from a PostScript file which is compiled into the interface programs "*if" (e.g. "papif"), or from "BANNER" in the printer's spool directory. The latter takes precedence, if it exists. The following special sequences ("variables") in the banner file are replaced auto-

matically by information about the print job (see **User and document names in print jobs** in appendix "A 7.1 EtherShare log files" for related information):

^U The user who created the print job (set by "%%For")

^T The current time

^N The file name of the document

^C The number of pages in the print job

^P The logical ("printcap") name of the printer

^H Host name

^n UNIX job title

^u UNIX user ID (login name)

Please note that the code "^U" in the above list does not mean *Control+U*, it means *uparrow* ("^") followed by an uppercase "U". With the **Banner Page** switch in the EtherShare Admin (which sets the "sh" suppress headers flag in "/etc/printcap") you can determine whether the printer will print a title (banner) page before outputting the print job or not.

papif

"papif" is the interface program for printers that support Apple's Printer Access Protocol (PAP) and are connected to the print server through AppleTalk. "papif" is used for all PostScript PAP printers (including photo-typesetters), and the Apple ImageWriter II and ImageWriter LQ.

Print jobs received by the Print Server from a workstation on the network are processed and queued before being sent to the PAP printer through the network again.

Due to print job spooling, it is more efficient to drive AppleTalk printers through the Print Server, rather than accessing them directly from the workstations. Accordingly, users should select the printer queue in the **Chooser**, and not the printer it is connected to. We recommend that you select a **Chooser** name for the queue which shows which printer it drives and also indicates that it is a queue and not a printer. For example, add "spooler" to the printer's name.

"papif" forms the link between "lpr" and PAP printers.

psif

"psif" is the interface program for PostScript printers which are connected directly to the UNIX host via a serial (RS232C) interface. Due to slow data transfer rates we normally do not recommend serially-connected printers for use with Desktop Publishing applications.

"psif" forms the link between "lpr" and serially-connected printers.

tcpif

"tcpif" is the interface program for PostScript printers that support the TCP/IP stream protocol. It is also used for printers which are connected with the Remote LPR protocol. TCP/IP stream printers must be compatible with the EtherShare TCP/IP stream implementation – contact your printer manufacturer or HELIOS supplier if you are not sure about this. TCP/IP stream has significant advantages over "Remote LPR" – see later.

Print jobs received by the Print Server from a workstation on the network are processed and queued before being sent to the printer through TCP/IP.

"tcpif" forms the link between "lpr" and TCP/IP printers.

diskif

"diskif" is the interface program for printing files to disk. This can be useful e.g. if you want to automatically generate PDF files. In this case you can print to files in a specific UNIX directory and induce the Acrobat Distiller software to scan this directory regularly and convert incoming files to PDF.

"diskif" forms the link between "lpr" and the disk where print jobs are directed to.

holdif

"holdif" is the interface program if you want to "store" print jobs which have been processed on a hold queue. "holdif" can be configured e.g. to forward faulty print jobs to a specific hold queue ("error" queue), and resolved print jobs to another ("hold" queue). In the **Settings** window of the EtherShare Admin (see **Hold Queue connection** in "5.10 Printers list"), **Hold Time**, i.e. the time a print job is stored on the "hold" queue or "error" queue respectively, can be specified.

"holdif" forms the link between "lpr" and hold/error queues.

balanceif

"balanceif" is the interface program for printer queues which are mutually connected in order to balance print job loads. For more information about "balanceif" settings refer to " Balance Group connection" in "5.10 Printers list".

"balanceif" forms the link between "lpr" and the balanced printer queues.

shmif

"shmif" is the interface program for PostScript interpreters (software RIPs) running on the same host which are able to communicate through a "Shared Memory" interface. The RIP must be compatible with the EtherShare "Shared Memory" interface specification – contact your RIP manufacturer or HELIOS supplier if you are not sure about this.

Print jobs received by the Print Server from a workstation on the network are processed and queued before being sent to the RIP through a common "Shared Memory" segment.

"shmif" forms the link between "lpr" and software RIPs.

Configuration

If more than one printer is to receive print jobs from the Print Server, each of them requires a new interface program task to be started. Each task requires a separate entry line in the main configuration file "atalk.conf" to specify, among other things, the printer queue's unique AppleTalk (NVE) name, type and zone.

"atalk.conf" is not allowed to have more than one entry with the same name (i.e. the printer queue name must be different from printer name) – the Print Server, otherwise, could not access a unique configuration for a particular physical printer. Accordingly, it is necessary to start the interface program with a new name for each additional printer.

By convention, a copy of the appropriate interface program ("papif", "tcpif" or "shmif") is renamed to the name of the logical (UNIX) printer, even if only one printer is being

driven by the interface. “atalk.conf” then contains a separate entry for each printer (e.g. “Laser1 ” and “Laser2”), but no longer contains an entry for the interface program itself.

The new names for the interface programs are assigned with the UNIX “ln” program during printer configuration, in order to avoid having to make several physical copies of the program on the hard disk.

11.4 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 send 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 via the PAP protocol 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” (“$ESDIR/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 chapter “11.7 Adobe Document Structuring Conventions” for related information.

Font including

Fonts required by a particular print job which are not normally supported by the printer (download 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 which are permanently available in each printer (resident fonts) are specified in the “FONTS” file in the printer’s spool directory (usually “/usr/spool/<printername>/FONTS”).

Furthermore, the EtherShare Admin can install Adobe “Type 1” and “Type 3” printer fonts (not screen fonts or TrueType fonts) into a central font directory on the host

("$ESDIR/psfonts"), directly from the font manufacturer's original font disk. The Print Server only sends those fonts to the printer which 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 loading, increases throughput and allows central administration of printer fonts.

The printer's resident font list is created automatically when you install a new printer with the EtherShare Admin program by interrogating the printer. The list must be updated (with **Update Fonts** in EtherShare Admin) if new fonts have been installed on the printer, through font cartridges, printer cache disks, etc.

If your printer is not fully LaserWriter compatible, and font interrogation does not work, standard font lists for the Apple LaserWriter and the Apple LaserWriter Plus are supplied automatically. For "Remote LPR" printers, the copying is done automatically if you set them up with the EtherShare 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 UNIX 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 "papif", 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 "/etc/printcap". "/etc/printcap" also specifies (with the "sh"

suppress headers flag) whether a title page (“banner”) is required. If necessary, the banner is generated in PostScript by “psof”, and printed before the print job.

The specified interface program includes the needed fonts, resolves any references to external images if you have the “OPI” option installed, resolves “%%Include...” references (see “11.7 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”. Users who have Helios Mail installed on their Macintosh will receive the message directly on their workstation. The user will also be notified by the “afpmsg” program, which displays an error message on the Macintosh. See **mail** and **clientmessages** in chapter “11.6 Configuring printers manually” and **User and document names in print jobs** in appendix “A 7.1 EtherShare log files” for related information.

Several types of error message, 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 determines 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 settings in the EtherShare Admin, e.g. forwarded to an error queue.

Since the print job is temporarily stored in the UNIX file system, it can be rapidly transmitted from the workstation to the host without the workstation having to wait for the printer (spooling function). Further processing of the 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 in the printer. This allows switching between different “prep” files which are incompatible with each other, 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.

However, the standard “prep” files provided for the Apple LaserWriter 6.0 printer drivers are designed to be transferred to the printer as resident “preps” in advance of the print job itself. Due to problems in the standard Apple “prep” files, errors may occur when the Print Server appends them to the job, and the job may not print properly.

For this reason, modified versions of the standard “prep” files for the drivers “LaserWriter Version 5.2” and “LaserWriter Version 6.0” are included in EtherShare in “$ESDIR/dicts”. Their names are “_AppleDict_md_68_0” and “_AppleDict_md_70_0”, respectively. The Print Server uses these modified files automatically, instead of the versions provided by Apple. This problem is no longer present with Mac OS Version 7.0 and above, since Apple no longer make their “prep” files resident. “$ESDIR/dicts” also contains a Linotype dictionary and a HELIOS dictionary.

Restarting the Print Server

If the server shuts down while there are print jobs running, you will need to restart the affected printers using the UNIX command “lpc restart all”. This can also be done with the **Restart Printer** option of the EtherShare Admin application.

restart-pap

The shell script “$ESDIR/restart-pap” is used internally by EtherShare to restart all printer queues. This is necessary to enable printer configuration changes in the “atalk.conf” file to come into effect immediately, without restarting the entire EtherShare system.

11.5 Parameters of the “papsrv” program

When it starts, the Print Server “papsrv” first accesses the main configuration file “atalk.conf” to determine its configuration and the number of printers that are available. Printers can be set up if necessary by using an editor such as vi, but we strongly recommend that you do this with the EtherShare Admin instead. See also chapter “5.14 Editing “atalk.conf” (and other configuration files) manually”.

The parameters described below can be defined for each “papsrv” process in “atalk.conf” (note that the parameter list is preceded by the program name “papsrv:”):

name `name=netname`
`netname` is the AppleTalk (NVE) name of the Print Server. This is the name with which it is known to the network. It is the name you see in the workstation’s **Chooser** under “LaserWriter”.

type `type=nettype`
`nettype` is the AppleTalk type of the Print Server with which it is known to the network. `nettype` should normally be set to “LaserWriter”, “ImageWriter” etc., since only then it will be recognized by the standard Macintosh **Chooser** extensions on the workstations. If the workstations are provided with a later version of the LaserWriter program, which also allows other printer types, a different type can be specified here if necessary.

The default for `nettype` is “LaserWriter”.

zone

`zone=zonename`

`zonename` is the name of the AppleTalk zone to which the Print Server should be allocated. Thus it determines the zone in which the Print Server can be seen in the **`Chooser`**. The chosen zone must be one of the local zones that the server is connected to. We strongly recommend to test this using the UNIX program “zones -l” (“$ESDIR/zones”)

By default “papsrv” registers itself in the first zone of the first interface entry in “atalk.conf”.

printer

`printer=printername`

`printername` is the logical (UNIX) name of the printer to which the Print Server should send the print jobs. By convention, this is also the name to which a copy of “papif” or “tcpif” has been renamed if the printer is connected via AppleTalk or TCP/IP. The same printer name must also be specified in the UNIX file “/etc/printcap”, which is accessed by the “lpr” program. The printer name is passed from the “papsrv” program to “lpr” without checking. Accordingly, it is up to the administrator to make sure that a correct entry is also included in “/etc/printcap”. This is done automatically when you set up a new printer with the EtherShare Admin.

dictdir

`dictdir=path`

`path` is the path containing PostScript dictionaries and printer “prep” files, such as “AppleDict...”, “HeliosDict...” and “LinoDict...”. You can specify an alternative path here if one of your printers is not fully compatible to the Apple LaserWriter and needs other dictionaries and/or “prep” files. Normally, all PostScript printers share the same files.

The default for `dictdir` is “$ESDIR/dicts”. If you change the default, you must copy “HeliosDict...” (and optionally the other dictionaries, too) to the new directory.

lpr

`lpr=path`

`path` specifies the path (including the file name) of an alternative “lpr” program to the one normally used by “papsrv”. If your server uses the BSD printing system, “papsrv” uses the standard “lpr” program provided by the server (e.g. “/bin/lpr”). If your host uses the System V printing system (e.g. Sun Solaris 2.x), “papsrv” automatically uses its own BSD-style “lpr” program, which is provided in the “$ESDIR” directory in such cases.

The `lpr` parameter can be used to specify another “lpr” program which is different from the one normally selected by “papsrv”. You should use this parameter if you have developed your own custom “lpr” program. You can also use this option to specify a shell script.

The default for `path` depends on the server type, and is usually “/bin/lpr” or “/usr/local/es/lpr”.

This parameter cannot be specified with the EtherShare Admin – you need to edit “atalk.conf” manually.

noresolve

`[no]resolve`

This following paragraph (`resolve` parameter) is maintained for historic reasons since with EtherShare 2.6, the printer interface program “diskif” is the easier way to handle “Print To Disk” files.

The `resolve` switch causes “papsrv” to “resolve” all print jobs for the specified printer queue before they are sent to “lpr”, i.e. “papsrv” incorporates all required font, dictionary

and OPI image information into the jobs in advance, and resolves “%%Include...” references. This is needed whenever you want to use printers that cannot be driven directly by the printer interface programs supplied with EtherShare. This includes the printer interface program “diskif” and proprietary printer connections. But be aware that if you use the resolve switch you will need substantially more spooling space on the local server.

Normally, print job resolving is done on-the-fly, by the specified interface program, such as “papif”, and jobs queued in the printer’s spool directory are not yet resolved. This design approach saves spooling storage, particularly if you are using EtherShare OPI.

The `resolve` switch causes the “papsrv” to call the pseudo-interface program “$ESDIR/psresolve”, which compares the fonts needed by the document with the printer’s resident font list which resides in the “FONTS” file in the printer’s spool directory, and with the list of available server fonts in “$ESDIR/psfonts/FontDirectory”. Thus, it is more intelligent than choosing **Postscript Job** from the application’s Print dialog – the latter always includes all document fonts, regardless of whether you need them or not. See **Font including** in chapter “11.4 The Print Server in operation” for related information.

You should use the `resolve` switch to prepare print job files for printing offline or with a printer or typesetter whose hardware interface is not supported by EtherShare, but you must not use `resolve` in conjunction with the standard EtherShare interface programs, because all references will be included twice and the job will fail.

The `resolve` switch must be specified in each “papsrv” entry for which job resolving is desired.

Be aware that if the job then gets printed on a different host and/or printer, it will not contain all required fonts if it has been resolved with an inappropriate “FONTS” file.

The default for this switch is `noresolve`, i.e. interrogate the printer for required fonts and dictionaries on a job-by-job basis, and include OPI images on-the-fly.

This parameter cannot be specified with the EtherShare Admin – you need to edit “atalk.conf” manually.

filter

`filter=path`
`path` specifies the path (including file name) of a custom filter program which is called in a pipe with the “standard input” connected to the print job and the “standard output” connected to “lpr”. The job will already be resolved if the `resolve` switch is specified.

Argv[0] is the printer name in this case. There is no default for `path`.

`filter` may be used in conjunction with the standard EtherShare interface programs.

This parameter cannot be specified with the EtherShare Admin – you need to manually edit the “atalk.conf” file.

filtercmd

`filtercmd=path`
`path` specifies the path (including file name) of a custom filter program which is called as follows:

```
path -Pprintername spoolfile
```

The “filtercmd” program can then process the file (which is not resolved) as required. The output file should appear under the same name (“spoolfile”) given in the argument – “papsrv” will wait until the custom filter program has finished before processing the job further. Compared to the `filter` parameter, `filtercmd` can be used for example to add a header (e.g. a PostScript init) or a trailer to the file without having to process the whole file. Use `filter` instead if you need to parse the entire file, e.g. for font names or job information.

There is no default for `path`.

`filtercmd` may be used in conjunction with the standard EtherShare interface programs.

This parameter cannot be specified with the EtherShare Admin – you need to manually edit the “atalk.conf” file.

publish

The `[no]publish` switch can be used to have a queue appear or not in the chooser. If the switch is set to `nopublish` the respective printer queue will not be appearing in the chooser. However, it can still be seen and configured in the EtherShare Admin. To set this flag to `nopublish`, tick the checkbox **Hide Queue** in the **Printers** list of the EtherShare Admin.

The default for this flag, i.e. the checkbox in the EtherShare Admin remains unticked, is `publish`.

groups

`groups=name`
`name` specifies, separated by commas, the names of the groups which are allowed to access the “papsrv”.

noauthenticate

The `[no]authenticate` switch determines whether printing to a LaserWriter queue is password-protected or not. In case the parameter is set to `authenticate`, user name and password have to be entered before printing. This setting affects all LaserWriter printer queues on the same server.

The default for this switch is `noauthenticate`.

foreground/ background

The Mac OS 9 LaserWriter (version 8.7) printer driver’s behavior is background printing by default. This means that spooling of print jobs is performed two times, locally on the Macintosh and on the selected printer queue.

The “papsrv” however induces Apple’s LaserWriter printer driver to spool the jobs directly on the selected queue by default, unless the `background` option is specified in the configuration file “atalk.conf”.

The default setting for this option (i.e. no flag is set) is `foreground`.

11.6 Configuring printers manually

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

If more than one printer queue is being serviced by the Print Server, a separate “papsrv” process must be configured for each of them. When first started, “papsrv” automatically determines the number of printer queues from the number of entries in “atalk.conf”, and starts a separate child task for each one by forking.

The program “papsrv”, which implements AppleTalk printing functions for the network, has no way of knowing how each printer is physically connected. All communication with the printer is done through the UNIX system program “lpd”, which extracts information about the printer from the UNIX system file “/etc/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 the optional banner page) and sends it to the appropriate interface program (“papif”, “psif”, “tcpif”, “balanceif”, “diskif”, “holdif”, or “shmif”).

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

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

11.6.1 Global parameters

When it starts, each printer interface program first accesses the main configuration file “atalk.conf” to determine its configuration.

The parameters described below can be defined in “atalk.conf” for any of the interface programs. They can be specified individually for each printer, together with the other parameters described later, in an “atalk.conf” section which is preceded by the logical printer name such as “Laser1:”. Alternatively, they can be specified in a special global “atalk.conf” section “if:”, in which case they apply to all interface programs (but the former method has precedence if they are specified in both locations). Currently, none of the parameters below can be specified with the EtherShare Admin – you need to do this manually using an editor such as vi. See also chapter “5.14 Editing “atalk.conf” (and other configuration files) manually”.

watchtime

`watchtime=time`

`time` specifies the time interval in seconds with which the printer interface program interrogates the printer’s status channel. As a diagnostic aid, you can use the UNIX “lpq” program to check the status of each spooled printer. “lpq” returns the status messages that you normally see in the dialog box of the LaserWriter driver for locally connected AppleTalk printers.

The Print Server does not return such status messages to the workstations – it only returns them to the “Print jobs” window in the EtherShare Admin. The `watchtime` parameter has been provided because the PostScript processors of some printers time out in certain unusual situations if you check the printer’s status channel for extended periods of time.

The default for `time` is 10 seconds.

Specify 0 (zero) if you do not want the printer interface program to check the printer's status channel. This does not affect the processing of printer error messages. However, in this case, "lpq" only returns "Printing job" or "No entries", depending on whether there are any jobs in the printer's queue.

If you need to be able to check the printer status with "lpq", a meaningful value of time is about 10 - 60 seconds.

mail

`[no]mail`
The `mail` switch determines whether printer errors are reported back to the originator of the print job through Helios Mail. Even if you specify `nomail`, printer errors are still recorded in the printer log file, and many types of errors are also written to the system messages file, allowing you to view them later with the EtherShare Admin or an editor program such as vi. See **User and document names in print jobs** in appendix "A 7.1 EtherShare log files" for related information.

The default for this switch is `mail`.

chargebanner

`[no]chargebanner`
This switch causes the printer's page count to include the number of banner pages – if, in the EtherShare Admin's **Settings** menu, **Banner Page** is ticked – to the total amount of pages.

The default for this switch is `chargebanner`.

bannerfirst

The `bannerfirst` parameter causes the printer to output a banner page *before* the print job.

bannerlast

`bannerlast` determines that the banner page is ouput *after* the print job has been terminated on the printer.

The default setting is `bannerfirst`.

clientmessages

`[no]clientmessages`
The `clientmessages` switch determines whether printer status messages are reported to the AFP-client (or PCShare client, respectively). These messages pop up as display messages and report e.g. paper jams, misfed paper, and other printer-related errors.

The default for this switch is `clientmessages`.

nospoolspool

`[no]spoolspool`
This switch determines whether a spooled print job is "marked" with the information that it has already been spooled. If it is set to `spoolspool`, a spooled print job is not recognized as already spooled, thus setting this switch to `spoolspool` is only sensible at the first spooler in line of a chained EtherShare queue.

The default for this switch is `nospoolspool`.

ignoreresolveopts

The parameter `ignoreresolveopts`, when set, makes a second EtherShare spooler ignore *all* remarks on resolved references from a prior spooling process. If you merely want a spooler to ignore single references, e.g. references regarding included fonts etc., you may set one or more of the following flags:

ignoreprocset-resolveopt With the `ignoreprocsetresolveopt` flag set, the next (second) EtherShare spooler ignores information about included *procsets* only.

ignorefontre-solveopt With the `ignorefontresolveopt` flag set, the next (second) EtherShare spooler ignores information about included *fonts* only.

ignoreinclude-resolveopt With the `ignoreincluderesolveopt` flag set, the next (second) EtherShare spooler ignores information about included *EPSF files* only.

ignoreopire-solveopt With the `ignoreopiresolveopt` flag set, the next (second) EtherShare spooler ignores information about resolved *OPI-references* only.

nice `nice=niceincrement`
The priority of a printer interface program – compared to other executable programs on the Print Server – can be altered. The UNIX parameter `nice` lets you increase/reduce the priority, and therefore the speed of a program. The higher the priority of a program, the less “nice” its behavior towards other applications. The values for `niceincrement` are as follows:

`niceincrement` > 0slower / “nice” towards other applications

`niceincrement` < 0faster / less “nice” towards other applications

The default value for `niceincrement` is 0.

About the current range of `nice` see the respective pages of your UNIX manual.

extendedinfo `[no]extendedinfo`
The Printer Log file ("$ESDIR/printer.acct.x") contains information about printing time/date, document name, user, fonts, and more. With `extendedinfo` set, the range of information for each print job is increased by e.g. an OPI image replacement list and the total number of bytes printed.

The default for this switch is `extendedinfo`.

facility `facility=logfacilityname`
`facility` is a string that ought to be set by the system administrator only since its use requires advanced knowledge on UNIX programming. For further reference see the UNIX manual pages "syslogd(1)".

rsslimit `rsslimit=maxbytes`
`rsslimit` (resident set size limit) is determined by `maxbytes` which is the maximum number of kB a printer interface program can utilize as memory. If this parameter is not set, the memory administration is up to your system settings.

nomagic `[no]magic`
PostScript printers normally cannot accept print jobs consisting of "flat" ASCII data. They require the print job to be in PostScript format. ASCII print data can be manually converted to PostScript with the "pstext" utility. In addition to this, the interface programs of the Print Server are also able to automatically detect whether a particular job is in PostScript or ASCII format, by scanning the start of the job for the "signature" string "%!PS-Adobe". If this string is missing, the job is assumed to be non-PostScript, and is converted to PostScript automatically before printing.

Some application programs, particularly those running under MS-Windows, do not generate the PostScript signature string reliably, causing job type auto-detection to fail, whereupon a PostScript program is printed rather than your document. In such cases, you can specify the `nomagic` switch to disable job type auto-detection.

The default for this switch is `nomagic`. The `magic` switch should only be used for PostScript printers – do not specify it in the global section "if:" if the Print Server is serving non-PostScript printers too – instead, specify it for each interface separately.

fontdir

`fontdir=string`
`string` is the path of the host directory which contains the server font list "FontDirectory". The fonts themselves are contained in subdirectories of `fontdir`, arranged alphabetically.

The default for `string` is "$ESDIR/psfonts".

volumes

`volumes=string`
`string` is the path (including name) of the file containing the EtherShare volume list.

The default for `string` is "$ESDIR/conf/afpvolumes".

dictdir

`dictdir=path`
`path` is the path containing PostScript dictionaries and printer "prep" files, such as "AppleDict...", "Helios-Dict..." and "LinoDict...". You can specify an alternative path here if one of your printers is not fully compatible to the Apple LaserWriter and needs other dictionaries and/or "prep" files. Normally, all PostScript printers share the same files.

The default for `path` is “$ESDIR/dicts”. If you change the default, you must copy “HeliosDict...” (and optionally the other dictionaries, too) to the new directory.

11.6.2 AppleTalk (PAP) connections

PAP-compatible printers which are connected via AppleTalk are identified on the network by their so-called Network Visible Entity (NVE), consisting of the NVE name, type and AppleTalk zone. These parameters must be known to the interface program in order to be able to uniquely identify a physical printer.

Printers that support PAP include Apple’s LaserWriter, LaserWriter Plus, ImageWriter II, and ImageWriter LQ.

The interface program for AppleTalk PostScript printers is the “papif” program (see “11.3 The Print Server Programs”). “papif” is called by the UNIX system program “lpd”, and extracts additional configuration information from the “/etc/printcap” file by using the logical (UNIX) printer name received from “lpr” as the key.

When it is started, each “papif” process first accesses the main configuration file “atalk.conf” to determine its configuration. Printers can be set up, if necessary, by using an editor such as vi, but we strongly recommend that you do this with the EtherShare Admin instead. See also chapter “5.14 Editing “atalk.conf” (and other configuration files) manually”.

The parameters described below can be defined for “papif” in “atalk.conf”. The parameter list is preceded by the logical printer name such as “Laser1:”, which is assigned to “papif” by linking.

entity `entity=nvename`
`nvename` is the NVE name/type/zone of the printer with which it is known to the AppleTalk network (NVE = Network Visible Entity). This name is not the same as the AppleTalk name of the printer queue. Note that if print jobs are sent from workstations directly to the printer, they bypass the printer queue, and thus do not gain the advantages of spooling, "prep" file management, etc.

The NVE address has the following structure:

```
entity="name:type@zone"
```

`name` is the NVE name of the printer and `type` is the NVE type. `zone` is the AppleTalk zone in which the printer resides. If both the UNIX host and the AppleTalk printer are in the same zone, the zone field can be specified as "*".

localwinsize `localwinsize=maxlpackets`
`maxlpackets` specifies the maximum number of data packets that are passed from "papif" to the printer through the network during a transaction. The number of packets may need to be limited if the buffer size in the printer is too small. `maxlpackets` can be varied to optimize the data transfer rate.

The default (and maximum) for `maxlpackets` is 8.

remotewinsize `remotewinsize=maxrpackets`
`maxrpackets` specifies the maximum number of data packets that are passed from the printer to "papif" through the network during a transaction. The number of packets may need to be limited if the buffer size in the UNIX host is too small. `maxrpackets` can be varied to optimize the data transfer rate.

The default (and maximum) for `maxrpackets` is 8.

As described above, a fully configured PAP printer requires an entry in both “atalk.conf” and “/etc/printcap”.

The following is a typical “atalk.conf” entry for a PAP printer:

```
papsrv: name=“SilentSpooler”, print-
er=“Laser1”
Laser1:entity=“Silentwriter:Laser-
Writer@LocalTalk”
```

The following is a typical “/etc/printcap” entry for a PAP printer:

```
Laser1:\
     :lp=/usr/local/es/lprdevdir/Laser1:\
     :if=/usr/local/es/if/Laser1:\
     :of=/usr/local/es/psof:\
     :sh:mx#0:du#0:sf:\
     :sd=/usr/spool/Laser1:\
     :af=/usr/local/es/printer.acct:\
     :lf=/usr/spool/Laser1/Laser1-log:
```

This entry contains a few special features which are not normally found in UNIX “printcap” entries. For example, a network printer does not need a device file in the “/dev” directory, although the “lpr” spool system still tries to obtain exclusive rights to such a file. Accordingly, it is necessary to create an empty, dummy file for each printer. The necessary file can be created for each printer with a command similar to the following:

```
touch /usr/local/es/lprdevdir/Laser1
```

where `Laser1` is the logical printer name.

This command is issued automatically if you set up printers with the EtherShare Admin. The use of a separate file for each printer allows multiple printers to work in parallel. Otherwise, it is only possible for “lpr” to service one printer at a time.

The other feature is the interface program (“if=”), which specifies the logical printer name “Laser1” instead of “papif”. “Laser1” is a “link” to “papif” through a subdirectory of the “$ESDIR” directory.

The necessary symbolic link for each printer can be created with commands similar to the following :

```
cd /usr/local/es
ln -s if_name /usr/local/es/if/xPrinter
```

where `if_name` is the interface program, and `xPrinter` is the logical (UNIX) printer name,

for example:

```
ln -s /usr/local/es/papif /usr/local/es/if/Laser1
```

or

```
ln -s /usr/custom/if_name /usr/local/es/if/Laser1
```

The “if=” line in “/etc/printcap” entry then specifies the symbolic interface “/usr/local/es/if/Laser1” rather than the real interface.

In this way, the “/etc/printcap” entry points to the printer’s interface program, but also allows the interface program to find the path to the EtherShare directory at the same time, to obtain auxiliary programs it needs while printing. Furthermore, in a situation with multiple printer queues, this allows each interface program to uniquely access its own configuration entry in “atalk.conf”.

The following shows an example of the symbolic links used by three printers, two connected via the EtherShare “papif” (AppleTalk) interface program and one through TCP/IP:

```
ibm$ ls -l *if
-rwxr-xr-x       1 root staff Jun 17 1991   20:01  papif
-rwxr-xr-x       1 root staff Jul 03 1991   20:01   psif
-rwxr-xr-x       1 root staff Nov 13 1991   20:01  tcpif


if:
total 0
lrwxrwxrwx 1 root system 8 Jun 17 1991 xw3 ->../tcpif
lrwxrwxrwx 1 root system 8 Jul 03 1991 lw ->../papif
lrwxrwxrwx 1 root system 8 Nov 13 1991 lwform ->../papif
ibm$
```

The necessary links are made automatically if you set up printers with the EtherShare Admin.

Lastly, when creating printers with the EtherShare Admin, the user of the printer dameon is set in “/etc/printcap” by default to ID 0 (“root”) with the flag “du#0”. This avoids errors relating to permissions when printing, especially if the print job contains external references to OPI images or “%%Include....” comments. This feature is associated with a slight security risk. See the **daemonuid** parameter in chapter “13.3 Parameters of the “admsrv” program” for related information.

If the printer needs several alternative logical names, they can be specified manually on the first line of the "/etc/printcap" entry separated by the "|" character, for example:

```
Laser1|lw|ps|PostScript:\
```

Note that all logical (UNIX) printer names must be unique on each host; the names must not include spaces.

11.6.3 Serial PostScript connections

Serially connected PostScript printers do not have a network identification. They are uniquely addressed by the host's physical "RS232" (serial or V24) port specified in the "/etc/printcap" file.

The interface program for serially connected PostScript printers is the "psif" program (see "11.3 The Print Server Programs"). "psif" is called by the UNIX system program "lpd", and extracts additional configuration information from the "/etc/printcap" file by using the logical (UNIX) printer name received from "lpr" as the key. "psif" then initializes the hardware parameters for the serial interface accordingly. The Print Server requires 8-bit, no parity and hardware handshake – please see **8-bit transparency** below for more details.

8-bit transparency

Many Macintosh applications need an 8-bit transparent communications channel to the printer, particularly if you print PostScript files which include binary bitmap data. If you connect a printer via "RS-232", as well as making sure that "/etc/printcap" specifies 8-bit communication and hardware handshake (this is taken care of by the EtherShare Admin automatically), you must also set up the printer ac-

cordingly, and use a printer cable which is suitable for hardware handshake. Even with the correct setup and cabling please note the possible problems described under nobinmode below.

Some printers have front panel or DIP switches for adjusting communications parameters, and with others you can do this with Apple's "LaserWriter Utilities" program (often supplied with LaserWriter printers). Please select the printer directly when you use this program, not a printer queue.

Since serially connected PostScript printers are uniquely addressed by the host's physical RS232 port (e.g. "/dev/ttyb"), which is specified in the "/etc/printcap" file, the printer's address does not need specifying in "atalk.conf", and thus "psif" does not always need an entry in this file.

The single parameter described below can be defined manually for "psif" in "atalk.conf". The parameter list is preceded by the logical printer name such as "Laser2", which is assigned to "psif" by linking.

nobinmode `[no]binmode`

Even if your communications channel is set to 8-bit, no parity and hardware handshake, bitmap images may still contain binary information which inadvertently correspond to special control codes for the serial port of the printer's PostScript interpreter. In particular, Ctrl-C is reserved for "abort current job", Ctrl-D is reserved for "end of file", and Ctrl-T is reserved for "return status". This problem only affects serial printer connections – AppleTalk, "TCP/IP stream" and "Shared Memory" connections are always binary transparent, and have a separate communications channel for status messages.

