

Administrator and User Guide

For Sun™ Systems

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1 – Preface

Welcome to uShare/CanOPI!

This preface explains how this User Guide is organized, lists the steps you need to follow to install CanOPI, introduces CanOPI, provides a partial list of new features offered in this version, and tells you how to contact IPT's Technical Support department.

About This User Guide

This User Guide is for people who use or install CanOPI. The User Guide assumes that you are familiar with the basic UNIX environment and that you have basic UNIX skills. If you do not, please refer to the appropriate UNIX documentation.

This User Guide contains the following information:

Preface – This preface explains how this User Guide is organized, lists the steps you need to follow to install CanOPI, introduces CanOPI, provides a partial list of new features offered in this version, and tells you how to contact IPT's Technical Support department.

Installing and Starting CanOPI – Provides all the information you need to install and start CanOPI on your Sun host, including:

- a list of helpful reference materials,
- steps for preparing to install CanOPI,
- an installation checklist, and
- instructions on installing and starting CanOPI

ScriptableAdmin – Gives instructions for starting ScriptableAdmin and using it to manage:

- UNIX Users & Groups

- CanOPI File Servers and Volumes
- CanOPI Print Spoolers
- CanOPI Processes
- the CanOPI Binder.

Drag & Drop and OPI – CanOPI’s Drag & Drop capability allows users to move their high-resolution images to a network file server and have low-resolution OPI images automatically generated for use in page-layout and printing. This chapter discusses the steps involved in configuring a Drag & Drop folder and discusses how to use Drag & Drop.

PrintQMgr – PrintQMgr lets you monitor and control the print queues for all available printers on your CanOPI server. PrintQMgr can be used only if your CanOPI Authorization Key has enabled this service. This chapter gives instructions for:

- installing the PrintQMgr application,
- starting the PrintQMgr application,
- changing your user authentication,
- monitoring and controlling printer queues, and
- performing administrative tasks as the “root” user.

Using uShare Manager for OpenLook – If you are running OpenLook on your Sun host, you can use CanOPI’s uShare Manager to manage some of CanOPI’s services. This chapter describes uShare Manager procedures and provides a summary of uShare Manager menus and windows.

Processes – You provide CanOPI services to your network by controlling processes on your Sun host and configuring each service for your particular needs. This chapter gives instructions for using UNIX commands to control CanOPI processes.

AppleShare File Server Service – CanOPI includes the AppleShare File Server service, which lets you define AppleShare (AFP) file servers and publish portions of your UNIX file system

as AppleShare volumes. This chapter gives instructions for managing and using CanOPI's AFP file servers from the UNIX command line.

Print Spooler Service – CanOPI's Print Spooler service allows Mac OS and UNIX users to share PostScript printers on your AppleTalk and TCP/IP networks. This chapter describes how to create and edit CanOPI print spoolers from a UNIX command line.

CanOPI Files – When you install CanOPI software on your Sun host, a number of files are placed on your UNIX file system. This chapter describes those files and lists their locations.

CanOPI Commands – CanOPI provides a number of user-level commands that let you control CanOPI processes, configure CanOPI services, and diagnose network problems. This chapter summarizes the syntax of those commands.

Compatibilities – Many products allow users to open their documents on multiple platforms. To maintain compatibility with these products, CanOPI sometimes requires specific configuration settings. This chapter describes the necessary configurations for CanOPI to work with the products listed below:

- Aldus FreeHand
- ccMail
- GroupWise
- EPOCH File migration software
- Microsoft Excel (when sharing files with PC users)
- Microsoft Windows (when printing to a UNIX spooler).

This chapter also includes a section regarding the steps you can perform to work with an 8-bit data stream, and a procedure to convert your system from Helios EtherShare to IPT's uShare (included with CanOPI).

Troubleshooting & FAQs – This chapter provides a troubleshooting guide, answers to frequently asked questions about CanOPI and its services, and instructions for getting technical support from IPT.

Appendix A - Suggested Reading – This appendix provides information regarding:

- minimum UNIX knowledge prerequisites,
- minimum AppleTalk prerequisites, and
- a brief introduction to AppleTalk networking.

Appendix B - Advanced Configuration of CanOPI – This appendix provides advanced configuration instructions for CanOPI including:

- Issues to be considered before configuring CanOPI's AppleTalk router.
- The steps involved in creating an advanced configuration
 - defining CanOPI's AppleTalk driver configuration,
 - activating network interfaces for CanOPI,
 - configuring CanOPI's AppleTalk router,
 - activating CanOPI's AppleTalk router, and
 - configuring CanOPI's default interface and zone.
- Tables describing the modifiable parameters of the following ScriptableAdmin files
 - group defaults,
 - users defaults,
 - AFP server defaults,
 - AF volumes defaults, and
 - `.iptadminrc` preferences.

Appendix C - CanOPI's File Tree & Printing Paths – This appendix provides the following information:

- A file system tree describing the location of commonly used, CanOPI-related files and directories,

- A flowchart describing the order in which an AppleTalk to UNIX to AppleTalk print job is handled by a CanOPI spooler,
- A flowchart describing the order in which an AppleTalk to UNIX print job is handled by a CanOPI spooler, and
- A flowchart describing the order in which a UNIX to AppleTalk print job is handled by a CanOPI spooler.

Appendix D - CanOPI Related Processes – Contains information regarding CanOPI server processes that run on your Sun host and client applications for Mac OS clients.

Appendix E - Installation Examples – This appendix contains several CanOPI installation examples.

Glossary – Defines terms that relate to the use of CanOPI.

Index – Contains topical entries and their locations in the User Guide for reference.

Getting Started

There are specific steps to follow when installing CanOPI in order to have it work properly. This section lists the steps and the chapter(s) that include the detailed instructions to complete each step.

Once the following steps are complete, you can use CanOPI's ScriptableAdmin application to create and manage CanOPI Services, File Servers, Shared Volumes and Print Spoolers (see the "ScriptableAdmin" chapter).

Preparation

Complete the steps listed in "Installing and Starting CanOPI" on page 17.

Fill out the Installation Checklist

By marking the appropriate boxes in the “Installation Checklist” on page 21, you will have all the necessary information to respond to the prompts that appear during installation. This will also provide you with a convenient record of what steps you took to install your new CanOPI software.

Installation

Several installation scenarios are presented in this User Guide. Refer to the appropriate section for your configuration:

- “Installing and Starting CanOPI - Solaris 2.5 and Higher” on page 24 (local and remote CD, tape, and floppy disk instructions), and
- “Installing and Starting CanOPI - SunOS 4.1.x” on page 27 (local and remote CD, tape, and floppy disk instructions).

Additionally, installation examples are presented in “Appendix E - Installation Examples”.

Enter Your Authorization Key

Your Authorization Key is unique to your Sun host and governs what CanOPI Services you can provide to your network. The Key Manager lets you update your key, and see at a glance your Sun host’s identification number (see “Updating Your CanOPI Authorization Key” on page 47).

Configure User and Group Accounts

In order to make best use of CanOPI’s File Server services, Mac OS users should have UNIX user accounts on your Sun host. ScriptableAdmin lets you create, modify and remove UNIX groups and user accounts (refer to “Creating & Editing CanOPI (UNIX) User & Group Accounts” on page 47).

If the UNIX groups and user accounts for your Mac OS users already exist on your UNIX host, you can proceed to “Creating or Editing a User Account” on page 52.

Configure File Servers

CanOPI's File Server service lets you publish portions of your Sun host's file system as AppleShare volumes. The File Server Manager lets you create, edit, and remove CanOPI file servers and their global volumes. You may create your own file server to publish your CanOPI volumes, or use the default server "<host-name>-CanOPI" (refer to "File Sharing" on page 55).

Configure Print Spoolers

CanOPI's Print Spooler service lets Mac OS and UNIX users share PostScript printers on your AppleTalk and UNIX networks. The Print Spooler lets you create, modify, and remove print spoolers (refer to "Print Spooling" on page 69).

What is CanOPI?

CanOPI is IPT's integrated software system for storing, retrieving, and printing high-resolution images.

CanOPI enables Mac OS clients to maintain a central archive of images. By using CanOPI's **Drag & Drop** feature, users can have low-resolution versions of high-resolution images generated automatically when the high-resolution image is placed on a network file server. Users can then use these low-resolution images as usual in their documents; clients print through CanOPI **print spoolers**. These print spoolers include an **OPI** filter that interprets OPI comments in client print jobs and automatically substitutes high-resolution versions of the included images. Clients can monitor and control their print jobs with CanOPI's PrintQMgr application, and the **AlertDriver** init sends any printer error messages directly to the client originator of the print job.

Each element of the CanOPI system is designed for a **multi-user** production environment, so user names, passwords, and access rights are honored and easily managed with CanOPI's **System Management** module, ScriptableAdmin.

This integrated system, through which clients manipulate low-resolution versions of images, results in dramatic reduction of network traffic and of processing overhead on client machines. The easy access to this system provided by CanOPI's client applications further expands the resources and productivity of your network and users.

uShare/CanOPI Modules

To better understand the structure of your uShare/CanOP software, you can think of the system as a series of modules:

uShare

This module provides basic AppleTalk connectivity for your Sun host. uShare's **file server** service lets your Sun host appear to your Mac OS clients as an AppleShare file server. With uShare's **uPrint spooler**, your Sun and Mac OS clients can share printers on your network. Your CanOPI administrator configures and controls these and other services with the ScriptableAdmin application for the Mac OS client.

Drag & Drop Low Resolution Placement

This module allows users to move their high-resolution images to a network file server and have low-resolution OPI For Position Only (FPO) images automatically generated for use in page layouts.

OPI Processor

This module interprets OPI comments in clients' print jobs and automatically substitutes high-resolution versions of included images. Clients access this feature simply by printing through CanOPI print spoolers from applications that support OPI.

ScriptableAdmin

This module is part of IPT's graphical interface for system and network administration. ScriptableAdmin provides an easy-to-use, Mac OS client-based set of tools that let you configure and control CanOPI services and manage UNIX user accounts and groups. ScriptableAdmin is also used to configure CanOPI print spoolers to handle OPI processing.

TurboTalk

CanOPI's TurboTalk product provides greatly improved performance of all file copy operations to or from your CanOPI and any Mac OS servers that have TurboTalk running. This includes Finder copies, opens, and saves, and application launches from any networked volume.

NetDoubler For uShare

CanOPI's NetDoubler for uShare product provides greatly improved performance of all file copy operations to or from your CanOPI and any Mac OS servers that have NetDoubler running. This includes Finder copies, opens, and saves, and application launches from any networked volume.

uPrint

CanOPI's uPrint Print Spooler product lets Mac OS and UNIX users share PostScript printers on your AppleTalk and UNIX networks. The Mac OS users select CanOPI spoolers with the Chooser desk accessory, while UNIX users use their familiar print tools and commands.

Partner

CanOPI's Partner product expands upon uShare's AppleTalk connectivity by letting your Sun host use Partner's OpenLook GUI, NetFinder, to mount AppleShare servers as if they were native UNIX file systems.

PrintQMgr

PrintQMgr provides an easy-to-use, Mac OS-based set of tools which enable you to manage your printing environment from any Mac OS client on the network. PrintQMgr lets Mac OS clients monitor and control the print queues of all available printers on your CanOPI server. PrintQMgr also allows individual users to control their own jobs in the printing queue, as well as resubmit finished jobs. The AlertDriver init informs Mac OS clients of printer errors directly from CanOPIs spoolers.

Print Accounting

CanOPI's Printer Accounting product allows the user to access a log of all print activities for each print spooler. Printer Accounting displays information such as the name and login of the user that initiated the print job; the spooler name; the document title; the number of pages; and when the print job was queued, spooled, and finished.

New Features

New in uShare 5.0, CanOPI version 1.5

CanOPI version 1.5 has several new features, including:

- **ScriptableAdmin** –

This version of ScriptableAdmin CanOPI includes IPT's Eddy award-nominated (MacWeek magazine's Editor's Choice award) server administration package, ScriptableAdmin. ScriptableAdmin lets you configure and control Sun host services from a Mac OS computer on your network. See "ScriptableAdmin" on page 35.

- **More Simultaneous Connections** –

CanOPI now supports up to 65 thousand simultaneous connections to the server (clients, printers, etc.), improving on the previous limitation of 256 connections. However, your CanOPI Authorization Key may restrict usage to a smaller number of users.

- **Multiple Stubs** –

Now you can configure CanOPI to produce multiple low-resolution images from a single high-resolution image. Up to four low-resolution images can be generated, each one different from the others.

- **GIF and JPEG Low-Resolution File Type Creation** –

CanOPI can now generate GIF and/or JPEG low-resolution image file formats, useful for HTML sites or online publishing work.

For more information, see “.opiconfig Attributes Table” on page 92.

- **New OPI Options Available Using ScriptableAdmin** –

Several options are now available for the first time in ScriptableAdmin’s **OPI Options** and **Advanced OPI Options** dialog boxes. These options include the ability to abort a job if a high-resolution image cannot be found, support for ALD image transparency, and more.

For more information, see “OPI Options” on page 82 and “Advanced OPI Options” on page 84.

- **New GUI-based OPI Setup Utility** –

CanOPI 1.5 contains an OPI Config Setup, a utility that allows users to create and edit opiconfig files using a graphical user interface (GUI) as opposed to text files. Contained in the MacApps folder, this utility is called **OPI Config Setup**.

- **Balloon Help** –

ScriptableAdmin provides context-sensitive balloon help. With balloon help on, placing your cursor on any item or text box that is supported by balloon help causes context-sensitive information to appear. See “Balloon Help” on page 41.