PostScript interpreters of printers manufactured from about 1992 on – especially those that support Level 2 PostScript – often support a special 8-bit binary transparent mode called “binmode”, which avoids conflicts with control codes by “quoting” them instead with two 7-bit characters.

The `binmode` parameter causes “psif” to query the specified printer at the start of each job for binary mode capability, and to automatically set binary mode if possible. Binary mode queries cause a small amount of processing overhead, so you should only specify this parameter if your printer supports this option.

The default for this switch is `nobinmode`.

The following is a typical “/etc/printcap” entry for a serially connected PostScript printer:

```
Laser2:\
     :lp=/dev/ttyb:\
     :br#9600:rw:fc#0000374:\
     :fs#0000003:xc#0:xs#0040040
     :of=/usr/local/es/psof:\
     :if=/usr/local/es/psif:\
     :sh:mx#0:du#0:sf:\
     :sd=/usr/spool/Laser2:\
     :af=/usr/adm/printer.acct:\
     :lf=/usr/spool/Laser2/Laser2-log:
```

This example configures a PostScript printer for direct connection to the serial interface of a Sun workstation.

The first line in the above example specifies the printer's logical name "Laser2". This is the name that must be included in the parameter list for "papsrv" ("printer=Laser2") in order to be able to assign the physical printer to the appropriate printer queue.

The two-character flags in subsequent entries of the example characterize specific features of the printer. The following list summarizes the parameters used. Please refer to your UNIX system documentation for full details or read, on the HELIOS CD-ROM, the online documentation (`manuals/lprman.pdf`).

```
lp   printer device
br   baud rate
rw   read/write
fc   flag clear
fs   flag set
xc   local mode clear
xs   local mode set
if   interface program
of   output filter
sh   suppress headers
du   daemon user
mx   maximum file size
sf   suppress form feeds
sd   spool directory
af   accounting file name
lf   log file name
```

If the printer needs several alternative logical names, they can be specified manually on the first line of the "/etc/printcap" entry separated by the "|" character, for example:

```
Laser2|lw|ps|PostScript:\
```

Note: All logical (UNIX) printer names must be unique on each host; the names must not include spaces.

11.6.4 TCP/IP PostScript connections

PostScript printers which are connected via TCP/IP are identified in the TCP/IP network by their Internet number and service port. These parameters must be known to the interface program in order to be able to uniquely identify a particular printer.

The interface program for TCP/IP PostScript printers is the "tcpif" program (see "11.3 The Print Server Programs"). "tcpif" is called by the UNIX system program "lpd", and extracts additional configuration information from the "/etc/printcap" file by using the logical (UNIX) printer name received from "lpr" as the key.

"tcpif" supports both the "TCP/IP stream" protocol and the "Remote LPR" protocol. "TCP/IP stream" is the default; "Remote LPR" is configured if the "service" parameter in "atalk.conf" is set to "printer" or "515". You must specify the parameter `rprinter="printer_queue_name"`, too.

Note: Keep in mind that if you edit "rm/rp" configurations in `printcap` manually, EtherShare will not recognize them anymore.

"TCP/IP stream" printers must be compatible with the EtherShare TCP/IP stream implementation – contact your printer manufacturer or HELIOS supplier (see the HELIOS Web site: **www.helios.de**) if you are not sure about this.

“TCP/IP stream” allows bidirectional communication with the printer, whereas “Remote LPR” only allows unidirectional communication. Furthermore, the HELIOS implementation provides a separate but optional communications channel for status messages with the address <port+1> (see below). This address cannot be configured.

You can test for bidirectionality by making a “telnet” connection to your TCP/IP printer from the UNIX command line as follows:

```
telnet <host> <port>
e.g.
“telnet 192.9.200.1 4000” or “telnet osiris bspp”
```

`host` is the Internet number (or host name) of the printer; host names are usually listed in the “/etc/hosts” file. `port` is the service port number (or service name) which specifies the process within `host`. If your printer has a network interface which supports TCP/IP, these parameters should be specified in your printer documentation.

You should be able to communicate with the printer’s PostScript interpreter and get PostScript responses (bidirectional communication), although this test alone is no proof that the connection is fully compliant with the EtherShare TCP/IP stream implementation.

Contacting the print server with “telnet” checks that at least basic communication is running properly. It does not verify that the communications channel is binary transparent and thus suitable for printing bitmap (graphics) data.

If the “telnet” session is able to communicate in a bidirectional way with the printer, try to set up the printer using the EtherShare Admin with the same host and port parameters you specified in the “telnet” test.

If it is not able to do this, then the TCP/IP connection is unsuitable for the “tcpif” filter in EtherShare. In this case you need to configure “Remote LPR”, or use a third-party TCP/IP driver and specify the EtherShare “resolve” option, as described elsewhere.

EtherShare uses a second service port with the address <port+1> to receive status information from the printer. You are still able to print if this address is not implemented on your printer, but you will not be able to receive status information on your print jobs, such as the “busy” message, or to cancel and flush jobs which are already being processed by the printer.

“Remote LPR” printers require substantially more spooling space on the local host than “TCP/IP stream” printers since they demand the total size of a print job first before they start transferring it. So the complete print job has to be spooled to a local disk first. Furthermore, they do not return status messages or answer font queries. Accordingly, a “TCP/IP stream” or AppleTalk connection is preferable. Furthermore, the local host must be defined on the remote host, in the remote “/etc/hosts” and “hosts.equiv” (or “hosts.lpd”) files. Otherwise, the print job will be rejected.

For “Remote LPR” printers, the EtherShare Admin copies the font information from the chosen PPD file into the “FONTS” file in the printer’s spool directory when the printer is created.

When it starts, each “tcpif” process first accesses the main configuration file “atalk.conf” to determine its configuration. Printers can be set up if necessary by using an editor such as vi, but we strongly recommend that you do this with the EtherShare Admin instead. See also chapter “5.14 Editing “atalk.conf” (and other configuration files) manually”.

The following parameters can be defined for “tcpif” in “atalk.conf”. The parameter list is preceded by the logical printer name such as “Laser3:”, which is assigned to “tcpif” by linking.

host

`host=inetno`
`inetno` is the Internet number of the printer in the TCP/IP network (or of the printer’s terminal server, if any). `inetno` can be specified in the conventional way (dotted decimal notation) by using the “.” character as a separator. Alternatively, a host name from the “/etc/hosts” file can be specified here instead. Examples:

```
host=192.9.200.1 or host=osiris
```

In the case of “Remote LPR” connections, `inetno` is the Internet number or name of the host which the remote printer is connected to.

statusport

`[no]statusport`
This switch determines whether a separate communications channel for status messages with the address <port+1> is provided.

The default is `statusport`.

service `service=port`
`port` is the service port number (also called the service code), which specifies the process within `host` which is responsible for the printer. The port number lies between 1 and 65535. Alternatively, a service name from the "/etc/services" file can be specified here instead.

Examples:

```
service=4000 or service=bspp
```

"tcpif" normally uses the "TCP/IP stream" protocol; the "Remote LPR" protocol is configured instead if you specify `service=printer` or `service=515`. You must specify the "rprinter" parameter, too.

noctrld `[no]ctrld`
`ctrld` determines whether the Ctrl-D character should be used to indicate "end-of-print-job". This is necessary if the printer is connected to TCP/IP through a terminal server and a serial interface. See **8-bit transparency** above for related information.

The default for this switch is `noctrld`.

tcpresolve `[no]tcpresolve`
When a print job is processed, and the switch is set to `notcpresolve`, the print job remains "untouched" and passes without any changes.

The default is `tcpresolve`.

writesize `writesize=block`
`block` is the number of bytes that are send through the network in a single write. The minimum value for `block` is `4096`.

The default value for `block` is `8192`.

rprinter

`rprinter=name`
`name` is the name of the remote printer on the remote host, as specified in the remote “/etc/printcap” file.

Example:

```
rprinter=rlw
```

The following is a typical “atalk.conf” entry for a “TCP/IP stream” printer:

```
papsrv: name=“TCPSpooler”, printer=“Laser3”
Laser3: host=192.9.200.1, service=4000
```

The following is a typical “atalk.conf” entry for a “Remote LPR” printer:

```
papsrv: name=“osiris-remote-spooler”,print-
er=“rm1”
rm1: host=“ibm”, service=printer, rprinter=“lw”
```

The entry required by the “lpr” program in “/etc/printcap” for a “TCP/IP” or “Remote LPR” printer is very similar to that required by a PAP PostScript printer.

The following is a typical example:

```
Laser3:\
     :lp=/usr/local/es/lprdevdir/Laser3:\
     :if=/usr/local/es/if/Laser3:\
     :of=/usr/local/es/psof:\
     :sh:mx#0:du#0:sf:\
```

```
:sd=/usr/spool/Laser3:\
:af=/usr/adm/printer.acct:\
:lf=/usr/spool/Laser3/Laser3-log:
```

The interface program (if=) specifies the logical printer name “Laser3” instead of “tcpif”. “Laser3” is a “link” to “tcpif” through a subdirectory of the “$ESDIR” directory.

Do not be concerned that the above entry does not contain the string “remote” or “rm”, this is normal since EtherShare does not recognize that entry.

If the printer needs several alternative logical names, they can be specified manually on the first line of the “/etc/printcap” entry separated by the “|” character, for example:

```
Laser3|lw|ps|PostScript:\
```

Note that all logical (UNIX) printer names must be unique on each host; the names must not include spaces.

11.6.5 Shared Memory software RIPs

PostScript software RIPs running on the same host as EtherShare can communicate with the Print Server through a “Shared Memory” interface. The RIP must be compatible with the EtherShare “Shared Memory” interface specification and be installed by authorized personnel (RIP vendor technical staff) – contact your RIP manufacturer or HELIOS supplier if you are not sure about this.

The RIP must be configured and running before you create the printer queue with the EtherShare Admin.

The interface program for the “Shared Memory” interface is the “shmif” program (see “11.3 The Print Server Programs”). “shmif” is called by the UNIX system program “lpd”, and extracts additional configuration information from the “/etc/printcap” file by using the logical (UNIX) printer name received from “lpr” as the key.

When it starts, each “shmif” process first accesses the main configuration file “atalk.conf” to determine its configuration. Printers can be set up if necessary by using an editor such as vi, but we strongly recommend that you do this with the EtherShare Admin instead. See also chapter “5.14 Editing “atalk.conf” (and other configuration files) manually”.

The following parameter can be defined for “shmif” in “atalk.conf”. The parameter list is preceded by the logical printer name such as “shm1”, which is assigned to “shmif” by linking.

key

`key=path`
`path` specifies the path (including file name) of the Shared Memory “key” file. The file must already exist. The RIP must be configured with the same path.

The RIP and the “Shared Memory” interface program use the key file’s “inode” to create a unique numeric key, and do not modify or write to the file in any other way. Accordingly, any existing file (such as “/bin/ls”) can be used for this purpose. See the description of “ftok” in your UNIX documentation for related information.

There is no default for `path`.

The following is a typical “atalk.conf” entry for a “Shared Memory” RIP:

```
papsrv: name="shm-spooler", printer="shm1"
shm1: key="/bin/ls"
```

The entry required by the "lpr" program in "/etc/printcap" for a "Shared Memory" software RIP is very similar to that required by a PAP PostScript printer.

11.6.6 Printing to disk

You may want to automatically generate PDF files, then you can print to files in a specific UNIX directory and induce the Acrobat Distiller software to scan this directory regularly and convert incoming files to PDF.

The interface program which processes the print jobs is "diskif" (see "11.3 The Print Server Programs"). It comprises the following parameters:

dir `dir=path`
`path` specifies the (absolute) UNIX path of the directory, where the processed print job is stored. The file name results from the print job title with the typically appended suffix ".ps".

If `path` points to UNIX FIFO (named "pipe") rather than pointing to a directory, the processed print data are written to that "pipe" directly.

If `path` starts with a *pipe* character ("|") the whole string following "|" is recognized as a UNIX command line, and the processed print data are *piped* into the executed program.

pssuffix `[no]pssuffix`
This switch determines whether the suffix ".ps" is appended to the processed print job file. In case the switch is set to `nopssuffix` the file name extension ".ps" is omitted.

The default is `pssuffix`.

prefix `prefix=filenameprefix`
`filenameprefix` specifies whether files which come from a specific printer queue are "marked" with a prefix before their original file name. This may be quite reasonable when several "Print To Disk" queues print to the same destination.

resolve `[no]resolve`
When a print job is processed to a "Print To Disk" queue, and the switch is set to `noresolve`, the print job remains "untouched" and passes without any changes.

The default is `resolve`.

notifyprog `notifyprog=path`
`path` is the (absolute) UNIX path of the program which, as soon as "diskif" has successfully resolved the print job, is started with the parameters: `-Pprintername pathtopsfile`

e.g.: `notifyprog=/usr/local/bin/distillnotify`

"diskif" exports the following environment variables during the program call:

HELIOS_JOBFOR=<user name (if available) of print job creator>

HELIOS_JOBUSER=<user name (if available) as known to "lpd">

HELIOS_JOBHOST=<name (if available) of server which hosts the printer queue>

HELIOS_JOBTITLE=<print job title (if available)>

HELIOS_PRINTERNAME=<logical (UNIX) name of the printer queue>

HELIOS_JOBPAGES=<expected number of pages. This value may differ slightly from the actual number>

HELIOS_JOBSIZE=<expected print job size (in bytes). The stated value is often smaller than the actual size>

compression

`compression=mode`
`mode` determines the compression type. You can choose from different types of compressing: `LZW`, `ZIP`, and `None`. `None` means there is no file compression at all.

11.6.7 Printing to a hold/error queue

The printer interface programs (e.g. “tcpif”, “psif”, “diskif”, etc.) can be configured to forward all processed print jobs to a hold queue. On a hold queue the resolved jobs are stored for an adjustable amount of time. However, the printer interfaces can also be configured to forward faulty print jobs – e.g. due to PostScript errors or failed pre-flight checks – to an error queue. In fact, an error queue is basically also a hold queue.

The interface program “holdif” (see “11.3 The Print Server Programs”) stores the print jobs for an adjustable amount of time before dropping it. It has the following parameters:

jobholdtime `jobholdtime=seconds`
`seconds` determines the time a processed print job remains on a hold/error queue. If `seconds` is set to 0, the print job perpetually remains on the hold/error queue. This parameter is compulsory, i.e. it has to be set with a certain value.

11.6.8 Balancing print job loads

You may direct your print jobs to a balance queue. In a balance queue two or more printers form a group of printers from which the print jobs are shifted to a second or third printer in this group whenever the first printer is busy with a huge job.

The interface program for balancing print jobs is “balanceif” (see “11.3 The Print Server Programs”). It has the following parameter:

printers `printers=listofprinters`
`listofprinters` is a string which contains, separated by commas and without any spaces, the logical (UNIX) printer names of those devices which form a printer group for balancing print loads

E.g.: `printers=color,color2,pro630`

11.7 Adobe Document Structuring Conventions

The EtherShare Print Server system has been designed to meet Adobe's 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 Macintosh application with a print job are captured automatically by "papsrv" and stored in "$ESDIR/dicts" with a name similar to the original "procset" name. If a following application needs the same "procset", it is sent from the "$ESDIR/dicts" directory rather than transferring it again from the Macintosh to the Print Server via the network.

Certain PostScript comments are recognized and reacted on by the EtherShare printer interface programs ("papif", "psif", "tcpif", "shmif", and "diskif") as follows:

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

If possible, the specified procset will be included in the print job from the "$ESDIR/dicts" directory. Otherwise, you will get a warning message.

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

All procsets needed – but not supplied – by the document will be included from the "$ESDIR/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 "$ESDIR/psfonts" directory, which contains download PostScript fonts which have been installed there manually with the EtherShare Admin.

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

All fonts needed by the document which are not resident in the printer are included with the print job. To do this, the Print Server checks the corresponding printer resident font list "/usr/spool/<printername>/FONTS". This file can be updated using the EtherShare 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 via "afpmsg" to the user. Users who have installed Helios Mail on their Macintosh will additionally receive the message directly on their workstation.

```
%%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 Macintosh file and path name conventions. In the latter case, the Print Server determines the corresponding UNIX directory by inspecting the File Server's volume list from "$ESDIR/conf/afpvolumes".

```
%%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 error situations, which are forwarded to the originating user accordingly.

EtherShare's automatic font downloader also supports all programs that print with Apple's "QuickDraw" driver, or with native PostScript containing "Adobe Document Structuring" comments. TrueType fonts are passed transparently from the Macintosh to the printer through the Print Server, but cannot be installed in the font downloader in the present version.

Linotype Color Separation Extensions

The Print Server also supports "Linotype Color Separation Extensions" – the Print Server interface programs function as an ICS (Included Color Separation) includer. A special PostScript dictionary "LinoDict 1.0" is provided in "$ESDIR/dicts" for this purpose. This functionality can also co-exist with the EtherShare OPI option without conflict. Please contact HELIOS if you need more details.

12 Text-to-PostScript Converter

12.1 General remarks

This chapter describes the conversion of “flat” ASCII text files to PostScript print jobs with the help of the “pstext” program.

pstext

The “pstext” program in the “$ESDIR” directory allows simple ASCII files and files in “nroff” format to be printed on PostScript printers. Since PostScript printers usually cannot accept print jobs consisting of “flat” ASCII data, it is normally not possible to print UNIX program listings or to print from UNIX programs that only support a simple matrix printer. The necessary conversion can be made with this program. “pstext” can also check the print job for special sequences starting with the “ESC” character, which can be used to control simple highlighting features such as bold printing, underscoring, and different fonts.

The EtherShare Print Server is able to differentiate “flat” ASCII data from PostScript data automatically, and calls “pstext” to convert the job accordingly. Thus, it is usually not necessary to call “pstext” manually. See the **nomagic** parameter in chapter 11.6 “Configuring printers manually” for related information.

“pstext” is started from the command line in order to convert an existing file for printing, or from inside a UNIX pipe in order to be able to directly print from an application without having to spool the ASCII print output to disk. “pstext” can be controlled with additional parameters in typical UNIX style.

The following is an example of a typical command to print an ASCII file:

```
pstext -P lw .profile
```

This command converts the file ".profile" to PostScript and sends it to the printer "lw". To do this, "pstext" calls "lpr" with the specified printer name. "pstext" first looks for "lpr" in the $ESDIR directory (usually "/usr/local/es"), and then in the directories specified in the hosts's path. If the option "-P printername" is omitted, the generated PostScript code is output to the terminal for test purposes, rather than to the printer.

The following is an example of the use of "pstext" in a UNIX pipe. It outputs the current directory to the printer "lw":

```
ls -l | pstext -P lw
```

The following example prints one entry from the UNIX manual:

```
nroff -man /usr/man/man1/ls.1 | pstext -P lw
```

12.2 Options

The command line options of “pstext” have the following significance:

-f `font`
`font` is the font with which the document should be printed. The default here is “Courier”, because this is one of the few commonly available non-proportional fonts, which makes it particularly suitable for listings and tables.

-s `size`
`size` is the size of the font in points. The default is 10 points. One point is 1/72 inch.

-e `prepfile`
`prepfile` is the name of a PostScript language “prep” file which should be added to the start of each print job. If you do not specify the **-e** option, “pstext” automatically uses the internal “prep” file. This file contains definitions which are needed by “pstext”. Instead of specifying an alternative “prep” file name in the command line with the **-e** option as above, you can set the name with the UNIX environment variable “$PSTEXT_PREP”. This avoids having to specify the **-e** option. See the **-d** option below, and chapter 12.4 “Umlauts and special characters” for more information about using and editing the “prep” file.

-h `title`
`title` is automatically printed on the top line of each page. If this option is omitted, “pstext” automatically prints the file name and the date on the top line.

-L `leftmargin`
`leftmargin` specifies the space to the left paper edge in points. The default varies slightly from printer to printer, and is approximately 20 points.

-T `topmargin`
`topmargin` is the spacing in points from the top paper edge. The default varies slightly from printer to printer and is approximately 14 points.

-o This option suppresses the title line. You normally want to suppress the title line if you are using the "pstext" escape interpreter, because you are probably printing with a more "intelligent" program which generates its own header in this case.

-l This option rotates the printed output by 90˚ (landscape mode printing).

-m This option is used to print the date of the last modification to the file on the top line of each page, instead of the current date.

-n This option turns off the "pstext" escape interpreter. No characters are checked for control functions.

-t `tabsize`
`tabsize` specifies the distance of each tabulator stop in units of the width of the character "M". The default is eight, i.e. the width of eight Ms ("MMMMMMMM") for each tab stop.

-P `printer`
`printer` is the name of the printer to which the file should be output. If this option is omitted, the generated PostScript code is output to the terminal ("stdout").

-c `lpi`
`lpi` defines the desired line spacing in font height. The default is once the height of the used font.

-d `NewPrepFile`
`NewPrepFile` parameter can be set to dump the internal "prep" file pstext.ps to a file for further editing and use it with **-e** option.

12.3 Escape Interpreter

"pstext" can check the print job for special sequences starting with the "ESC" character, which can be used to control simple highlighting features such as bold printing, underscoring and different fonts. This is particularly useful for programs that normally work with a matrix printer. With such programs, it is often possible to enter the control codes to specify particular print attributes such as bold printing into a configuration table.

An escape sequence for "pstext" has three parts: The first is the ESC character (Hex 1B), which is then followed by a command (a digit between one and six), followed by the value of the parameter within square brackets, for example:

```
ESC 4 [10]
```

or in hex:

```
1B 34 5B 31 30 5D
```

Escape sequences

The following is a list of the supported escape sequences:

`ESC 1 [1]`

Underline on.

`ESC 1 [0]`

Underline off.

`ESC 2 [1]`

Bold printing on.

`ESC 2 [0]`

Bold printing off.

```
ESC 3 [Helvetica]
```

Choose a new font, in this example “Helvetica”.

```
ESC 3 [Courier]
```

Choose the standard font. “Courier” is the default font.

```
ESC 4 [12.5]
```

Choose a new font size in points, in this example 12.5 points.

```
ESC 5 [
    gsave
        newpath
            50 50 moveto
            80 80 lineto
        closepath
        stroke
    grestore
]
```

This escape sequence example shows how to include your own PostScript code (e.g. a trademark) during the printing procedure. It is important to store and restore the current position, which is why the program should always start with “gsave” and finish with “grestore”.

```
ESC 6 [2]
```

Set line spacing (in this example to 2 times the font height).

12.4 Umlauts and special characters

“pstext” provides facilities to allow the PostScript coding (character set translation) of the printer font to be changed, for example to allow national accented characters such as Umlauts to be printed correctly. The default character set coding in PostScript only supports a few of the available accented characters. “pstext”, however, re-codes the allocation of such characters by accessing the PostScript language “prep” file that is built into EtherShare. This file contains two different, modified versions of the so-called “Standard Encoding Vector”, called “decEncoding” (for DEC Ultrix computers) and “ibmEncoding” (for IBM computers) respectively. Neither of these encoding tables are complete implementations of the corresponding character sets, they have only been set up to support the German Umlaut characters. However, they can easily be extended to add other special characters, or to specify completely new codings. Note that modification of the coding requires some knowledge of the PostScript language.

To edit the default “prep” file, you have to use the “pstext” program with the “-d” option. This dumps the “prep” contents into a file which can then be revised. We assume that the file name of the editable “prep” file is “pstext.ps”.

The two alternative encoding tables can be found at the beginning of the “pstext.ps” file. They both function by copying the standard coding and changing it to add the required special characters. The following is the code table provided for the DEC VT200 character set:

```
%    reencode font for DEC VT200 font
/decEncoding StandardEncoding dup length array
copy
     dup 196  /Adieresis  put
     dup 228  /adieresis  put
     dup 220  /Udieresis  put
     dup 252  /udieresis  put
     dup 214  /Odieresis  put
     dup 246  /odieresis  put
     dup 223  /germandbls put
def
```

Each line of this table re-defines a single character. The decimal number (e.g. 196) is the decimal value of the character ("ASCII" value) in the input file's character set. This is followed by the PostScript name of the character. In PostScript, characters have names and not numbers. For example, "/Adieresis" is the PostScript name for "Ä".

The encoding tables are followed by a line which determines which of the two tables are used when printing. The table "decEncoding" implements a character set according to ISO 8859-1 (DEC VT200) whereas "ibmEncoding" implements a character set that corresponds to the IBM PC extended ASCII code. The following line in "pstext.ps" selects DEC encoding:

```
% we use the DEC encoding by default
/theEncoding decEncoding def
```

If you want to use IBM PC umlaut codes, change the above line as follows:

```
% we use the IBM encoding by default
/theEncoding ibmEncoding def
```

You can as well make a local copy of “pstext.ps” with a new – more individual – name, then modify this file, and specify its name with the -e option when calling “pstext”, e.g.:

```
pstext -e myprep1.ps -P lw testfile
```

This command prints the file “testfile” using a new PostScript definition contained in the “prep” file “myprep1.ps”. If you use a particular encoding table often, instead of specifying the “prep” file name in the command line as above, you can write the name to the UNIX environment variable “$PSTEXT_PREP”. This avoids having to specify the “-e” option.

13 The Administration Server

13.1 General remarks

This chapter describes the function and configuration of the Administration Server. In conjunction with the EtherShare Admin application, the Administration Server allows the EtherShare system to be configured from any Macintosh workstation in the network in a secure and convenient way.

13.2 The Administration Server Program

The EtherShare Administration Server system consists of the program “admsrv”. It is created automatically in the “$ESDIR” directory during installation. EtherShare is configured to start “admsrv” automatically when UNIX is booted.

admsrv

“admsrv” implements administration server functions on the host and manages the communication with the EtherShare Admin program on Macintosh workstations. Each new login request from the EtherShare Admin results in a new “admsrv” process being created. Accordingly, when a number of users use the EtherShare Admin application at the same time, a number of “admsrv” processes run simultaneously.

13.3 Parameters of the “admsrv” program

When it starts, the Administration Server program “admsrv” first accesses the main configuration file “atalk.conf” to determine its configuration. The “install” program automatically sets up this file with initial values. The values can be changed if necessary by using an editor such as vi. See also chapter 5.14 “Editing “atalk.conf” (and other configuration files) manually”.

The parameters described below can be defined for “admsrv” in “atalk.conf” (note that the parameter list is preceded by the program name “admsrv”):

name

`name=netname,name=netname2,name=netname3`
`netname` is the AppleTalk (NVE) name of the Administration Server. This is the name with which it is known to the network. It is the name you see in the **Chooser** of the EtherShare Admin program. Several names in a row, separated by a comma, are optional.

The default for `netname` is the name of the UNIX host.

Note: The AppleTalk type of the Administration Server is not configurable. The type is always AdminServer.

zone

`zone=zonename,zone=zonename2,zone=zonename3`
`zonename` is the name of the AppleTalk zone to which the administration server should be allocated. This parameter determines the zone in which the Administration Server can be found in the **Chooser** of the EtherShare Admin program. The chosen zone must be one of the local zones that the host is connected to. You can test this with the “zones -l” program.

The default for `zonename` is “*”, i.e. the zone of the first interface entry in “atalk.conf”. Several names in a row, separated by a comma, are optional, e.g.:

```
admsrv: zone="marketing", zone="support",
        zone="developer"
```

sessions

`sessions=maxclients`
`maxclients` specifies the maximum number of workstations (clients) that are permitted to work on the Administration Server simultaneously. This value can be the same as the total number of workstations that are connected to the AppleTalk network, but is usually smaller than that.

The default for `maxclients` is 4.

yppasswd

`yppasswd=file`
`file` specifies the name and path of the file in which the user data for the “Yellow Pages” system are stored (see later).

There is no default for `file`.

ypgroup

`ypgroup=file`
`file` specifies the name and path of the file in which the group data for the “Yellow Pages” system are stored (see later).

There is no default for `file`.

ypafppasswd

`ypafppasswd=file`
`file` specifies the name and path of an optional AFP user list for use with the “Yellow Pages” system.

There is no default for `file`.

savepasswd `[no]savepasswd`

As a time-saving feature when logging on, the AppleShare selection in the Chooser on the Macintosh lets you save your File Server user name and/or user password on the Macintosh’s local hard disk.

To improve security, specify the `nosavepasswd` switch 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 the EtherShare Admin. Note: you can still change your File Server password in the **Chooser** in the normal way (with **Change Password**).

The default (if this switch is omitted) is `savepasswd`.

Note: The `[no]savepasswd` setting only works for Mac OS Version 7.0 and above.

fontdir `fontdir=file`

`file` is the path of the host directory which contains the server font list “FontDirectory”. The fonts themselves are contained in sub-directories of `file`, arranged alphabetically.

The default for `file` is “$ESDIR/psfonts”.

`fontdir` is also available as a global printer parameter. You should make sure that you do not specify different font directories for the Administration Server and the Print Server.

unprotected `[un]protected`

This switch (if set to `protected`) can be specified to protect (lock) all configuration data. Then, merely maintaining spool queues is possible.

The default for this switch is `unprotected`.

sysadmgroup `sysadmgroup=groupname`

The EtherShare Admin allows users with sufficient permissions to configure the EtherShare system from any Macintosh workstation on the AppleTalk network in a convenient and secure way. For example, it can be used to set up users, groups, volumes, and printers, and re-schedule print jobs. Normally, only the system administrator is allowed to make any changes. Non-privileged users can inspect the configuration and the print job queue, but cannot change anything except delete their own print jobs.

Members of the special “system administrators” group can also use the EtherShare Admin to make any changes they like, including printer configuration, and sending AFP messages with **Lists/Active Users/Message/Message To All...** to all AppleShare users logged-on to the EtherShare server. However, these group members are not allowed to modify any information on users with an ID less than 100 (note: the system administrator has a user ID of 0). The `groupname` parameter specifies the name of the special “system administrators” group.

The default for `groupname` is “SysAdm”.

prnadmgroup `prnadmgroup=groupname`

Members of the special “printer administrators” group can use the EtherShare Admin to manipulate print jobs from a Macintosh workstation, i.e. they are allowed to:

- delete a job
- move a job to another queue
- change a jobs priority
- set a queue to **Spool only/Spool and Print**
- restart a printer queue with **Lists/Printers/Printer/Restart Printer**

The `groupname` parameter specifies the name of the special “printer administrators” group.

The default for `groupname` is “PrnAdm”.

queueadm-group

`queueadmgroup=groupname`

Members of the special “queue administrators” group can use the EtherShare Admin to manipulate print jobs and queue configurations from a Macintosh workstation. Thus, they have even more privileges than members of the “printer administrators” group that is described above. Queue administrators are allowed to:

- any task “PrnAdm” is allowed to do
- create/change/remove printer queues
- update fonts for queues
- download fonts to the EtherShare Server
- adjust “PDF Settings”
- adjust “OPI/ICC Settings”
- adjust “Edit Initialization” settings
- specify PPDs for queues

The `groupname` parameter specifies the name of the special “queue administrators” group.

The default for `groupname` is “QueueAdm”.

Note: The default values “SysAdm”, “PrnAdm”, and “QueueAdm” are created automatically during installation.

---

daemonuid

`daemonuid=idnumber`

When creating printers with the EtherShare Admin, the user of the printer daemon is set in “/etc/printcap” by default to ID 0 (“root”) with the flag “du#0”. This simplifies

permission considerations when printing, especially if the print job contains external references to OPI images or “%%Include...” comments. This feature is associated with a slight security risk. Specify `daemonuid` to instruct the EtherShare Admin to set the user of the printer daemon to the ID of another user, for example to ID 1 (user “daemon”). An alternative option for the system administrator is to change the “du” flag value for all printer entries in “/etc/printcap” manually.

The default for `idnumber` is 0 (the ID of “root”).

13.4 Administration Server utility program

Restarting the Admin Server

If you are unlucky enough to experience a system crash, the following temporary files are occasionally left over by the "admsrv" program: "ptmp", "gtmp", "atmp" and "vtmp" in the directories "/etc" or "$ESDIR/conf".

They must be deleted before restarting "admsrv" to ensure proper functioning of this program. This is done automatically by the "start-atalk" script.

13.5 Configuration with Yellow Pages

The Administration Server has been designed to support the UNIX yellow pages (NIS) system, which, in a network of several UNIX hosts, allows user names, group names, and passwords as well as other configuration details to be stored centrally on the so-called “Yellow Pages Master” host. This considerably simplifies setting up new users, particularly if they each need access to more than one host. Please note that the user configuration data maintained under Yellow Pages is only stored on the Master host. You can only change it with the EtherShare Admin by logging on to the Administration Server on the Master host, and not one of the Slaves.

Furthermore, the special Yellow Pages password and group files (e.g. “/var/yp/passwd” and “/var/yp/group”) are usually stored on the Master host in a subdirectory of “/etc”. For this reason, and assuming that you also have EtherShare installed on the Master host, the configuration entry for the Administration Server in “atalk.conf” allows you to specify the name and location of the Yellow Pages password and group files with the parameters `yppasswd` and `ypgroup`, respectively. These parameters only need specifying on the Master host.

If you have not installed EtherShare on the Yellow Pages Master host, you can edit the Yellow Pages password and group files to set up Slave users by using the standard UNIX Yellow Pages tools in the normal way. We would like to point out, however, that the EtherShare Admin is much easier to use for setting up Yellow Pages users and groups than the standard UNIX tools. You can use the EtherShare Admin to set up both, EtherShare users and regular UNIX users.

The optional AFP user list (“$ESDIR/conf/afppasswd”) can also be used with the Yellow Pages system by setting up a second “afppasswd” file on the Master host (e.g. /var/yp/afppasswd) containing the names of all users of the Master and its interconnected Slaves. You must specify its name and path in the Master’s Administration Server parameter `ypafppasswd`. The Master host’s “$ESDIR/conf/afppasswd” file should only contain the “root” and system logins, terminated by “+:” in the last line.

The installation includes in the directory “$ESDIR/etc” the script “ypMakefile”, which contains the necessary changes required to implement the AFP user list under Yellow Pages. It must be copied as “Makefile” to “/var/yp”.

Since, in the Yellow Pages system, the password and group files are often stored in “/var/yp” rather than in “/etc”, a typical configuration for the Administration Server on the Master host is as follows:

```
admsrv:  name=“AdminServer”, sessions=8,

         yppasswd=/var/yp/passwd,

         ypgroup=/var/yp/group,

         ypafppasswd=/var/yp/afppasswd
```

The “$ESDIR/conf/afppasswd” file of each host in the Yellow Pages system (Master and Slaves) must include a line containing only “+:” at the position where the Yellow Pages user and group map should be included. This usually follows entries for the “root” and the system logins only, to make sure that it is still possible to log on to the host in the case of a failure of the network connection to the Master:

```
root:8c9373c57a229c7a
+:
```

When the Yellow Pages system is being used, the Administration Server automatically calls the program “$ESDIR/etc/yp-update” whenever user or group data are changed, in order to update the Yellow Pages files. The network connection results in a slight additional time delay when making such changes.

If you install your yellow pages using different directories to the ones listed above under “admsrv:”, you will also need to modify the “$ESDIR/etc/yp-update” script accordingly.

14 The Mail Server

14.1 General remarks

This chapter describes the function and configuration of the EtherShare Mail Server. In conjunction with the HELIOS Mail application, the Mail Server allows workstations in the AppleTalk network to send electronic mail messages and files to other Macintosh or UNIX users on the network. Incoming mail is received in the background while you will be informed by a “Mail Notification Feature”. You also receive EtherShare server messages, such as printer messages, via electronic mail.

HELIOS Mail requires to install and configure your host’s mail program (e.g. “sendmail”). If you have a modem attached to your host and configured for UNIX mail (uucp), you can also communicate with several million users of this worldwide e-mail system.

EtherShare’s built-in (TCP) POP3 Server allows you to use mail clients other than Macintosh and mail applications other than HELIOS Mail.

14.2 The Mail Server Program

The Mail Server system consists of the program “mailsrv”. It is created automatically in the “$ESDIR” directory during installation. EtherShare is configured to start “mailsrv” automatically when UNIX is booted.

mailsrv

“mailsrv” implements mail server functions on the host and manages the communication with HELIOS Mail and the UNIX “mail” programs on the host. It also notifies Macintosh users of incoming mail via the “Mail Notification Feature”, which runs in the background on each workstation. Each new login request from the HELIOS Mail program on a Macintosh workstation starts a new host process.

14.3 Parameters of the “mailsrv” program

When it starts, the Mail Server program “mailsrv” first accesses the main configuration file “atalk.conf” to determine its configuration. The “install” program automatically sets up this file with initial values. The values can be changed if necessary by using an editor such as vi. See also chapter 5.14 “Editing “atalk.conf” (and other configuration files) manually”.

The parameters described below can be defined for “mailsrv” in “atalk.conf” (note that the parameter list is preceded by the program name “mailsrv”):

name

`name=netname,name=netname2,name=netname3`
`netname` is the AppleTalk (NVE) name of the Mail Server. This is the name with which it is known to the network. It is the name you see in the **`Chooser`** of the HELIOS Mail program. Several names in a row, separated by a comma, are optional.

The default for `netname` is the name of the UNIX host.

type

`type=nettype`
`nettype` is the AppleTalk type of the Mail Server. This is the type with which it is known to the network. `nettype` should normally be set to “MailServer”.

The default for `nettype` is “MailServer”.

zone

`zone=zonename,zone=zonename2,zone=zonename3`
`zonename` is the name of the AppleTalk zone to which the Mail Server should be allocated. This parameter determines the zone in which the mail server can be seen in the Chooser of the HELIOS Mail program. The chosen zone must be

one of the local zones that the host is connected to. You can test this with the “zones -l” program (see **zone** in chapter 13.3 “Parameters of the “admsrv” program”).

The default for `zonename` is “*”, i.e. the zone of the first interface entry in “atalk.conf”. Several names in a row, separated by a comma, are optional, e.g.:

```
admsrv: zone="marketing", zone="support",
        zone="developer"
```

localwinsize

`localwinsize=maxlpackets`
`maxlpackets` specifies the maximum number of data packets that are passed from “mailsrv” to workstations through the network during a transaction. The number of packets may need to be limited if the buffer size in the workstations is too small. `maxlpackets` can be varied to optimize the data transfer rate.

The default (and maximum) for `maxlpackets` is 8.

remotewinsize

`remotewinsize=maxrpackets`
`maxrpackets` specifies the maximum number of data packets that are passed from workstations to “mailsrv” through the network during a transaction. The number of packets may need to be limited if the buffer size in the UNIX host is too small. `maxrpackets` can be varied to optimize the data transfer rate.

The default (and maximum) for `maxrpackets` is 8.

spooldir

`spooldir=spooldirectory`
`spooldirectory` is the directory to which all incoming mail is spooled. Outgoing mail is not spooled, since it is passed directly to the UNIX mail system.

The default for `spooldirectory` is “/var/spool/mail”, or “/var/mail” (depending on your UNIX operating system).

mailinterval

`mailinterval=seconds`

`seconds` gives the interval in seconds with which the mail directory is polled for new mail. Usually, you use the “biff” program for mail notification instead, since you get immediate notification this way, and because “biff” needs less system overhead.

The Mail Server only polls for mail at the time interval specified by `seconds` if “biff” has been disabled or is not available for some reason.

The default for `seconds` is 60 (one minute).

biff

`[no]biff`

This switch specifies whether or not to use the UNIX “biff” program for mail notification. “biff” is the preferred method, since it needs less system overhead than polling for mail. However, on some systems “biff” is already used by other programs such as “comsat”, and may not be available for use by the Mail Server. In this case, the Mail Server automatically falls back to polling for mail.

If you want to release “biff” from “comsat” for use with the Mail Server, bracket out the corresponding line in the UNIX configuration file “/etc/inetd.conf” by inserting a “#” at the start of the line.

Then re-initialize “inetd” with the command “kill -1 xxx”, where “xxx” is the process id of the “inetd” process. Finally, stop and restart the AppleTalk network with “stop-atalk” followed by “start-atalk”.

History: “biff” was the name of a dog belonging to a Berkeley programmer who wrote part of the UNIX mail system. Biff used to bark each time the postman delivered a (conventional paper) letter to the door.

The default for this switch is `biff` (for all UNIX architectures) provided that it is not already in use by other programs.

passwd

`[no]passwd`

When you installed EtherShare, a new address book was automatically created as the empty UNIX text file “addressbook” in “$ESDIR/conf”. You can add new addresses to the list with the **New Address...** function of HELIOS Mail. When you use the address book, normally you will also see all users of your UNIX host, including root, in addition to users you have included manually with the **New Address...** function. Specify `nopasswd` to turn off this feature, in which case the address book will only show users who have been included manually.

The default for this switch is `passwd`.

officialname

`officialname=name`

`name` is a string containing the official name (UNIX mail name) of your host. This is the name which users of other systems need to include in their mail address when they want to reach you. It is made up of a name (e.g. the host name “osiris”) and the domain in which the host resides (e.g. “helios.de”).

The default for `name` is made by concatenating the name of your host and its domain name (e.g. “osiris.helios.de”).

addresses `addresses=filename`
`filename` is the name and path of a file containing a list of e-mail addresses. The list can be accessed by and maintained from HELIOS Mail. You can use it to save time when you often mail to the same people.

The default for `filename` is “$ESDIR/conf/addressbook”.

mailer `mailer=mailerpgm`
`mailerpgm` is the name and path of the UNIX program used to send mail. You should normally use the “sendmail” program for this purpose. In some cases, you may need to use “/bin/mail” instead. However, you may encounter problems with the mail program, such as lack of 8-bit transparency. You need 8-bit transparency if you want to send mail containing national accented characters such as “Umlauts”. A character conversion table in the Mail Server allows you to send mail containing Umlauts to UNIX users, too (see chapter 6.3.2 “Text preferences”).

The default for `mailerpgm` is “/usr/sbin/sendmail”.

autologin `[no]autologin`
If you check **Save name** in the HELIOS Mail login window, HELIOS Mail makes a note of your name, and the zone and name of the Mail Server you want to use (see chapter 6.4 “Configuring the connection”). Next time you start HELIOS Mail, you only need to enter your password. Furthermore, if you log on first to the EtherShare File Server on the same host, you will not have to enter your name and password for either the Mail Server or the “Mail Notification Feature” anymore. This is convenient, but presents a security risk if you leave your Macintosh unattended with volumes mounted – even if you have quit HELIOS Mail, others can start it again and have access to your mailbox without needing to type in any password. Specify the `noautologin` parameter to force HELIOS Mail to ask for a

password each time it is started. This is similar to unchecking the **Save name** box in the HELIOS Mail login window, but applies to all HELIOS Mail users on that host. To make use of the `noautologin` feature, do not forget to always uncheck **Save password** in the same window. The default for this switch is `autologin`.

TCP/IP pcmail port

`port=2001 (or other value)`
You have to configure the pcmail port. The default port number is 2001.

vacation

`vacation=file`
The UNIX vacation program is required if you want to make use of HELIOS Mail’s vacation message option. For details about the vacation program and the “.vacation.msg” file, see the respective UNIX man pages.

14.4 The POP3 Server

EtherShare 2.6 includes a POP3 Server so that it is possible to use a mail client other than HELIOS Mail with the Mail Server on the UNIX host.

Configuration

In order to use this feature, you have to activate the "TCP/IP" Control Panel on the Macintosh client. In the "TCP/IP" setup window, you have to specify how the Macintosh allocates its IP address, e.g. by "Using DHCP Server". This, however, is determined by your system administrator. The mail client has to be configured as well. You have to enter the name of the server on which EtherShare is running as POP3 Server. Note that some programs call the POP3 Server "Email account", "POP account", or "Mail Server".

Sockets

For internal communication, EtherShare uses certain TCP sockets which have to be available, otherwise certain EtherShare services will not be available and an appropriate error message will be issued.

For the EtherShare Mail Server which is providing POP3, POPPASSD, and PCMAIL services, the "mailsrv" process has to be able to connect to specific sockets to allow POP clients to communicate properly. In the following, there is a list of the sockets used on the server:

```
Service         socket

poppassd        106/tcp
pop3            110/tcp
pcmail          2001/tcp
```

You can verify available/used sockets by checking the contents of "/etc/services" and the output of "netstat -a -n".

Verifying whether the HELIOS POP3 Server is running

In order to check whether the HELIOS POP3 Server is running, you can enter the following command under UNIX:

```
telnet localhost 110
```

The server will issue the following response:

```
+OK HELIOS POP3 Mail Server <...> ready
```

Type `quit`.

If you receive a response other than that shown above, this indicates that another Mail Server had already been running before HELIOS Mail was started. In that case, HELIOS Mail cannot use the socket, recognizes the other Mail Server, and does not start.

Passwords

The POP3 protocol allows non-encrypted and encrypted passwords. If you want to use encrypted passwords, you have to make sure that your UNIX host is configured accordingly. The users have to be set up with “afppasswd”. You will get an error message from the client if the server has not been configured properly. For more information, please refer to chapter 9.5 “Users and groups”.

15 The Terminal Server

15.1 General remarks

This chapter describes the function and configuration of the Terminal Server. In conjunction with the HELIOS Terminal application, the Terminal Server allows workstations in the AppleTalk network to make simultaneous terminal connections to one or more UNIX hosts (multiple sessions capability).

15.2 The Terminal Server Program

The EtherShare Terminal Server system consists of the program “termsrv”. It is created automatically in the “$ESDIR” directory during installation. EtherShare is configured to start “termsrv” automatically when UNIX is booted.

termsrv

“termsrv” implements terminal server functions on the host and manages the communication with HELIOS Terminal. Each new login request from a Macintosh workstation starts a new host login process. “termsrv” then re-directs the host’s input and output to the workstation via the network.

15.3 Parameters of “termsrv” program

When it starts, the Terminal Server program “termsrv” first accesses the main configuration file “atalk.conf” to determine its configuration. The “install” program automatically sets up this file with initial values. The values can be changed if necessary by using an editor such as vi. See also chapter 5.14 “Editing “atalk.conf” (and other configuration files) manually”.

The parameters described below can be defined for “termsrv” in “atalk.conf” (note that the parameter list is preceded by the program name “termsrv”):

name

`name=netname,name=netname2,name=netname3`
`netname` is the AppleTalk (NVE) name of the Terminal Server. This is the name with which it is known to the network. It is the name you see in the **Chooser** of the HELIOS Terminal program. Several names in a row, separated by a comma, are optional.

The default for `netname` is the name of the UNIX host.

type

`type=nettype`
`nettype` is the AppleTalk type of the Terminal Server. This is the type with which it is known to the network. `nettype` should normally be set to “UNIXTerminal”. The same type must be set in the “Connection Settings” window of the HELIOS Terminal program.

The default for `nettype` is “UNIXTerminal”.

zone

`zone=zonename,zone=zonename2,zone=zonename3`
`zonename` is the name of the AppleTalk zone to which the Terminal Server should be allocated. This parameter determines the zone in which the Terminal Server can be seen in

the Chooser of the HELIOS Terminal program. The chosen zone must be one of the local zones that the host is connected to. You can test this with the “zones -l” program (see **zone** in chapter 13.3 “Parameters of the “admsrv” program”).

The default for `zonename` is “*”, i.e. the zone of the first interface entry in “atalk.conf”. Several names in a row, separated by a comma, are optional, e.g.:

```
termsrv: zone="marketing", zone="support",
         zone="developer"
```

localwinsize

`localwinsize=maxlpackets`
`maxlpackets` specifies the maximum number of data packets that are passed from “termsrv” to workstations through the network during a transaction. The number of packets may need to be limited if the buffer size in the workstations is too small. `maxlpackets` can be varied to optimize the data transfer rate.

The default (and maximum) for `maxlpackets` is 8.

remotewinsize

`remotewinsize=maxrpackets`
`maxrpackets` specifies the maximum number of data packets that are passed from workstations to “termsrv” through the network during a transaction. The number of packets may need to be limited if the buffer size in the UNIX host is too small. `maxrpackets` can be varied to optimize the data transfer rate.

The default (and maximum) for `maxrpackets` is 8.

term

`term=capname`
`capname` is the name of the terminal emulation. This name is written by “termsrv” to the UNIX environment variable “$TERM” on starting a new connection. In the standard UNIX configuration, the VT100 emulation (i.e. a definition

of terminal control codes) is defined in each of the files “termcap” and “terminfo”. If you change `capname` to specify another emulation, you must ensure that the new emulation definition has been added to both files. Whereas many programs refer to the “termcap” file, an entry is also required in “terminfo”, since, under Solaris 2, some programs refer to “terminfo” (like the editor program vi) instead of “termcap”. Note that the standard UNIX VT100 emulation is a subset of the VT320 emulation provided in HELIOS Terminal.

The default for `capname` is `vt100`.

banner

`banner=bannerstring`
`bannerstring` is a string which is output to each Macintosh terminal whenever a connection is made and before the login itself is started. For example, you can use this parameter to output a company trademark. The following escape sequences are recognized within `bannerstring`:

```
%n   The host name of the UNIX system
\r   A Carriage Return character
\n   A Line Feed character
\f   A Form Feed character
\t   A tabulator character
\033 An Escape character. This allows any
     required bit pattern to be constructed
     with a 3-position octal number.
```

If you do not specify `bannerstring`, the default is:

```
“\r\n\r\nADSP Terminal Server on host
%n\r\n\r\n(C) 1990 Helios Software GmbH\r\n\r\n”.
```

Specify `banner=“”` if you do not want a banner.

16 The Time Server

With the “EtherShare Client Installer” that is described in chapter 4.6 you can add the “Time Server” option to your **Chooser** as shown in figure 158 below. You can then select a specific server, press the **Set Time** button in the Chooser dialog and thus make sure that the time on your Macintosh client is always synchronized to the time on the server you have chosen. If the time of your Macintosh goes wrong by one hour, you have to open the **Date & Time** control panel and check whether **Daylight Savings Time** has been set up correctly.

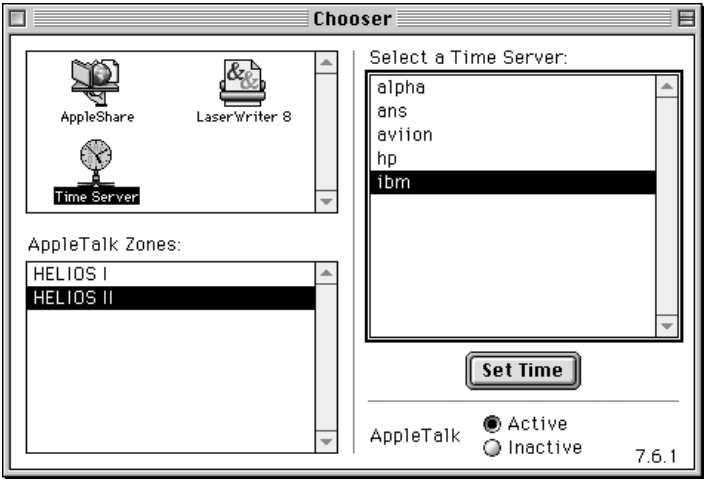

Fig. 158: Selecting a time server for time adjustment

After the Time Server has been selected, the local Macintosh time will be set according to the server time whenever you boot your Macintosh.

17 Technical support

17.1 Support options

HELIOS offers a variety of support options to help you get the most from HELIOS products. This section summarizes those options.

If you have any questions about your HELIOS product, first read the printed documentation. Also consult the README files, which may have been provided with the product to describe late news which are not covered by the main manual. Last but not least, you may check our Web site regularly:

http://www.helios.de

If you still cannot find the answer to your question, your first line of support is your HELIOS product supplier or dealer. Please have the following information at hand:

- Did you try to get help from one of our dealers or distributors? Please let us know if you found your dealer to be little helpful and/or lacking in experience.
- The serial number of your HELIOS product (this is printed on your "Activation Key Request" form. Alternatively, the machine ID of your computer (see **What you have to do** in chapter "Welcome to EtherShare 2.6").
- Your full address, telephone/fax number, and e-mail address, if available.
- HELIOS partner contact: name, e-mail address, fax, phone.

- For every EtherShare/PCShare server at your site:
  - EtherShare: contents of “atalk.conf”, “afpvolumes”, “Versions”
  - PCShare: contents of “pcshare.cnf”, “exports.pcs”, “Versions”
- UNIX: information about the hardware and operating system
- The version of all relevant HELIOS software modules (see chapter 5.13.6 “Versions”) and the name and version of any Macintosh application software (such as DTP programs) or INITs you were using at the time.
- Details about your EtherShare configuration file “atalk.conf”. For printer-related queries, we will need details of your “/etc/printcap” file, too.
- The type of hardware you are using and the operating system version (use the “uname” command (with an appropriate parameter e.g. `uname -a` to find out).
- The exact wording of any messages that appeared on your screen, and details of relevant messages in the following files:
  - Printer log file
  - System message file
- What happened and what were you trying to do at the time the problem occurred?
- How did you try to solve the problem? Contents of “/etc/passwd”, “yp/passwd” (we are only interested in the location of users’ home directories)

For “dt” utilities-related problems:

- Output of “/etc/(v)fstab”, “exports”
- Output of “find / -name .afpvolumes -print”, “find / -name .Desktop -print”
- “rebuild -s” for every EtherShare volume
- In case any changes have been made to your initial EtherShare/PCShare configuration, we need the contents of the current configuration files.
- Send the exact and complete command sequences you issued together with the exact and complete output produced by the “dt” utilities and/or other UNIX programs you have used. (If you can use a scrollable command window, e.g. within XWindows, OpenWindows, CDE, or similar tools, this will facilitate the task of providing this information, especially since the history of earlier command sequences is also available in this window!)
- Let us have the output of “ls -la” for the directory where you applied the “dt” command, as well as for the corresponding “.rsrc” directory. In case you applied a change recursively, you can simply use “ls -laR”.
- If you used a “dt” command which processes a source and destination file/folder, please submit all the information for both, source and destination.
- Let us have the output of “ps -efl”, or “ps aux”, respectively.
- Let us have the output of “$ESDIR/swho -c” and “$PCDIR/swho -c”.
- Let us have the output of “df”.

- Specify the contents of the system messages files since the last start of EtherShare.
- Let us have a description of what you wanted to achieve, and what – you think – has happened.
- Is the result reproducible or does it emerge only occasionally? Any clue on the suspected pattern will be helpful!
- In case you have additional information available, e.g. core files, trace output, please store it safely and make a note in your report – *do only send it on request*.

Depending on the severity of the problem it may be necessary to stop and start EtherShare services completely. If you use shared volumes together with PCShare, stop PCShare first, and restart it only after restarting EtherShare.

If the dealer cannot solve the problem, he or she can contact the official HELIOS distributor in your country. HELIOS has appointed distributors in about 20 countries – you can find their addresses on HELIOS product brochures or on the HELIOS Web site **www.helios.de**. Each distributor and HELIOS OEM customer is obliged by contract to have technical support staff who are experienced with HELIOS products.

Note: The current HELIOS CD-ROM provides a support questionnaire called “es_quest.pdf” which helps you have all important information at hand when contacting the HELIOS product supplier or dealer.

17.2 Keys and updates

Demonstration keys

All HELIOS products require an Activation Key (or password) to be entered during (or after) the installation. Without the Activation Key, the software cannot be started. End-user Activation Keys are dependent on the machine ID of the host and the EtherShare serial number. The installation program will let you know your machine ID automatically.

Note: If we generate a key twice for the same combination of machine ID and EtherShare serial number, the second key may be different from the first one. This is normal.

At their discretion, HELIOS distributors can provide their dealers – for a reduced fee – with so-called dealer demonstration versions of our products, which are fully working copies of our software but carry a special Activation Key which expires after a given period of time. You will be informed about the time remaining on your demonstration copy by a “afpsrv” message which pops up each time you log on to the File Server, and then each 3 - 4 hours while being logged-on to the File Server (see figure 159):

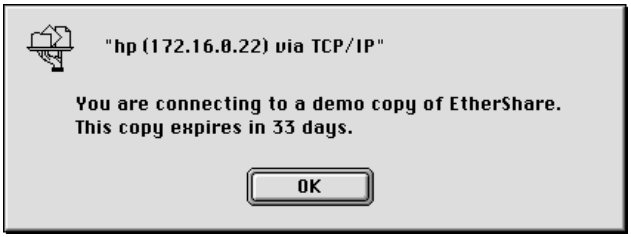

Fig. 159: Demonstration key warning

Activation Key Transfers

If you are transferring your EtherShare software from one host to another, then we call this an “Activation Key Transfer”. When you apply for a new key, you will need to state that you will no longer use EtherShare (and depending EtherShare OPI, PDF Handshake, Print Preview, or user expansion licenses) on the original host – fax our key registration department (+49-5131-70 93 25) and ask for details of the exact wording to use and the conditions that apply.

Note: If you do not enter any Activation Key the HELIOS product you have installed will run in a 3 hour demo mode only.

Update service

HELIOS releases new versions of its software products from time to time, for example to make improvements or to correct known faults. HELIOS distributors and OEM customers automatically receive the latest version in new shipments.

An automatic software update service (“Software Update Service Agreement”) is available for endusers who wish to receive new major product versions and intermediate product releases automatically. This is implemented by shipping a single CD-ROM containing the latest versions of all of our products. The CD-ROM will be produced whenever a significant new product version is released.

Customers not taking part in the update service will only receive replacement software modules if their installation does not function according to the claims made by HELIOS at the time of purchase. For example, if Apple upgrades its printer driver and this causes a problem with one of our products, the solution to the problem will only be made

available to customers with a service contract. Other customers can still upgrade their software when new major releases become available, by paying the appropriate upgrade fee. HELIOS will inform all customers who do not have an update service contract about fees for upgrading existing installations as soon as new releases become available.

Another way to obtain the latest HELIOS software updates is called “Internet Update Access”, which provides the customer with the latest updates via HELIOS Web site.

For both update service products contact your supplier for price information and for a copy of the relevant application form, or visit the HELIOS Web site: **www.helios.de**.

17.3 Error Messages

The following section lists and describes the most important error messages for all UNIX program modules except for the Desktop Server. Desktop Server errors are described in the corresponding chapter.

All error messages are constructed the same way. They start with the name of the issuing program followed by the UNIX process ID [in brackets]. This is then followed by a verbose error message which may include variable strings and numbers, for example:

```
afpsrv[12345]: The file %s cannot be opened: %m
```

In the following, strings are abbreviated by “%s”, numbers by “%d” and UNIX system error messages by “%m”. Refer to your UNIX documentation for more information on UNIX system error messages.

17.3.1 “license” error messages

All EtherShare servers verify the integrity of the executable image by performing a checksum and verify the license by reading the license file “$ESDIR/conf/ethershare.license”.

program file corrupted, please reinstall

The program checksum did not match. A common reason is that you have transferred your EtherShare installation via FTP and you have forgotten to set FTP to image (binary) mode.

$ESDIR/conf/ethershare.license: %m

The license file could not be opened, probably because it is missing.

no valid EtherShare license found

The license file "$ESDIR/conf/ethershare.license" contains no valid license for EtherShare.

the demo license has expired

EtherShare demo versions run for a limited time, and the license has now expired. Each user is warned at every login to the File Server that he is using a demo version, and also for how many days the license will still be valid. Thus, the expiry should not take effect surprisingly. See **Demonstration keys** in chapter 17.2 "Keys and updates".

the license checksum is invalid

The "Checksum" field in the license does not match the data in the other fields. This should not happen as the installation procedure verifies that a license is valid before entering it into the license file. However, this error message may appear e.g. if you have upgraded from EtherShare 2.2 to EtherShare 2.6 but still use the old key, or when you installed another version of the product to another directory and the data mix up.

the license is not valid on this machine

The "MachID" field of the license does not match the host's machine ID. This might happen if you transfer a complete installation to a new host or if you get a new machine due to a hardware replacement. Contact our license department

for a license transfer (see **Activation Key Transfers** in chapter 17.2 “Keys and updates”).

missing required base license %08lx

The user expansion license did not find the proper base serial number. Verify that you have specified the proper base serial number when requesting the user expansion license from our license department.

17.3.2 “generic” error messages

Most programs issue a generic error message when anything goes wrong for a simple system call.

syscall: %m

Various error messages from system calls are logged-in this form. “syscall” is one of the common system calls (fork, malloc...) and “%m” gives the reason why the call failed. Common reasons like “No more processes” or “Not enough core” point to resource shortages, such as “not enough swap space”, or “process table too small”. Refer to your UNIX documentation for more details.

MPPOpen: %s

The AppleTalk toolkit could not be initialized. This happens if “atalkd” is not running or not a single known interface could be activated. This situation is usually preceded by messages from “atalkd”. The message can also start with “ATPLoad” or “OpenXPP” rather than “MPPOpen”.

PRegisterName: %s

The server in question could not register its name on the network. If "%s" = "Duplicate name exists already", this indicates that the AppleTalk name of the specified EtherShare server is already in use. EtherShare servers by default use the UNIX host name, but you can stop EtherShare on the server in question and rename it using the "name=" parameter in "atalk.conf".

17.3.3 "atalkd" error messages

"atalkd" is the first program started by "start-atalk", and is responsible for configuring the network interfaces. Thus, most of the error messages are concerned with network errors. All error messages are prefixed with "atalkd:". This is left out in the following for brevity. "atalkd" can also issue any of the error messages listed above under 17.3.1 ""license" error messages" and 17.3.2 ""generic" error messages".

Some error messages depend on the class of operating system (OS). "atalkd" divides the variations in two classes: streams-based OS (e.g. Solaris 2.x) and socket-based OS (SGI, RS/6000...).

/dev/ddp: %m

"atalkd" could not open the DDP streams multiplexor. This will happen if the kernel modules are not installed (streams-based OS only).