New in CanOPI version 1.4h

The following are several new features that were included in CanOPI version 1.4h:

- **Recursive search paths** –

Now you can specify whether or not CanOPI will search recursively for an image, using the specified directory as a starting point. This flag must be entered for each search directory for which you want to enable recursive image searching.

See “docman” on page 215.

- **Fractional TIFF resolution** –

Now CanOPI can use a fraction of a pixel in defining the low resolution stub file, such that it will conform exactly to the size of the high resolution original.

See Table 4-1 on page 92.

- **Decompressable JPEG for printable previews** –

Allows the user to disable decompressing of JPEG encoded EPS files, in order to save time. If this flag (in the opiconfig file), is set to **false**, the JPEG data in EPS files will not be decompressed to build the printable, PICT, and TIFF previews.

See Table 4-1 on page 92.

- **Ability to print to a remote device over a TCP/IP network connection** –

This version of CanOPI lets the user print a job to a remote printer using a TCP/IP connection when that device's IP address is entered during the definition of that Print Spooler. See "Creating a TCP/IP Print Spooler" on page 75.

- **Font Reporting –**

ScriptableAdmin's **Spooler List** dialog box contains a button allowing users to generate a report showing all fonts resident on a particular output device.

See "Reporting an Output Device's Fonts" on page 80.

- **Printer Accounting –**

CanOPI contains a Printer Accounting feature that allows the user to access a log of all print activities for each print spooler. There are two levels of accounting available in the Printer Accounting package: **Job Accounting** and **Page Accounting**.

See "Printer Accounting" on page 86.

- **Low-resolution image files lock while being generated –**

opistub locks the low-resolution image file while it is being generated, providing a means of notifying the user that the low-resolution file is not yet completely processed by **opistub**, and should not yet be used. Any application attempting to place such low-resolution image files in a document will get the following error message:

```
'File <name of low-resolution file> is  
locked'
```

- **TIFF (PC) previews can contain clipping paths –**

If an EPS or DCS high-resolution original image that contains a TIFF (PC) preview with a clipping path set in it is placed into an OPI volume, the TIFF (PC) preview of the resultant low-resolution image file will also contain the clipping path.

Conventions in this Guide

Typeface Conventions

Throughout this guide, several conventions are followed:

- UNIX commands that you enter at a command line appear in the **Courier bold** typeface and are preceded with a pound sign (#) representing the UNIX shell prompt, for example:

```
# cd /ushare/bin
```

- File names in the text appear in **Courier bold**, for example:

```
/ushare/etc/mtab
```

- UNIX shell output and the contents of editable files appear in the **Courier bold** typeface.
- The chapter heading is indicated by **Helvetica Bold** typeface, aligned flush with the left side of the page.
- Each chapter is divided into individual topics, as indicated by the **Helvetica Bold** typeface at the beginning of each new topic.
- **NOTES**, that include helpful advice, pertinent information about configuration, and warnings, are indicated by the *Times italic* typeface.

Other Conventions

- When you are instructed to “edit the **<namedfile>** file...” you should open the named file with a text editor such as **vi** or Open Windows' **Text Editor** program, make the indicated changes, then save the file.
- When you are instructed to “issue the following command at a UNIX command line,” you are expected to be running a C-shell, or the like, on your Sun host and issue the indicated command. If you are running Sun View or OpenWindows, you must open a shell tool or command tool to see a UNIX command line.

Note – In addition to representing a UNIX shell prompt, the pound sign (#) can be used to comment-out lines in files.

- The abbreviation `~username` indicates the home directory of a user.
- Input or output that does not fit on a single line in this guide is broken by a backslash (\), for example:

```
# lwdq.x -n '<LaserWriter>' \  
-z '<ZONE>' < /tmp/junk
```

describes a single command line.

- `<TEXT>` indicates text that you should replace. For example `<LaserWriter>` should be replaced with the name of a LaserWriter printer.

Technical Support

Before you request technical support, be sure to look at the “Troubleshooting & FAQs” chapter for troubleshooting tips.

If you have qualified for 30 days of free support, or if you have purchased a maintenance program from IPT, you can call IPT’s technical support line:

(805) 541-3076

between 9:00 AM and 5:00 PM Pacific Time. In addition, after hours Emergency Support is available for a fee of \$100 per hour (weekdays), \$200 per hour (weekends - defined as 5:00 PM Friday to 9:00 AM Monday Pacific Time). Billing by credit card is preferred.

You can also contact the IPT technical support staff via email at

support@iptech.com.

When you contact IPT technical support, please be prepared to provide the following information:

- a description of your Sun host, that is, the hostid, model, and operating system version

- your version of CanOPI as indicated in the `/ushare/bin/VERSION` file, and
- a description of your problem.

2 – Installing and Starting uShare/CanOPI

This chapter provides all the information you need to install and start CanOPI on your Sun host, including:

- a list of helpful reference materials,
- steps for preparing to install CanOPI,
- an installation checklist, and
- instructions on installing and starting CanOPI

Note – *If you have previously used an AFP server package for your UNIX hosts, other than IPT's uShare or CanOPI products, you must completely deactivate its services before proceeding with your installation. This includes preventing the software from starting automatically after reboot, as well as unloading any kernel modules it may install to function.*

Helpful Reference Materials

Your CanOPI manual focuses mainly on the installation, configuration, and operation of CanOPI itself. Below are some suggestions for more in-depth reading on the operating environments of your UNIX and Mac OS client systems:

- For basic information about UNIX commands, read Sun Microsystems, Inc.'s *Sun System User's Guide* (part # 800-4826-10).
- For a complete description of OpenWindows, read the following documents from Sun Microsystems, Inc.:
 - **for OpenWindows Version 2:**

OpenWindows Version 2 Installation & Start-Up Guide
(part # 800-4899-10)

OpenWindows Version 2 User's Guide (part # 800-4930-10);

- **for OpenWindows Version 3:**

OpenWindows Installation and Start-Up Guide (part # 800-6029-10)

OpenWindows User's Guide (part # 800-6618-10).

- For information related to TCP/IP networking and system administration in the SunOS environment, read Sun Microsystems, Inc.'s *System & Network Administration* (part # 800-3805-10).
- For an in-depth description of AppleTalk networking, read Apple Computer, Inc.'s *Planning and Managing AppleTalk Networks*.
- For instructions on installing and using AppleTalk networking software on Mac OS clients, read Apple Computer, Inc.'s *AppleShare User's Guide*.
- For detailed technical information about AppleTalk networking, protocols, and routing, read Apple Computer, Inc.'s *AppleTalk Phase 2 Introduction and Upgrade Guide*, and *Apple Internet Router Administrator's Guide*,

Preparing to Install

Before installing CanOPI for SunOS or Solaris, please complete the following steps:

- Make sure your Sun host is a Sun SparcStation 1+ or higher running SunOS 4.1 or higher, or Solaris 2.3 or higher.
- Make sure you have all necessary Operating System patches installed. Always install any CanOPI patches shipped with your software AFTER installing the base package.

Check your CanOPI package for a **bright pink insert**

describing any operating system patches that must be installed before continuing with your CanOPI installation. This sheet will also indicate whether or not you should have received any current CanOPI patches as well. These patches must be installed after you have installed your CanOPI software, and before starting any services.

- Make sure that your disks or tape indicate the correct operating system for the machine onto which you are installing your software. You can install CanOPI by using a local device, or one that is available on a remote host, via a TCP/IP network connection.
- In the event that it is necessary to install CanOPI from a remote machine (a machine that has a CD, tape or disk device available to “borrow” for the installation), make sure the remote machine is “trusted” by the target machine. This requires the appropriate entries in the `/etc/hosts` and `/.rhosts` files for the “root” user on the target machine.

See your System Administrator or read part three, “Network and Communications Administration,” of Sun Microsystems Inc.’s System and Network Administration for more information.

- Make sure you have an Authorization Key.

Your Authorization Key governs what CanOPI services you can provide to your network. To obtain your key, fill out the “CanOPI Key Request” form included with your software package and FAX it to IPT. Note the entry for “Host ID” on your form. To determine your Sun host’s Host ID, issue the following command at a UNIX command line:

Solaris users:

```
# hostid
```

Sun OS users:

```
/bin/hostid
```

The output of this command is an eight-character hostid, for example:

```
53000a37
```

Your new CanOPI key will be faxed back to you promptly.

- Make sure that your Sun host is configured as a networked system.
 - a. Issue the following command at a UNIX command line:

```
# hostname
```

This command returns your Sun host's name, for example, `sparcipc`.

- b. Issue the appropriate command for your operating system:

Solaris:

```
# /usr/sbin/ping <HOSTNAME>
```

SunOS:

```
# /usr/etc/ping <HOSTNAME>
```

where `<HOSTNAME>` is the name returned by the `hostname` command. If your Sun host is properly configured, you should see output similar to this:

```
<HOSTNAME> is alive
```

If these commands fail to return the expected output, read part three, "Network and Communications Administration," of Sun Microsystems Inc.'s *System and Network Administration* for instructions on how to configure your Sun host as a networked system.

Default Configuration

During the installation process, you will be given the opportunity to start your new software immediately. If your Sun host has only one default Ethernet interface (that is, Sun's built-in Ethernet interface), and you plan to use EtherTalk Phase II Protocol, select "Yes" to this option. However, if you are going to use your CanOPI software with any of the options listed below, additional steps will be required before starting your software, and you should select "No".

DO NOT use the default configuration if you plan to use:

- multiple interfaces, that is, for AppleTalk Routing,
- a FDDI, ATM or 100BaseT interface, or
- Phase I AppleTalk network protocol.

Users who are upgrading from earlier versions of CanOPI will be provided the option to preserve their existing configuration files during the installation procedure.

Installation Checklist

By marking the appropriate boxes below, you will have all the necessary information to respond to the prompts that appear during installation. This will also provide you with a convenient record of what steps you took to install your new CanOPI software.

<p>Do you have a local tape, floppy disk, or CD drive attached to your future CanOPI host, or will this be a remote installation?</p>	<p>Installation: Local <input type="checkbox"/> Remote <input type="checkbox"/></p>
<p>Enter the appropriate device path for your tape, floppy disk drive, or CD here. Some common device paths are:</p> <p>SOLARIS - TAPE: <code>/dev/rmt/0</code> SOLARIS - FLOPPY: <code>/dev/rfd0c</code> SunOS - TAPE: <code>/dev/rst0</code> SunOS - FLOPPY: <code>/dev/rfd0c</code> If Volume Management is on: SOLARIS - CD: <code>/dev/dsk/d0t6d0s2</code> If Volume Management is off: SOLARIS - CD: <code>/dev/sr0</code> SunOS has no Volume Management, so: SunOS - CD: <code>/dev/sr0</code></p>	<p>Device Path:</p> <p>For remote installations, use the device path appropriate for the operating system that is running on the machine with the device attached.</p>
<p>During installation, you will be asked to select a location where you would like your CanOPI software installed. You will see a list of available file systems with enough room to store the software. You can choose an alternate directory, but it must exist within a file system that has at least 30 MB of space available.</p>	<p>CanOPI Directory:</p> <p>(select from the list provided during installation or choose your own destination)</p>
<p>If you are upgrading from a previous version of CanOPI, your current configuration will be used. However, performing a backup of the current installation is recommended. If you select “yes” to this option, you will be provided with a list of file systems that have room to store your backup. An alternate path may be provided.</p>	<p>Back Up Old Software?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>

<p>For print spooling, CanOPI uses a special directory to create and manipulate temporary files. You will be asked to choose from a list of available file systems to designate this spooling area. An alternate location may be selected, provided the directory exists on a file system with a minimum of 500 MB of free space. For heavy spooling usage, you may need even more space available (up to 5 GB); a good rule of thumb is to have twice as much space available for spooling as the maximum number of print jobs will occupy at any given time (that is, if your heaviest printing needs will require the ability to spool 300 MB of print jobs, at least 600 MB of space should be available).</p>	<p>Spooling Directory:</p> <p>(select from the list provided during installation or choose your own destination)</p>
<p>If you are upgrading from a previous version of CanOPI, it is strongly recommended that you build CanOPI caches for all published file server volumes before starting your new CanOPI services. This is because the procedure may take a considerable period of time for large volumes. If you have not yet defined the file server volumes or want to perform this task at another time, then select “No” to this option. You can run the procedure manually by typing the command <code>/uShare/bin/cachevol</code> while logged in as the “root” user. This procedure also is performed automatically when the file server is started. Once built, caches will be automatically maintained by the server.</p>	<p>Cache Old Volumes?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>Mark here whether you would like your CanOPI services to be started automatically whenever your machine re-boots. For more information on this option, see the section entitled “Autostarting Processes” on page 151.</p>	<p>AutoStart CanOPI?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>You can have your CanOPI software start up immediately after installation if you will be using the default configuration, or if you are using a previous configuration of CanOPI only. DO NOT USE THE DEFAULT CONFIGURATION if you meet any of the criteria discussed in “Default Configuration” on page 21.</p>	<p>Immediate Start-Up?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>Fill out and fax your key request form to IPT. Make note of the key that you are assigned, and the hostid of the uShare/CanOPI machine.</p>	<p>Software Key:</p> <p>Hostid:</p>

You are now prepared to install uShare/CanOPI by IPTech.

Installing and Starting - Solaris 2.5 and Higher

Note – Use the provided examples, “Local Floppy” on page Appendix E - i, “Remote Tape” on page Appendix E - v, or “Local CD” on page Appendix E - x, to guide you through the installation procedure. All examples are performed on a Solaris machine, but they are identical to their SunOS counterparts except where noted.

Local Installation (tape or floppy disk)

To install your uShare/CanOPI software on a machine with a local device attached:

1. Make sure you have completed the steps described in “Preparing to Install” on page 18, and completed the “Installation Checklist” on page 21.

2. Insert your tape or floppy disk into the appropriate device.

3. For floppy disk installation only, enter:

```
/etc/init.d/volmgt stop
```

4. To install your software, type:

```
csch -f <device path>
```

where **<device path>** is the appropriate path for your tape or floppy drive (see “Installation Checklist” on page 21).

5. Follow the instructions on the screen. Refer to the entries in the “Installation Checklist” on page 21 to answer the questions as they appear.

6. For machines using a floppy disk device, issue the following command after the cursor has returned to the command prompt:

```
/etc/init.d/volmgt start
```

7. Proceed to “After Installation” on page 30.

Local Installation (CD)

These instructions assume that you have the CD drive attached to the first SCSI bus, and that the SCSI ID is set to '6'.

With Volume Management

If you have Volume Management running (which is usually the case unless it has been explicitly disabled), the CD will automatically be mounted when you insert the CD in the drive. To install CanOPI, you should carry out the following steps:

1. Insert the CD in the drive, and type the command:

```
# cd /cdrom/cdrom0
# ./install
```

Follow the instructions on screen. You can refer to the installation example, "Local CD" on page Appendix E - x.

(If you want to do a remote install, append `to<hostname>` to the `./install` command.)

2. When the CanOPI installation is complete, you should unmount the CD and eject the disk as follows:

```
# cd
# eject cdrom
```

3. Proceed to "After Installation" on page 30.

Without Volume Management

If you do not have UNIX Volume Management running, the CD will have to be mounted manually. Carry out the following steps:

1. Insert the CD in the drive, and type the command:

```
# mount -F hsfs -o ro /dev/dsk/d0t6d0s2 /cdrom
```

(It may be necessary to first create the `/cdrom` directory.

2. Enter the following commands:

```
# cd /cdrom
# ./install
```

Follow the instructions on screen. You can refer to the installation example, “Local CD” on page Appendix E - x.

(If you want to do a remote install, append `to<hostname>` to the `./install` command.)

3. When the CanOPI installation is complete, you should unmount the CD and eject the disk as follows:

```
# cd
# umount /cdrom
# eject cdrom
```

4. Proceed to “After Installation” on page 30.

Remote Installation

Note – *If the remote machine with the CD, tape or floppy disk device attached is running the SunOS operating system, see “Installing and Starting - SunOS 4.1.x” on page 27.*

1. Make sure the remote machine (the one with the CD, tape or floppy disk device attached) is “trusted” by the host machine onto which you would like to install your CanOPI software. This requires the appropriate entries in the `/etc/hosts` and `/.rhosts` files for “root”, on the machine upon which CanOPI is being installed.

See your System Administrator or read part three, “Network and Communications Administration” of Sun Microsystems Inc.’s System and Network Administration for more information.

2. Make sure you have completed the steps described in “Preparing to” on page 18, and have completed the “Installation Checklist” on page 21.

3. Insert your CD, tape or floppy disk into the appropriate device.
4. For floppy disk installation only, issue:

```
/etc/init.d/volmgt stop
```
5. To install your software, type:

```
csch -f <device path> to <hostname>
```

where **<device path>** is the appropriate path for your tape or floppy disk drive, and **<hostname>** is the name of the machine to which you want to install your CanOPI software (see “Installation Checklist” on page 21).
6. Follow the instructions on the screen. Refer to “Installation Checklist” on page 21 to answer the questions as they appear.
7. For machines using a floppy disk device, issue the following command after the cursor has returned to the command prompt:

```
/etc/init.d/volmgt start
```
8. Proceed to “After Installation” on page 30.

Installing and Starting - SunOS 4.1.x

Local Installation (tape or floppy disk)

Note – Use the provided examples, “Local Floppy” on page Appendix E - i, “Remote Tape” on page Appendix E - v, or “Local CD” on page Appendix E - x, to guide you through the installation procedure. All examples are performed on a Solaris machine, but they are identical to their SunOS counterparts except where noted.

1. Make sure you have completed the steps described in “Preparing to Install” on page 18, and completed the “Installation Checklist” on page 21.
2. Insert your tape or floppy disk into the appropriate device.
3. Login as the “root” user and issue the following at the command prompt:

```
csch -f <device path>
```

where **<device path>** is the appropriate path for your tape or floppy disk drive (see your Installation Checklist).
4. Follow the instructions on the screen. Refer to “Installation Checklist” on page 21 to answer the questions as they appear.
5. Proceed to “After Installation” on page 30.

Local Installation (CD)

SunOS 4.1.x has no Volume Management so the CD will have to be mounted manually. Carry out the following steps:

1. Insert the CD in the drive, and type the command:

```
# mount -t hsfs -o ro /dev/sr0 /cdrom
```

(It may be necessary to first create the **/cdrom** directory.)

2. Enter the following commands:

```
# cd /cdrom  
# ./install
```

Follow the instructions on screen. You can refer to the installation example, “Local CD” on page Appendix E - x.

(If you want to do a remote install, append **'to<hostname>'** to the **./install** command.)

3. When the CanOPI installation is complete, you should unmount the CD and eject the disk as follows:

```
# cd
# umount /cdrom
```

4. Proceed to “After Installation” on page 30.

Remote Installation

Note – *If the remote machine with the CD, tape or floppy device attached is running the Solaris operating system, see “Installing and Starting - Solaris 2.5 and Higher” on page 24.*

1. Make sure the remote machine (the one with the CD, tape or floppy disk device attached) is “trusted” by the host machine onto which you would like to install your CanOPI software. This requires the appropriate entries in the `/etc/hosts` and `/.rhosts` files for the “root” user, on the machine being installed to.

See your System Administrator or read part three, “Network and Communications Administration” of Sun Microsystems Inc.’s System and Network Administration for more information.

2. Make sure you have completed the steps described in “Preparing to” on page 18, and have completed the “Installation Checklist” on page 21.
3. Insert your CD, tape or floppy disk into the appropriate device.
4. Log in as the “root” user on the machine with the CD, tape or floppy disk drive, and issue the following at the command prompt:

```
# csh -f <device path> to <hostname>
```

where `<device path>` is the appropriate path for your tape or floppy disk drive, and `<hostname>` is the name of the machine to which you want to install your CanOPI software (see your “Installation Checklist” on page 21).

5. Proceed to “After Installation” on page 30.

After Installation

New Installations

A server called **<hostname>-uShare** will appear in your Mac OS client Chooser, in the AppleTalk Zone that is local to your CanOPI host. By default, this server automatically publishes a volume called “MacApps,” which contains applications you can use to further customize your CanOPI software (see “MacApps” on page 31). The home directory of each UNIX account holder also is published as a volume (each user sees only his or her own home directory listed). To customize your CanOPI software, advance to “Chapter 3 – ScriptableAdmin”.

Using a Previous Configuration

You may continue to use your CanOPI software as usual. Any previously defined servers, volumes, and spoolers will appear as usual to your Mac OS clients.

If you need to make custom configuration adjustments:

- To use multiple interfaces (for AppleTalk routing), see “Appendix B - Advanced Configuration of CanOPI”.
- To use Phase I AppleTalk network protocol, see “Defining CanOPI’s AppleTalk Driver Configuration” on page Appendix B - viii.
- To use a FDDI, ATM or 100BaseT interface, see “Activating Network Interfaces for CanOPI” on page Appendix B - ix.

Note – *If you are upgrading from a previous version of CanOPI, and answered “No” when asked if you would like to pre-cache any existing volumes, you may find that volumes appear slow to open when they are first mounted, and that there are CPU-intensive **build_cache.x** processes running on your UNIX machine. This behavior is expected, and should be temporary. This happens because your CanOPI software is*

*caching the contents of the volumes being published to provide better performance. Depending on the size and contents of the file systems you are publishing as Mac OS volumes, and how soon the file systems are accessed by users, you may find that this behavior is apparent anywhere from a few minutes to a few days. If this is not acceptable at your site, you may run the provided utility: **ushare/bin/cachevol** as the “root” user before starting your software. This will pre-cache any volumes that were defined while using an earlier version of CanOPI (see the example below).*

```
root@server % /ushare/bin/cachevol
Building cache for /ushare/MacApps
Building cache for /Applications/Marketing
Building cache for /Applications/Design
root@server %
```

MacApps

Upon installation of CanOPI, you will find that an AppleShare server called **<hostname>-CanOPI** will appear in your Mac OS Chooser, in the AppleTalk Zone that is local to your CanOPI host. You can log on to this server as the “root” user (or any other available user) and a default volume will be found called “MacApps”.

This volume contains the following files and folders:

Copy to Extensions

Contains the AlertDrv file. Copy this file to the Mac OS machine’s local hard drive’s **System Folder** folder. This ensures that print jobs from the Mac OS machine are properly identified for error messages and such.

Documentation

Folder containing Adobe Acrobat .pdf versions of this Administrator and User Guide. Also contains the Adobe Acrobat Reader application.

Key Request Form

Text file you may fill out and FAX to IPT to obtain an Authorization Key.

opiconfig

File that must be copied to the CanOPI server volume where you will be placing high-resolution images for automatic low-resolution For Placement Only (FPO) image generation.

opiconfig Setup Folder

Contains a AppleScript™ graphical user interface (GUI) utility for modifying your opiconfig files. Run the "OPI Config Setup from the server or your local volume. For an explanation of the fields please switch on Mac OS Ballon Help. For more information, see "Using OPI Config Setup" on page 86.

Note – *AppleScript extension must be loaded on the Mac OS machines that will run this utility.*

PrintQMgr

IPT's PrintQMgr application that connects to the CanOPI server to manage the server's print queues.

README

Text file describing the contents of the **MacApps** volume.

ScriptableAdmin

Folder containing IPT's ScriptableAdmin application, several example scripts, and release notes (if any) in Adobe Acrobat .pdf format. Please refer to this documentation or "ScriptableAdmin" on page 35 for more information on this application.

Tech Support Form

Text file you may fill out and FAX to IPT to log a Technical Support Request with IPT's Technical Support Department.

3 – ScriptableAdmin

IPT's ScriptableAdmin application lets you configure and control Sun host services from a Mac OS computer on your network. You can find ScriptableAdmin in the CanOPI volume "MacApps", automatically published by your Sun host upon CanOPI installation. This chapter gives instructions for starting ScriptableAdmin and its associated administration tools:

- Services
- Users & Groups
- File Sharing
- Print Spooling.

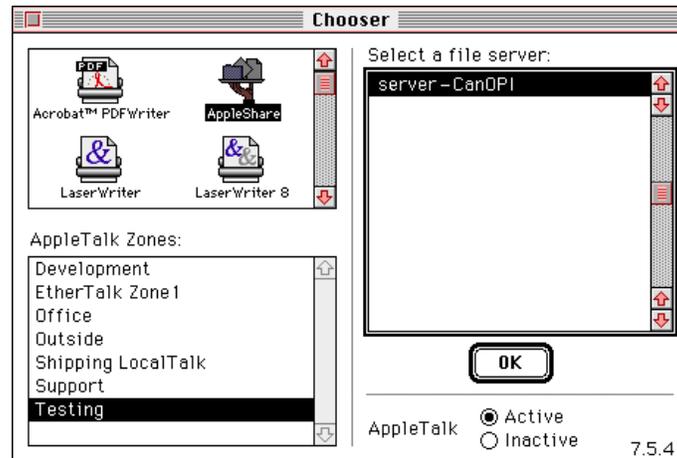
Note – *For full-function access to ScriptableAdmin for a particular user or users (other than the "root" user), you must create a group called "IPTAdmin" and add these users to the "IPTAdmin" group. Only those users who log on as the "root" user or as a member of the "IPTAdmin" group can use the full functionality of ScriptableAdmin.*

For details on creating a group and adding users to a group, see "Creating or Editing a Group" on page 49.

Starting ScriptableAdmin

After installing CanOPI on your Sun host, you will need copy the ScriptableAdmin application from it. Use the Chooser on your Mac OS machine to locate your Sun host, and mount the **MacApps** volume on to your desktop (you do not need to use the Chooser to mount volumes if you have and prefer to use another utility, such as PowerTalk). Inside **MacApps** is the ScriptableAdmin folder.

1. Click on the “” (Apple) menu and select the **Chooser** option. This will display the **Chooser** window.
2. Click on the **AppleShare** icon and locate your Sun host.

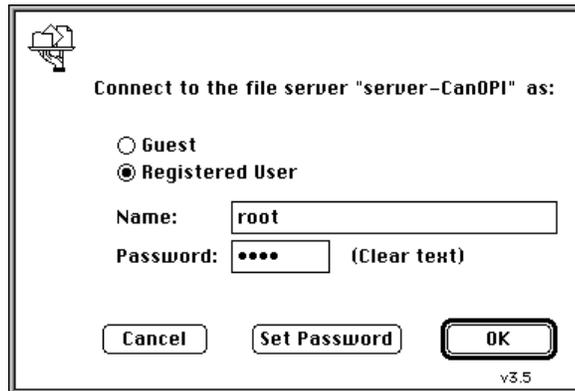


You will find the server listed as **<hostname>-CanOPI** (where **<hostname>** represents the name of your Sun host). If your network consists of many zones, you will find that your Sun host server resides in the zone associated with its physical subnet. (If you are not sure which zone your server is in, select each zone until you find the server.)