PopenSkt %s: %s

An error occurred while opening an AppleTalk socket. The first "%s" is the socket (rtmp, nbp...) and the second "%s"

is the error cause. The most likely reason is that an attempt was made to start a second “atalkd” process while one is already running.

addif: garbled interface “%s”

“atalkd” could not understand the syntax of the “if=%s” entry in “atalk.conf”. Use “netconf” (in “$ESDIR”) for network configurations instead.

addif %s: %m

The interface “%s” could not be opened due to “%m”. You will get this error e.g. if you specify a non-existent interface in the “if=” parameter in “atalk.conf” (streams-based OS only).

addif DL_ATTACH_REQ %s to %d: cannot attach

With a streams-based OS, you will get this error if you specify an interface unit number which is not supported by the underlying network driver (e.g. “le2” if you have only “le0” and “le1”).

addif DL_BIND_REQ %s: cannot bind to sap 0x%x

With a streams-based OS, this can happen if the specified service access point is already in use. For example, this could happen if you start “atalkd” twice or if you have another product installed that already uses AppleTalk.

ignoring interface %s, no seed router found

The interface “%s” was supposed to be configured automatically, but no external seed router was found to supply network numbers and zone names. For example, more than

one interface card is installed on your server and none of the network segments has an active seed router.

network range conflict on %s:%d-%d, ignoring interface

The interface “%s” was configured with a network number range that conflicts with other network interfaces. Use the “autoconf” option in “netconf” (in “$ESDIR”) to let “atalkd” automatically configure the interface.

conflicting seed info on %s, using %d-%d instead of %d-%d

The interface “%s” was configured manually to use a particular network range, but an external seed router did supply a different range for this cable segment. “atalkd” will use the value from the external seed router and ignore the manual configuration.

routing conflict on %s from net %d, node %d

While the network was already up and running a new router on network interface “%s” was sending conflicting routing table information. The conflicting information will be ignored. This can happen if a router starts up later (e.g. on a dialup line) or two previously independent AppleTalk networks are merged. All routers that seed that cable segment must be checked for proper configuration.

too many hops via %s to %d (%d)

The routing information received on interface “%s” shows that the maximum hop count of AppleTalk packets would be exceeded attempting to reach network “%d”. Check your AppleTalk network topology in order to provide no network is more than 15 hops away from any other part of the network.

autoconf: socket %m

With a socket-based OS, “atalkd” could not create an AppleTalk socket. If “%m” = “Protocol not supported”, this means that no AppleTalk kernel modules are found in the currently running UNIX. If “%m” = “Can’t assign requested address”, this means that none of the network interfaces specified in “atalk.conf” succeeded to configure.

autoconf %s: SIOCGIFFLAGS %m

“atalkd” could not get the flags associated with interface “%s”. This can happen if the interface specified in the “if=” parameter in “atalk.conf” does not exist (socket-based OS only).

autoconf: SIOCSIFADDR %m

“atalkd” could not set the AppleTalk address for an interface. This happens on all interface cards that do not support AppleTalk.

routine: DDPWrite to %d: %s

The named routine (nbp, rtmp...) could not write a packet to network “%d”. If “%s” = “Network unreachable”, this usually means that network numbers are misconfigured.

rtmp_kupdate: %m

A route could not be added by “atalkd” to the kernel-resident routing table. This usually means that network numbers are misconfigured.

multi_kupdate on %s: %m

"atalkd" could not add a multicast address (functional address on Token Ring) for interface "%s". This can happen if there are too many zones configured for one Phase II network, or if the hardware interface does not support multicast addresses.

register_me: cannot register %s

"atalkd" could not register its serial number on the network. This can happen if you use the same enduser serial number twice on the network, e.g. you have transferred EtherShare to a new host and not deleted the old copy.

nbp_listener: duplicate EtherShare serial

"atalkd" has detected that there is another end user copy of EtherShare on the network which is using the same serial number.

Note: The following "atalkd" error message can only occur with EtherShare 2.6 under Linux:

---

addif: cannot autoconf more than one interface, entry "%s" ignored

With a socket-based OS, "atalkd" can only configure one network interface automatically. All following interfaces are ignored. See appendix A 3.3 "Network automatic configuration option" for more details.

17.3.4 “afpsrv” error messages

“afpsrv” can issue any of the error messages listed above under 17.3.1 ““license” error messages” and 17.3.2 ““generic” error messages”, as well as a few messages related to the communication with “opisrv” and “desksrv” and the “Shared Memory” segment used to hold the file and record locking table.

setrlimit: cannot increase open file limit: %m

The “maxfiles=” parameter specified more open files per process than the current system configuration allows.

cannot create %s: %m

“afpsrv” cannot create the “Shared Memory” segment file “%s” (“$ESDIR/locktable”).

share_fork: cannot reopen %s: %m

“afpsrv” could not open the “Shared Memory” file “%s” (“$ESDIR/locktable”) after forking for a new login. If this file is removed, no one can log in until the next restart of “afpsrv”.

share_brlock: no more locks

The number of record locks issued by clients exceeds the number configured by the “locks=” parameter.

initEvents bind: %m

“afpsrv” could not bind its event listener socket. If the reason is “Address already in use” then this is due to a second master “afpsrv” process running on the same machine.

Bad syntax in %s, line %d

"afpsrv" could not parse file "%s" ("$ESDIR/conf/suffixes") in line "%d". This might happen if you edit the "suffixes" file by hand instead of using the EtherShare Admin.

Added additional error messages for "afpsrv" to indicate potential problems due to corrupted "Shared Memory" segments:

lock_shm: mutex held by non-existent process <ID>

Shows up to indicate that a process has been terminated by UNIX or user.

afpsrv slave process <ID> was killed by signal <signal>, use stop-atalk followed by start-atalk to ensure integrity of shared memory segments

This message can occur on all currently supported platforms and indicates that "afpsrv" slave processes were intentionally killed by a UNIX user.

[Volume name]: RPC: Timed out. Only readonly access possible.

"afpsrv" will try 6 times for 5 seconds each to reach the desktop server to retrieve or store information from/to the desktop database of its volumes. Earlier versions of "afpsrv" tried 3 times for 5 seconds. Although even the older values were a very long time for network or RPC connections, we decided to even extend these values.

If "afpsrv" does not get a response from "desksrv" within this period of time this indicates a severe problem with the underlying UNIX operating system, UNIX file system or

RAID/HSM drivers, or a hardware problem related to SCSI or hard disks.

To prevent inconsistencies between information stored in the desktop databases of an EtherShare volume and the files/folders on this volume, the “afpsrv” client process encountering this time-out will secure this volume (all mounted volumes) against write access. Opening folders and reading files will still be possible, but creating/renaming/moving files or folders will not be possible any longer. Not even trashing files/folders will be allowed.

Apart from the usual messages issued in the UNIX system error log, this message will also be sent to the Macintosh client whose “afpsrv” server process encountered the problem. For more information on the Macintosh client messages refer toafpmsg in chapter 9.4 “Parameters of the “afpsrv” program”.

Since applications usually work with temporary files/folders, it may not be possible to save single files. If this problem was only temporary, unmounting all EtherShare volumes and remounting them will make these volumes writable again. If instead, this was no temporary problem and is not solved in the meantime the Macintosh volume **Chooser** will list all volumes grayed out, and no volume will be mountable. Not even root will be able to mount any of these volumes.

Note: Each time such an error message occurs, EtherShare has to be restarted by entering “stop-atalk” and “start-atalk” respectively, otherwise the File Server is prone to improper operation.

Make sure that the cause of this problem is solved before restarting EtherShare services.

“afpsrv” will now issue error messages on the client if the communication to “desksrv” fails and the volume falls back to read-only access. The message is:

```
Volname: localhost: RPC: Timed out
Only readonly access possible
```

Under certain conditions, an additional error message is issued and the volume is unmounted automatically by the Finder.

Though this message is issued by one “afpsrv” client process only, it is likely that all other “afpsrv” processes may encounter the same problem and therefore, the UNIX system administrator should be notified immediately.

lock_shm flock: Bad file number

“afpsrv” could not lock the “Shared Memory” segment file “locktable”. This might happen if the file was removed using the UNIX command “rm”.

17.3.5 “papsrv” error messages

“papsrv” can issue any of the error messages listed above under 17.3.1 ““license” error messages” and 17.3.2 ““generic” error messages”, as well as a few messages related to the spooling system and to the communication with the client.

SLInit failed for entity %s: %s

"papsrv" could not register its name on the network. This is because the name in the **Chooser** specified by "name=" in "atalk.conf" is already being used by another printer or spooler on the network.

chdir %s: %m

"papsrv" could not change its current directory to the spool directory. Check if the directory specified in the printcap entry really exists and the spelling is correct.

opening dir %s: %m

"papsrv" cannot scan the "dicts" directory for PostScript dictionaries. Check that the "$ESDIR/dicts" directory exists or the "dictdir=" parameter in "atalk.conf" points to the appropriate directory.

%s: %m

If "%s" is an argument to a "filtercmd=" parameter specified in "atalk.conf", then it could not be executed. Check the syntax, it has to be a valid shell command.

execl %s: %m

"papsrv" could not execute the program "%s". This program may be an argument to a "filter=" or "lpr=" parameters in "atalk.conf".

open tmp file %s: %m

"papsrv" could not open the temporary spool file in the spool directory. Check the free space (blocks and inodes) on the disk containing the spool directory.

17.3.6 “termsrv”, “mailsrv” and “admsrv” error messages

“termsrv”, “mailsrv” and “admsrv” can issue any of the error messages listed above under 17.3.1 ““license” error messages” and 17.3.2 ““generic” error messages”. There are only a few other commonly encountered error messages from “mailsrv”.

cannot find mail spool directory

Use `spooldir=` in “atalk.conf”.

cannot find mail send program

Use `mailer=` in “atalk.conf”.

cannot find vacation program

Use `vacation=` in “atalk.conf”.

A more detailed description of the Mail Server parameters and their default settings are described in chapter 14.3 “Parameters of the “mailsrv” program”.

17.3.7 Printer interface errors and status messages

Since, under EtherShare, printer interface programs are referenced by the logical (UNIX) printer name rather than their real name (such as “papif” or “tcpif”) it is neccessary to look up the real program name in the “if” directory as described in chapter 11 “The Print Server”. The following section describes errors using the real program names.

17.3.8 Messages shared by all printer interfaces

The following messages can be issued by any of the printer interfaces.

Usage: %s [-n user] [-h host] [acctfile]

The interface program “%s” was called with missing or wrong parameters.

Cannot create an unique log filename: %m

A temporary file name for saving error output until the real error message file has been established could not be determined. System call failure.

Cannot open log file `%s': %m

The temporary file “%s” for saving error output until the real error message file has been established could not be created. System call failure.

Cannot initialize library libsched.

The “libsched” shared library could not be initialized. Mostly a system call failure.

Cannot initialize library libhelios: Error %d

The “libhelios” shared library could not be initialized. Error is given in “%d”.

Cannot register AppleTalk error handler: %m

AppleTalk error handler could not be registered. System call failure.

Cannot find product locations: %s

None of the locations (directories) of the HELIOS products were found. “%s” is an explanatory error message.

Cannot find HELIOS EtherShare product location.

The HELIOS EtherShare product location (directory) could not be found. Mostly an installation error.

Cannot find executable `%s'.

The executable program could not be found. Mostly an installation error.

Cannot open resource `%s': %s

The named resource “%s” could not be opened. “%s” is an explanatory error message.

Cannot initialize library libprint: %s

The print support library could not be initialized. “%s” is an explanatory error message.

Cannot initialize resource messages `%s': %s

The message string handling for the message block “%s” could not be initialized. “%s” is an explanatory error message.

License initialization failed

License code init failed. Mostly a lack of system resources.

License read failed

License file is seriously corrupted.

No valid license found

No valid license could be found in the license file.

Invalid license

The license found is not valid.

Printer not in printcap

The printer does not have an entry the “/etc/printcap” file.

Missing spooldir entry in printcap

The printer has an entry in the “/etc/printcap” file but lacks the information about its spool directory.

Preference does not exist

A preference requested does not exist. This is mostly an informative message.

The following messages may appear while retrieving information from a printer’s PPD file. They mostly occur because of bad, misformed or damaged PPD files:

Missing REQUEST object

Missing UI object!

Missing KEY object!

Missing group object!

Unknown attribute!

fseek failed!

fread failed!

Syntax error!

Wow...a recursive error! Error in error

Invalid PPD file name!

Cant open file

Syntax error: Missing "!

Error in the translation string

Expected *End key

Unknown object!

Illegal use of attribute GROUP_PROC

Missing Key word

Group proc expected

Mismatched OpenUI, CloseUI!

Missing UI name

Missing order parameter

Missing section parameter

Missing keyword parameter

Missing Key!

Missing Object!

Out of memory!

Invalid value!

Function not executed

Key not found

Function not yet implemented

Line too long!

No more entries available!

'Key-name' not found!

'Key-Option' not found!

'Key-OptionTrns' not found!

'Key-ValueTrns' not found!

'Group-NameTrns' not found!

'UI-NameTrns' not found!

Error while restarting lpd

A fatal error occured while restarting the line printer daemon. Mostly a UNIX system failure caused by a lack of system resources or an already running “lpd”.

No current control file

The current print job does not have an control file. This may occur in case a printer interface program is started manually and not by the “lpd”.

No history information found

The current print job should have a history entry in its control file but none is found. This occurs with damaged control files either created while the system was out of resources or manipulated manually.

No such printer in cap

The printer requested has no entry in “/etc/printcap”.

No such value in cap

The capability requested is not listed in the printer's capabilities.

Output from lpd: %s

The line printer daemon process issued the output "%s" while starting or handling requests. This output normally is an error message and indicates a serious problem of the "lpd" system.

Allocation of %d bytes failed: %m

A memory block of "%d" bytes could not be allocated. This indicates a lack of virtual memory.

Cannot parse filename `%s'

The filename "%s" could not be parsed into its key and path parts. This indicates a configuration error of a preference value.

Cannot open file `%s'

The file "%s" could not be opened. This indicates an access problem either because the file does not exist or there are not enough privileges to open the file.

Cannot find spool directory for printer `%s': %s

The spool directory for printer "%s" does not exist. "%s" is an explanatory error message.

Cannot open printer queue `%s': %s

No information could be gathered for printer queue “%s”. This indicates a configuration error. “%s” is an explanatory error message.

Cannot query status for queue `%s': %s

The status of the printer queue “%s” could not be determined. This indicates a configuration error. “%s” is an explanatory error message.

Cannot read control file for current job: %s

The control file of the current print job cannot be read. This indicates a damaged or missing control file. “%s” is an explanatory error message.

Cannot rewrite control file `%s': %s

The modified print job’s control file could not be written. This indicates a UNIX system call failure. “%s” is an explanatory error message.

Cannot open job history file `%s': %m

The print job’s history file could not be opened due to a UNIX system call failure.

Cannot seek in job history file `%s': %m

The print job’s history file could not be sought due to a UNIX system call failure.

Cannot seek in job log file: %m

The print job's message log file could not be sought due to a UNIX system call failure.

Cannot write to job history file `%s': %m

Writing to a print job's history file failed due to a UNIX system call failure.

Cannot write to job log file: %m

Writing to a print job's message log file failed due to a UNIX system call failure.

Cannot add job history to control file: %s

The job history file entry could not be appended to a job's control file. "%s" is an explanatory error message.

Cannot find resource `%s': %s

The HELIOS resource "%s" could not be found. This indicates a corrupted program file. "%s" is an explanatory error message.

Cannot create stream from pagecount string: %m

A file stream could not be created due to a system call failure.

Cannot fstat() `%s': %m

Information on an open file could not be retrieved due to a UNIX system call failure.

Cannot query hold queue status: %s

The status of the hold queue for the current job's printer queue could not be queried. "%s" is an explanatory error message.

Cannot copy job to hold queue: %s

The current print job could not be copied to the hold queue after job completion. "%s" is an explanatory error message.

Cannot restart hold queue: %s

The hold queue could not be restarted after a job had been copied. "%s" is an explanatory error message.

Cannot query error queue status: %s

The status of the error queue for the current job's printer queue could not be queried. "%s" is an explanatory error message.

Warning: Cannot query queue status: %s

The status of printer the queue for the current job could not be queried. "%s" is an explanatory error message.

Cannot disable queue after fatal error: %s

The status of the printer queue for the current job could not be changed. "%s" is an explanatory error message.

Cannot copy job to error queue: %s

The current print job could not be copied to the error queue after job completion. "%s" is an explanatory error message.

Cannot restart error queue: %s

The error queue could not be restarted after a job had been copied. “%s” is an explanatory error message.

Error while writing accounting file

An error occured while writing to the EtherShare printer accounting file. This is mostly due to a UNIX system call failure in case no space is left on the disk.

Cannot mail to print job initiator: missing user name

A printer interface program could not send mail to a print job’s originator because the originator is unknown.

No mailer program found

A printer interface program could not find the required program for delivering mail to a print job’s originator. This is mostly caused by an inappropriate system installation.

Cannot read from job log file: %m

A UNIX system call error occured while reading from the job’s message log file.

Error while opening mailer: %m

A printer interface program could not start the required program for delivering mail to a print job’s originator. This is mostly caused by an inappropriate system installation.

Error while writing to mailer

A UNIX system call failed while piping data to the mailer program. This is mostly caused by an unexpected abortion of the mailer program due to e.g. a lack of resources.

Cannot copy data to `%s': %m

A UNIX system call failure occured while copying data to a file or location “%s”.

Error while writing to `%s': %m

A UNIX system call failure occured while writing data to the file “%s”.

Cannot reopen file `%s': %m

A UNIX system call failed while trying to reopen the just created file “%s”.

Cannot open file `%s': %m

A UNIX system call failed while trying to open the file “%s”.

Cannot open pipe to `%s': %m

A UNIX system call failed while trying to open a pipe to the program “%s”.

Error during read: %m

A UNIX system call failed while reading data from a file.

Error while writing: %m

A UNIX system call failed while writing data to a file.

Cannot parse PostScript: %s

An error occured while parsing PostScript data. “%s” is an explanatory error message.

Cannot create temporary string stream: %m

A UNIX system call failed while creating a temporary stream.

Cannot initialize OpenImage

The OpenImage library could not be initialized. This mostly happens in case EtherShare has not started correctly. More error output follows after this text.

Cannot set OpenImage parameter

An error occured while setting an OpenImage parameter. More error output follows after this text.

Cannot include procset `%s': %m

The required procset “%s” could not be included into the PostScript print jobs due to a UNIX system call failure.

Unknown or illegal option `%s'

The unknown or illegal option “%s” was supplied to a printer interface program.

Missing font `%s'

The required font “%s” could not be found and the option “checkfonts” is switched on. Therefore printing is aborted.

Warning: cannot open font file `%s': %m

The required font “%s” could not be found and the option “checkfonts” is switched off. Therefore printing is continued.

Cannot read directory `%s': %m

The UNIX directory “%s” could not be enumerated due to a UNIX system call failure.

Warning: cannot find procset file `%s' %s %s

The required procset “%s” version “%s” revision “%s” could not be found. This error is ignored due to real world programs which mostly generate wrong procset references which can be ignored without messing up the print job.

Missing version in procset file `%s'

The procset file “%s” does not contain a version string and therefore is ignored.

Cannot move font to fontlist: %s

An error occured while moving font information between internal lists. “%s” is an explanatory error message.

Your print job has been interrupted.

A print job has been canceled by user request.

Printing disabled due to a fatal error. Please inspect system and printer logs.

A fatal error occured while initializing a printer interface program. This error will be a persistent system failure and would cause the following print jobs also to fail. Therefore the printer queue has been stopped until the cause of the failure has been eliminated. The queue has to be restarted manually by using the EtherShare Admin.

Error on printing device:

A serious error occured on a printing device. More error output follows this message.

PostScript error on printing device:

A PostScript error occured on a printing device. More error output follows this message.

Warning: Cannot set RSS limit to %dkB: %m

The “Resident Set Size” UNIX parameter could not be changed to “%d Kilo bytes”.

Warning: PPDCreate failed: %s

A PPD file query request could not be established. “%s” is an explanatory error message.

Warning: PPDSend failed: %s

A PPD file query failed. “%s” is an explanatory error message.

Warning: Cannot open PPD file `%s': %m

The PDD file “%s” could not be opened due to a UNIX system call failure.

Warning: Cannot open PPD file `%s': %s

The PDD file “%s” could not be opened due to error “%s”.

Cannot add execution op

An internal execution operation failed. This mostly occurs in case the system is low on virtual memory. More error output follows after this text.

Warning: Execution of DSC comment `%s' failed (ignored)

The execution of the DSC comment “%s” failed but can be ignored.

Error while executing DSC comment `%s'

The execution of the DSC comment “%s” failed. The print job does continue printing but the result may not be as expected.

Fatal error while executing DSC comment `%s'

The execution of the DSC comment “%s” failed. The print job is aborted.

Error while reading from PostScript stream

An error occured while reading from a PostScript data stream. Mostly an explanatory error message follows.

Cannot insert registered fonts: %s

An error occured while registering font information in internal lists. “%s” is an explanatory error message.

Cannot read from file: %m

A UNIX system call failed while reading from a file stream.

Cannot create string stream: %m

A UNIX system call failed while creating a stream.

17.3.9 “balanceif” error messages:

Cannot get job history from control file: %s

The job history file reference in the control file of the current print job is required but missing or damaged.

Missing parameter `%s' in `%s'

The parameter “%s” is missing in file “%s”.

No printer queues for balancing available

The list of balanced queues is empty.

Cannot copy job to queue `%s': %s

An error occured while copying a job from the balance queue to the balanced queue “%s”. “%s” is an explanatory error message.

Cannot restart queue `%s': %s

The balanced queue “%s” could not be restarted. “%s” is an explanatory error message.

Cannot rename `%s' to `%s': %m

A UNIX system called failed while renaming file “%s” to “%s”.

17.3.10 “diskif” error messages:

Command `%s' be must a named pipe or executable

The configured notify program “%s” is neither an executable program nor a named pipe.

Cannot start command `%s': %m

The notify program could not be started due to a UNIX system call failure.

Cannot stat `%s': %m

Information about the file “%s” could not be gathered due to a UNIX system call failure.

`%s' must be a directory

The file “%s” must be a UNIX directory.

Cannot create file `%s': %m

The file “%s” could not be created due to a UNIX system call failure.

Cannot write to `%s': %m

The “diskif” program could not write data to the file “%s” due to a UNIX system call failure.

PostScript resolving failed

An error occured while resolving the PostScript print job. Mostly more error messages follow this text.

Read failed: %m

A read UNIX system call failed.

Cannot copy to `%s': %m

A UNIX system call failed while copying the PostScript print job to the file “%s”.

Error while closing output: %m

A UNIX system call failed while flushing and closing the PostScript output file.

Error while writing to `%s': %m

A UNIX system call failed while piping PostScript data to an executable program or named pipe “%s”.

Cannot convert `%s' to UNIX path

The configured directory for placing resolved PostScript print jobs is in an unknown notation and cannot be converted to a UNIX filename.

Cannot lock `%s'

The file “%s” could not be locked for exclusive access.

Cannot create output discipline for requested compression `%s'

The requested compression method could not be created.

Attention: Disk full. Waiting for disk free space becoming available...

The disk space went low while creating the PostScript output file. In this case the “diskif” program stops and waits until more disk space is available.

Free disk space available. Continuing writing to output file

The “diskif” returned to normal operation after waiting for disk space to become available.

17.3.11 “papif” error messages:

The following error messages are issued by the “papif” printer interface program.

NBPExtract failed: %s

Extraction of the AppleTalk address obtained from an NBP lookup failed. “%s” is an explanatory error message.

PPAPOpen failed: %s

Initiating open of a PAP connection failed. “%s” is an explanatory error message. It can also appear if AppleTalk sockets are exhausted.

PPAPOpen completion failed: %s

An AppleTalk error occured while trying to open the PAP connection. “%s” is an explanatory error message.

Cannot find printer `%s'

The PAP printer “%s” could not be found on the network. Mostly this indicates that the printer is switched off.

ATPLoad failed: %s

An error occured while loading an AppleTalk protocol module. “%s” is an explanatory error message.

Cannot initiate PPAPRead: %s

An error occurred during “establish read data” from a PAP connected printer. “%s” is an explanatory error message.

Cannot initiate PPAPWrite: %s

An error occurred during “establish write data” to a PAP connected printer. “%s” is an explanatory error message.

PPAPRead failed: %s

An error occured while reading data from a PAP connected printer was in progress. “%s” is an explanatory error message.

PPAPWrite failed: %s

An error occured while writing data to a PAP connected printer was in progress. “%s” is an explanatory error message.

PPAPNetworkInfo failed: %s

An error occured while retrieving network address of a PAP connected printer. “%s” is an explanatory error message.

PPAPStatus failed: %s

An error occured while gathering status information from a PAP connected printer. “%s” is an explanatory error message.

Cannot open file from string: %m

A UNIX system call failed while creating a file stream from a string buffer.

17.3.12 “psof” error messages:

The following error message is issued by the “psof” printer output filter.

Cannot open banner file `%s': %m

The bannerfile “%s” cannot be opened for reading. This indicates the failure of a UNIX system call.

17.3.13 “psif” error messages:

The following error messages are issued by the “psif” printer interface program.

Cannot set non-blocking mode to serial line: %m

A UNIX system call failed while setting the serial line into a non-blocking mode.

Cannot get attention of printer

The printer cannot be accessed.

Writing to printer failed: %m

A UNIX system call failed while writing data to a serially connected printer.

Read from printer failed: %m

A UNIX system call failed while reading data from a serially connected printer.

17.3.14 “psresolve” error messages:

Usage: %s [-o options] [PrinterName]

A illegal or wrong option was given or an argument is missing while running the “psresolve” program from the command line.

Cannot write to output file: %m

A UNIX system call failed while writing the resolved PostScript data to disk. This indicates mostly that there is not enough disk space available.

17.3.15 “shmif” error messages:

Cannot find shared memory printer `%s'

Cannot connect to the printer with key “%s”.

Error while opening shared memory printer `%s': %m

An error occured while opening the “Shared Memory” interface.

Warning: cannot get maximum write size (using default size %d bytes): %m

A UNIX system call failed while retrieving information about the maximum size for a write operation.

Warning: cannot send EOF to shared memory printer: %m

A UNIX system call failed while signaling EOF to the “Shared Memory” printer.

Warning: cannot interrupt shared memory printer: %m

A UNIX system call failed while signaling an interrupt to the “Shared Memory” printer.

Cannot request I/O buffer from shared memory: %m

A UNIX system call failed while accessing the “Shared Memory” buffer space.

Cannot release I/O buffer to shared memory: %m

A UNIX system call failed while accessing the “Shared Memory” buffer space.

Cannot read from shared memory: %m

A UNIX system call failed while reading data from the “Shared Memory” printer.

Cannot receive from shared memory: %m

A UNIX system call failed while reading status messages from the “Shared Memory” printer.

17.3.16 “tcpif” error messages:

The following error messages are issued by the “tcpif” printer interface program.

Cannot find protocol `%s'

The TCP/IP protocol is missing in the UNIX system databases. Please check your UNIX network configuration.

Cannot find host `%s'

The host with name “%s” is missing in the UNIX “/etc/hosts” database. Please check your UNIX network configuration.

Cannot find service `%s' for protocol `%s'

The service “%s” specified in the UNIX “/etc/services” database is missing, or the service is not supported in conjunction with protocol “%s”. Please check your UNIX network configuration.

Cannot open socket: %m

Cannot create a socket for TCP/IP network usage. This indicates the failure of a UNIX system call.

Cannot open reserved port: %m

Cannot open a reserved network port to connect to a “Remote LPR”.

Connect to printer `%s' failed: %s

Cannot connect to the TCP/IP internetworked printer. This indicates the failure of a UNIX system call.

Cannot shutdown tcp connection: %m

A UNIX system call failed during shutdown of the TCP/IP network connection to the printer.

Writing to remote failed: %m

The connection to the “Remote LPR” “%s” is broken. This might be caused by a crash of host “%s”.

Connect to remote lpd on `%s' failed: %s

Connecting to a remote “lpd” on host “%s” failed. “%s” is an explanatory error message.

Read from remote failed: %m

A UNIX system call failed while reading data from a TCP/IP connected printer.

Cannot set non-blocking I/O on tcp connection: %m

A UNIX system call failed while setting the TCPI/IP connection into non-blocking mode.

Cannot create name for temporary file

A temporary file used for storing resolved PostScript data could not be created.

Cannot write to file: %m

A UNIX system call failed while writing data to a temporary file.

Error while copying file: %m

A UNIX system call failed while copying PostScript data from a temporary stream into the output stream.

Error while writing to file: %m

A UNIX system call failed while writing PostScript data into the output stream.

Lost connection to printer `%s' on `%s': %m

Lost TCP/IP connection while talking to printer “%s” on host “%s”.

Lost file: %m

A recently created file cannot be accessed anymore.

No space on remote; waiting for queue to drain

The “lpd” on the remote system signals that its queue has no disk space left to store the print job.

Cannot send to remote; queue full

The “Remote LPR” printer “%s” will not accept a print job any longer because the remote queues are overfilled.

File `%s' changed size

The transfer of file “%s” to a “Remote LPR” failed because the local and transferred size of the file differ.

Appendix

A 1: Sample configurations

atalk.conf: main configuration file

"atalk.conf" in "$ESDIR/conf" is the main configuration file for the EtherShare programs. The following example (figure A-1) shows a sample configuration for the AppleTalk protocol stack ("atalkd"), the File Server ("afpsrv"), the Print Server with three printers (three "papsrv" entries, "lw" and "ps"), the Terminal Server ("termsrv"), the Mail Server ("mailsrv"), and the Administration Server ("admsrv").

The AppleTalk protocol stack is connected to the AppleTalk network via an Ethernet interface (interface="le0..."). The network number 10 will be assigned as a Phase II network to zone "EtherZone". The UNIX host's node number will be larger or equal to 140.

The File Server has been assigned the name "isis". Guest access is enabled (guestid=...). As a security feature, it is not possible to save passwords on the local Macintosh hard disk (nosavepasswd) and the minimum password length is 7 characters (minpwlen=...).

The Print Server will show the names of three printers in the Macintosh's **Chooser** window ("SilentSpooler", "TCPSpooler", and "SerialSpooler", specified by name=...). Print jobs can be passed to the logical printers "lw", "ps" and "Laser2" (specified by printer=...). "lw" is defined as the AppleTalk Printer "Silentwriter" in zone "LocalZone" (entity=...). "ps" is defined as the TCP/IP stream printer with service port number 4000 on internet

host 192.9.200.1. “Laser2” is defined as the printer connected to local host port “ttyb”, which designates a serial (RS-232) interface in this example.

The Terminal Server will use a VT100 emulation.

The Mail Server will notify recipients immediately if mail is received (biff), check every 30 seconds for incoming mail (mailinterval=...) if “biff” is otherwise occupied, and send mail with the UNIX “sendmail” program (mailer=...).

The Administration Server has been assigned the name “AdminServer” (name=...), The maximum number of workstations that can use the Administration Server at the same time is 8 (sessions=...).

```
# $ESDIR/conf/atalk.conf
#
atalkd:  if=“le0:10-10:140:EtherZone”
         if=“le1:20-20:140:OtherZone”
afpsrv:  name=“isis”, guestid=macuser,
         nosavepasswd, minpwlen=7
papsrv:  name=“SilentSpooler”, printer=“lw”
lw: entity=“Silentwriter:LaserWriter@LocalZone”
papsrv:  name=“TCPSpooler”, printer=“ps”
ps:      host=192.9.200.1, service=4000
papsrv:  name=“SerialSpooler”, printer=“Laser2”
termsrv: term=vt100
mailsrv: biff, mailinterval=30,
         mailer=/usr/lib/sendmail
admsrv:  name=“AdminServer”, sessions=8
```

Fig. A-1: Example of “$ESDIR/conf/atalk.conf”

/etc/printcap: UNIX printer configuration file

The example for “/etc/printcap” (see figure A-2) contains the required entry for the three printers “lw”, “ps” and “Laser2”. The “lw” entry directs data to an AppleTalk printer via the interface program “papif”, here: “lw”

(/usr/local/es/if/lw). The “ps” entry directs data to a TCP/IP printer via the interface program “tcpif”, here: “ps” (“/usr/local/es/if/ps”). The “Laser2” entry directs data to a serially connected PostScript printer via the interface program “psif”, here: “Laser2” (“/usr/local/es/if/Laser2”).

```
# /etc/printcap
#
lw:\
    :lp=/usr/local/es/lprdevdir/lw:\
    :if=/usr/local/es/if/lw:\
    :of=/usr/local/es/psof:\
    :sh:mx#0:du#0:sf:\
    :sd=/usr/spool/lw:\
    :af=/usr/local/es/printer.acct:\
    :lf=/usr/spool/lw/lw-log:
ps:\
    :lp=/usr/local/es/lprdevdir/ps:\
    :if=/usr/local/es/if/ps:\
    :of=/usr/local/es/psof:\
    :sh:mx#0:du#0:sf:\
    :sd=/usr/spool/ps:\
    :af=/usr/local/es/printer.acct:\
    :lf=/usr/spool/ps/ps-log:
Laser2:\
    :lp=/dev/ttyb:\
    :br#9600:rw:fc#0000374:\
    :fs#0000003:xc#0:xs#0040040
    :of=/usr/local/es/psof:\
    :if=/usr/local/es/if/Laser2:\
    :sh:mx#0:du#0:sf:\
    :sd=/usr/spool/Laser2:\
    :af=/usr/local/es/printer.acct:\
    :lf=/usr/spool/Laser2/Laser2-log:
```

Fig. A-2: Example of “/etc/printcap”

afppasswd: AFP user list

The file “$ESDIR/conf/afppasswd” contains an entry for every Macintosh user who is allowed access to the EtherShare File Server. It is optionally created by calling the “$ESDIR/etc/mkafppasswd” program, in order to create the “AFP user list” and thus provide additional AFP security. Three users and the administrator (“root”) are shown in

this example (see figure A-3). The entry after the user's name is the encrypted password of the user. If the AFP user list exists, the password is inserted automatically by the File Server (by calling the "afppasswd" program) whenever the **Change Password...** function is used in the **Chooser**, and should not be inserted manually.

```
# $ESDIR/conf/afppasswd
#
root:8c9373c57a229c7a
David:723bd87a5c623214
Tim:2095abc56eff899a
Doris:6abc295d9ace901c
```

Fig. A-3: Example of "$ESDIR/conf/afppasswd"

You can delete this file if you do not want the additional security it provides (see **mkafppasswd** in chapter 9.9 "File Server utility programs" for details).