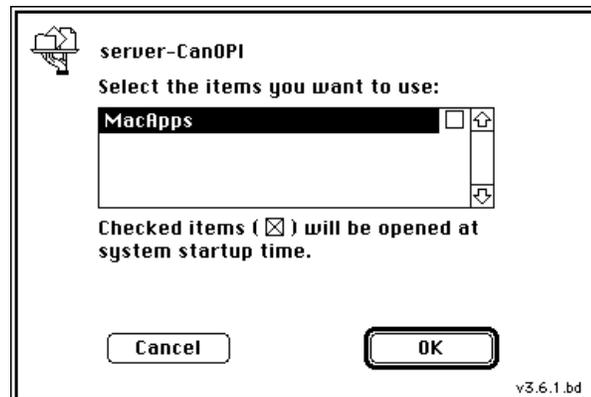
When you have found your Sun host, select it and click **OK**.

Note – If the default *CanOPI* server cannot be located in the *Mac OS Chooser*, see “Chapter 13 – Troubleshooting & FAQs” for suggestions.

3. You will be asked to log in with your UNIX username and password, or you can log in as the “root” user.



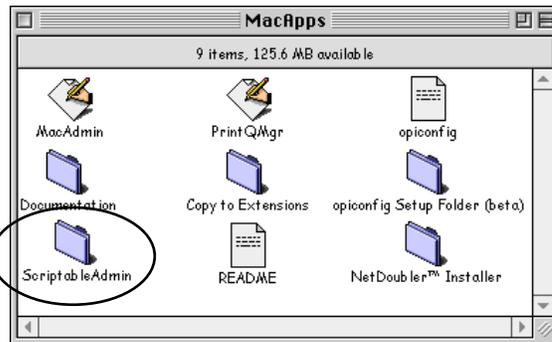
4. When you log in, you will see the **MacApps** volume is available to mount. Users who do not log in as the “root” user will see their UNIX home directory published as a volume called **YourHome** (<hostname>-<username>). The “root” user’s home directory is not published by default.



5. Select the **MacApps** volume. This default volume is published automatically by CanOPI. Click **OK** and **MacApps** will be mounted on your Mac OS machine’s desktop.

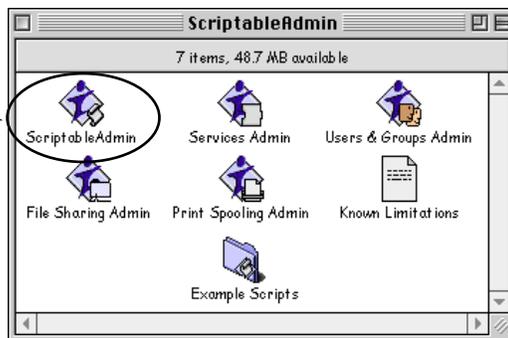
6. Double-click the **MacApps** volume that now appears on your desktop to open it. Drag and drop the ScriptableAdmin folder inside directly to your desktop to copy it to your local machine.

Copy the entire ScriptableAdmin folder to your Mac OS client machine's desktop before launching the ScriptableAdmin application



7. Open the ScriptableAdmin folder and click on the ScriptableAdmin icon to launch the ScriptableAdmin application.

Double-click on the ScriptableAdmin icon to launch the ScriptableAdmin application



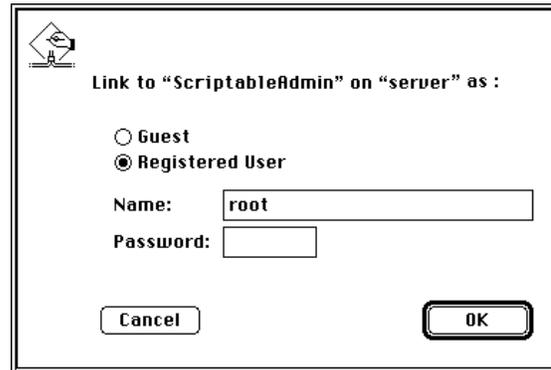
Note – Full-function access to ScriptableAdmin is restricted to either the “root” user or users who are part of the group “IPTAdmin”. Therefore, if you want to enable access to ScriptableAdmin for a particular user (or users), you must create a group called “IPTAdmin”, then add the user(s) to this group.

For details on creating a group and adding users to a group, see “Creating & Editing CanOPI (UNIX) User & Group Accounts” on page 47.

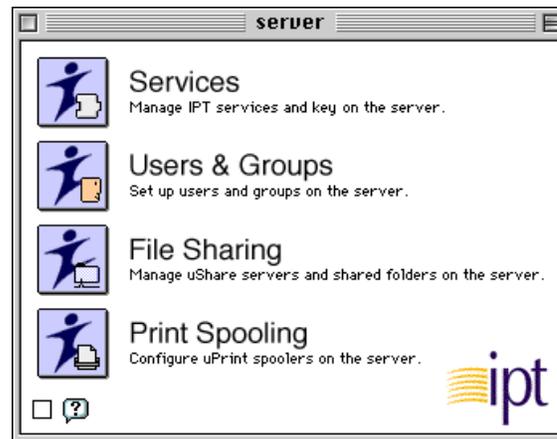
8. After launching ScriptableAdmin, you will be prompted to “Please select a server”. Navigate to your Sun host in the ScriptableAdmin **Servers** window, then select the appropriate AppleTalk zone until you find the server named <host-name>-ScriptableAdmin. Select it and click **OK**.



9. Log on as the “root” user (no password required by default, but we strongly recommend that you assign one as soon as possible, since “root” is the highest UNIX access level attainable) or as a member of the “IPTAdmin” group (if previously created).



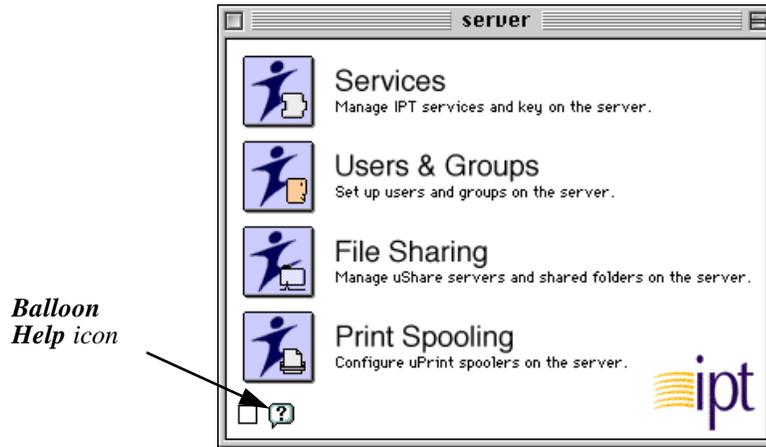
After logging in, the ScriptableAdmin utility appears:



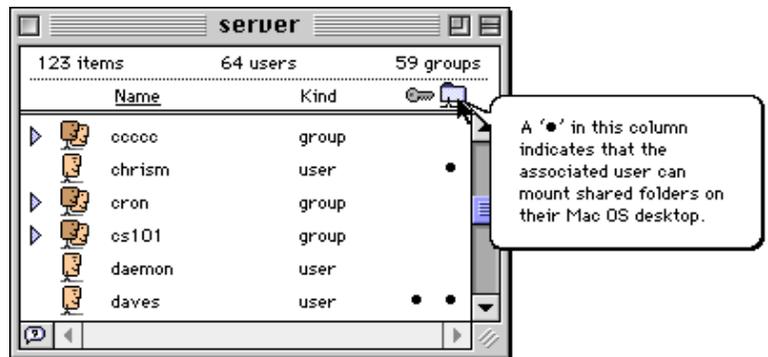
The ScriptableAdmin utility contains buttons representing administration tools that let you configure individual CanOPI services. The remainder of this section will provide you with step-by-step instructions for creating and managing CanOPI services, file servers, folders, and print spoolers. If you have just completed installation of your software, turn to "Services" on page 42 to begin customizing your CanOPI environment.

Balloon Help

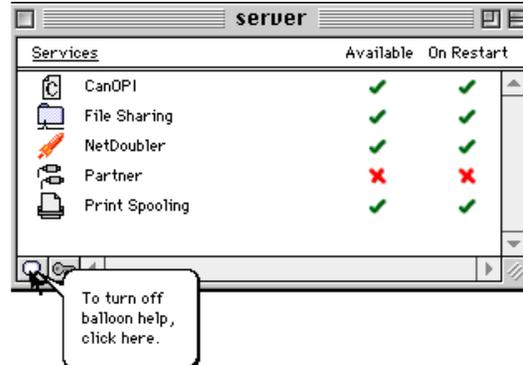
ScriptableAdmin provides context-sensitive balloon help. To activate this feature, click on the **Help** icon (?) on the menu bar at the top of your screen and choose **Show Balloons**, or click the balloon help icon on any window in which it appears.



With balloon help on, placing your cursor on any item or text box that is supported by balloon help causes context-sensitive information to appear, as shown in the figure below.



Turn off balloon help at any time by clicking the help icon from the menu bar on the top of your screen and choosing **Hide Balloons**, or by clicking the **Help** icon on any window.



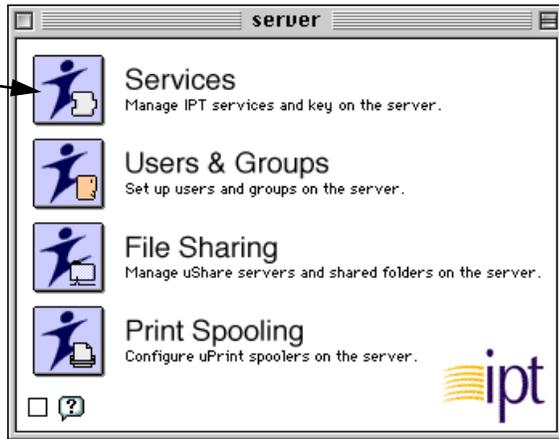
Services

Using Services

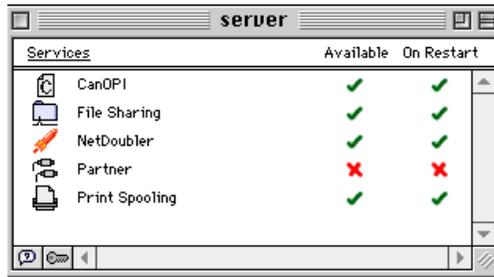
CanOPI's **Services** administration tool lets you update your key, verify your Sun host's ID, and see at a glance which IPT software services are available on your network.

Access the **Services** administration tool by clicking the ScriptableAdmin window's **Services** button:

Click here to launch the **Services** administration tool.



ScriptableAdmin will display the **Services** window:



The **Services** window displays information regarding IPT software services installed on your CanOPI server and their status.

CanOPI - This service generates low-resolution images for page layout work, then automatically substitutes the high-resolution originals into the document at print time.

File Sharing- This service allows users to share file and folders across the network by enabling the CanOPI server to appear as an AppleShare file server on the Mac OS desktop.

NetDoubler - This service significantly improves transfer rates between Mac OS clients and the CanOPI server.

Partner - This service provides bidirectional file sharing between Mac OS clients and the CanOPI server by allowing your Sun host to mount AppleShare servers as if they were native UNIX file systems.

Print Spooling- This service enables the CanOPI server to act as a print spooler for the PostScript printers on the network.



A “check mark” in a service’s **Available** column indicates that the service is currently available. Clicking on the check mark will cause that service to become unavailable.

A check mark in a service’s **On Restart** column indicates that the services will be available when CanOPI is restarted. Clicking on the check mark will cause that service to be unavailable when CanOPI is restarted.



An “X” in a service’s **Available** column indicates that the service is currently unavailable. Clicking on the X will cause that service to become available.

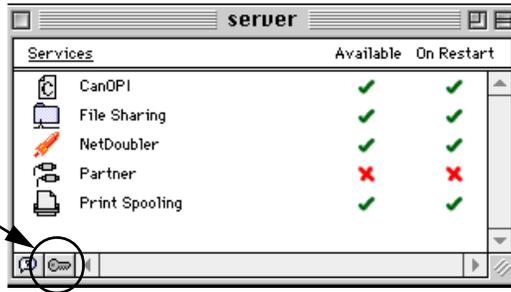
An X in a service’s **On Restart** column indicates that the services will be unavailable when CanOPI is restarted. Clicking on the X will cause that service to be available when CanOPI is restarted.

Key Information

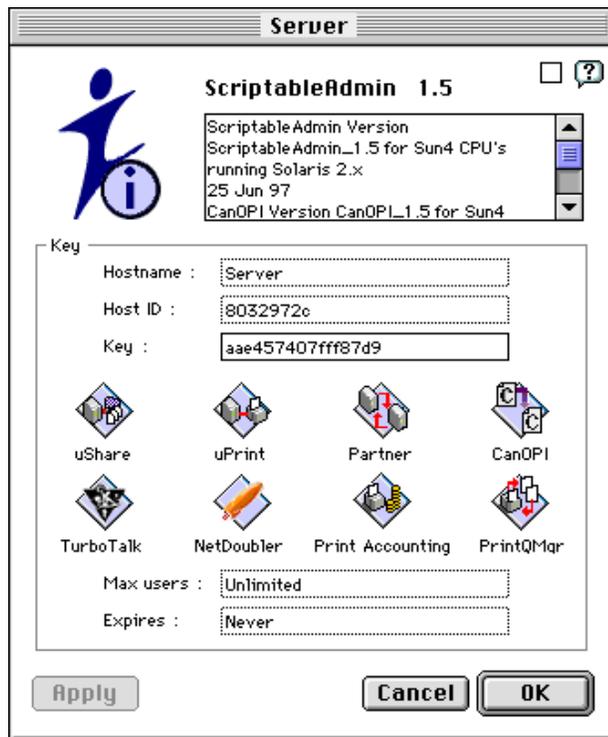
The **Key Information** dialog box displays information regarding the version of ScriptableAdmin you are running, the Sun host’s ID number, your Authorization Key, and a series of icons representing IPT software products. These products are installed on your Sun host when you install CanOPI; whether they are enabled for use on your network or not is a function of your particular key. If an icon is “dimmed”, that particular product is disabled.

To access the **Key Information** dialog box, click the **Key** icon in the **Services** window.

Click here to open the **Key Information** dialog box.



ScriptableAdmin will display the **Key Information** dialog box:





uShare – This product provides basic AppleTalk connectivity between your Sun host and Mac OS clients. uShare's file server service lets your Sun host appear to your Mac OS users as an AppleShare file server.



uPrint – CanOPI's uPrint Print Spooler product lets Mac OS and UNIX users share PostScript printers on your AppleTalk and UNIX networks. The Mac OS users select CanOPI spoolers with the Chooser desk accessory, while UNIX users use their familiar print tools and commands.



Partner – CanOPI's Partner product expands upon uShare's AppleTalk connectivity by letting your Sun host use Partner's OpenLook GUI, NetFinder, to mount AppleShare servers as if they were native UNIX file systems.



CanOPI – This product interprets OPI comments in clients' print jobs and automatically substitutes high-resolution versions of included images. Clients access this feature simply by printing through CanOPI print spoolers from applications that support OPI.



TurboTalk – CanOPI's TurboTalk product provides greatly improved performance of all file copy operations to or from your CanOPI and any Mac OS servers that have TurboTalk running. This includes Finder copies, opens, and saves; and application launches from any networked volume.



NetDoubler – CanOPI's NetDoubler for uShare product provides greatly improved performance of all file copy operations to or from your CanOPI and any Mac OS servers that have NetDoubler running. This includes Finder copies, opens, and saves; and application launches from any networked volume.



Print Accounting – CanOPI's Printer Accounting product allows the user to access a log of all print activities for each print spooler. Printer Accounting displays information such as the name and login of the user that initiated the print job; the spooler name; the document title; the number of pages; and when the print job was queued, spooled, and finished.



PrintQMgr – Part of IPT’s graphical interface for print queue administration. PrintQMgr provides an easy-to-use, Mac OS-based set of tools that allows administrative control of CanOPI print spoolers. PrintQMgr also allows individual users to control their own jobs in the printing queue, as well as resubmit finished jobs.

Note – To contact IPT and purchase an Authorization Key that will enable currently disabled services, see “Technical Support” on page 261.

Updating Your CanOPI Authorization Key

Your Authorization Key is unique to your Sun host and governs what CanOPI services you can provide to your network. To set your key, edit the **Key Information** dialog box’s **Key** field and click **OK**.

Users & Groups

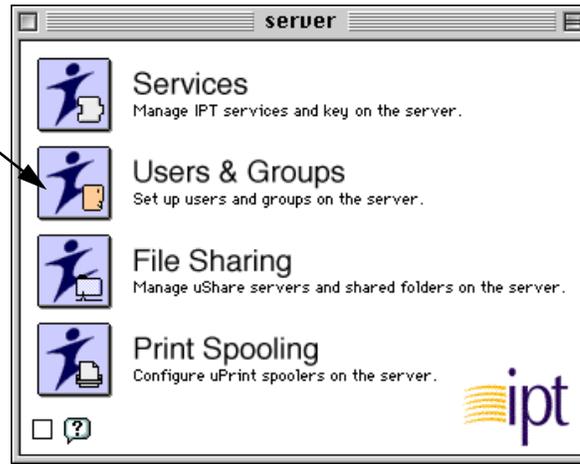
Creating & Editing CanOPI (UNIX) User & Group Accounts

In order to make best use of CanOPI’s **File Sharing** services, Mac OS users should have user accounts on the CanOPI. ScriptableAdmin’s **Users & Groups** administration tool lets you create, modify, and remove user and group accounts. If the UNIX groups and user accounts for your Mac OS users already exist on your CanOPI, you may proceed to “Creating & Editing CanOPI Servers and Shared Folders” on page 55.

Launch ScriptableAdmin’s **Users & Groups** administration tool by clicking the ScriptableAdmin window’s **Users & Groups** button.

The **Users & Groups** window appears, containing a list of your CanOPIserver’s group and user accounts.

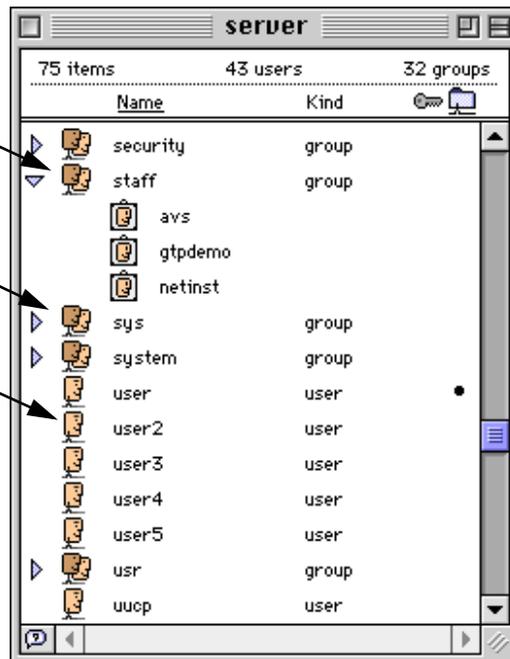
Click here to launch the **Users & Groups** administration tool.



"Twisted down" group showing its users.

Group account

User account



You can display the users in a particular group by clicking on the triangle to the left of the group.

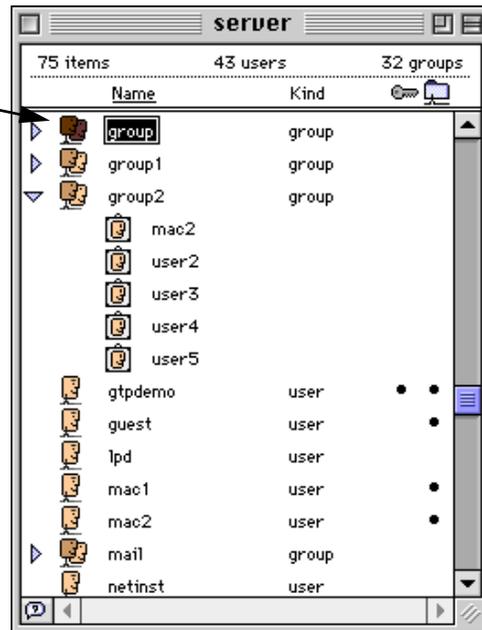
Creating or Editing a Group

Before creating user accounts for your Mac OS users, it is a good idea to define the group or groups of which they will be a member. These groups allow you to control the ability to see files and folders and to make changes to items that are owned by a user that is a member of the same group. If you plan to use existing CanOPI groups with user accounts, refer to “Creating or Editing a User Account” on page 52 to create and edit your UNIX user accounts.

Note – *The example below is for creating a new user group with ScriptableAdmin. Editing an existing group involves identical field definitions. To edit an existing group, double-click on a group from the provided list, and change parameters in the **Group** window. Use the steps below as a key to the field definitions. You can edit an existing group without opening its **Group** window, if all you want to do is modify the list of users that belong to it.*

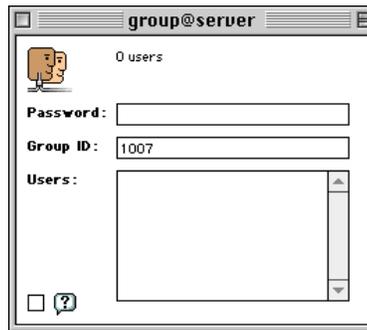
To create a new group on your Sun host, choose **New Group** from the **File** menu. A new group will appear in the Users & Groups window with the default name of “group”. If “group” already exists, ScriptableAdmin will create a group named “group1” or “group2”, and so on, until a unique group name is created.

Newly created group
with default name of
group.



You can change the name by typing in text as you would for any Mac OS folder or file. You can add users to a group by dragging and dropping them into a particular group. You can see which users are a part of a group by clicking on the triangle adjacent to that group to “twist it down” and display its users.

Double-click the new group to display its **Group Options** window.



You can enter the appropriate information in the fields:

1. **Password** - This is the password associated with this group. CanOPI is fully AppleShare-compliant, and therefore supports login by group. For this reason it is recommended that all groups have passwords.
2. **Group ID** - This is a unique group ID number. It is set automatically when creating a new group and should only be changed if absolutely necessary.
3. **Users** - This is a list of all currently defined users that are part of the group. To add an existing user to the group, drag and drop the user into this field.

Closing the window saves your changes. To cancel your changes, press the **esc** key.

Deleting Groups

To delete a group on your Sun host, use the mouse to drag and drop that group from the **Users & Groups** window to the Trash.

Note – The group named “nogroup” is locked, as shown by the  icon; therefore, you cannot delete “nogroup.”

Creating or Editing a User Account

Note – The example below is for defining a new user account with ScriptableAdmin. Editing an existing user account involves identical field definitions. To edit an existing user account, double-click on that user's name in the **Users & Groups** window. Use the steps below as a key to the field definitions.

To create a new user account, choose **New User** from the **File** menu. A new user will be added with the default name of “user”. If “user” already exists, ScriptableAdmin will create a group named “user2” or “user3”, and so on, until a unique user name is created. You can change the name of this new user by typing in the appropriate text.

Double-clicking on any user causes ScriptableAdmin to display that user's **User Options** window:



Enter appropriate data in the fields (see Table 3-1 on page 54 for a complete description of these fields):

1. **Full Name** - Modify the name to be used for login on the Sun host.

2. **Password** - Enter a password to be used with this UNIX account. If you are editing an existing account, the password will appear as bullets (•).
3. **Groups** - This list box displays all groups to which the user belongs.



4. **Home** - This is the user's home folder. If the yellow warning icon shown at left appears, the path to the folder, or the folder itself, no longer exists. Click **Select** to display a browser window that will allow you to locate the folder.

Click the **More Details** triangle to display these additional fields:

5. **User ID** - This number will be filled in automatically when creating a new user. It is a unique user identification number.
6. **Shell** - This defines the UNIX shell used when logged in at the Sun host. `/bin/false` is the default. This setting prevents the user from logging in at a UNIX terminal. You may change this setting if you want to define an alternate shell for your user.
7. **Default** - This group is the user's default group. You can change a user's default group by dragging and dropping another group to this field from the **Users & Groups** window.
8. **Plan** - Text to be displayed when the UNIX command `finger` is performed on a user.

Close the window to save your new user account and all information that you entered.

Deleting a User Account

Select the account name of the user whose account you want to delete in the **Users & Groups** window. Drag and drop that user to the Trash to delete that account.

Note – The user “root” is locked, as shown by the  icon; therefore, you cannot delete “root.”

Table 3-1: User Account Attributes

Attribute	Description
Full Name	The name by which the user is known by other users of your Sun host. This is your “long name”, which is used when logging on at your Mac OS machine. This is different from your “short name”, which is what you must use when logging on at the Sun host itself.
Password	<p>An alphanumeric string, known only by the user, that controls access to the user’s account. In “secure” environments, make sure the selected password meets standards for your network. If you are not sure if this is a concern, ask your Network Administrator for more details. This field can be left blank.</p> <p>To prevent a user from logging in from either a Mac OS machine or an UNIX terminal, this field may be set to “*”.</p>
Groups	This list box displays the names of all groups to which the particular user belongs.
Home	The directory within your Sun host’s file system in which the user’s private files reside. The Home folder is user-selected by clicking Select and navigating to the desired location.
User ID	A numeric ID by which the user is known by your Sun host; this number must be unique within the <code>/etc/passwd</code> file.

Table 3-1: User Account Attributes (Continued)

Attribute	Description
Full Name	The name by which the user is known by other users of your Sun host. This is your “long name”, which is used when logging on at your Mac OS machine. This is different from your “short name”, which is what you must use when logging on at the Sun host itself.
Default	This group is the user’s default group. You can change a user’s default group by dragging and dropping another group to this field from the Users & Groups window.
Plan	Enter text here to be displayed when the UNIX command finger is performed on a user.

File Sharing

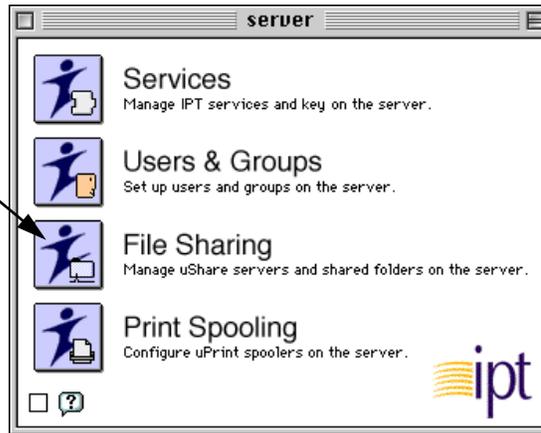
Creating & Editing CanOPI Servers and Shared Folders

Note – *If you are creating or modifying CanOPI servers, you must restart CanOPI’s AFP process for the changes to take effect (ScriptableAdmin will automatically prompt you to do this when applicable). It is recommended that you complete all configuration changes with ScriptableAdmin at one time, then restart CanOPI after all of your changes have been made.*

ScriptableAdmin’s **File Sharing** administration tool lets you publish portions of your CanOPI’s file system as AppleShare volumes and create, edit, and remove CanOPI servers and shared folders. You can create your own CanOPI server to publish your CanOPI volumes, or use the default server **<hostname>-CanOPI**. The default server can be configured to fit in your individual network.