The corresponding UNIX password file may look like the following (note that, in this example, passwords have not yet been allocated for users David, Tim and Doris):

```
root:HCg9Cb2AhPkqE:0:0:System Admin:/:/bin/csh
David::152:16:David Smith:/usr/home/David:/bin/sh
Tim::154:16:Tim Arty:/usr/home/Tim:/bin/sh
Doris::201:18:Doris Lovely::/bin/date
```

Fig. A-4: Example of "/etc/passwd"

In this example, user "David" has the user number 152. His primary group is group number 16, his full name is "David Smith" and his home directory is "/usr/home/David". If he logs on to UNIX directly, he will get the UNIX Bourne

shell. User “Tim” has the user number 154 and his primary group is also group number 16. His full name is “Tim Arty” and his home directory is “/usr/home/Tim”. Like David, he will get the UNIX Bourne shell. User “Doris”, however, will not get any home directory and has a disabled shell. Her full name is “Doris Lovely”, she has the user number 201 and belongs to the primary group 18.

/etc/group: UNIX group list

The file “/etc/group” contains an entry for every group on the UNIX host, both UNIX groups, and EtherShare groups. Two groups are configured in this example (see figure A-5). The group “Projects” has the group number 21 and its members are users David and Tim. The asterisk (“*”) in the password field specifies that it is not possible to switch to this group dynamically after logging in. The group “MacUsers” has the group number 18 and its sole member is Doris.

```
Projects:*:21:David,Tim
MacUsers::18:Doris
```

Fig. A-5: Example of “/etc/group”

afpvolumes

The file “$ESDIR/conf/afpvolumes” contains an entry for each public File Server volume. In this example (figure A-6), four public volumes have been configured: “EtherShare Applications”, “EtherShare”, “Projects” and “MO Disk”. Each user’s optional private volume list, which is disabled by default, (“.afpvolumes” in the user’s home directory) has the same format.

“EtherShare Applications”, “EtherShare” and “Projects” are accessible to members of the “helios” group, “EtherShare Applications” is also accessible to the “developers”

group. “MO Disk” is accessible to the “developers” group only.

For space reasons, the first line starting “/usr/...” and ending “...developers” is shown on two lines in figure A-6; in reality, it is a single line without a hyphen in “read-only”.

```
# $ESDIR/conf/afpvolumes
#
/usr/macapps:EtherShare Applications::fixed:read-
only:helios,developers
/usr/ethershare:EtherShare::fixed:readwrite:helios
/usr/Projects:Projects::fixed:readwrite:helios
/mo:MO Disk::changeable:readwrite:developers
```

Fig. A-6: Example of “$ESDIR/conf/afpvolumes”

Font Directory

Figure A-7 shows an example of “$ESDIR/psfonts/FontDirectory”.

```
Helvetica
ZapfDingbats
Bookman-Light
Bookman-LightItalic
BrushScript
Centennial-Bold
Centennial-BoldItalic
Centennial-Italic
Centennial-Light
Centennial-LightItalic
Centennial-Roman
Chicago
Futura-Condensed
Futura-CondensedBold
Futura-CondensedLight
Futura-CondensedLightOblique
Futura-CondensedOblique
Futura-CondExtraBoldObl
Garamond-Bold
Garamond-BoldItalic
Garamond-Light
Garamond-LightItalic
NewCenturySchlbk-Bold
NewCenturySchlbk-BoldItalic
NewCenturySchlbk-Italic
NewCenturySchlbk-Roman
```

Fig. A-7: Example of “$ESDIR/psfonts/FontDirectory”

Appendix

A 2: Files in the EtherShare directory

The following directory listing shows all files created in the "$ESDIR" file system after installation.

The "$ESDIR" directory contains the "install" program (which uses "machid"), the AppleTalk protocol stack ("atalkd"), all server programs ("afpsrv", "afppasswd", "papsrv", "psof", "papif", "psif", "diskif", "balanceif", "shmif", "holdif", "tcpif", "termsrv", "timesrv", "lpd", "mailsrv", "admsrv", "desksrv", etc.), the "pstext" program with its configuration file, printer and server accounting files, a README file, and some user utility and test programs ("atechoping", "rebuild", "dt", "start-atalk", "stop-atalk", "poll", "vpoll", "swho" (which uses "stmp"), "netconf", and "zones").

The "$ESDIR/etc" directory contains a script to mount/unmount removable volumes ("mount-afp"), two scripts used by the EtherShare Admin to update Yellow Pages information ("yp-update") and to restart the "papsrv" ("restart-pap"), some internal utility programs ("forall" , "mkafp-passwd"), the "uninstall" script and sub-programs, templates for the "install" program, and sample files.

The "conf" directory contains the following EtherShare configuration files: the public volumes list ("afpvolumes"), the optional AFP user list ("afppasswd"), the main config-

uration file (“atalk.conf”), the mail program address book (“addressbook”), the licensing file “ethershare.license”, the extension mappings file “suffixes”, the EtherShare servers list “servers”, and the IP-access list “afpipaccess”.

The “dicts” directory contains corrected Apple dictionaries, the HELIOS dictionaries, and the dictionary for the “Linotype color separation” process.

The “kernel” directory contains UNIX drivers (AppleTalk etc.) for various machine and interface types.

The “macapps” directory (the Macintosh volume “EtherShare Applications”) contains the Macintosh applications “EtherShare Admin”, “Helios Terminal”, “Helios Mail”, and the “EtherShare Client Installer” as well as the “Admin Plug-Ins” directory (containing the Japanese localization plug-in for the EtherShare Admin), and the “Time Server”.

Macintosh files are stored on the host in two parts – the data file and the resource file. The latter is stored in the resource directory. In the case of Macintosh applications (as distinct from documents), the program code is stored in the resource file only, and the data file will have zero length.

The “macapps/Helios Terminal” directory (“Helios Terminal” folder on the “EtherShare Applications” volume) contains “Helios Terminal”, tools, drivers and utilities needed by the toolbox, and a README file.

The “macapps/Helios Mail” directory (“Helios Mail” folder on the “EtherShare Applications” volume) contains the Macintosh program “Helios Mail”, the mail notification program “Helios Mail Init”, and a README file.

The “macapps/Unsupported” directory (“Unsupported” folder on the “EtherShare Applications” volume) contains the “HELIOS LanTest” and an “About LanTest” file.

The “macapps/Time Server” directory (“Time Server” folder on the “EtherShare Applications” volume) contains the “Time Server” and a README file.

The “psfonts” directory (initially empty) is used to store the Print Server’s download PostScript fonts.

The actual listings depend on the machine type and may vary slightly. For space reasons, the columns “owner” and “group” were omitted in this manual. However, if you call up a directory listing (`ls -lR`) in your EtherShare directory those two columns are part of the list, of course.

Directory listings

```
$ pwd
/usr/local/es
$ ls -lR
total 8814
-rw-rw-r--  1     3938 Mar  12 1999  Manifest
-rw-r--r--  1     5610 Mar  12 1999  README
-rw-r--r--  1     4297 Sep  14 10:57 Versions
-rwxr-xr-x  1   207358 Mar  12 1999  admsrv
-rwsr-xr-x  1    34900 Mar  12 1999  afppasswd
-rwxr-xr-x  1   189305 Mar  12 1999  afpsrv
-rwxr-xr-x  1    17268 Mar  12 1999  atechoping
-rwxr-xr-x  1   308522 Mar  12 1999  balanceif
drwxrwsr-x  2     1024 Sep  14 10:56 conf
-rwxr-xr-x  1   176949 Mar  12 1999  desksrv
drwxrwsr-x  2     1024 Sep  14 10:46 dicts
-rwxr-xr-x  1   333074 Mar  12 1999  diskif
-rwxr-xr-x  1   558484 Mar  12 1999  dt
drwxrwsr-x  2     1024 Sep  14 10:47 etc
-rwxr-xr-x  1   308054 Mar  12 1999  holdif
-rwxr-xr-x  1     3685 Mar  12 1999  install
drwxrwsr-x  2     1024 Sep  14 10:46 kernel
-rwxr-xr-x  1    92936 Mar  12 1999  lcheck
```

```
drwxrwsr-x  2     1024 Sep  14 10:46 lib
-rw-rw-rw-  1   700416 Dec  16 15:00 locktable
-rws--s--x  1    42832 Mar  12 1999  lpc
-rws--s--x  1    60732 Mar  12 1999  lpd
-rws--s--x  1    34516 Mar  12 1999  lpq
-rws--s--x  1    26080 Mar  12 1999  lpr
drwxrwsr-x  2     1024 Sep  14 10:46 lprdevdir
-rws--s--x  1    26268 Mar  12 1999  lprm
drwxrwsr-x  8     1024 Sep  14 10:57 macapps
-rwxr-xr-x  1    58948 Mar  12 1999  machid
-rwxr-xr-x  1    80562 Mar  12 1999  mailsrv
-rwxr-xr-x  1   333366 Mar  12 1999  papif
-rwxr-xr-x  1   122506 Mar  12 1999  papsrv
-rwxr-xr-x  1    17256 Mar  12 1999  poll
-rw-rw-r--  1        0 Sep  14 10:47 printer.acct
drwxrwsr-x  2     1024 Sep  14 10:46 psfonts
-rwxr-xr-x  1   334058 Mar  12 1999  psif
-rwxr-xr-x  1    17268 Mar  12 1999  psof
-rwxr-xr-x  1   323974 Mar  12 1999  psresolve
-rwxr-xr-x  1    50114 Mar  12 1999  pstext
-rwxr-xr-x  1    45914 Mar  12 1999  rebuild
-rw-rw-rw-  1        0 Sep  14 10:47 server.acct
-rwxr-xr-x  1   459992 Mar  03 18:41 shmif
-rwxr-xr-x  1     5267 Sep  14 10:47 start-atalk
-rw-rw-rw-  1      320 Sep  14 11:01 stmp
-rwxr-xr-x  1     1550 Sep  14 10:47 stop-atalk
-rwxr-xr-x  1    17368 Mar  12 1999  swho
-rwxr-xr-x  1   341990 Mar  12 1999  tcpif
-rwxr-xr-x  1    45605 Mar  12 1999  termsrv
-rwxr-xr-x  1    35913 Mar  12 1999  timesrv
-rwxr-xr-x  1   168660 Mar  12 1999  vpoll
-rwxr-xr-x  1    17252 Mar  12 1999  zones

./conf:
total 12
-rw-rw-rw-  1        0 Sep  14 10:47 addressbook
-rw-r--r--  1      381 Sep  14 10:47 afpipaccess
-rw-r--r--  1      103 Sep  14 10:47 afpvolumes
-rw-r--r--  1      122 Sep  14 10:47 atalk.conf
-rw-r--r--  1      101 Sep  14 10:56 ethershare.license
-rw-r--r--  1       63 Sep  14 10:47 servers
-rw-r--r--  1       21 Sep  14 10:47 suffixes

./dicts:
total 132
-rw-r--r--  1    30871 Mar  12 1999  _AppleDict_md__68_0
-rw-r--r--  1    35206 Mar  12 1999  _AppleDict_md__70_0
```

```
./etc:
total 738
-rw-r--r--  1     2716 Mar  12 1999  ESmodes
-rwxr-xr-x  1     8415 Sep  14 10:47 activate
-rwxr-xr-x  1    26160 Mar  12 1999  afpmsg
-rwxr-xr-x  1    25876 Mar  12 1999  afpshutdown
-rwxr-xr-x  1      160 Sep  14 10:47 dirname
-rwxr-xr-x  1      837 Sep  14 10:47 es.daily
-rwxr-xr-x  1      363 Sep  14 10:47 forall
-rwxr-xr-x  1    17240 Mar  12 1999  ifstat
-rwxr-xr-x  1     1354 Sep  14 10:47 kconfig
-rwxr-xr-x  1      930 Sep  14 10:47 logrotate
-rwxr-xr-x  1    17048 Mar  12 1999  lsif
-rwxr-xr-x  1     1540 Sep  14 10:47 mkafppasswd
-rwxr-xr-x  1      711 Sep  14 10:47 mkipaccess
-rwxr-xr-x  1      543 Sep  14 10:47 mount-afp
-rwxr-xr-x  1    16728 Mar  12 1999  nl
-rwxr-xr-x  1     8575 Sep  14 10:47 prginstall
-rwxr-xr-x  1      184 Sep  14 10:47 procstat
-rwxr-xr-x  1      280 Sep  14 10:47 rc.atalk.rhappc
-rwxr-xr-x  1      324 Sep  14 10:47 restart-pap
-rwxr-xr-x  1      343 Sep  14 10:47 rmtrash
-rwxr-xr-x  1    17472 Mar  12 1999  setmode
-rwxr-xr-x  1      753 Sep  14 10:47 stop-afp
-rwxr-xr-x  1    16680 Mar  12 1999  suser
-rwxr-xr-x  1   124932 Mar  12 1999  tic
-rwxr-xr-x  1     1633 Sep  14 10:47 uninstall
-rwxr-xr-x  1     1464 Sep  14 10:47 update-versions
-rwxr-xr-x  1     3318 Sep  14 10:47 usrinstall
-rwxr-xr-x  1    67356 Mar  12 1999  uwhat
-rw-r--r--  1     1581 Mar  12 1999  vt200.ti
-rwxr-xr-x  1      187 Sep  14 10:47 yp-update
-rw-r--r--  1    10388 Sep  14 10:47 ypMakefile

./kernel:

./lib:
total 5426
-r-xr-xr-x  1  1375411 Mar  12 1999  libOI_s.a
-r-xr-xr-x  1    89556 Mar  12 1999  libddpi_s.a
-r-xr-xr-x  1    41816 Mar  12 1999  libdl_s.a
-r-xr-xr-x  1  1070412 Mar  12 1999  libhelios_s.a
-r-xr-xr-x  1   169728 Mar  12 1999  libimgfmt_s.a
-r-xr-xr-x  1    71824 Mar  12 1999  libsched_s.a
-r-xr-xr-x  1   193644 Mar  12 1999  libsfdisc_s.a
-r-xr-xr-x  1   124520 Mar  12 1999  libsfio_s.a
```

```
-r-xr-xr-x  1   149432 Mar  12 1999  libtoolkit_s.a

./lprdevdir:

./macapps:
total 656
drwxrwsr-x  4     1024 Sep  14 10:46 AdminPlug-Ins
-rw-rw-r--  1   322894 Mar  10 1999  EtherShare Admin
-rw-rw-r--  1     2116 Jun  16 1997  EtherShare Client Ins
drwxrwsr-x  3     1024 Sep  14 10:47 Helios Mail/
drwxrwsr-x  3     1024 Sep  14 10:46 Helios Terminal/
drwxrwsr-x  3     1024 Sep  14 10:46 Time Server/
drwxrwsr-x  3     1024 Sep  14 10:46 Unsupported/

./macapps/Admin Plug-Ins:
total 2
drwxrwsr-x  3     1024 Sep  14 10:46 International/

./macapps/Admin Plug-Ins/International:
total 0
-rw-rw-r--  1        0 Mar   3 1999  Japanese*

./macapps/Helios Mail:
total 266
-rw-rw-r--  1   130178 Mar   8 1999  Helios Mail
-rw-rw-r--  1        0 Mar   3 1999  Helios Mail Init
-rw-rw-r--  1      840 Feb  24 1997  READ ME

./macapps/Helios Terminal:
total 114
-rw-rw-r--  1        0 Mar  10 1999  AppleTalk ADSP Tool
-rw-rw-r--  1    51261 Mar   3 1999  Helios Terminal
-rw-rw-r--  1      489 Sep   9 1998  READ ME
-rw-rw-r--  1        0 Oct  20 1998  VT320 Tool
-rw-rw-r--  1        0 Feb  24 1997  VT320Font

./macapps/Time Server:
total 2
-rw-rw-r--  1      518 Feb  27 1997  READ ME
-rw-rw-r--  1        0 Mar   3 1999  Time Server

./macapps/Unsupported:
total 208
-rw-rw-r--  1     7588 Sep   9 1998  About LanTest
-rw-rw-r--  1    92582 Sep   9 1998  Helios LanTest

./psfonts:
```

```
./terminfo:
total 8
drwxrwsr-x  2     1024 Sep  14 10:46 d
drwxrwsr-x  2     1024 Sep  14 10:46 s
drwxrwsr-x  2     1024 Sep  14 10:46 v
drwxrwsr-x  2     1024 Sep  14 10:46 x

./terminfo/d:
total 4
-rw-r--r--  1     1505 Mar  12 1999  dtterm

./terminfo/s:
total 6
-rw-r--r--  1     1019 Mar  12 1999  sun
-rw-r--r--  1     1049 Mar  12 1999  sun-cmd

./terminfo/v:
total 16
-rw-r--r--  1     1143 Mar  12 1999  vt100
-rw-r--r--  1     1137 Mar  12 1999  vt102
-rw-r--r--  1      959 Mar  12 1999  vt200
-rw-r--r--  1      959 Mar  12 1999  vt220
-rw-r--r--  1     1286 Mar  12 1999  vt300

./terminfo/x:
total 4
-rw-r--r--  1     1378 Mar  12 1999  xterm
```

Appendix

A 3: Configuring EtherShare as an AppleTalk network router

A 3.1 General remarks

The HELIOS “netconf” utility offers a very convenient user interface for network configuration.

Note that HELIOS “netconf” only is a configuration tool. Messages, like information about whether “Automatic configuration” is possible or not, are issued by the respective server programs, not by “netconf” itself.

“netconf” automatically recognizes and displays the network interfaces that are supported by EtherShare, i.e. Ethernet, FDDI, and Token Ring. Even though it is possible to enter new interfaces not yet known to EtherShare, you should keep in mind that these new interfaces may, under certain conditions, cause a system crash.

You do not need stop EtherShare before configuring your interfaces and zones with “netconf”. However, you have to stop and start EtherShare after the work is done in order to let the new configuration take effect.

You can use the HELIOS “vpoll” program to check your network for existing zone information. See **The HELIOS vpoll program** in chapter 4.5 “Verifying the UNIX installation” for a more detailed description of this program.

A 3.2 Example network setups

The following figures show example network setups with one NIC (Network Interface Card) up to four NICs:

Single Network

Figure A-8 shows a network setup comprising a server (with one NIC), two clients, and a network printer. This configuration is simple because all nodes are attached directly to the bus.

Fig. A-8: Network with 1 NIC

Internet with router and two NICs

In the second example configuration the setup again comprises one server, but now with two NICs. The server has to link two networks, which enclose two clients each. Additionally, a network printer is connected to one of the “single” networks (see figure A-9). A set of single networks, linked together by routers and forming a larger network, is called *internet*.

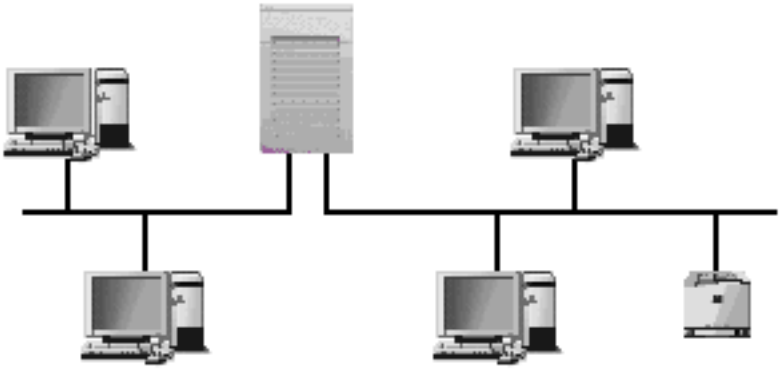

Fig. A-9: An internet with 2 NICs and one router

Internet with two routers and 2+2 NICs

In the last example configuration (figure A-10) three single network segments form an internet. Two servers route the networks via four (2+2) NICs. The nodes (see **Node** in chapter A 11: “Glossary”) in each segment are accessible from any other network in this particular internet.

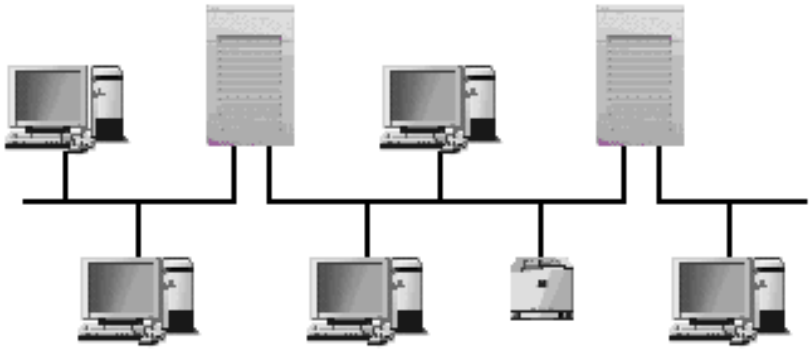

Fig. A-10: An internet with 2+2 NICs and two routers

A 3.3 Network automatic configuration option

If your EtherShare host only has a single network interface, or you do not want to configure EtherShare as a “seed device” (see below), EtherShare’s AppleTalk protocol stack can be configured to “interrogate” network numbers and zone information automatically each time it loads, and thus avoid the necessity of manually specifying these parameters during EtherShare configuration. This situation is automatically recognized by the install script. If automatic configuration is possible, you will get the following message when you select the menu item

```
Configure AppleTalk network numbers:

This system has only one network interface in-
stalled, thus there is no need to configure any
network numbers
```

If only one interface is existing, the installation program does not allow manual configuration with “netconf”.

Note: The “Automatic configuration” option requires other AppleTalk routers to be connected up and online during EtherShare startup. If it does not detect any available external routers it starts in single-network mode.

For all EtherShare-supported UNIX operating systems (except for Linux) , the “Automatic configuration” option is also allowed if you have more than one network interface.

In such cases, you can allow automatic configuration by omitting the `Configure AppleTalk network numbers` step during installation.

Automatic configuration is enabled by a simplified interface specification in the EtherShare main configuration file "atalk.conf" as follows:

```
atalkd: if=<interface name>
```

Example for Solaris 2.x with a single Ethernet interface:

```
atalkd: if=le0
```

Example for Solaris 2.x with two Ethernet interfaces:

```
atalkd: if=le0, if=le1
```

The entries are inserted automatically by the "install" script for all recognized hardware interfaces.

To reinstate automatic configuration after you have already configured the interfaces with `Configure AppleTalk network numbers` during EtherShare installation, you need to edit "atalk.conf" manually and insert appropriate entries as shown above – or start "netconf" as described in chapter A 3.5 "Manual network configuration".

A 3.4 Seed routers, non-seed routers

If, in addition to EtherShare, your network includes other, external routers, or if it includes certain other types of AppleTalk entities such as a “Novell Netware for Macintosh” file server, then it is necessary to specify network numbers and zone information for each physical segment in your network. Routers are configured in accordance with the manufacturer’s instructions. The EtherShare configuration is described below.

When you consider an example network with two standalone routers, you can either “hard-configure” both routers with identical zone information, or configure one of them to “interrogate” the zone information broadcast by the other one. In the first case, both routers are so-called “seed” routers. In the latter case, one of the routers is a “seed router”, since it is responsible for broadcasting the zone information, and the other router is a passive, “non-seed” device.

The latter case requires less work, because you only have to hard-configure one of the routers. If you change the configuration of the seed router, the non-seed router automatically reconfigures itself after a short delay. Of course, this will require EtherShare to be restartet.

However, the first case is technically safer because the network is left completely without zone information if the seed router fails or loses power. This can cause serious disruption of your entire network.

EtherShare can be configured as a “seed” device by manually configuring the network connection as described below. However, even if you have chosen to use EtherShare’s “Automatic configuration” option instead, it is still not a

true non-seed router, because it only "interrogates" network numbers and zone information of the local network segments once, when the AppleTalk module loads, and not on-the-fly like a conventional non-seed router. Nonetheless, it always adjusts automatically to changed network numbers and zone names of remote network segments (on the far side of external routers), of course.

You can use the HELIOS "vpoll" program to check your network for existing zone information. See **The HELIOS vpoll program** in chapter 4.5 "Verifying the UNIX installation" for a more detailed description of this program.

A 3.5 Manual network configuration

Automatic configuration is described earlier in this appendix, and also in chapter 4 “Installation”. Manual configuration is only necessary if automatic configuration is not possible or not desired.

The `Configure AppleTalk network numbers` option of the installation script edits the EtherShare configuration by calling the routine “$ESDIR/netconf”. We strongly recommend that you configure your network connection in this way, and not by editing the “atalk.conf” file, because “netconf” checks the validity of your entries, and in particular the use of valid network numbers.

Note: If required, you may see paragraph **atalkd** in chapter 8.3 “The AppleTalk protocol stack” for technical details of network configuration parameters in “atalk.conf”.

➢ Start “netconf” with the `Configure AppleTalk network numbers` option of the installation script. Alternatively, if you have already finished the installation and quit the installation script, you can start “netconf” with the following UNIX command:

```
cd /usr/local/es (or current EtherShare directory)
./netconf
```

Important: You should not run “netconf” from a terminal connection on one of the Macintosh computers. Always run it on the host’s console. Otherwise, you cannot stop and restart EtherShare after you have finished (using “stop-atalk” and “start-atalk”), because the “stop-atalk” command would cut the connection to the server.

The “netconf” startup screen shows the program’s main menu (see figure A-11).

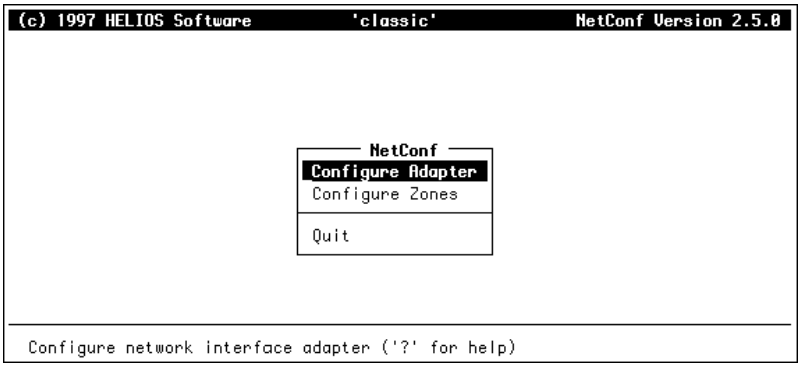

Fig. A-11: Main menu of the “netconf” program

Using “netconf”

The following keys are available to handle the “netconf” program:

- TAB key: navigate within a “netconf” dialog
- CTRL -J, CTRL -K (or ARROW keys): navigate within a list of items
- “+” and “-”: (un)mark items from a list
- ESC key: quit the current dialog

Further keys that are required in a specific dialog only, are listed in the bottom line of the respective dialog. Alternatively, they are described in the help windows.

Online help system

“netconf” includes a convenient online help system which can be activated by pressing “?”. An example is shown in figure A-12.

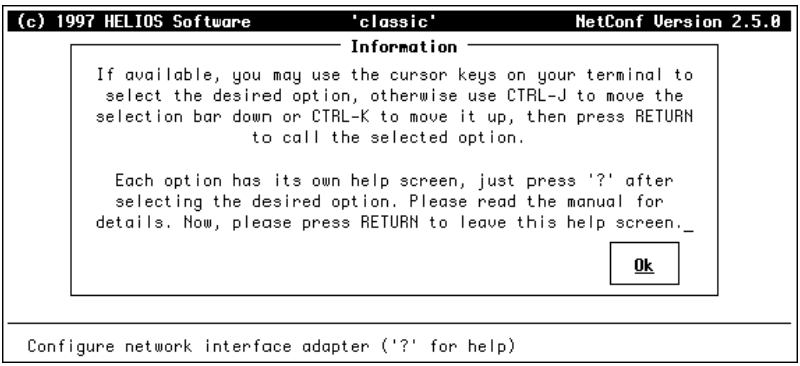

Fig. A-12: The “netconf” online help system

General remarks

Please note that:

- “netconf” gets its information from the “atalk.conf” file.
- If you are making an upgrade installation, the “install” program automatically preserves your previous “atalk.conf” file so that previously entered zone, network, and printer information, etc. do not get lost.
- If you de-activate one interface temporarily, the configuration will also be saved in “atalk.conf”, and will be available again on re-activating the interface.
- If you have an IBM RS/6000 host, note that two logical interface names exist for each card. “et0” is used for AppleTalk (and is used by EtherShare), and “en0” is used for TCP/IP. You should see in the list an “et0” entry for the AppleTalk connection and an “tr0” entry if your host has a “Token Ring” interface as well.

Configure Adapter

The `Configure Adapter` option from the main menu lets you see the list of interfaces that are available.

Figure A-13 shows a network with one single interface only, where no configuration is necessary. If you pressed RETURN in order to open the configuration dialog a corresponding information message would pop up.

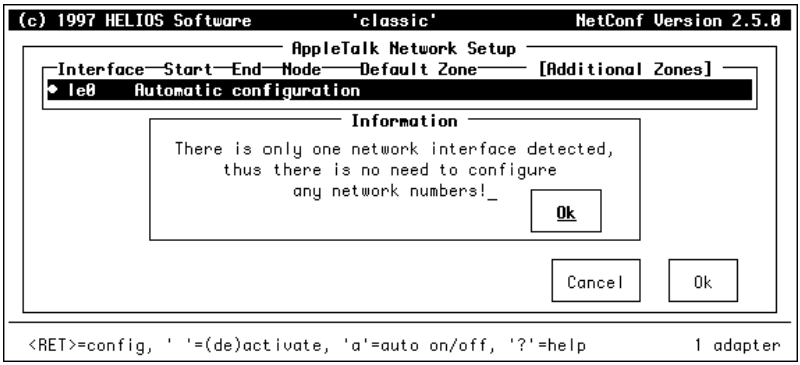

Fig. A-13: The “No need to configure” information message

List of interfaces / Adding an interface entry

Figure A-14 shows a network with two interfaces. As mentioned before, “netconf” automatically checks for all recognized Ethernet interfaces in your host and shows them on the screen. If an interface cannot be recognized it will be missing in the list. In that case, you can press CTRL-V (on some machines it may be necessary to press CTRL-V two times) to open a dialog that lets you enter a new interface. This dialog is shown in figure A-15. For instructions on how to fill in the dialog, please read paragraph **Changing an interface entry** below.

Remember that for a new entry, you need to know the correct name of the interface and whether it supports AppleTalk. Incompatibilities may cause system crashes.

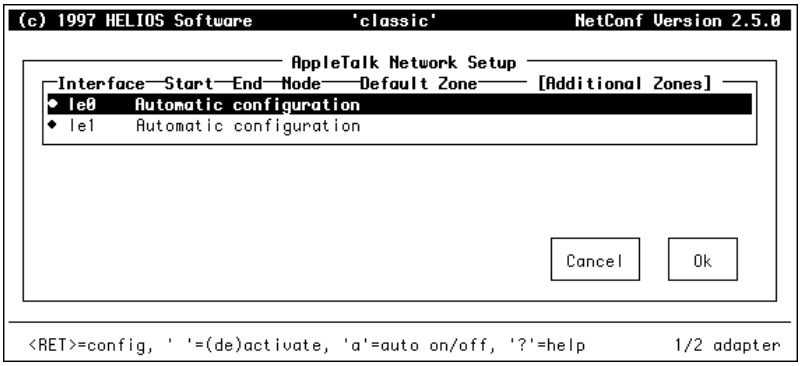

Fig. A-14: Network with two interfaces

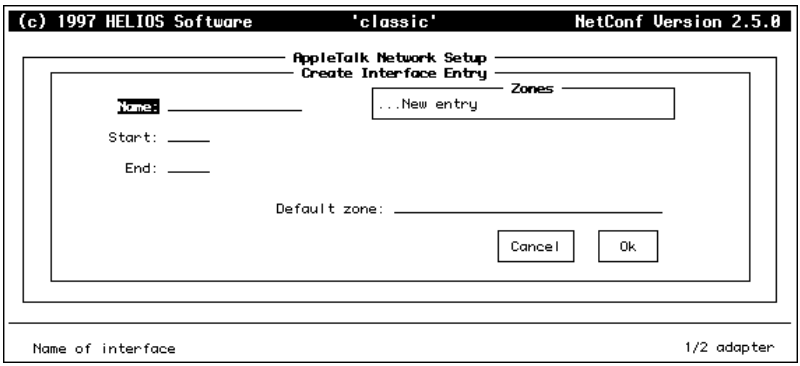

Fig. A-15: Creating a new interface entry

Changing an interface entry

If you want to change the configuration of an existing interface, you have to switch off automatic configuration by using the “a” key, and then press RETURN.

Note that you can enter a manual configuration and then switch between *active* and *non-active*. The manual settings will be stored in the “atalk.conf” file when you switch on automatic configuration, and they will be available when you switch automatic configuration off again.

Figure A-16 shows the dialog window that lets you change the configuration of a particular interface.

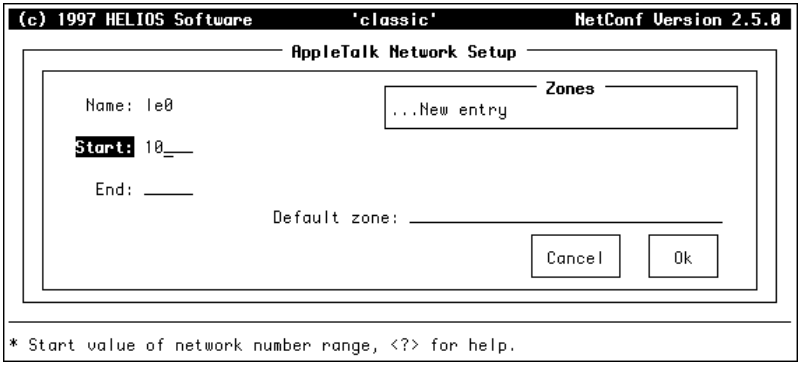

Fig. A-16: Changing the configuration of interface “le0”

In the above dialog, you have to enter a network number range from `Start – End`, where `Start` can be equal to `End`.

If you have either an external or an internal router, a valid number for `Start` and `End` is any number between 0 and 65279. Numbers between 65280 and 65534 are only used if you do not have a router, otherwise they are reserved. Note

that EtherShare provides an internal router automatically if you have more than one network connection, as in this example.

Each range, e.g. `10-10`, allows approx. 250 entities (nodes).

The correct choice of the network number range is subject to the following restrictions:

- If you have no router (i.e. only one internal Ethernet connection in your host and no other, external routers) do always use the “Automatic configuration” option.
- If you want to connect your host to an external router box on the same network segment (cable), you must use the same network number range (`Start - End`) and the same zone names in the same order as the router. Please refer to the router’s manual to find out how to determine its configuration. This is often done with a configuration program on a Macintosh attached to the router.
- If an external router broadcasts information that differ from the configuration you have entered, you will receive a warning when EtherShare starts. The system will always rely on the router’s information, in that case, and will ignore your entries.
- If your host has more than one network connection, as in this example, network numbers and network number ranges must be unique and must not overlap each other or those of other, external routers to which you do not want to establish a connection.

- If you have two internal Ethernet interfaces and want to route between Phase II and a (rather old) Phase I connection, the network number `Start` must be equal to the network number `End` (e.g. 30–30). This may require reconfiguring external Phase II routers (if you have any) accordingly.

Note: Phase I connections are no longer supported by EtherShare.

Proceed to the “Zones” list in the dialog and press RETURN to open a second dialog that lets you specify the name of the default zone for the current interface (see figure A-17). You can use the “New Zone” dialog again to define additional zones for the interface later.

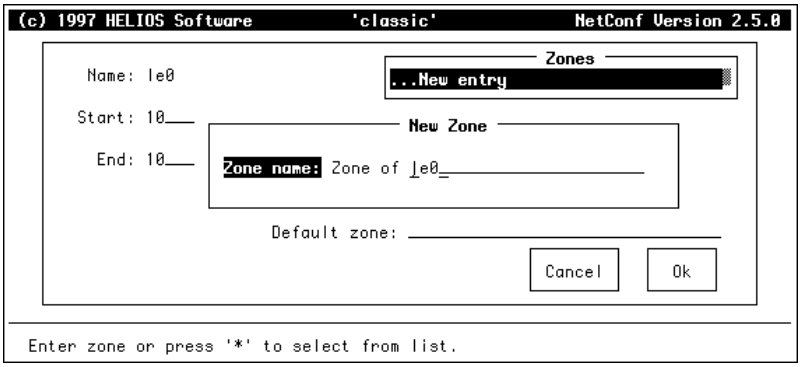

Fig. A-17: Entering an individual zone name

When entering names, please keep the following in mind:

- Zone names may have up to 31 characters.

- After entering the default zone name, you can enter additional zone names for the same network number range.
- If you want to connect your host to an external AppleTalk router box, you must use exactly the same zone name(s) in the same order as the router. Please refer to the router's instruction manual to find out how to determine its configuration. This is often done with a configuration program on a Macintosh attached to the router.
- If an external router provides one or more zone names for the local network segment, you must either specify all of them or none of them. In the latter case, EtherShare "interrogates" the router for the names. This is, however, less safe, as described in chapter A 3.4 "Seed routers, non-seed routers" above.
- If your network has more than 12 zones, they can be specified by editing the "atalk.conf" file manually.
- If you want to replace an entry, use the BACKSPACE key first to delete the existing one.
- In the "New Zone" dialog, you can use the "*" key to open a pop-up menu that shows all recently used zone names.

Figure A-18 shows the completed dialog. The settings will be saved on selecting the `Ok` button and then appear in the list of interfaces as illustrated in figure A-19.

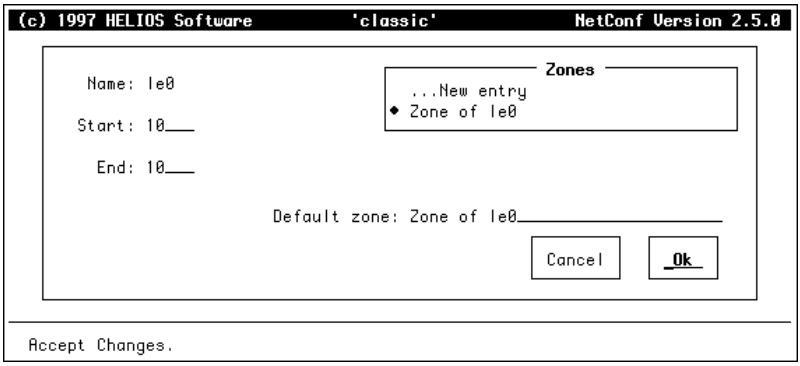

Fig. A-18: Saving the settings in the interface dialog

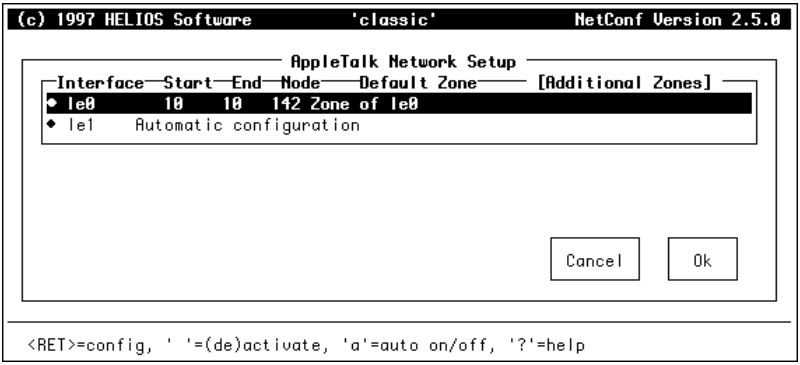

Fig. A-19: List of interfaces showing the new settings for “le0”

Figure A-20 shows the dialog for the interface “le1”. In that dialog, we have entered two zones, and have made the second one the default zone by pressing the SPACE key.

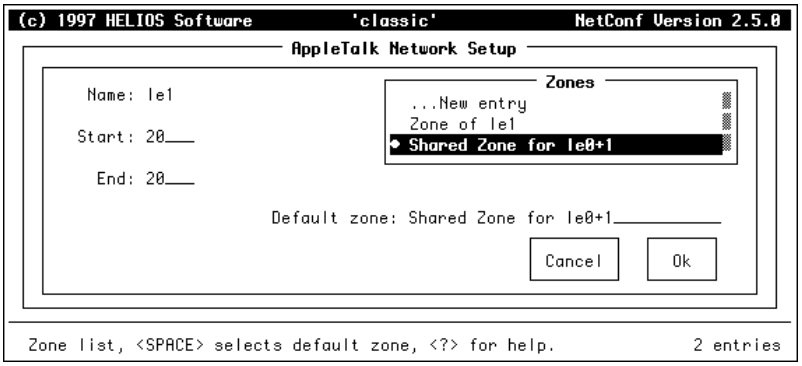

Fig. A-20: Adding zones to an interface and changing the default zone setting

The final example configuration is shown in figure A-21. The configuration includes two interfaces with two zones each. One of the zones is a shared one.

You can now press the ESC key to return to the main menu and then select item `Configure Zones` to register the available zones (see figure A-22).

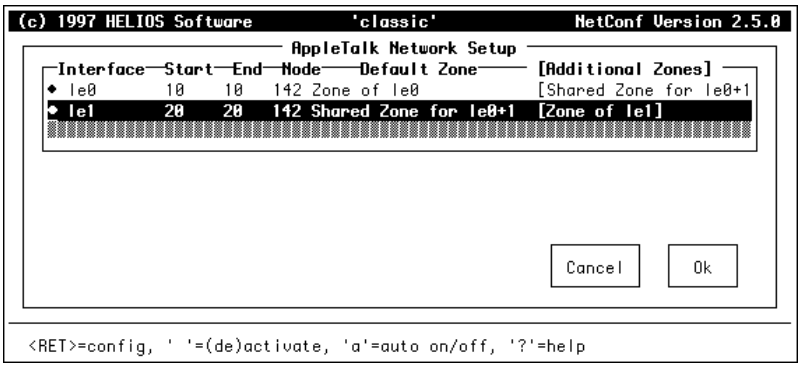

Fig. A-21: Example of a final adapter configuration

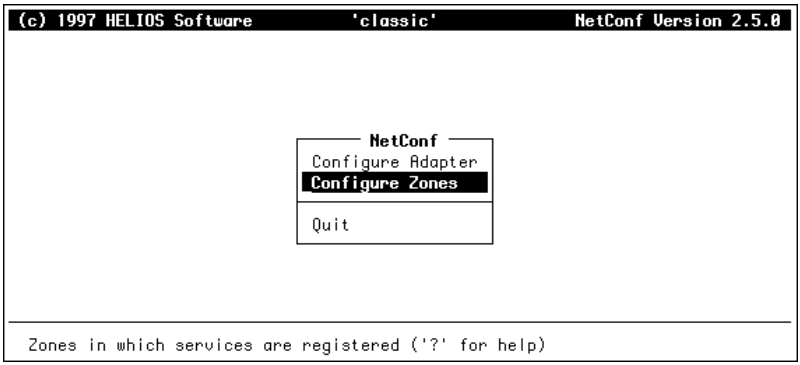

Fig. A-22: Opening the “Configure Zones” dialog

Figure A-23 shows the dialog that lets you register zones, i.e. specify zones where EtherShare services should be listed.

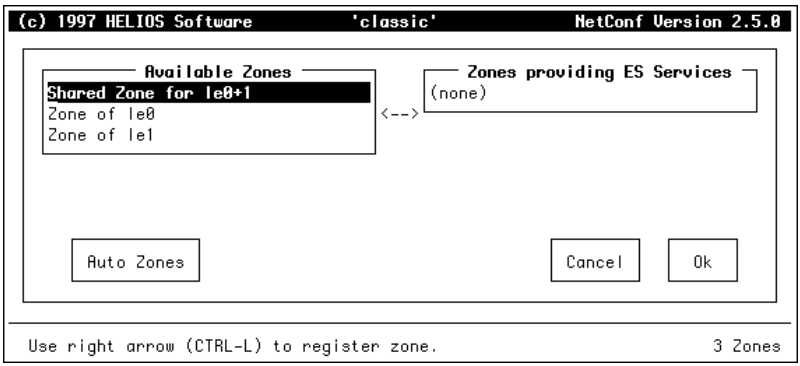

Fig. A-23: Moving entries between two lists of zones

You can move a zone between the left and right column of the dialog by using the CTRL-L, or the CTRL-H key. This is illustrated in figures A-23 above and A-24 below.

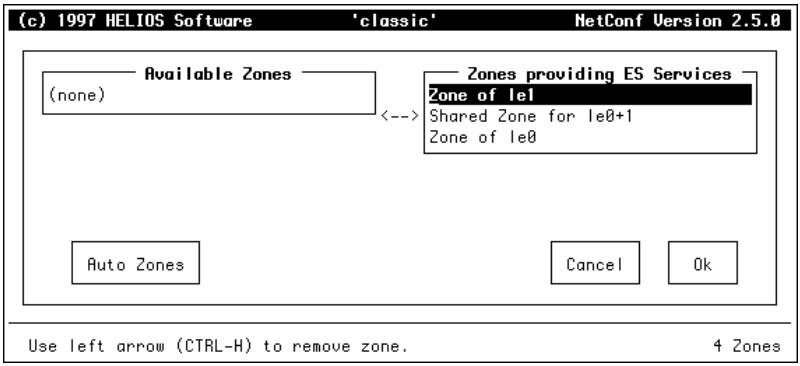

Fig. A-24: Removing items from “Zones providing ES Services”

The `Auto Zones` button in the dialog can be used to make sure that for each active interface at least one of its zones is registered.

EtherShare services can only be registered in local zones, i.e. in zones that have been set up on a network segment (cable) which is directly connected to the server.

Note: The lists in the dialog ("Available Zones" and "Zones providing ES Services") would be empty if "Automatic configuration" was activated.

Priorities in "atalk.conf"

In "atalk.conf", the line "atalkd" indicates the zones that are available. The line "zones" will be checked by all starting server processes (such as "afpsrv", "papsrv", ...) to find out in which zones they have to register. In case the line "zones" is missing in "atalk.conf", and there is no "zone=" entry for the server, the server processes will register in the default zone. The default zone can be seen when using the `zones -l` command on a UNIX shell. In the list of zones, the default zone is marked by a "*".

Reconfiguring network connections

If your network changes (on segments where EtherShare is installed) , for example if you have added a new router, you can use "netconf" again to reconfigure the network connection at a later date, without re-installing EtherShare. To do this, stop EtherShare from the host's console using the "stop-atalk" command, start the "install" program, and select menu item

```
Configure AppleTalk network numbers.
```

The connections will be active as soon as you restart EtherShare with "start-atalk".

If you have chosen the “Automatic configuration” option rather than manual configuration with “netconf”, all you need to do is stop EtherShare with “stop-atalk” and restart it again – EtherShare’s AppleTalk protocol stack will “interrogate” the network numbers and zone information again when it re-loads.

Appendix

A 4: EtherShare utility programs

The following utility programs are provided with EtherShare.

HELIOS LanTest

HELIOS LanTest is a tool for testing and measuring the performance of AppleShare services. It offers detailed AppleTalk network evaluations for file and record locking as well as for many typical file system operations. LanTest results can be used for finding bottlenecks, for troubleshooting, or just for maintenance purposes.

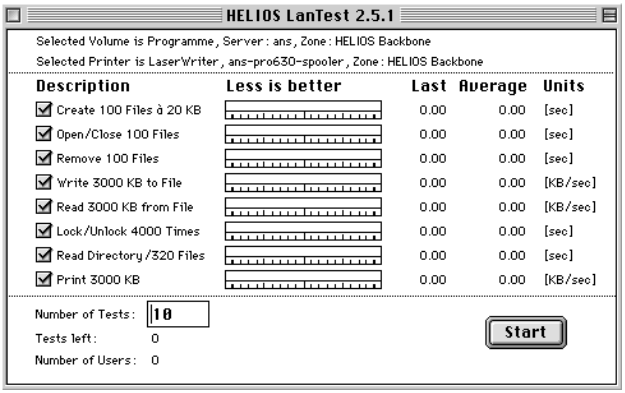

Fig. A-25: HELIOS LanTest dialog window

The LanTest tool resides on the “EtherShare Applications” volume in the folder “Unsupported”. After double-clicking

on the program icon the LanTest dialog window (see figure A-25) opens.

From the **File** menu choose **Select Test Volume...** and confirm with the **Select "<Volume name>"** button. Before you start examining the performance you should state the type of your network:

From the **Edit** menu choose **Edit Other Settings...** and – in the upcoming dialog window – select the net type you are connected to (see figure A-26). 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.

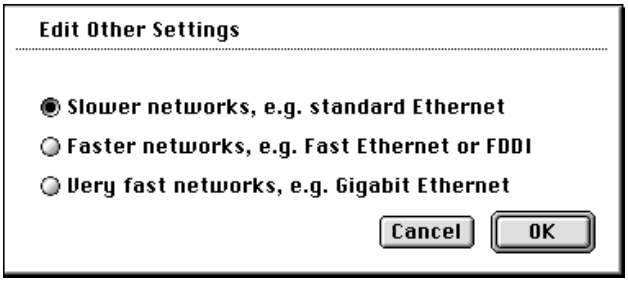

Fig. A-26: Other settings dialog window

This is sensible since FDDI or Fast Ethernet (100 Mbit/s) networks have a higher data throughput than the standard Ethernet (10 Mbit/s). The new Gigabit Ethernet is very fast and reaches a data throughput up to 1 Gbit/s (1000 Mbit/s).

logrotate

Log files such as printer or server log files are being modified with each new login on the respective server. To maintain a certain order, they can be allocated a particular file name extension, e.g. by an ascending numbering. For ex-

ample, the printer log file which records the entries of today may be named `printer.acct`, the one with yesterday's entries `printer.acct.0` and so on.

It may be reasonable to determine a cycle after which the oldest log file is discarded, e.g. after one week. The EtherShare utility program `logrotate` coordinates the "rotation" of the log files with the following parameters:

```
logrotate [-n numlogs] [-m mode] [-o owner]
          [-g group] logfile
```

The next line shows a practical example:

```
logrotate -n 6 -m 664 -o John -g helios printer.acct
```

`6`	number of accumulated log files before `logrotate` starts the "rotation"
`664`	octal expression for the file access rights, i.e. "owner" and "group" have the right to *read* and *write*, whereas "others" are just allowed to *read* the file
`John`	owner of the file
`helios`	group to which the file is allocated
`printer.acct`	log file name

Preferences

The programs "prefrestore", "prefdump", and "prefvalue" can be used to create and update the EtherShare, PC Share*, EtherShare OPI 2.1*, PDF Handshake*, and Print Preview* preferences file "$ESDIR/conf/Preferences".

* only if installed on the same server

Usage:

```
prefrestore [-p PreferencesFile] ASCIIPreferenceExport
```

`PreferencesFile` is the binary preference database file which imports the preferences from ASCIIPreferenceExport. Any old preferences are deleted then.

If omitted, the default file “$ESDIR/conf/Preferences” will be taken.

`ASCIIPreferenceExport` is a text file, normaly exported from the preference file using prefdump, which builds the new preference file.

Dumping preferences into a readable form can be done using prefdump.

Usage:

```
prefdump [-o AsciiPreferenceExport] [PreferencesFile]
```

`PreferencesFile` is the binary preference database file which exports the preferences. If omitted, the default file “$ESDIR/conf/Preferences” will be taken.

If `ASCIIPreferenceExport` is specified the preference database will be exported to that file. If omitted, the preference database will be printed to “stdout”.

Setting and retrieving single entries of the preference database can be done using the program “prefvalue” found in “$ESDIR/etc”.

Usage:

```
prefvalue -k Keys [-d] [-t type] [-p PreferenceFile]
[-f valuefile||value]
```

PreferenceFile is the binary preference database file to use. If omitted, the default file "$ESDIR/conf/Preferences" will be taken.

`Valuefile` is a pathname of a file to print a preference value to or read a preference value from. If omitted `stdout` respective `stdin` will be used.

`Keys` is a single string conatining the key strings for the preference delimited by "/" characters. To set an OPI preference system wide, the first key element is OPI. To set a preference for a specific program, the first key element is the name of the program (for example "opisrv"). To set a preference for all printers, the first key element is "If". To set a preference for a specific printer, the first key element is the UNIX name of the printer. Please keep in mind that key names are case sensitive!

`Value` is the value the preference will be set to.

`Type` is one of the following and may only be used when setting a preference:

Type	Value is
bool	TRUE or FALSE
int	a signed (32 bit) integer value

uint	an unsigned (32 bit) integer value
int64	a signed (64 bit) integer value
uint64	an unsigned (64 bit) integer value
double	a floating point number
ulist	a list of unsigned integers separated by comma
str	a string
strlist	a list of strings separated by comma
data	The value cannot be taken from the command line and therefore requires a valuefile specified

To get the current value of a preference only specify a key.

To set a preference value, specify a key, type and value together.

To delete a preference, specify a key and the `-d` option.

A list of recognized keys can be found in the file "$ESDIR/etc/OpenImagePreferences".

A few examples:

To add a color alias for 'Process Black' to 'Black' for system wide use, specify:

```
prefvalue -k 'Opi/ColorAliases' -t strlist "Process
Black=Black"
```

To set the layout creator to “UNIX” for the “opisrv” program only, specify:

```
prefvalue -k 'opisrv/LayoutCreator' -t str 'UNIX'
```

To set the “nice increment” value for all printer interfaces to 10, specify:

```
prefvalue -k 'If/NiceIncr' -t uint 10
```

To set the “Resolve All” option for the printer “lw” only, specify:

```
prefvalue -k 'lw/ResolveAll' -t bool true
```

Appendix

A 5: Standard UNIX utility programs

The following standard UNIX tools can help you when configuring EtherShare and diagnosing network problems. Other UNIX tools, such as “swho”, “poll”, “netstat”, “zones”, “vpoll”, and “machid”, are described elsewhere.

hostname, uname, arp

Your UNIX host name must never include a slash (“/”) character (for example “my_rs/6000”). It is best to use lower case characters only, no spaces, no underlines and no punctuation marks except hyphen.

A slash causes problems with EtherShare, PCShare and other UNIX programs. This is because “/” is also the directory path separator. AIX does not return an error message if you use the “/” character in your host name.

The procedure to follow to determine the host’s name and internet address depends on the UNIX operating system type, and sometimes on its version, too. The following programs are often available:

The “hostname” command (BSD systems) or the “uname” command (System V systems) can be used to determine a UNIX computer’s host name. Call “uname” with the “-n” switch (`uname -n`). Use the “-a” switch instead to see your operating system version, too.

“arp” is used to display and edit the UNIX host’s “internet address/computer name” conversion table. If the “arp”

command includes a computer name as a command line argument, it tries to get more information on the specified computer, including its internet address. Although the conversion table does normally not contain information on your own host, it is still often possible to determine its internet address in this way, for example:

```
ibm $ <path>/arp ibm
0021-237 arp:  The entry ibm (192.9.200.11) is not
               present in the local arp table.
```

ifstat

This tool ("$ESDIR/etc/ifstat") is used to determine, for each built-in network interface, the AppleTalk and TCP/IP configurations.

```
ans$ ifstat

lo0: flags 134744075<UP,BROADCAST,LOOPBACK
     SIMPLEX,NOECHO> mtu 16896
       inet 127.0.0.1 netmask 255.0.0.0 broadcast
       127.255.255.255
en3: flags 134744163<UP,BROADCAST,NOTRAILERS
     RUNNING,SIMPLEX,NOECHO> mtu 1500
       inet 172.16.0.1 netmask 255.255.252.0
       broadcast 172.16.3.255
       atalk locable 20 hicable 30 net 20 node 143
en0: flags 134744163<UP,BROADCAST,NOTRAILERS
       RUNNING,SIMPLEX,NOECHO> mtu 1492
       atalk locable 31 hicable 40 net 31 node 142
```

The parameters `locable 31 hicable 40` replace the formerly used `range 31-40`.

Appendix

A 6: Data backup with “dump” and “restore”

Under UNIX, hard disks are usually subdivided into partitions, each being allocated to a particular logical device. The “2” partition usually specifies the entire disk. Information on disk partitioning can be displayed with a UNIX program (e.g. “format” under Solaris 2.x), and the corresponding logical devices can be determined by inspecting the “vfstab” file. The “df” (disk free) program shows how much of the disk space is already allocated:

```
$ cat /etc/vfstab

/dev/dsk/c0t0d0s0 /dev/rdsk/c0t0d0s0 /      ufs  1  no
/dev/dsk/c0t0d0s3 /dev/rdsk/c0t0d0s3 /space ufs  2  yes
```

```
$ df -k
Filesystem          kbytes    cap.    Mounted on
/dev/dsk/c0t0d0s0   1984230   79%     /
/dev/dsk/c0t0d0s3   6484885   34%     /space
```

“dump”

To improve data throughput, “dump” should be called without disk caching. Accordingly, in the following example, which backs up the entire “2” partition to the tape streamer “/dev/rmt/0”, the “/dev/rdsk” prefix has been placed in front of the device name:

```
$ dump 0ucstbf 560 12 126 /dev/rmt/0 /dev/rdsk/c0t0d0s0
```

Note: The program name “dump” originates from BSD-style UNIX . Under Solaris 2, the appropriate command is `ufsdump`, under AIX `backup`. For the appropriate commands on other UNIX architectures refer to your UNIX documentation.

You can use “cron” to automate data backup with “dump”. Please refer to your UNIX documentation for details.

Using “restore”

The easiest way to use “restore” is in interactive mode, which you call as follows:

```
restore -i -f <device>
```

You are presented with restore’s interactive prompt, which looks similar to the following:

```
restore>
```

Use standard UNIX directory related commands like “cd” and “ls” to find the files and directories you want to restore; use wildcards “*” and “?” in the usual way. Use the “add” command to add files or directories to the list of things you want to restore, e.g. `add helios*` adds all files and directories in the current directory which start with the string “helios”. For Macintosh files, do not forget to restore the resource files too, for example:

```
add helios*
add .rsrc/helios*
```

Use the “extract” command when you have finished choosing. Files are extracted into the current directory, so usually you will want to use the “cd” command to switch first to the same directory from which you made the backup.

“restore” does not accept file name specifications containing spaces or accented characters (Umlauts). You can get round this limitation by using wildcards.

See also A 9.7.7 “Using “dt” for backup/restore” for related information on backing up and restoring files.

Appendix

A 7: Technical notes

The following section contains miscellaneous technical information about EtherShare which is primarily of interest to experienced system administrators only.

A 7.1 EtherShare log files

The following describes the structure of the EtherShare printer log file and server log file. Please refer to your UNIX manuals for a description of the "system messages" file. All three files can be inspected in the EtherShare Admin by choosing the appropriate item in the **Lists** menu.

Printer log file structure

Each entry in the printer log file "$ESDIR/printer.acct" (with the appendices ".0", *yesterday* to ".6", *seven days ago*) has the following format:

```
status, ptrName, "username", "JobTitle",
startTime, duration, pages, ListOfFonts
```

where:

`status` (decimal):

3	general UNIX warning
2	PostScript output
1	UNIX info (e.g. Extended print information)
0	OK
-1	communications error
-2	PostScript error
-3	terminated job (e.g. killed signal)
-4	UNIX error (e.g. file not found)

`ptrName` (string): logical (UNIX) printer name

`"username"` (string): from PostScript header of job

`"JobTitle"` (string): i.e. document name, from PostScript header of job

`startTime` (decimal): seconds since 1.1.1970 (UNIX time_t values)

`duration` (seconds): = endTime-startTime

`pages` (decimal): = endPage-startPage (determined by printer interrogation with the “pagecount.ps” query.

`ListOfFonts` (string array): fonts used, space delimited

If `status≠0`, the line is followed by the error output of the printer, bracketed by the lines “Error output:” and “End error output”. Also, if no printable data are sent to the printer (pages=0), then duration will be “0”.

Please refer to mail in chapter 11.6 “Configuring printers manually” for information on which types of message are written to the printer log file. Messages are only written to the printer log file if you checked the **Accounting File** switch when creating the printer queue with the EtherShare Admin.

User and document names in print jobs

The user name logged with each print job in the printer log file “$ESDIR/printer.acct” (and the user to which error messages are sent as mail) is determined by interrogating the PostScript header of the job for the name in the “%%For” comment.

Under Macintosh System 7.x or later, the name in the “%%For” comment is automatically set to the user name specified in the Macintosh’s “Sharing Setup” control field.

If the “%%For” comment or the name field is missing, all jobs will be allocated to “nobody” by default.

If a name is specified but it cannot be found in the list of long or short names in "/etc/passwd", the specified (unknown) user name will still appear in the printer log file, but any error messages are sent as mail to "nobody" instead.

Note: If you check **Save My Name Only** or **Save My Name and Password** in the Macintosh **Chooser**, the name saved in the system may not be the same as the name in the **File Sharing** control field, since it is possible to overwrite the prompted name before saving it. The name stored in **File Sharing** is the one used by the log file.

The document title is determined by interrogating the PostScript header of the job for the name in the "%%Title" comment.

It may be possible for you to set these comments for UNIX and MS-DOS print jobs, too, in order to ensure that they also have complete records in the printer log file.

Server log file structure

Each entry in the server log file "$ESDIR/server.acct" (with the appendices ".0", *yesterday* to ".6", *seven days ago*) has the following format:

```
status, svrName, ws_address, pe_status, usrname,
startTime, duration, usrTime, sysTime, rusage
```

where:

`status` = 1 (normal login)

`svrName` (string): server name

`ws_address` (string): workstation network address (TCP/IP or AppleTalk)

`pe_status` (decimal): UNIX process exit status (0 = OK; 1...127 = error exit, i.e. the program has been terminated; 128... = abnormal termination, ask your system administrator)

`usrname` (string): user login name

`startTime` (decimal): login time, seconds since 1.1.1970 (UNIX time_t values)

`duration`, seconds: = endTime-startTime

`usrTime` (decimal): processor time consumed by user process

`sysTime` (decimal): processor time consumed by the process while in system mode

`rusage` (decimal array): = resource usage information. The structure is operating system dependent – see the description of “getrusage” in your UNIX documentation. Some of the resource usage fields are decoded and used by the EtherShare Admin in the “Server log file” window.

Each entry in the server log file “$ESDIR/server.acct” has the following format for an unsuccessful login:

```
status, svrName, ws_address, pid, name, time
```

where:

`status` = 2 (bad login)

`svrName` (string): server name

`ws_address` (string): workstation network address (TCP/IP or AppleTalk)

`pid`: process ID

`name` (string): attempted login name

`time` (decimal): attempted login time, seconds since 1.1.1970 (UNIX time_t values)

A 7.2 PostScript RIP INITs in the EtherShare Admin

Printer INITs in the EtherShare Admin must not contain the "exitserver" operator, because the following print job will not execute properly. This is because the INIT is sent to the printer in the same PAP (RIP) session as the following job.