Launch the **File Sharing** administration tool by clicking **File Sharing** in the ScriptableAdmin window.

Click here to launch the **File Sharing** administration tool.

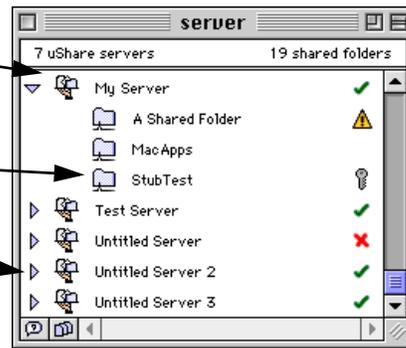


The **File Sharing** hierarchical list window appears displaying the names of CanOPI's file servers.

"Twisted down" CanOPI server, showing its shared folders.

Shared folder

CanOPI server



To display a list of all shared folders that the CanOPI server contains, click on the triangle next to a file server to "twist it down".

To the right of each CanOPI server, different icons may appear:



This icon indicates that the CanOPI server is published as an AppleShare volume in the Mac OS Chooser.



This icon indicates that the CanOPI server is not published as an AppleShare volume.

To the right of each shared folder, additional icons may also appear:



This **Key** icon indicates that the shared folder, or a folder that it contains, has an access restriction, and therefore is not accessible to all users. If no icon appears, there are no restrictions on the shared folder, and anyone can log on. Refer to “Creating or Editing a Shared Folder” on page 60.



This **Warning** icon indicates that the UNIX path to the shared folder, or a folder that it contains, either has not yet been defined or no longer exists. This icon always appears in the case of a newly created shared folder until its path has been defined. If this icon appears by an existing shared folder, the folder may have been deleted or altered by someone on the Sun host, or the drive on which it resides is temporarily unavailable.

Creating or Editing a CanOPI Server

Note – *The following example is for editing an existing CanOPI server with ScriptableAdmin. In the case of a new installation, the server you should edit is <hostname>-CanOPI. You may change the attributes of this server to meet your network demands.*

Some characters, such as “:” or “@”, cannot be used in naming servers or shared folders. ScriptableAdmin will cause your Mac OS machine to beep if an illegal character is typed in.

To edit an existing CanOPI server, double-click on it in the **File Sharing** hierarchical list window. ScriptableAdmin will display that CanOPI server’s **Options** dialog box:



Enter the appropriate value in each field (for a complete description of each field value, see Table 3-2 on page 59).

1. **Password Exchange** – Choose from among three options for password exchange between Mac OS clients and the Sun host (Clear Text, 1-Way Encryption, and 2-Way Encryption).
2. **Maximum number of connected users** – This field determines how many users can log in to the server at one time. The default is 64. You can change it to meet the needs of your clients.
3. **Allow users to change password** – Checking this box allows users to change their own passwords.
4. **Automount without password** – Checking this box allows users to have their Mac OS machine mount a shared folder from this CanOPI server at startup without requiring them to type in the password.
5. **Export home folders** – Checking this box allows users to mount their “Home folder” (using the Chooser) as an icon on their desktop.
6. **Allow guest access** – Checking this box allows a user logged in as a “guest” user to access this CanOPI server.

Close the window to save your changes.

Now that you have defined your CanOPI server, you can create the shared folders that it will publish to your Mac OS users. See “Creating or Editing a Shared Folder” on page 60.

Deleting a CanOPI Server

1. Select the server in the **File Sharing** hierarchical list window that you want to delete.
2. Drag and drop it to the Trash.

Table 3-2: CanOPI Server Attributes

Attribute	Description
Password Exchange	Choose among the following options from the pop-up menu: Clear Text - Choosing this option does not encrypt passwords, as they are transmitted over the network. 1-Way Encryption - This option provides a higher level of password protection than the “Clear Text” option. 2-Way Encryption - This option provides a higher level of password protection than the “1-Way Encryption” option.
Maximum number of connected users	The maximum number of Mac OS users that can simultaneously login to the server; default = 64. It must be set to no more than 128 (as defined by AppleTalk protocol — theoretical limit is ≤ 253 sockets/machine); your CanOPI Authorization Key may restrict usage to a smaller number of users.
Allow users to change passwords	Checking this box allows users to change their own passwords.
Automount without password	Checking this box allows users to have their Mac OS machines mount a shared folder from this CanOPI server at startup without requiring them to type in the password.
Export home folders	Checking this box allows users to mount their “home folder” (using the Chooser) as an icon on their desktop.
Allow guest access	Checking this box allows a user logged in as “guest” to access this CanOPI server.

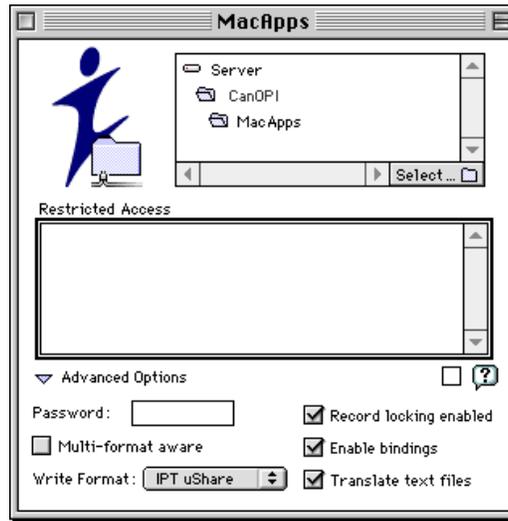
Creating or Editing a Shared Folder

Note – *The following example is for creating a new shared folder with ScriptableAdmin. Editing an existing folder involves identical field definitions. To edit an existing folder, double-click on it in the **File Sharing** hierarchical list window. Use the steps below as a key to the field definitions.*

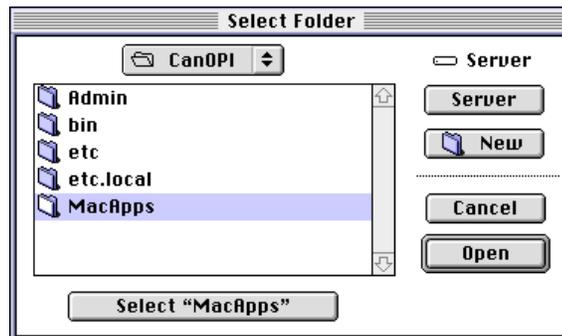
1. To create a new shared folder, first select the CanOPI server to which you want to add a shared folder from the **File Sharing** hierarchical list window.
2. Choose **New Shared Folder** from the **File** menu. ScriptableAdmin adds a new shared folder to the selected CanOPI server with a default name of “Untitled Shared Folder”. You can change the name of this new shared folder by typing in the desired text.

Note – *You cannot publish a folder as a CanOPI volume on your desktop if it is contained within an already published volume.*

3. Because the new shared folder needs to have its location (path) defined, you will see the yellow “warning” icon (⚠) to its right. Define its path by double-clicking it (or select it and choose the **Open Shared Folder** option from the **File** menu) to display its **Options** box (see Table 3-3 on page 63 for a complete description of each option).



- Click **Select** in the bottom right corner of the hierarchical list window to display the **Select Folder** path browser window.



- Navigate to the location where you want your new Shared Folder to reside and click **Select "<folder>"** (where **<folder>** is the name of the folder in which your new folder will reside). You will return to the **Shared Folder Options** window.

The following shared folder options can be modified, although generally they can be left with the default settings intact:

1. **Shared Folder Location** – This hierarchical list window displays the UNIX path location of your shared folder. Click **Select** to open a browser window from which you can change the shared folder's location.
2. **Restricted Access** – This list window shows the users and groups that have access to this particular shared folder, in alphabetical order. Place users and groups into this list window by dragging and dropping them there.

Click the **Advanced Options** triangle to display the following additional options:

1. **Password** – Enter the (optional) password required to access the selected shared folder.
2. **Multi-format aware** – Allows the particular shared folder to recognize all three file formats listed in the **Write Format** box, below.
3. **Write Format** – Choose from among three file format write options here (AppleSingle, AppleDouble, and IPT uShare).
4. **Record Locking Enabled** – Allows CanOPI to pass Mac OS record locking calls to the Sun host.
5. **Enable Bindings** – Enables CanOPI's Binder program to determine a file's type and creator.
6. **Translate text files** – Enables automatic translation of text files between Mac OS and UNIX systems.

Save your changes to the shared folder by closing the window.

Several CanOPI folders are protected, and therefore cannot be shared, by default. These folders appear in the browser window with a "belt" around them, and the **Select** button is dimmed when you view their **Shared Folders Options** window. These files are protected because they contain settings or information that, if changed, could affect the performance of CanOPI.

It is possible, although not recommended, to change the “protected” status of these folders by modifying the `.iptadminrc` file in the `uShare/Admin` folder on your Sun host. See “`.iptadminrc` Preferences” on page Appendix B - xix for more details.

Table 3-3: Shared Folder Attributes

Attribute	Description
Shared Folder Location	The UNIX path of the folder you want to publish as an AppleShare shared folder.
Restricted Access	Lists users and groups that have access to the selected shared folder. If this list window is blank, then no access restrictions apply. Users and groups can be placed in this list window by dragging and dropping them there.
Password	Enter the password that a user must enter to gain access to a particular shared folder.
Multi-format aware	Placing a check mark in this box enables the particular shared folder to recognize all three file formats listed in the “Write Format” box, below. Checking this box can slow down system performance. The default is “checked”.
Write Format	Choose between three options in this pop-up menu: AppleSingle - Choosing this option sets the shared folder file format for writing to “AppleSingle” format. AppleDouble - Choosing this option sets the shared folder file format for writing to “AppleDouble” format. IPT uShare - Choosing this option sets the shared folder file format for writing to “IPT uShare” format. This is the fastest of the three options.

Table 3-3: Shared Folder Attributes (Continued)

Attribute	Description
Record locking enabled	Disabling this attribute prevents CanOPI from passing Mac OS record-locking calls to the UNIX system and is helpful when file systems do not support record locking or when record locking functions poorly (or example, some versions of NFS), or in the event you are using ccMail in conjunction with a CanOPI volume (see the “Compatibilities” chapter). The default is “checked”.
Enable bindings	Setting this attribute enables CanOPI’s Binder program that reads the first 64 bytes and the file names of untyped files to determine their AFP Finder information (type and creator). The default is “checked”.
Translate text files	Mac OS text files have Carriage Return characters at line ends, while UNIX text files have Line Feed characters at line ends. Setting this attribute enables automatic translation of these characters when a text file is written to or read from the volume. The default is “checked”.

Note – *In addition to the options above, there are several advanced options not accessible with ScriptableAdmin. This includes the ability to have CanOPI mark open files as “busy”. Also, it is possible to prevent CanOPI from counting the offspring of sub-directories (for increased performance on file systems with very large directory trees). For a full description of these options, see “Configuring Your File Servers” on page 156.*

Deleting a Shared Folder

1. Select the shared folder you want to delete from the **File Sharing** hierarchical list window.
2. Drag and drop the folder to the Trash.

Note – *Deleting a shared folder has no effect on the directories or files residing within that folder. Only the folder definition is deleted, not the contents of the folder.*

Bindings

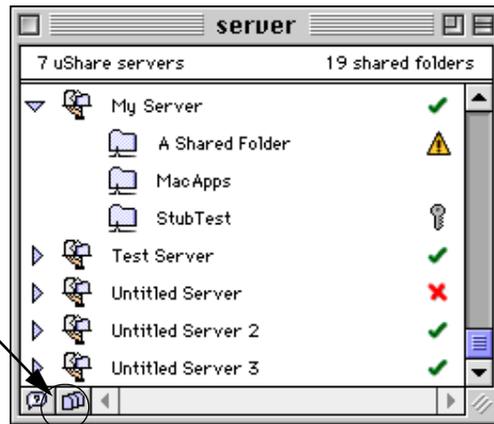
ScriptableAdmin's Binder enables the user to create or modify bindings, which are the associations between file types and the application used to create or work with them.

The Binder is necessary only when sharing files across platforms. UNIX files, unlike Mac OS files, do not have a type or creator associated with them. The Binder provides a way for files created on your Sun host to be recognized on the Mac OS client and associated with their application. For example, files created on the server with an extension of `.doc` should be seen on the client as a word processing file of a certain application, such as Microsoft Word. The ScriptableAdmin Binder associates UNIX files that match specific criteria with specific Mac OS applications.

Note – *When the Binder associates a particular type and creator with a file, this information is stored in the CanOPI cache for the volume in which it exists, assuming that Enable Bindings has not been disabled as a Shared Folder attribute. The Binder does not create an actual resource fork for the file; it simply types the file based on the criteria provided in the binding.*

To access the **Bindings** dialog box, click **Bindings** on the **File Sharing** administration tool window:

Click the **Bindings** button to display the **Bindings** window.



Scriptable Admin will display the **Bindings** window, showing the existing bindings:



A binding consists of three elements: Match Criteria, Application Program, and File Type.

1. The **Match Criteria** element contains three fields: The first field can be either "name" or "content"; the second field can be "contains", "starts with", "ends with", "is", or "matches"; the last field is the character string with which you want the binding type to be associated.

Note – Using “matches” in the second field requires a UNIX regular expression in the third field, and should be used only by an experienced system administrator.