Discussion: The INIT does not normally need to permanently change the server dictionary, because it automatically pre-fixes each and every print job. Furthermore, it is not recommended to try and change the server dictionary in an Admin INIT, because serverdict information is written each time you print to RIP EEPROM, and the latter has a programming life of 10,000 cycles only.

Solution: Simplify the INIT by removing the "exitserver" operator.

If possible, the INIT should also be designed to test the parameter it wants to change first, in order to see if the parameter already has the required value. This saves RIP processing time. For example:

INIT recommended in the RIP manual:

```
serverdict begin 0 exitserver
statusdict begin 2400 setresolution end
```

INIT recommended for use in EtherShare Admin:

```
statusdict begin
resolution 2400 eq not {2400 setresolution} if
end
```

The EtherShare Admin can be extended with custom PostScript calibration tools, which appear automatically in the **Edit Initialization** menu. HELIOS will provide on request programming guides for developing such tools to typesetter manufacturers.

Note:	INITs cannot contain PostScript code to interrogate the RIP because at present, there is no way of returning the response to the EtherShare Admin.

Important:	Please contact your RIP supplier and not HELIOS if you have any problems and/or questions regarding RIP INITs or RIP configuration.

A 7.3 Using the ISO-8859-1 character set under IBM AIX 4

Starting with AIX version 3.2, IBM supports two character sets for all text displayed by application programs and system utilities. The two supported character sets are IBM-850 (IBM-PC style) and ISO 8859-1 (DEC VT200 style). AIX 3.1 supported the IBM-850 character set only.

Helios Terminal is a DEC VT320 emulator and thus uses the ISO-8859-1 character set. By default, AIX uses IBM-850 encoding and thus all national accented characters such as German umlauts will not display properly. The “LANG” environment variable determines the encoding used. If the first letter of the “LANG” variable is in upper case, IBM-850 encoding is used, if the first letter is lower case, ISO-8859-1 is used. For Germany this would be:

```
LANG=de_DE  for ISO-8859-1

LANG=De_DE  for IBM-850
```

The “LANG” environment variable can be set locally in your “.profile” or “.login” files or globally as the default for the whole system with SMIT using the following SMIT menu path:

```
System Environments
     -> Manage Language Environment
          -> Change Language Environment
```

Unfortunately, not all message catalogs are available in all character sets. Luckily, SMIT has a menu option to convert message catalogs from one character set to another. Use the following SMIT menu path to do this:

```
System Environments
     -> Manage Language Environment
          -> Convert Files
               -> Convert System Messages
```

You then specify inputs similar to the following (the example converts the German catalogs):

```
* CURRENT DIRECTORY name    [/usr/lib/nls/msg/De_DE]    +
 NEW DIRECTORY name         [/usr/lib/nls/msg/de_DE]
 CURRENT CODE set           [IBM-850]                   +
 NEW CODE set               [ISO8859-1]                 +
```

This converts all messages catalogs in the "/usr/lib/nls/msg/De_DE" directory from IBM-850 to ISO-8859-1 format. The original IBM-850 files are retained, so you will then have all message output available in both formats.

A 7.4 Accessing spool queues from an IBM logical printer

To use a printer setup for EtherShare from the IBM spooling system, you can define a new IBM queue to automatically forward all jobs it receives to the EtherShare spooling system. Assuming you have used the EtherShare Admin to define a UNIX printer that is named “lw”, you should add the following lines to “/usr/lpd/qconfig”:

```
lw:
     device = lwdev
     discipline = fcfs
lwdev:
     backend = /usr/local/es/lpr -Plw
```

This creates an AIX queue named “lw” that uses the EtherShare queue “lw”.

As all jobs are forwarded, you will no longer be able to see jobs in the IBM queue, and the jobs will appear in EtherShare’s queue display instead.

Alternatively, you get the same functionality if you always remember to specify the full path of the EtherShare “lpr” program (“/usr/local/es/lpr”) each time you use “lpr”.

You can also create a queue that automatically converts text to PostScript, e.g.:

```
pstext:
     device = textdev
     discipline = fcfs
textdev:
     backend = /usr/local/es/pstext -Plw
```

A 7.5 Accessing the System V “lpr” from the Print Server

The EtherShare Print Server is based on the BSD printing system. If your host uses the System V printing system (e.g. Sun Solaris 2.x), the Print Server normally uses its own BSD-style “lpr” program, which is provided in the “$ESDIR” directory in such cases. Manual pages for the BSD-style “lpr” are provided on the CD-ROM in the “manuals” directory.

In order to access the System V “lpr” from the EtherShare Print Server, you need a configuration which is very similar to that of “Printing to disk”:

```
papsrv: name=“xxxx”, printer=xPrinter,
        lpr=/bin/lpr, resolve
```

where:

`xxxx` is the required AppleTalk printer name,

`xPrinter` is the logical (printcap) printer name, and

`lpr` specifies the System V “lpr” program rather than the EtherShare “lpr” program in “/usr/local/es”.

In order to set up the required spool directory and symbolic link, and create a “/etc/printcap” entry and “FONTS” file automatically, we recommend that you first set up a dummy printer with a “Remote LPR” connection, then edit the corresponding “atalk.conf” entry and “FONTS” file manually.

A BSD-style “lpq” command is also provided with the RS/6000 version of EtherShare, because it is not included with AIX. You can use it to check the job status from a UNIX shell as follows: lpq

```
/usr/local/es/lpq -P<printername>.
```

Or instead, you can use “diskif” and a notify script (see **notifyprog** in 11.6 “Configuring printers manually”).

A 7.6 Accessing the Print Server through “Remote LPR”

If your host uses the System V printing system (e.g. Sun Solaris 2.x), in the special case where you want to receive print jobs through “Remote LPR” into EtherShare’s BSD-based printing system, you must disable the local System V network printing functionality before you can do this. By default the install procedure comments out the “printer” line in “/etc/inetd.conf”.

A 7.7 AppleTalk kernel configuration

In order to be able to communicate using the AppleTalk protocols, EtherShare needs support from the operating system. Commonly, UNIX suppliers deliver the TCP/IP networking protocols together with their standard operating system release, but no AppleTalk networking protocols. EtherShare thus contains drivers that implement the AppleTalk protocol with Ethernet. On some machines, EtherShare also supports other network connections like Token Ring. All files that relate to the kernel side of the EtherShare system reside in the directory "$ESDIR/kernel". The following is a detailed description of what is changed in the operating system by the EtherShare installation. This is probably of interest to advanced UNIX users only, since the EtherShare configuration shell scripts hide most of the details necessary to get the AppleTalk drivers running.

The kernel modules come in two flavors, depending upon host operating system architecture. System V.4 based systems use a streams-based architecture where each AppleTalk communication endpoint is represented as a file descriptor opened through the streams multiplexor "/dev/ddp". Berkeley-based systems use file descriptors opened through the socket mechanism.

A 7.7.1 Loadable Drivers

Solaris 2.x, SGI IRIX, HP-UX 11, and IBM RS/6000 systems support a concept of loading drivers, which can be loaded into the operating system during runtime. In such cases, it is not necessary to re-link the UNIX kernel with new modules. The "start-atalk" shell script takes care of

loading the driver when starting AppleTalk, if the driver is not already loaded.

Solaris 2.x systems

EtherShare uses two kernel modules on Solaris 2 systems, “aarp” contains the “AppleTalk Address Resolution Protocol” streams module and “ddp” the “Datagram Delivery Protocol” streams multiplexor. “aarp” is located in “/kernel/strmod” and “ddp” in “/kernel/drv”. The installation procedure copies the files from “$ESDIR/kernel” to the “/kernel” directory. In addition, the installation script adds a line to the “/etc/minor_perm” and “/etc/devlink.tab” and files to get the proper link from “/devices/ pseudo/ clone:ddp” entry to “/dev/ddp” using the proper permissions. The drivers are loaded and unloaded by Solaris 2.x automatically, no loading or unloading should be necessary.

A long list of all loaded modules can be produced by using the “modinfo” command. The “modunload” command can be used to unload the drivers, but only if they are unused.

IBM RS/6000 systems

On IBM RS/6000 systems, only one driver is loaded by the “start-atalk” script (“$ESDIR/kernel/atalk”). This driver is dependent upon the AIX version. The installation procedure makes a link from the corresponding and appropriate file to “/usr/lib/drivers”.

In addition, entries are added to the ODM database to allow the loading of the driver through the “mkdev” command. The logical name for the kernel module is “atalk0”. Use the following command to load the module:

```
mkdev -t atalk
```

The “lsdev” command can be used to see if the kernel module is loaded:

```
lsdev -C -l atalk0
```

Note: Under AIX, the unloading of network protocols is not supported.

SGI IRIX

On SGI IRIX systems, the loadable drivers reside in “/usr/local/es/kernel” and are automatically loaded by “start-atalk” with the `ml` command. A list of all loaded drivers can be displayed using `ml list`. With `ml unld` and the corresponding ID number (which can be obtained from the drivers list) the module can be unloaded again.

HP-UX 11

The drivers “aarp” and “ddp” are copied into the system directory of a HP-UX 11 operating system by the `kminstall` command. To automatically load the modules in the kernel use `kmupdate`.

To delete the drivers again, use the following commands:

```
kminstall -d aarp

kminstall -d ddp
```

A 7.7.2 Re-linking the kernel

For Data General AViiON systems, the AppleTalk driver is supplied in linkable form. The “install” shell script takes care of installing the necessary files in the system directory and rebuilding the kernel. All files modified or replaced by the script are saved with the “.noatalk” suffix.

DG AViiON

On AViiON systems the installation procedure uses the "sysadm" menus to do most of the complicated rebuilding procedure. The installation procedure copies template and library files from the "$ESDIR/kernel" directory to "/etc/master.d" and "/usr/src/uts/aviion". The kernel is rebuilt using the following command:

```
asysadm -m system:kernel -o auto
```

The automatic option causes "sysadm" to collect all templates into a new system description and build a new kernel accordingly. The new kernel is installed into "/" when successful. Upon each boot, the "ddp" multiplexor driver creates a "/dev/ddp" entry for the user programs.

A 7.8 UNIX kernel tuning

This section describes optional tuning procedures which require substantial UNIX experience. With the exception of **Other tuning tips** (below), they should not be attempted by beginners.

If the EtherShare host has plenty of memory, it may be worthwhile adjusting some data structures inside the operating system to be larger than normal. This keeps more information in memory that otherwise may need to be continuously re-read from the disk. Modern operating systems adjust the data structure values depending on the available memory size. See your UNIX documentation for more information.

Solaris 2.x tuning

The Solaris 2.x operating system has no facilities to rebuild the kernel. Thus parameters are not set by modifying a C-language source and rebuilding the kernel, but simply by editing a text file. The file "/etc/system" may contain simple statements of the form "set variable=value" to tune system parameters. The two parameters especially interesting for EtherShare are "ufs_ninode" and "ncsize". "ncsize" is not prefixed by "ufs_" because it relates to all file systems, not just the normal UNIX file system. To set these two values to 20000, one would include the following statements in "/etc/system":

```
set ufs_ninode=20000

set ncsize=20000
```

Increasing the number of inodes that can be held in memory improves the performance considerably when doing Macintosh Finder operations or repeated opening and closing of

files. Each file that needs to be accessed (directories are files as well) will occupy an inode entry. The inode will be kept around after closing a file or directory in case it will be referenced again, unless the operating system is out of free entries. In the latter case, the entry may not be re-used but is used for a different entry that will be loaded from disk. Thus, if you have several megabytes of memory to spend, you may increase the number of inode entries to, e.g. `20000`, which will require approximately 4 MB of RAM.

If the kernel fails to boot because of wrong parameters in "/etc/system" you can boot the system using the "-a" option. You will then be asked which files and partitions to use, when asked for "/etc/system" just answer "/dev/null" instead.

Other tuning tips

EtherShare contains highly-efficient AppleTalk router modules which do not present an excessive load on the host's CPU, even with heavy routing traffic. You can often improve network response by installing two or more network cards in your host, and arranging your network to share traffic between two separate network segments. This approach is particularly beneficial if you have installed the EtherShare OPI option – in such cases we recommend installing a second network card to deal with printer/RIP traffic only, and thus separate it from workstation traffic. There is no theoretical limit to the number of network cards supported by the EtherShare router, but generally there are no gains to be made by installing more than 3 cards except in the fastest hosts.

Other UNIX architectures

For tuning on other UNIX architectures, please refer to the appropriate UNIX documentation. Generally, the sections describing "Performance tuning" in the respective manuals may be read carefully.

Appendix

A 8: IP configuration – Reference Part

General remarks

AppleShare IP offers some new features that are quite useful for your EtherShare UNIX–Macintosh network. In the following, we give you a rather short summary of configurations we recommend when using TCP/IP.

For advice on the software requirements, please refer to chapter 5.13.8 “IP Access”.

Access control via addresses and domains (under UNIX)

IP access configuration can be performed on a Macintosh using the EtherShare Admin program or under UNIX using an editor such as vi. The “Macintosh solution” is much easier and more convenient – it is described in chapter 5.13.8. Before proceeding with this paragraph, please read “About defaults” in chapter 5.13.8 “IP Access”.

If you configure IP access under UNIX, you have to change the “afpipaccess” configuration file. This does not require stop/start-atalk. EtherShare will read the configuration file on every login.

The script “$ESDIR/etc/mkipaccess” will create an initial configuration file in “$ESDIR/conf/afpipaccess”, allowing access to clients on the same network segment only. This file may contain the following statements:

```
allow ipaddr/mask
deny ipaddr/mask
```

```
allowdomain do.main
denydomain do.main
```

If the file is empty – or not present at all – access is allowed (this corresponds to

```
allow 0.0.0.0/0.0.0.0
```
).

The IP Address 0.0.0.0 with the mask 0.0.0.0 matches any address, it is thus a good idea to use the statement:

```
deny 0.0.0.0/0.0.0.0
```

as the last line in the access file and only explicitly allow access to selected networks or IP numbers. You can grant access to the class C net 192.9.200 only using the following statements:

```
allow 192.9.200.0/255.255.255.0

deny 0.0.0.0/0.0.0.0
```

The mask (255.255.255.0 in the example) specifies the significant bits that are to be compared against the IP number. If the mask is not specified, it is assumed to be 255.255.255.255, meaning that it will match the number exactly. The example:

```
allow 192.9.200.1

deny 0.0.0.0/0.0.0.0
```

will thus allow access to a single machine only, namely to 192.9.200.1.

The IP address can also be specified as a normal host name, it must then be resolvable through the configured name service, e.g. DNS or NIS. If DNS or NIS is properly configured to resolve host names, you can also use domain-based access controls.

The statement:

```
denydomain hacker.com
```

will deny access to any IP number that resolves to a host name that ends with the domain hacker.com. The `allowdomain` statement works the other way round:

```
allowdomain company.com

deny 0.0.0.0/0.0.0.0
```

would allow access to any machine that uses an IP address that resolves to a host name ending in company.com.

The domain-based access controls do cause a reverse lookup for the host name of every IP address that is used to connect to the server. If you use any IP addresses that do not have reverse mapping, timeouts might occur that slow down establishing a connection to the server. Please note that anybody who owns the reverse mapping of a set of IP addresses can specify arbitrary domains in his reverse DNS mapping, not only his own domains.

Access control via port number (Firewalls)

AFP over TCP uses connections to port 548. The port can be changed by specifying the “afpport” parameter in “atalk.conf”:

```
afpsrv: afpport=1024
```

would use port 1024 instead. For successful connections, the port number on the client side must be changed accordingly. This can be done by either specifying `hostname:port` in the dialog that lets you enter an IP number or by using the “AppleShare Client Setup” tool: (**http://www.apple.com/appleshareip/**)

Figure A-27 shows the user interface of this setup tool – the *Default TCP Port* is set to 1024.

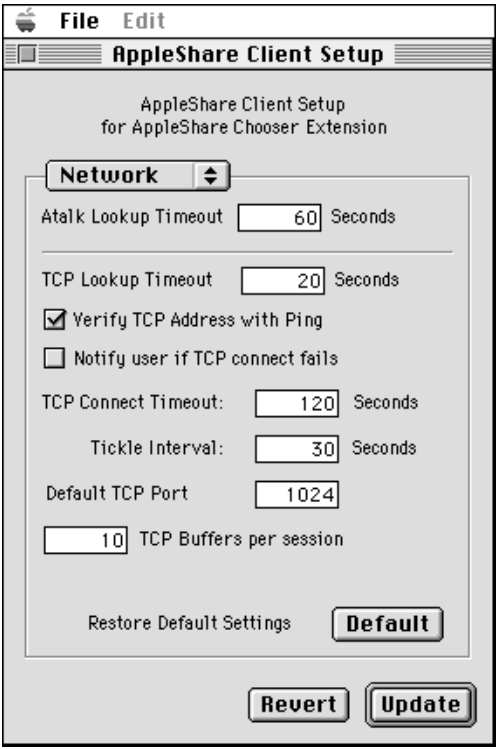

Fig. A-27: Setting up a default TCP port on a Macintosh

Configuring message delivery

The above-mentioned “AppleShare Client Setup” tool is also very useful for defining timeouts for server messages. You can induce your Macintosh to close specific message dialogs automatically after a given period of time. This can be sensible, because otherwise all processes that are running on your computer will be stopped until *you* close the message window. Figure A-28 shows an example configuration. The settings are always valid for one client only.

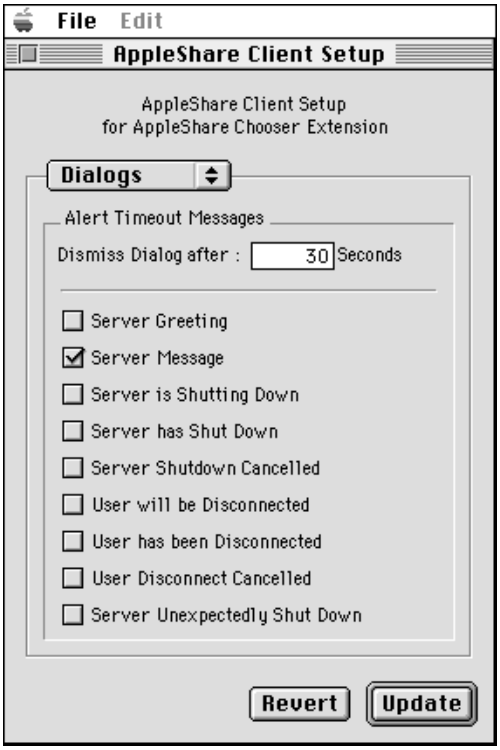

Fig. A-28: AppleShare settings for incoming server messages

Learn more about the AppleShare Client Setup

As far as the other dialogs of the "AppleShare Client Setup" tool are concerned, we recommend to keep the default settings. For specific questions you may refer to Apple's online documentation. Please note, that for some configurations, you have to specify the respective parameter on both platforms, the Macintosh and the UNIX server.

New EtherShare parameter for volume modification checking

AFP 2.2 specifies the use of server notifications that avoid the client polling for changes on volumes. By default, the server checks for volume changes every ten seconds and notifies clients accordingly. This is similar to previous AFP versions where the client did poll every 10 seconds. If you have very busy volumes that change all the time, however, you may wish to specify another interval. With EtherShare 2.6 you can configure the respective parameter on the server in "atalk.conf". For example:

```
afpsrv: volcheckinterval=60
```

The above command will induce the server to check every minute for volume changes, which reduces the volume status traffic to one sixth compared to previous AFP versions. Please note that clients using workstation software older than 3.7 will continue to poll every 10 seconds.

Note: Changes to "afpsrv" require `stop-atalk` and then again `start-atalk`.

Additional information about AppleShare IP

IP access to the server can also be switched off completely – if necessary. You can use the `noip` parameter to deny the mounting of volumes via TCP/IP:

```
afpsrv: noip
```

The number of AppleTalk sockets is still limited to 250. If you now use AppleShare IP connections for mounting EtherShare volumes, you have the 250 sockets available for pap (printers) and adsp (terminal, mail) connections.

Appendix

A 9: The Desktop utilities

A 9.1 Introduction

License information

The “dt” utilities are not a separate product. They may be used by owners of a full HELIOS EtherShare 2.6 license only.

About the product

This appendix describes the “dt” utilities, which mimic the functionality of some major UNIX commands for handling files, while maintaining the integrity of the desktop database. “dt” utilities also provide access to Macintosh specific file information from a UNIX prompt.

About YOU – the potential users of the “dt” utilities

These utilities are meant for people who have some knowledge about UNIX and Mac – from novice to expert UNIX/Macintosh users.

Important: The ”dt“ program does **not** consider any file locking and can therefore also copy files in use. In order to avoid damage, consider this and make sure nobody is working concurrently on these particular files before manipulating them with ”dt“.

A 9.2 Do I need the “dt” utilities?

If you access all your files from your Macintosh only, you do not need to read any further. But if you need to access files which are stored in an EtherShare volume from the UNIX prompt, there are a lot of reasons for using the “dt” utilities.

Note: “UNIX prompt” here means *any* access under UNIX, e.g. any script or program (like a backup program), which accesses files stored on an EtherShare volume.

Any manipulation to a file or folder inside a Macintosh volume using ordinary UNIX commands like “cp”, “mv”, “rm” or other programs, will cause an inconsistency between volume information and the related desktop database. Especially restoring files from a backup will trigger such an inconsistency.

In the following sections, you will find more information on this problem and about how the “dt” utilities help avoid it.

Please use the utilities *whenever* you would (usually) use any of the following UNIX commands (in case either source and/or destination files/folders are located in an EtherShare volume):

- `rm`
- `rmdir`
- `mv`
- `cp`
- `ls`
- `mkdir`
- `touch`
- `chmod`

- `chown`
- `chgrp`

You may use the “dt” utilities even if the source or destination is not located in an EtherShare volume, or if you are not sure about this. The “dt” utilities automatically select the proper mode of operation.

It is required to use the “dt” utilities together with EtherShare 2.6, PCShare 2.5 or higher and/or EtherShare OPI 2.1. These HELIOS product versions have improved verification mechanisms to recognize potentially harmful configurations, and will disable access to volumes for which consistency between volume and desktop information cannot be assured. In addition, warning or error messages are logged to the system error log which may help you locate the cause of the problem.

What are the differences to standard UNIX commands?

Just to help you understand the possible error messages and the specific behavior of the “dt” utilities, here are the main differences to standard UNIX commands:

Each Macintosh file consists of two parts, the so-called “data fork” which is stored as a standard UNIX file, and a corresponding “resource fork” which is stored by EtherShare in a “.rsrc” subdirectory. Additional information for each file are stored in a corresponding entry in a volume based “desktop” database. Therefore, when using UNIX commands, each operation like move, copy, or delete, must consider both the “data fork” and “resource fork”, as well as the database entry instead of just a single file.

When looking into a volume as a UNIX directory you may not notice the differences, because the resource fork subdirectory and the database files are stored as hidden UNIX files.

The “dt” utilities simulate the behavior of standard UNIX commands as close as possible, but there are slight differences in the number and functionality of the available options, and due to the extended functionality you may notice a different behavior and different error messages. For example, you may see error messages about the resource fork of a file, which you would not see when using standard UNIX commands (the UNIX commands – in fact – ignore this part of the file).

For all of the “dt” utilities commands, a behavior that differs from that of their UNIX counterparts may be visible. This is due to the fact that different semantics are used by Macintosh Finder operations on the one side and UNIX file system operations on the other. The “dt” utilities will behave like an “afpsrv” on recognized EtherShare volumes, and will behave like ordinary UNIX commands like “cp”, “mv”, “rm”, in areas where no EtherShare volume is defined. The “dt” utilities will process data and resource part of files and will also assure that ownership and permissions are compatible to the Macintosh Finder operations. Due to the limitation on file/folder name length, “dt” will only process objects with a name of 31 characters at the most on EtherShare volumes (filefolder names exceeding 31 characters will be invisible on Macintosh workstations). See also chapters 9.3 “Directory and file formats”, and 9.5 “Users and groups” to 9.7 “Access privileges”.

Before you try and use any of the “dt” commands, you should be well familiar with the corresponding UNIX commands. If you need more information about how the “dt” utilities work and how problems arise without the utilities, please read the “Technical notes” following each command description, and chapter A 9.7 “Additional information”.

A 9.3 How to install the “dt” utilities

Installing “dt”

The “dt” utilities do not require a special installation procedure.

We do not recommend to sym-link regular “cp”, “mv”, “rm” commands to the “dt” utilities. Although this is possible, you should verify your current and future system environment very carefully, to assure proper operation of your programs, scripts and established workflow.

Especially, you should check whether your site uses special HSM, tape robot, or RAID software which may also use their own versions of these UNIX commands. Take into account that different users and script based programs may make use of different shells and environment settings.

Before getting started...

We suggest to check for each EtherShare volume the consistency between the volume information and the volume’s desktop database. EtherShare 2.6 offers a new rebuild option, namely `-s` (scan only), which can be used for this purpose.

Simply issue `rebuild -s <volume mount point>` for every defined public or private EtherShare volume. Any output of this “scan” indicates a potentially harmful inconsistency between volume and desktop information. You should only continue after having re-synchronized the desktop database by means of an ordinary rebuild.

Take some time to make yourself familiar with the utilities and the way they behave inside a Macintosh volume, between different Macintosh volumes, and between non-Macintosh and Macintosh volumes.

A 9.4 Notes about error messages

The “dt” utilities use standard error messages starting with the program name (including the command argument), followed by the file or directory currently processed, and the error message, e.g.:

```
dt rm notHere
```

may result in the error message:

```
dt rm: notHere: no such file or directory
```

The error messages used are similar to the errors issued by the standard UNIX commands. Please note that you may encounter additional error messages regarding the resource fork or the desktop database.

In some cases the “dt” utilities may issue error messages displaying the full path of a file name instead of the passed relative one. This is due to the fact that the desktop database always needs absolute file names instead of relative ones. In this case, you may see the completely resolved (including symbolic links) absolute path name in the error message.

A 9.5 Command descriptions

A 9.5.1 General remarks

In the following command descriptions the knowledge of the functionality of the corresponding UNIX commands is assumed. Please refer to your UNIX manual if you are not familiar with the commands.

If you do not need or want to know, how the “dt” utilities operate, you only need to read the main command description for each UNIX command which is emulated by the “dt” utilities. The technical description following each command is meant for advanced users or system administrators and explains some details or the special behavior of the respective command.

With very few exceptions, “dt” behaves identically on all HELIOS-supported platforms. Please note that therefore some platform-specific options could not be implemented.

For all commands, the standard UNIX permissions apply when accessing, removing, or overwriting a file.

“dt” checks each passed argument for the following names:

```
.Desktop

.DeskServer

.rsrc
```

These files are handled implicitly by “dt” and there is no need to specify them directly. You should *never* move,

copy, or remove these files with other commands, as e.g. the standard UNIX tools. Do not manipulate them at all.

Note:	In the following, the term “volume” is used for a directory that is defined as an EtherShare volume which contains a desktop database (in contrast to a simple UNIX “directory”).

Note:	In the following, the term “volume root” means the top level folder of an EtherShare volume. The “EtherShare Applications” volume, e.g., is by default defined to reside in the “/usr/local/es/macapps” directory, which is its “volume root” directory under UNIX.

“dt” will recognize an EtherShare volume by locating its desktop database “.Desktop” file.

“dt” will recognize access to EtherShare volumes from another server only by means of available “.DeskServer” files.

“dt” will process all supplied files and folders, but only file/folder names of up to 31 characters will be kept in desktop databases.

“dt” may process files/folders differently, depending on whether the source/destination of the operation is inside/outside an EtherShare volume. The Macintosh Finder and the UNIX file system use different semantics and “dt” assures that on EtherShare volumes the Macintosh semantics will be applied. The differences are mainly visible in permissions/ownership.

Symbolic links to folders will not be processed on EtherShare volumes.

“dt” will process data and resource parts of files/folders on EtherShare volumes. In case no resource information exists, “dt” will be able to create at least minimum information. Especially copy or move operations may require more free space on destination file systems.

The following command modes are supported:

```
rm       remove a file or directory (UNIX “rm”)

rmdir    remove directory (if empty)
         (UNIX “rmdir”)

mv       move/rename a file or directory
         (UNIX “mv”)

cp       copy a file or directory (UNIX “cp”)

set      set or change the Macintosh specific file
         attributes

ls       list contents of a directory including
         Macintosh specific file attributes
         (UNIX “ls”)

mkdir    create a directory (UNIX “mkdir”)

touch    create a file or set its access time
         (UNIX “touch”)

upd      force update of Macintosh volume view
```

```
chmod    change or assign the mode of a file
         (UNIX “chmod”)

chown/   set the user and group ID of a file
chgrp    (UNIX “chown”, “chgrp”)

idinfo   display database information for the
         passed ID
```

A 9.5.2 dt (no argument)

If called without any argument, “dt” prints the usage line:

```
Usage: dt { rm | rmdir | mv | cp | set | ls |
mkdir | touch | upd | chmod | chown | chgrp |
idinfo }
```

Calling “dt” with the command argument but no arguments, prints the usage for the specific command,
e.g. calling `dt rm` prints:

```
Usage: dt rm [-fir] file ...
```

Calling “dt” with a question mark, prints the version in addition to the usage line, e.g. calling `dt -?` prints:

```
dt (c) Helios Software GmbH, Version 2.6.0

Usage: ...
```

A 9.5.3 dt rm

The “rm” command removes the directory entry specified by each file argument.

```
Usage: dt rm [-fir] file ...
```

The following options apply:

```
-f  force removing without prompting the user.

-i  prompt for confirmation for each file. If
    the answer begins with y (yes), the file
    is deleted, otherwise the file remains.

-r  recursively remove passed directory and
    its subdirectories.
```

In case of symbolic links, the link itself and not the file the link refers to is removed.

If the standard input is not a terminal, the command will operate as if the `-f` option were set.

Examples

```
dt rm a.out core
```

removes the directory entries: *a.out* and *core*.

```
dt rm -rf junk
```

removes the directory *junk* and all its contents, without prompting.

Technical notes

Missing resource forks are not reported unless the `-v` verbose option is set.

The volume root directory is automatically touched to announce the changes to any Macintosh that has mounted the volume.

When removing a directory using the `-r` option, "dt" automatically tries to remove any orphan resource forks. The volume root directory may only be removed, if this volume is not in use by any other client, either EtherShare or the "dt" utilities, otherwise a "directory not empty" error is issued.

A 9.5.4 dt rmdir

The "dt rmdir" command will remove the directory entry specified by each *dirname* operand, provided that this operand refers to an empty directory.

```
Usage: dt rmdir [-ps] dirname ...
```

The following options apply:

```
-p  allow users to remove the directory
    dirname and its parent directories which
    become empty. A message is printed on the
    standard error about whether the whole path
    is removed or part of the path remains for
    some reason.

-s  suppress the message printed on the
    standard error when -p is in effect.
```

A 9.5.5 dt mv

"dt mv" moves the selected files or directories to a destination file or directory.

```
Usage:  dt mv [-fiknvz] f1 f2

        dt mv [-fiknvz] f1 ... fn d1

        dt mv [-fiknvz] d1 d2
```

The three different usages are provided for the following cases:

- move a file f1 to the destination file f2
- move the passed files "f1... fn" into the destination directory "d1"
- move the passed directory into the destination directory "d2", and create "d2" if it does not exist.

The following options apply:

`-c` move a file from one Macintosh volume to another Macintosh volume with a different character set without getting an error message.

Important: If you do not use the `-c` option with the "dt mv" and "dt cp" commands, an error message only occurs if you copy/move files from a Macintosh volume to another. Copying/moving from a UNIX directory or a PCShare volume to a Macintosh volume will not provoke any warning at all and might irritate the ".Desktop" file.