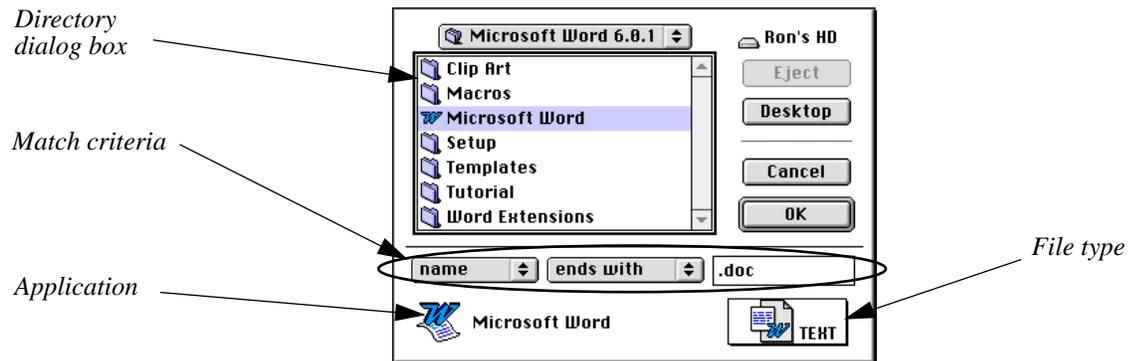
2. The **Application Program** is the name of the Mac OS application to which files matching the criteria will be bound.
3. **File Type** is a file type selected from the list of available types for the chosen application.

These three elements can be edited only as discussed below in the “Changing a Binding” and “Creating a New Binding” sections.

To select a binding, click on it. To select more than one binding, hold down the **shift** key while clicking. To select all items, click **Select All** from the **Edit** menu. To deselect items, click **Select None** from the **Edit** menu, or command-click individual items. To delete items, select them and drag them to the Trash. (**Cut**, **Copy**, and **Paste** on the **Edit** menu are not active for Bindings.)

Changing a Binding

To make changes to an existing binding, select it and click **Open Binding** in the **File** menu, or double-click on the item you want to edit. (Only one binding may be open at a time.) A window similar to the one below will appear:



To change the file type of the binding, navigate through the directory dialog box until you find the application to which you want to change the binding's type. Select the application. The application field on the bottom left of the dialog box will change to reflect the new application. Select the file type icon on the bottom right of the dialog box. A list of all the available file types for that application will appear. (Applications with no file types should not be used for binding.) Select the file type to which you want the binding to be changed.

Creating a New Binding

A new binding can be created from scratch or based on an existing binding.

To create a new binding that is not based on an existing binding, click **New Binding** from the **File** menu. A window similar to the one above will come up. Choose "name" or "content" in the first option box; choose "contains", "begins with", "ends with", "is", or "matches" in the second option box.

Note – Using "matches" in the second field requires a UNIX regular expression in the third field, and should be used only by an experienced system administrator.

In the blank field, type the name of the character string with which you want this binding type to be associated.

For example, if you want to create a binding type for files with names that end with "%", the three fields for the match criteria would look as follows:



The image shows a graphical user interface for setting match criteria. It consists of three main components arranged horizontally: a dropdown menu with 'name' selected, a second dropdown menu with 'ends with' selected, and a text input field containing the character '%'. Each dropdown menu has a small arrow icon on its right side.

Then navigate through the directory dialog until you find the application to which you want to bind files that match those search criteria.

Select the application, and the field at the bottom left will change to the name of the selected application. Select the icon in the bottom right corner. You will see a list of all file types associated with that application. Select the icon that represents the file type you want the binding to be associated with. The new icon will appear in the icon window. Click **OK**. The window with the list of bindings will appear and show the newly created binding.

To base a new binding on an existing binding, select a binding and click **Duplicate** from the **Edit** menu. Edit the fields as described above, and click **OK**. The new binding will appear in the list of bindings, and the old binding will not be overwritten.

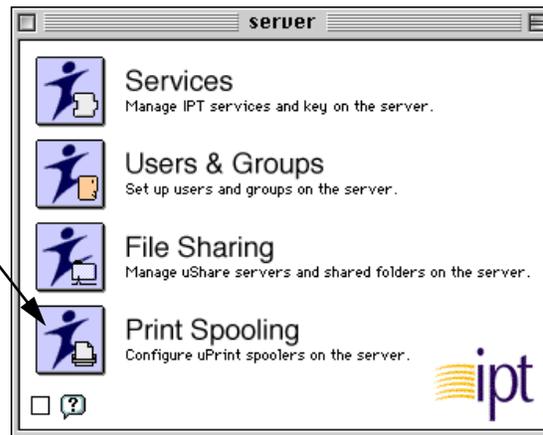
Print Spooling

Creating & Editing CanOPI Print Spoolers

Note – *If you are creating or modifying Print Spoolers, it is not necessary to restart CanOPI's Spooler process for the changes to take effect, as this will be done automatically.*

CanOPI's **Print Spooling** administration tool lets Mac OS and UNIX users share PostScript printers on your AppleTalk and UNIX networks. The **Print Spooling** administration tool lets you create, modify, and remove print spoolers. Launch the **Print Spooling** administration tool by clicking **Print Spooling** in the ScriptableAdmin window.

Click here to launch the **Print Spooling** administration tool



The names of existing print spoolers are displayed in the **Spooler List** dialog box:



Creating a Print Spooler

Note – The following example is for defining a new print spooler with *ScriptableAdmin*. Editing an existing spooler involves identical field definitions. To edit an existing spooler definition, select a spooler from the provided list by clicking on the name, and click **Edit** in the **Spooler List** window. Use the steps below as a key to the field definitions.

1. Click **New**. The **Edit Spooler** window appears:

The screenshot shows the 'Edit Spooler' window with the following fields and controls:

- AppleTalk Spooler Options:** A single text field labeled 'Chooser Name:'. A 'Set...' button is located to the right of the field.
- Unix Spooler Options:** Two text fields labeled 'Name:' and 'Spool Directory:'. A 'Set...' button is located to the right of the 'Name:' field.
- Output Device Options:** Two radio buttons labeled 'AppleTalk Printer' (selected) and 'Unix Printer'. Below them are three text fields labeled 'Device Name:', 'Type:', and 'Zone:'. A 'Set...' button is located to the right of the 'Device Name:' field.

At the bottom of the window are four buttons: 'More Options...', 'OPI Options...', 'Cancel', and 'OK'.

2. Define or modify the print spooler's attributes as described below.

Defining Spooler Options

You create and modify print spoolers by defining spooler options in the **Edit Spooler** window:

For each spooler, you can define three elements:

- **AppleTalk Spooler** – This element defines the name that appears in the Chooser to your Mac OS users. Do not use spaces, or the characters “:” or “@”, in this field.
- **UNIX Spooler** – This element defines the UNIX print spooler. It is used both as an actual UNIX spooler when printing from a UNIX command line, as well as a spool directory when printing from a Mac OS to a CanOPI spooler that connects to an AppleTalk device (read on for further details).

- **Output Device** – This element defines the destination device being printed to. It may be set to an AppleTalk printer, UNIX printer, or if you prefer, a directory (see the following for more information).

AppleTalk Spooler Options

To define a spooler that appears in the Mac OS Chooser, you must make entries in the **Edit Spooler** window's "AppleTalk Spooler Options" portion:

AppleTalk Spooler Options	
Chooser Name:	<input type="text"/>

- **Chooser Name** - the user-defined name registered through NBP that appears in the Mac OS Chooser. *Do not use spaces, or the characters ":" or "@", in this field.*

UNIX Spooler Options

To define a spooler that is available to UNIX users, you must make entries in the **Edit Spooler** window's "UNIX Spooler Options" portion:

Unix Spooler Options	
Name:	<input type="text"/> <input type="button" value="Set..."/>
Spool Directory:	<input type="text"/>

Note – *The most common scenario that involves a UNIX print spooler is the creation of an AppleTalk to UNIX to AppleTalk. With this type of spooler, a print job originates from a Mac OS client and is printed on an AppleTalk device, but is spooled to CanOPI first. This has an advantage over printing directly to an AppleTalk device because it minimizes the amount of time your Mac OS computers spend printing. Using this type of spooler also provides administrative control of printing from the UNIX side. In addition, by using CanOPI's PrintQMgr (enabled as a separate service), users are able to control their*

own print jobs. With *PrintQMgr*, the “root” user may operate from the Mac OS side as well, and manage print services. For more information, see “Chapter 5 – *PrintQMgr*”.

The editable field in this portion is:

- **Name** - the name entered in your CanOPI’s printer list. When creating an *AppleTalk to UNIX* spooler (printing from a Mac OS to your CanOPI), click **Set** to open a list of your CanOPI’s printers. The following dialog will appear, and you may select a printer from the list:



With an *AppleTalk to UNIX to AppleTalk* spooler, the name that you assign the UNIX portion of your spooler is relatively arbitrary. For consistency, it is a good idea to use a convention by which you can easily associate this UNIX spooler with its *AppleTalk* counterpart (for example, if your *AppleTalk* spooler is called “LW_CanOPI”, then a good name for the UNIX spooler would also be “lw_CanOPI”). The UNIX printer name should be different for each *AppleTalk to UNIX to AppleTalk* spooler.

Output Device Options

To define a spooler’s output device, you must make appropriate entries in the **Edit Spooler** window’s **Output Device Options** portion.

Output Device Options

AppleTalk Printer **Unix Printer**

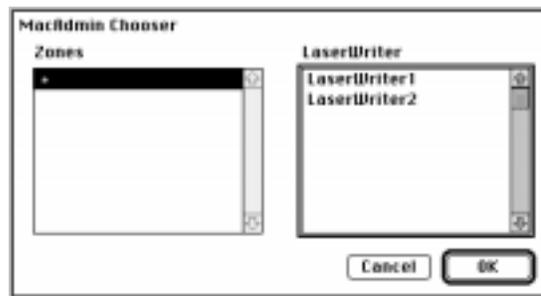
Device Name:

Type:

Zone:

The editable fields in this portion are:

- **AppleTalk/UNIX Printer buttons** - Click the appropriate button to specify if the printer is a UNIX device or an AppleTalk device. If the output device is a UNIX device, no other entries are necessary in this box. *If **pr2file** is specified in the **More Options** window, the **Device Name** will appear as **pr2file**. (See “More Options” on page 77 for more information.)*
- **Name** - If the output device is an AppleTalk printer, click the field’s corresponding **Set** button to select the name and zone of the AppleTalk printer. The following dialog box will appear:



Select an appropriate zone and LaserWriter for the spooler, and click **OK**. The **Type** and **Zone** fields will be filled automatically.

- **Type** - If the output device is an AppleTalk printer, this field specifies the entity type of the destination printer (this field should always be set to type “LaserWriter” unless you are

sure that your destination device uses Printer Access Protocol (PAP), and publishes itself as something other than type “LaserWriter”).

- **Zone** - This is the zone in which the AppleTalk output device exists. If the output device is an AppleTalk printer, the printer’s zone is automatically entered in this field when you click **Set** in the **Name** field.

Creating a TCP/IP Print Spooler

You can create a spooler that prints to a remote device over a TCP/IP connection by following the steps below:

1. Launch the **Print Spooling** administration tool by clicking ScriptableAdmin’s **Print Spooling** button.

The **Spooler Manager** appears and the names of existing print spoolers are displayed in the **Spooler List**:



2. Click **New**. The **Edit Spooler** window appears:

The screenshot shows a dialog box titled "AppleTalk Spooler Options". It is divided into three main sections:

- AppleTalk Spooler Options:** Contains a text field labeled "Chooser Name".
- Unix Spooler Options:** Contains a "Name" field with a "Set..." button to its right, and a "Spool Directory" field below it.
- Output Device Options:** Contains two radio buttons: "AppleTalk Printer" (which is selected) and "Unix Printer". Below these are three text fields: "Device Name" (with a "Set..." button to its right), "Type", and "Zone".

At the bottom of the dialog are four buttons: "More Options...", "DPI Options...", "Cancel", and "OK".

3. Select the **AppleTalk Printer** option in the **Output Device Options** box.
4. Enter **TCP:<IP address or hostname>,<port number>** in the **Device Name** field. The **Type** and **Zone** entries are insignificant.

For example:

Device Name: **TCP:server,500**

Type: **IP**

Zone: **none**

5. Click **OK**. ScriptableAdmin will display an alert box warning you that it can't find the device. This is because ScriptableAdmin searches the AppleTalk network for the device, and since it is connected via a TCP/IP connection, it is not found.

Click **OK** to dismiss the alert box.

Note – *The Use Shared Memory Interface and Enable OPI options are always enabled for devices connected via TCP/IP. For more information on these options, see “OPI Options” on page 82.*

More Options

Clicking **More Options** in the **Edit Spooler** window brings up the following window:

The screenshot shows the "AppleTalk Spooler Options" dialog box. It is organized into three main sections:

- AppleTalk Spooler Options:** Contains radio buttons for "PostScript" (selected) and "NeWSPrint". Below are "Type:" (LaserWriter) and "Zone:" (*) fields, a "Set..." button, and "Fonts" checkboxes for "Include" and "Extract".
- Unix Spooler Options:** Features a "Print Program:" dropdown menu set to "lpdq", a checked "Use PS Header:" checkbox with a file path and "Edit..." button, and an unchecked "Enable Printer Accounting" checkbox.
- Job Space Options:** Includes four numeric input fields: "Max Jobs:" (30), "Min Free:" (100 MB), "Max Entries:" (30), and "Max Space:" (100 MB).

At the bottom right of the dialog are "Cancel" and "OK" buttons.

These options generally do not need to be set, but are sometimes useful when customizing the features of your print spooler. For a complete description of the values of each field, see Table 3-4 on page 78.

Click **OK**. To cancel changes to this window, click **Cancel**.