`-f` move the file(s) without prompting even if it is overwriting an existing target. Note that this is the default if the standard input is not a terminal.

```
-i  prompt for confirmation for each file. If
    the answer begins with y (yes), the file is
    moved, otherwise it remains where it is.

-k  keep ID, try to allocate the source ID and
    use it for the destination as well (see
    also
    A 9.7.7 “Using “dt” for backup/restore”).
    In case this is impossible, you will only
    get a warning if -v is set.
    You can use this parameter to preserve
    proper working of Macintosh aliases.

-n  no resource forks if no desktop (see
    A 9.7.3 “Default resource fork handling”).

-v  verbose, display extended warnings.

-z  force zero ID for destination, please
    refer to A 9.7.6 “Zero IDs” and
    A 9.7.7 “Using “dt” for backup/restore”.
```

Technical notes

The behavior of the different UNIX implementations differs if both, the `-f` option and the `-i` option, are set. “dt mv” uses the following rule: if both the `-f` option and the `-i` option are set, this is not considered an error; here, the `-f` option will override the `-i` option.

If you move a directory between two EtherShare volumes, “dt” cannot simply move just the directory entry. The Macintosh Finder would have to perform two steps for this operation, namely copying a folder from one volume to the other and then deleting the folder on the source volume. “dt” has a similar task to accomplish. For every file and folder within the directory to move, first the object must be moved to the destination volume and registered in the destination desktop. Then, the moved objects must be deleted from the source volume and unregistered from its desktop database.

Please note that any Macintosh files/folders to which aliases are pointing, will have lost their connection after successfully been moved between volumes. This would be the same if you used the Macintosh Finder for this operation.

If source and target directory are on different file systems, “dt mv” copies the file and deletes the original; any hard links to other files are lost.

Volume root for both source and destination, is automatically touched to announce the changes to any Macintosh that has mounted the volume.

Please note that whenever the destination is a volume, the volume specific permissions will apply, meaning that the file you have moved will automatically inherit the permissions of the directory it has been moved to.

Usually, if a file is copied to a directory without a desktop (pure UNIX directory), the file ID is set to zero. When using the `-k` option, the file ID is maintained (if possible).

Even though the execution bit of the data fork should be masked out (according to the permission handling implemented by “afpsrv”), this is often inconvenient to UNIX users. Therefore, any existing execution bit is preserved by default.

A 9.5.6 dt cp

“dt cp” copies the passed files or directories to a destination file or directory.

```
Usage:  dt cp [-finpvz] f1 f2
```

```
dt cp [-finpvz] f1 ... fn d1

dt cp -r [-finpvz] d1 ... dn-1 dn
```

The three different usages are provided for the following cases:

- copy a file f1 to the destination file f2
- copy the passed files “f1... fn” into the destination directory “d1”
- copy the passed directory into the destination directory “dn”

The following options apply:

`-c` copy a file from one Macintosh volume to another Macintosh volume with a different character set without getting an error message.

`-f` copy the file(s) without prompting even if it is overwriting an existing target. Note that this is the default if the standard input is not a terminal.

`-i` prompt for confirmation for each file. If the answer begins with y (yes), the file is copied, otherwise it is not.

`-r` recursively copy passed directory.

`-n` no resource forks if no desktop (see A 9.7.3 “Default resource fork handling”).

`-p` preserve the owner and group IDs, permission modes, modification and access time.

`-v` verbose, display extended warnings.

```
-z  force zero ID for destination, please refer
    to A 9.7.6 “Zero IDs” and
    A 9.7.7 “Using “dt” for backup/restore”.
```

Technical notes

The volume root directory for both, source and destination, is automatically touched to announce the changes to any Macintosh that has mounted the volume.

If your source does not have a resource fork, and your destination is a volume, a default resource fork is created. These default resources are only recognized properly by EtherShare 2.6; earlier EtherShare versions will display files with plain document icons. Please do also take into account that every default resource will require 64 bytes, thus using the minimum disk block size on the destination file system. If there is only little free disk space on the destination volume, first check whether the destination file system can store all of the files. You can roughly calculate 1K (fragment size) per file/folder. Consult your UNIX system administrator or the appropriate pages in your UNIX manual for information on how to retrieve more exact information about your file system settings.

Even though the data fork execution bit should be masked out (according to the permission handling implemented by “afpsrv”), this is often inconvenient to UNIX users. Therefore, any existing execution bit is preserved by default.

A 9.5.7 dt set

“dt set” modifies the additional file information stored in the file’s resource fork. For more information about the flags and fields used here, please refer to your Macintosh documentation, e.g. Apple’s “Inside Macintosh”.

You can use the EtherShare Admin to extract the creator/type information an application sets for certain icons. See also chapter 5.13 “Other lists and accounting files” in your EtherShare documentation (and the contents of “$ESDIR/conf/suffixes”).

```
Usage:  dt set [-t type | -c creator | -f sfile
        | -L integer | -C clear] file ...

        dt set -a[-][isrlbp] file ...
        dt set -v[mini symbol name date
                size type label list button]
```

The following options apply:

`-t` set the file type for “file” to the passed value

`-c` set the file creator for “file” to the passed value

`-f sfile` copy the file type and creator from “sfile” to “file”

`-L integer` set the file to number of allowed concurrent program launches, where “integer” is the number of launches

`-C` clear the file ID numbers in the resource fork (set to zero) and force the “afpsrv” to allocate new ID numbers

---

Note: The `dt set` options `-L` and `-C` replace the outdated `set launch` program from older EtherShare versions.

`-a` flag, where flag specifies the following modes:

```
i   invisible

s   system

r   read only

l   locked (norename nodelete)

b   backup

p   protected
```

`-v` flag, where flag specifies one of the following Macintosh view modes:

```
mini symbol name date size type label list
button
```

Note: `button` applies to Mac OS 8.x and later only.

Please note that you may list these information using "dt ls". If you need to set type or creator info with non-printable values, you may as well enter these values as octal values with a preceding backslash ("\"), and use the following escape sequences:

```
\b  backspace

\n  newline

\r  carriage-return

\t  tab

\f  form-feed

\E  escape
```

Please note that for both type and creator, all characters including 0 are valid. Each passed creator or type must be exactly 4 bytes long.

Examples

```
dt set -t “TEXT” -c “R*ch” file
```

sets type and creator for file using ASCII values.

```
dt set -c “\001\002\003\004” file
```

sets creator for file using octal values.

```
dt set -f mypic file
```

copies type and creator from mypic to file.

```
dt set -ai file
```

sets the invisible flag for file.

```
dt set -a-i file
```

clears the invisible flag for file.

Technical notes

When you call “dt set” for a file without a resource fork, a default resource fork updated with the passed parameters is created, even if the destination file does not lie in a Macintosh volume.

Please note that “dt set” does not create a missing “.rsrc” directory; use “dt touch” first on the file name in order to force creation of a related “.rsrc” subdirectory where the file’s resource information can be stored.

A 9.5.8 dt iddump

Each Macintosh file on an EtherShare volume has an ID number that is stored in both its resource fork and the desktop database. The `dt iddump` command outputs all file IDs of the volume in question (specify volume path) from the desktop database to `stdout`.

```
Usage: dt iddump [path to Macintosh volume]
```

A 9.5.9 dt ls

For each file that is a directory, the contents of the directory is listed; for each file that is an ordinary file, the name and resource related information are listed. When no argument is given, the current directory is listed.

```
Usage: dt ls [-axotTsmldi] file ...
```

The following options apply:

```
-a  list all entries, including those
    beginning with a dot (.), which are
    normally not listed.

-x  force printing of non-printable characters
    for type and creator – which are normally
    shown as underscore (_) – in the
    hexadecimal \xdd notation.
```

```
-o  force printing of non-printable characters
    for type and creator – which are normally
    shown as underscore (_) – in the octal \ddd
    notation.

-t  for each file, print the Macintosh creation
    time.

-T  for each file, print the UNIX last
    modification time.

-s  for each file, print the size of the data
    and the resource fork.

-m  print file name stored in the desktop
    database instead of UNIX name. If any
    difference between these names is detected,
    both names are shown. If the target
    directory does not have a corresponding
    desktop, this option is ignored.

-l  list in long format. This option is
    equivalent to specifying the option -tsi.

-d  if the argument is a directory, list only
    its name and not its contents.

-i  for each file, print the file or directory
    id (as stored in the resource fork) and the
    parent id (as stored in the desktop
    database).

    This information may not be correct in case
    files/folders were manipulated with UNIX
    programs other than the “dt” utilities.
    Use “rebuild -s” to verify consistency
    between volume and desktop information.
```

The attributes printed in the first column consist of 8 characters, and are indicated as follows:

```
d   directory
A   alias
i   invisible
s   system
r   read only
l   locked (norename nodelete)
b   backup
p   protected
```

Please note that Macintosh aliases cannot be created with the “dt” utilities. The internal structure of aliases is not documented by Apple.

Examples

```
dt ls /usr/ethershare

d-i-rl--       Network Trash Folder

d------- OpiPics

-------- 'XDOC' 'XPR3'mydoc
```

This command prints the names of all files in the passed directory “/usr/ethershare”, showing the file attributes, the type and creator for that file and its name. Please note that directories do not have any type or creator and therefore the fields are empty for directories.

Often you may want to include more Macintosh specific information in the output. You can use the `-l` option for that:

```
dt ls -l /usr/ethershare
```

Here you see the attributes, the ID, parent ID, type, creator, Macintosh date, size of the data, size of the resource fork, and the file name.

```
d-i-rl-  3201/15/97 09:47 51264 Network
          Trash Folder
```

```
d------  4201/16/97 13:50 51264 OpiPics

-------  222 'XDOC' 'XPR3'06/09/97 13:39 97664
         mydoc
```

Technical notes

Please note that the output format (e.g. time format) is dependent on the current settings for the local environment.

The output will not be sorted (as it would be if you used the UNIX “ls” command).

A 9.5.10 dt mkdir

The “mkdir” command creates the passed directories including the corresponding resource fork and the desktop database entry.

```
Usage: dt mkdir [-m mode] [-p] dir ...
```

The following options apply:

```
-m mode  specify the mode to be used when
         creating the directory.

-p  With this option, mkdir creates “dir”
    by creating all the non-existing
    parent directories first. The mode
    given to intermediate directories will
    be the difference between 777 and the
    bits set in umask.
```

Example

```
dt mkdir -m0444 mydir
```

creates the directory “mydir” with the passed modes.

Technical note If no mode parameter is set, the final directory is created in mode 777 considering the file mode creation mask “umask”.

A 9.5.11 dt touch

The command “touch” sets the access and modification times for the passed files. A file is created if it does not already exist.

```
Usage: dt touch file ...
```

Example

```
dt touch myfile
```

A 9.5.12 dt upd

The “upd” command touches the volume directory for the passed file or directory, so that all Macintosh computers that have mounted this volume can display the changes. This may be necessary e.g. if a file is created under UNIX and the Macintosh would display the new icon only after closing and re-opening the corresponding window.

Please note that all “dt” commands automatically update any needed volumes; so this command is only required, if files are created or changed by other, non-“dt” commands. Check whether you can adjust your workflow to “dt” commands and thus avoid potentially harmful non-“dt” commands.

```
Usage: dt upd file... | dir ...
```

Example

```
dt upd myfile
```

Technical note The Macintosh clients only scan for changes every 10 seconds. Usually, folder information are updated within this 10 seconds period. However, depending on folder sizes, number of folders open, foreground applications, etc., this may take longer. Thus, it may take some time after issuing an "upd" command, before the changes become visible on the client. You can either click into the folder window, or close and re-open it in case the displayed information do not seem to be up-to-date. In rare situations, it may be necessary to unmount and remount the volume in question in order to let the Macintosh flush its cache entries. Make sure that you are using the latest Macintosh OS and up-to-date AppleTalk/Network drivers.

A 9.5.13 dt chmod

The "chmod" command changes the permission mode of a file. The mode may be absolute or symbolic.

```
Usage:  dt chmod [-fRn] absMode file ...

        dt chmod [-fRn] [ugoa]{+|-|=}[rwxstugo]
        file ...
```

The following options apply:

```
-f  force, do not complain if the mode change
    fails.

-R  recursively descend through directory
    arguments.

-n  change directory only – not the files
    within the directory. The default
    behavior of the "dt chmod" command is
    as follows:
```

```
If a pure UNIX directory is changed,
the changes are applied to the directory
only. Else, if a directory on a volume
is changed, the changes are applied to the
files within this directory as well (they
are not applied to subdirectories).
The -n option makes sure that the
command is always applied to the direc-
tory only.
```

An absolute mode is specified using octal numbers (0-7), please see the UNIX documentation for a full description.

A symbolic mode specification is a comma-separated list (without any intervening spaces) of symbolic mode expressions of the form:

```
[who] operator [permissions]
```

In order to adjust permissions to files/directories and their related resource parts, you must own the directory in question. In case the resource directory does not match the enclosing directory's permissions, "dt chmod" cannot adjust the ".rsrc" directory's permissions. You have to log in as "root" in order to synchronize permissions of the two directories. Please refer to the UNIX documentation for a full description.

Examples

```
dt chmod 444 file
```

sets only read permission (0444) to "file".

```
dt chmod a=rwx,g+s file
```

sets read ("r"), write ("w"), and execution ("x") permission for all ("a") users, and adds group set-ID mode ("s") for groups' permissions.

A 9.5.14 dt chown

The “chown” command sets the user ID of the passed file to the new user ID specified by owner, and, optionally, the group ID to the new group.

```
Usage: dt chown [-fhRn] owner[:group] file ...
```

The following options are supported:

```
-f  do not report errors.

-h  if the file is a symbolic link, change the
    owner of the symbolic link (not the owner
    of the file that is referenced by the
    symbolic link). This option is not
    supported on all platforms.

-R  recursively descend through the directory
    when setting the ownership for each file.

-n  change directory only – not the files
    within the directory. The default
    behavior of the “dt chown” command is
    as follows:

    If a pure UNIX directory is changed,
    the changes are applied to the directory
    only. Else, if a directory on a volume
    is changed, the changes are applied to the
    files within this directory as well (they
    are not applied to subdirectories).

    The -n option makes sure that the command
    is always applied to the directory only.

owner[:group] (use “.” or “:”)
    A user ID and an optional group ID to be
    assigned. Both IDs may either be specified
    by the numeric ID or by the corresponding
    user or group name.
```

Please note that you need the necessary access rights to change the user or group ID of a file – according to UNIX semantics, only the user id “root” is allowed to change ownership settings.

Examples

```
dt chown frank:support myfile
```

changes the owner for myfile to “frank”, and the group to “support”.

```
dt chown 100 myfile
```

changes the owner for myfile to the user defined with the ID 100.

A 9.5.15 dt chgrp

The “chgrp” command sets the group ID of a given file to that of the new group.

```
Usage: dt chgrp [-fhRn] group file ...
```

The following options are supported:

```
-f  do not report errors.

-h  if the file is a symbolic link, change the
    group of the symbolic link (not the group
    of the file that is referenced by the
    symbolic link). This option is not
    supported on all platforms.

-R  recursively descend through the directory
    when setting the group for each file.
```

```
-n  change directory only – not the files
    within the directory. The default
    behavior of the “dt chgrp” command is
    as follows:
    If a pure UNIX directory is changed,
    the changes are applied to the directory
    only. Else, if a directory on a volume
    is changed, the changes are applied to the
    files within this directory as well (they
    are not applied to subdirectories).
    The -n option makes sure that the
    command is always applied to the direc-
    tory only.
```

A group ID may either be specified by the numeric ID or by the corresponding group name.

Please note that you need the necessary access rights to change the group ID of a file – according to UNIX semantics, only the user id “root” is allowed to change ownership settings.

Examples

```
dt chgrp support myfile
```

changes the group to “support”.

```
dt chgrp 100 myfile
```

changes the group for myfile to the group defined with the ID 100.

A 9.5.16 dt idinfo

The main purpose of this command is problem detecting. The Macintosh file, or respectively directory ID, is stored in both the file’s resource fork and the desktop database.

The ID stored in the resource fork may be listed by using the “dt ls” command.

The “idinfo” command may be used to display database information for the passed ID. If there is no difference between the resource data and the corresponding database entry, you should get the same information, otherwise the system administrator should issue a “rebuild” for the specific volume. You can use `rebuild -s <volume root>` to verify that the volume information is properly reflected in the related desktop database; see **Before getting started...** in chapter A 9.3 “How to install the “dt” utilities” above.

```
Usage: dt idinfo [-v volume] id ...
```

Please note that each volume has its own ID scope. Therefore, you must specify the correct volume for each ID you request. If you do not specify a volume with the `-v` option, the current working directory is assumed.

```
-v  allows to specify the volume to be used, or
    any file or directory inside the target
    volume.
```

Example

```
dt idinfo -v /usr/ethershare/etc 20
```

prints the following information:

```
volume: “/usr/ethershare” id=20 pid=18 name:
“qdoc”
```

specifying the volume detected, the ID, the parent ID for this file, and the corresponding name stored in the database.

Technical note

Please note that an ID detected in the database that does not have any corresponding file in that volume does not cause any problems or data loss.

A 9.6 “dt” warning messages

%s: move to volume with different charset not permitted.

This warning message appears if you intend to move a file from one Macintosh volume to another, and the volumes’ character sets do not match.

%s: copy to volume with different charset not permitted.

This warning message appears if you intend to copy a file from one Macintosh volume to another, and the volumes’ character sets do not match.

A 9.7 Additional information

A 9.7.1 General remarks

The information in this section are mainly meant for system administrators who want to integrate the “dt” utilities into custom solutions, e.g. backup scripts. You do not need these information for the simple use of the “dt” utilities (it does not hurt, however, to read on).

A 9.7.2 Macintosh files under UNIX

As described in this EtherShare manual, each volume used in EtherShare is accompanied by a corresponding desktop database, which holds additional information about each file or directory stored on this volume.

Each file or directory in a Macintosh volume consists of two parts: “the data fork” and the “resource fork”.

Though invisible to the Macintosh user, both parts of a file and the corresponding information in the desktop database are handled transparently and automatically by EtherShare.

If you also use EtherShare OPI 2.1 and/or PCShare 2.5 or higher, these HELIOS products will also coordinate access to shared files/folders with EtherShare’s volume desktop databases (see chapter 9 “The EtherShare File Server”).

When you look at a volume from the UNIX point of view, you will find two files: the data fork as the “normal” UNIX file, and the resource fork in a subdirectory “.rsrc” of the same name.

You will find more information about this in chapter 9.3 “Directory and file formats”.

A 9.7.3 Default resource fork handling

Since UNIX files consist of only one part, but Macintosh files of two (see A 9.7.2 “Macintosh files under UNIX”), each pure UNIX directory (“UNIX-dir”) should only have entries without a corresponding resource fork, and in a Macintosh volume (“volume-dir”) each entry should have a corresponding resource fork.

If you now copy or move an entry from a “UNIX-dir” into a “volume-dir”, “dt” always creates a default resource for this file. This is also the default behavior, if you move or copy a file from one “volume-dir” to the other.

If you copy an entry from a “volume-dir” into a “UNIX-dir”, “dt” copies or moves the resource fork as well, even if the resource fork is not needed here. This is done in order to avoid any unintentional data loss. If you do not want to consider the resource forks here, you may use the `-n` option for the “mv” or “cp” command.

A 9.7.4 EtherShare and desktops

The “dt” utilities do not require EtherShare to run on the UNIX server where you issue the commands, but by default the “dt” utilities try to connect to the local desktop server on the server where you issue the commands first.

If this volume is already in use (e.g. mounted as a volume on a Macintosh) the “dt” utilities try to connect to the current server which serves this volume. This could be a differ-

ent server, e.g. if this volume is mounted via NFS. Source and destination are handled completely independently, e.g. a source file for a copy command may be served by a local desktop server, while the destination directory which is located on a NFS-mounted directory is served by another EtherShare desktop server.

You can run “dt” utilities on a workstation without having EtherShare installed. In this case, a reference to the host running the “desksrv” program must be defined by the environmental variable “DESKSERVER_HOST”=[host name] which must be exported in order to take effect.

The “dt” utilities are unable to connect to a desktop server, when the target directory is not mounted by any Macintosh and *no local* desktop server is running. In this case start a local EtherShare copy or mount this volume on a Macintosh.

The “dt” utilities will do an extensive verification in order to connect to the proper desktop server. Nevertheless, please verify your environment so that no single EtherShare volume can be accessed at the same time from different EtherShare servers.

Note: In case different desktop servers are involved in a move directory operation, it may be necessary to traverse through directories instead of just moving the directory entry – see **Technical notes** for “dt mv” for more details.

A 9.7.5 “mount points” and “auto-mounter”

Double mounts (access to the same directory under different mount points, e.g.:

```
mount   myserver:/usr/es  /es

mount   myserver:/usr/es  /home/user1/es_copy)
```

will lead to differences between volume and desktop information, resulting in inconsistencies.

Please note that you may unintentionally cause this problem by accessing an already mounted volume via auto-mounter:

```
dt cp /net/myserver/usr/etherhare/file1 file2
```

You may avoid this problem by running auto-mounter on any involved server (source and destination).

A 9.7.6 Zero IDs

On any mounted volume, EtherShare automatically detects any file which has an accompanying resource fork with a zero ID (the ID set to numerical zero) when the parent directory is opened from a Macintosh.

A file without a valid ID does not have any database entry, and therefore, a new desktop database entry is created, and the resource fork is updated using the new ID.

The “dt” utilities never create zero ID resource forks in volumes unless you force this behavior using the `-z` flag for the “cp” and “mv” command.

Important: This option should only be used by system administrators – it is not intended for normal use.

A 9.7.7 Using “dt” for backup/restore

One main purpose of the “dt” utilities is to avoid problems when restoring data from a backup device. Here we describe how you should use the “dt” utilities for backup/restore purposes:

backup

You may backup your data as usual directly from your volume. Please make sure that the hidden “.rsrc” directories are included. To prevent backup of incomplete data in files, make sure that the files/folders to be backed up will not be manipulated from other Macintosh or UNIX applications. Only if you intend to do a complete backup and restore of an EtherShare volume you might include the “.Desktop” file. For the period of time you need to backup and restore this volume, EtherShare *must* be stopped with “stop-atalk”.

restore

Important: Do never restore your data directly into the destination volume!

Please create a restore directory on the same device (partition) where the destination volume resides, e.g. if you intend to restore files into “/data/mypics”, create a directory “/data/restore”. This “restore” directory must not be defined as a volume, or mounted.

Now restore your data using your usual restore procedure into this newly created directory “restore”. Make sure that you do not restore the “.Desktop” and “DeskServer” files.

Important:	Do never remove these files (".Desktop" and ".DeskServer") from a mounted volume or manipulate them directly. This may cause not only data loss for this volume, but may cause problems for all defined volumes on the server. In case you want to backup/restore these files, make sure that EtherShare and PCShare (if you are sharing volumes) are stopped completely prior to your backup/restore operation. Only if you stop EtherShare by means of "stop-atalk" and stop access from other EtherShare servers, intermediate access to these files from EtherShare processes can be prevented.

Finally move the restored files with e.g.:

```
dt mv /data/restore /data/mypics
```

into their final destination. This procedure avoids any data loss and may be used on a mounted destination volume.

Usually, new (unused) file IDs are assigned when you copy files to a backup destination. It may, however, be sensible to keep the file ID (using the `-k` option). Thus, the file can be re-used with its original ID.

This is especially useful if you are using Macintosh aliases pointing to these files/folders. You should use this option sensibly. In case a complete desktop rebuild has been conducted after your backup operation, aliases may point to the wrong destination.

To avoid any problems, it may be a good idea to run an integrity check for the destination volume using the "rebuild -s" command before restoring any files.

Appendix

A 10:Macintosh and Windows characters

When it comes to character transfer between Windows 98 / Windows NT and Macintosh computers respectively, it must be considered that Macintosh and Windows character encoding utilizes 8-bit values which are not always mutually compatible. A well-known example are special characters.

Thus, in order to provide proper file name exchange between the different platforms, the “Unicode/UTF-8” encoding can be applied (compare **“UTF-8 encoded file names”** in chapter 9.3 “Directory and file formats”).

Notwithstanding, there are some characters which are not displayable at all on the other system. The following tables show the characters in question, categorized by the operating system, and their respective hexadecimal value.

Fig. A-29 shows Windows 98 (left) and Windows NT4 (right) characters which the Macintosh cannot display.

Fig. A-30 shows Macintosh characters which Windows 98 cannot display. Similarly, Macintosh characters not displayable by Windows NT4 are shown in Fig. A-31.

5E	^
A4	¤
A6	¦
AD	-
B2	²
B3	³
B9	¹
BC	¼
BD	½
BE	¾
D0	Ð
D7	×
DD	Ý
DE	Þ
F0	ð
FD	ý
FE	þ

5E	^
86	+
87	+
88	^
A4	¤
A6	¦
AD	-
B2	²
B3	³
B9	¹
BC	¼
BD	½
BE	¾
D0	Ð
D7	×
DD	Ý
DE	Þ
F0	ð
FD	ý
FE	þ

Fig. A-29: Windows 98 (left) and Windows NT4 (right) characters not displayable by Macintosh

20		CF	œ	FE	˘
22	"	D0	–	FF	ˇ
2A	*	D1	—	8D	ç
2E	.	D2	“		
3C	<	D3	”		
3E	>	D4			
3F	?	D5			
7C	|	D7	◊		
82	Ç	D8	ÿ		
A0	†	D9	Ÿ		
A5	•	DA	⁄		
AA	™	DC	‹		
AD	≠	DD	›		
B0	∞	DE	fi		
B2	≤	DF	fl		
B3	≥	E0	‡		
B6	∂	E2	,		
B7	∑	E3	„		
B8	∏	E4	‰		
B9	π	F0			
BA	∫	F5	ı		
BD	Ω	F6	ˆ		
C3	√	F7	˜		
C5	≈	F9	˙		
C6		FA	·		
C9	…	FB	°		
CA		FC	¸		
CE	Œ	FD	˝		

Fig. A-30: Macintosh characters not displayable by Windows 98

20		C9		FB	ß
22	"	CE	˘	FD	
2A	*	CF	ˇ	FE	
2E	.	D0	—	FF	
3C	<	D1			
3E	>	D2			
3F	?	D3			
7C	|	D4			
82		D5			
A0		D7			
A5	¥	D9			
AA	“	DA			
AD	›	DC			
B0		DD			
B2	†	DE			
B3	‡	DF			
B6	¶	E0			
B7	•	E2			
B8	¸	E3	ª		
B9	„	E4			
BA	”	F0			
BD	‰	F6			
C3	ˆ	F7			
C5	¯	F9	ø		
C6	˘	FA	œ		

Fig. A-31: Macintosh characters not displayable by Windows NT4

Appendix

A 11:Glossary

AFP server Apple file server using the AppleTalk Filing Protocol (AFP).

AppleTalk A generic term for the most common network protocol used by Apple Macintosh computers.

Chooser A program provided by Apple for Macintosh computers which lets you choose a server for a particular service, such as printing or storing files.

Client Software that uses the services of a server in a network.

Driver A program which is part of the operating system of a computer and controls part of the hardware of the computer.

Ethernet, Fast Ethernet Ethernet is a network system which has been standardized by the XEROX company. A differentiation is made between Thin Ethernet (which uses low-cost thin coaxial cable with a maximum length of approximately 185 m per network segment), and 10Base-T Ethernet, which uses standard telephone cable with a connector like a US telephone jack. Network cards for Thin Ethernet are usually provided with coaxial (BNC) connectors. Some network cards have connectors for more than one of these methods. Ethernet (see also chapter 3.5 “Network topology”) is logically characterized by a linear bus topology. However, nowadays the 10Base-T Ethernet and 100Base-T Ethernet – also called *Fast Ethernet* – sport, from the physical point of view, a star-shaped topology. Fast Ethernet is similar to Ethernet but achieves data transfer rates of 100 Mbit/s (instead of 10 Mbit/s).

EtherShare A program developed by HELIOS for AppleTalk networks. It allows among other things the sharing of hard disks (file server function) and printers (print server function), and

uses the AppleTalk protocol and AppleShare IP for network communications.

EtherShare OPI An optional add-on for EtherShare which considerably speeds up print spooling if you are printing DTP layouts containing large high-resolution images. OPI (Open Prepress Interface) is an interface specification which was developed by Aldus Corp.

EtherTalk A term used by Apple Computer when the AppleTalk protocol is used on an Ethernet network.

FDDI The Fiber Distributed Data Interface (FDDI) is a network system based on fiber-optic cables. FDDI is characterized by very high speed and medium to high cost. It largely is immune to electromagnetic interference, which is an advantage in certain industrial situations.

FDDITalk A term used by Apple Computer when the AppleTalk protocol is used on an FDDI network.

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

Home directory Private directory provided for each UNIX user. The home directory is the current directory as soon as you log in to a server.

Host In this manual, the UNIX computer on which the EtherShare Software runs.

LocalTalk A low speed network interface which is built into Apple Macintosh computers. A LocalTalk interface is provided in all Macintosh workstations and in many printers. Nowadays, the LocalTalk technology is outdated already.

Network A cabling system which allows a number of devices such as workstations and printers to communicate with each other. Each device in the network can offer specific services, or be a user of services provided by other devices. For example, when a printer offers services to the network (the printing of documents), it can be used by any of the workstations in the network.

Node A node is a data-link addressable entity on a network.

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 TCP/IP-based file server, print server, and terminal server software for MS-DOS/Windows computers which are attached to UNIX computers through Ethernet, Token Ring, etc. Since PCShare is compatible with EtherShare, DOS/Windows users can share network printers and files with Macintosh and UNIX users, too.

PDF The "Portable Document Format" (PDF) is an Adobe Acrobat file format that has been created for application independent file exchange. With the Acrobat Reader software — which can be installed from our CD-ROM or downloaded from the Adobe Web site — you may read and print any given PDF document.

Phase II A new version of the AppleTalk protocol which, among other improvements, allows up to 254 units in each network segment and approximately 2^{24} units in each network.

PPD "PostScript Printer Description" (PPD), is a file format developed by Adobe Systems, Inc. PPD files contain information enabling software to produce the best results possible for each type of designated printer.

Protocol A standardized data format which allows workstations to communicate via a network.

RIP A “Raster Image Processor” (RIP) performs the final calculation of the data which are sent to the output device. The RIP may be either an external unit or part of the output device itself. A PostScript laser printer for example contains its RIP.

Root directory The top-most directory on a UNIX computer is called “root” directory. If you are logged in as “root”, you can access all other directories and subdirectories on the system.

Router A program or hardware unit which interconnects two or more networks (or zones) in order to transfer data in a bidirectional way between them. For example, EtherShare can be configured as a router to interconnect a FDDI and an Ethernet network.

Server Software which provides services to a network, such as printing (print server) or the storage of files (file server). In this book, when we write Print Server or File Server in capitalized initial letters like this, we refer to the EtherShare Print Server and File Server.

Socket A socket is an addressable entity within a node connected to an AppleTalk network. Sockets are owned by software processes known as socket clients.

Spooler A spooler is a set of programs which manage print jobs. A spooler acts as a buffer for the files that have been sent to an output device. A spooler may also be called “printer queue”.

TCP/IP An internet network is a virtual data network specification based on a packet-oriented protocol (the internet protocol =

IP) 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.

Token Ring Token Ring is a network system which was pioneered by IBM. It is based on a token-passing system (i.e. a logical ring) but its topology usually is a distributed star (see also chapter 3.5 "Network topology").

TokenTalk A term used by Apple Computer when the AppleTalk protocol is used on a Token Ring network.

Workstation Any computer connected to a network, for example a Macintosh computer, or a PC-compatible computer running the AppleShare-PC program.

Zone A section of a network. You need a router if you want to use two or more zones. Note that the Macintosh's **Zone** menu may not be shown in the **Chooser** if you do not have zones.

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