Table 3-4: More Options Table

Parameter	Description
PostScript/ NeWSPrint	This value is always set to PostScript (the NeWSPrint value is disabled).
Type	This is the device type that is published with Apple's Name Binding Protocol. The default is "LaserWriter". This setting should not change unless you are sure that you want your CanOPI spooler to appear with a type other than "LaserWriter" in the Chooser.
Zone	<i>This value is only effective when using Phase I Network Protocol.</i> It can be set to determine which zone users must be in to access the AppleTalk spooler.
Fonts	<p>Include: This box enables CanOPI's ability to insert pre-cached fonts into a document if they are not permanently downloaded to the output device already. This saves time by eliminating the need for the Mac OS client to download the font description with the print job once the font has been cached. The default is "unchecked".</p> <p>Extract: This box enables CanOPI's ability to extract, or "learn about," fonts that the output device does not have downloaded permanently. When a print job is sent to the spooler, CanOPI determines which fonts need to be downloaded from the Mac OS computer to the printer, and caches this information. By doing this, subsequent print jobs using the same fonts will print without having to download the same font information from the Mac OS client again. The default is "unchecked".</p>

Table 3-4: More Options Table (Continued)

Parameter	Description
<p>Print Program</p>	<p>This is the program that “sends” the job to the print device, or as an option, to a file. The default print program is called lwdq, and is responsible for delivering a print job to an AppleTalk printer. If you want the print job to be passed to a UNIX directory instead, hold down the mouse button on the Print Program box, and select pr2file. This will bring up box requesting additional information:</p> <div> <p>The image shows a small rectangular dialog box with a title bar that says "Path to print file:". Below the title bar is a single-line text input field. At the bottom right of the dialog box are two buttons: "Cancel" and "OK".</p> </div> <p>Enter the UNIX directory path you want to set as the destination for the print jobs. This is especially handy when printing to a UNIX software RIP that monitors a directory for the presence of print jobs and picks them up to be processed on the fly.</p> <p>You can specify a directory path by entering the following: <code>/directory1/directory2/</code> This will create a file with the Job Title, User Name and Process ID of the print job in the above directory path. This can be changed by actually specifying the name of the target file in the same field. For example: <code>/directory1/directory2/\${tt}_\${uu}__\$</code> where (tt) = job title, (uu) = user name, \$\$ = process ID). If you replace the string tt with a filename of your choice, all files printed through this spooler will have the same name. The following: <code><desiredstring>__\$</code> where <desiredstring> is the string of text that you wish to name the resulting print jobs, will ensure that each file is given a different name because the __\$ will assign the UNIX process ID associated with the print job.</p> <p>IMPORTANT - The Print file name entry cannot contain spaces.</p>

Table 3-4: More Options Table (Continued)

Parameter	Description
Use PS Header	This field is used to define a PostScript file that is to be prepended to each print job as it passes through the spooler. This is helpful when you need to pass specific printer options via postscript to the printing device. To edit the PostScript header file, click Edit . Click OK to save your changes, or click Cancel to ignore them.
Enable Printer Accounting	“Checking” this box enables the Print Accounting function. Check this box to store all print events for each spooler in a log that can be viewed by the user. To view a spooler’s log, click Show Log in the Spooler List dialog box. The default is “unchecked”.
Max Jobs	This entry determines how many finished print jobs will be held in the spooler’s .finished queue, so that they can be re-submitted by the PrintQMgr application. When the number of finished print jobs matches the value for this field, subsequent finished jobs will “push” the oldest saved job out of the .finished queue (see “Chapter 5 – PrintQMgr” for more details). The default value is 30.
Max Entries	This determines how many completed print jobs will be held in the list of finished jobs, as reported by PrintQMgr. When used in conjunction with the Max Jobs entry, it is a convenient way to keep track of many finished jobs, while saving only the most recent jobs for re-submission. The default value is 30.
Min Free	Specifies the minimum available disk space required for activation of the .finished queue, in megabytes (to be used in conjunction with the PrintQMgr). The default value is 100.
Max Space	Specifies the maximum disk space used by the .finished queue in megabytes (to be used in conjunction with the PrintQMgr). The default value is 100.

Reporting an Output Device’s Fonts

ScriptableAdmin’s **Spooler List** dialog box contains a button allowing users to generate a report showing all fonts resident on a particular output device. Select a spooler in the **Spooler List** dialog box, click **Fonts**, and ScriptableAdmin will send a PostScript command to the associated output device to return a list of all installed fonts.

Select a printer here...

then click **Fonts**.



The output device's fonts will be displayed in a dialog box similar to the following:



Update All Fonts

This button, located in the **Spooler List** dialog box, updates the font lists for every output device listed. For more information about reporting a device's fonts, see "Reporting an Output Device's Fonts" on page 80.

OPI Options

This button is used to define OPI options for a spooler using the CanOPI Open Prepress Interface engine. To configure your print spooler to process OPI print jobs, click **OPI Options** and CanOPI will display the **OPI Options** dialog box:

Output Resolution dpi

- Enable OPI
- Enable Direct RIP
- Parse Embedded PostScript
- Cancel job if high resolution image is missing
- Enable APR Replacement
- Enable DCS Merge
- Use Shared Memory Interface

Use Table 3-5 on page 83 to determine which options should be defined to enable OPI processing. Click **OK** to save your changes when finished, or **Cancel** to ignore changes.

Table 3-5: OPI Options Table

Option	Description
Output Resolution	This field may be used to specify the output resolution of the spooler for faster printing. By setting the Output Resolution, you can speed the printing of high-resolution images when the printer is limited to output at a lower resolution than that of the image. For example, by setting a value of 150 , CanOPI will only generate and deliver a 150dpi description of images when printing, even if the images themselves are saved at higher resolution. It is not required to set this if printing to a high-resolution output device such as a PostScript RIP to an imagesetter.
Enable OPI	This box must be checked for CanOPI's image replacement to take place.
Enable Direct RIP	Check this option to allow color-separated jobs to start printing faster by using docpipe . docpipe allows the job to begin printing to the output device before spooling is complete.
Parse Embedded PostScript	This option should be used to support low-resolution images within low-resolution images. In other words, if you are spooling a document containing a low-resolution image, that is the low-resolution stub of another OPI file (one that has more low-resolution images imbedded within itself), this option forces CanOPI to search for the embedded PostScript image path comments so that all high-resolution images will be properly replaced.
Cancel job if high resolution image is missing	If checked, this option causes CanOPI to abort a print job if a high resolution graphic is missing. A graphic is considered missing if it is no longer in the directory where it was originally placed, and cannot be found in one of the user-specified search directories (see "OPI Search Path" on page 85). If disabled, the print job will be processed, and a corresponding blank space will be left in place of the missing graphic.

Table 3-5: OPI Options Table

Option	Description
Enable APR Replacement	This option will force docman to search for low-resolution files with the '.e' extension, generated by the PSImage utility, and substitute the relative PSImage high-resolution image files.
Enable DCS Merge	This allows for DCS high-resolution images to be output at full resolution when printed with composite data.
Use Shared Memory Interface	The shared memory interface allows for output from the OPI function to be passed through RAM buffers to the target output device, as opposed to building the OPI'd file on disk. It greatly improves the output performance of OPI and is recommended for use to all AppleTalk devices. This option has no effect on output to UNIX printers or Print2file spoolers.

Advanced OPI Options

This button is used to define advanced OPI options for a spooler using the CanOPI Open Prepress Interface engine. To configure your print spooler to process OPI print jobs, click **Advanced** and CanOPI will display the **Advanced OPI Options** dialog box:

OPI Search Path

- Search PostScript for EndBinary
- Examine high resolution image before job is printed
- Separate CMYK EPS files when printing separations
- Use Binary Image Data
- Enable Caching
- Remove OPI comments from PostScript job
- Enable ALD Image Transparency

Extra Arguments

Use Table 3-6 on page 85 to determine which advanced OPI options you want to implement. Click **OK** to save your changes when finished, or **Cancel** to ignore changes.

Table 3-6: Advanced OPI Options Table

Option	Description
OPI Search Path	Used to define alternate search directories for docman to use when locating replacement images during the OPI substitution process. Multiple search directories may be specified, each separated by a semicolon – ;.
Search PostScript for EndBinary	Forces docman to ignore the binary count given in %%EndBinary and search for %%EndBinary that marks the end of the binary data.
Examine high resolution image before job is printed	Using this option instructs docman to parse images in page layout application files to determine if they are high resolution originals and if so, disable image replacement. Otherwise, a high resolution file will be removed and subsequently replaced by itself. This option is useful when a user places a high resolution grayscale TIFF image in Quark and colorizes it.
Separate CMYK EPS files when printing separations	This option separates the four color plates of CMYK Encapsulated PostScript (EPS) images when performing OPI replacement of images within documents that are printed with the Color Separation option selected from the page layout application (QuarkXPress, Adobe PageMaker).
Use Binary Image Data	Checking this box enables binary representation of image data. This option should be used unless your printer cannot handle binary data.
Enable Caching	Checking this box enables docman 's internal caching feature. This feature provides for faster OPI processing and should only be removed for debugging purposes.
Remove OPI comments from PostScript job	Enables docman to remove OPI comments from PostScript files that contain low-resolution stub files once these PostScript files have been processed by docman for high-resolution image replacement. This is required for PostScript files that will be processed by TrapWise. If the OPI comments are left in the file, TrapWise assumes that the images pointed to by the leftover OPI comments are not in the file, and displays them in the 'Images Link' window.

Table 3-6: Advanced OPI Options Table

Option	Description
Enable ALD Image Transparency	Enables support for %ALDImageTransparency. This allows images to be printed with background set to None. This option is provided because some versions of QuarkXPress (and other page layout programs) do not support this operator correctly (in such cases all images print with background set to None).
Extra Arguments	This field allows the user to enter arguments that control additional OPI parameters that are otherwise unavailable from this dialog box. For a complete list of OPI arguments, including those not accessible through ScriptableAdmin, see Table 9-2 on page 193.

Deleting a Print Spooler

To delete a print spooler, select an entry in the **Spoolers** list and click **Delete**.

Note – *To delete a spooler that has both AppleTalk and UNIX spooler options, and whose output device is an AppleTalk printer, you must separately delete the AppleTalk and UNIX spoolers.*

Printer Accounting

ScriptableAdmin contains a Printer Accounting feature that allows the user to access a log of all print activities for each print spooler. Printer Accounting is enabled/disabled as a function of your software Authorization Key. Contact your sales representative or IPT directly to obtain an Authorization Key that will enable Printer Accounting. For information regarding setting your key, refer to “Updating Your CanOPI Authorization Key” on page 47.

There are two levels of accounting available in the Printer Accounting package: **Job Accounting** and **Page Accounting**.

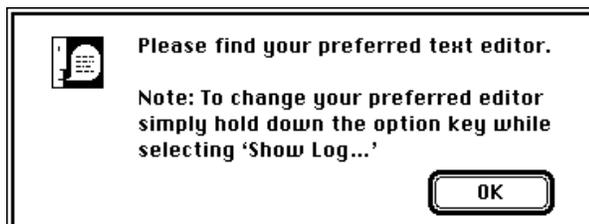
Job Accounting maintains and reports information regarding all jobs in a log file but will not count the number of pages for each of the printed jobs. This is useful when you are interested in seeing who prints to what spoolers at what times, but are not concerned with the number of pages being printed. One reason when you may want to do this is when the extra time spent for counting pages is not worth the information of the number of pages printed.

Page Accounting is a subset of Job Accounting. This means that Job Accounting is required to be enabled for Page Accounting to work properly. This accounting will (in addition to logging jobs) count the number of pages that is printed by each job. This level of accounting will add some time to the total time a job will take to print since it requires exchanging more information with the printer.

Printer Accounting, as a whole, encompasses the entire concept of logging any information related to print jobs submitted to a spooler. Therefore, Job Accounting and Page Accounting are BOTH elements of Printer Accounting.

To create a print log for a print spooler, you must place a check mark in the **Enable Printer Accounting** check box in the **More Options** window. You can then view the contents of that print spooler's log by selecting that spooler and clicking on the **Show Log** button in the **Spooler List** dialog box.

ScriptableAdmin will ask you to find a text editor to use for viewing the file:



Click **OK** and browse your system to find a desired application such as Apple SimpleText. After you select your application, click **OK** and a Printer Accounting log for the specified spooler is displayed.

The data that can be stored in the Printer Accounting log file include:

- **Login** – The UNIX login that the job was submitted under. For Mac OS-UNIX jobs, this will be the name in the Mac OS computer's sharing set-up.
- **User Name** – The real name extracted from the `/etc/passwd` file for UNIX jobs. For Mac OS-UNIX jobs, this field will be set to `<unknown>` unless the user name in the sharing set-up is set to a valid UNIX log in which exists in the `/etc/passwd` file, in which case it will be set to the real name extracted from the `/etc/passwd` file.
- **Spooler Name** – The spooler name to which the job was submitted.
- **Title** – The job title (filename).
- **Queue Date** – The date and time that the job was submitted.
- **Spool Date** – The date and time that the job was spooled to the spooler.
- **Finish Date** – The date and time that the job was completed by the spooler.
- **Start Page** – The starting page count value of the printer.
- **End Page** – The ending page count value of the printer.
- **Pages** – The number of pages printed for the job (this is **End Page** minus the **Start Page**).
- **Interrupt Date** – The date and time that the job may have been interrupted for an error or by a user.
- **Messages** – Any error messages that may have been sent back from the printer during the printing of the job.

The Printer Accounting log will also tell you if you have not purchased an Authorization Key.

A default log entry will look similar to this:

```
Login:tjones User:Tom Jones Pages:0 Start:0
End:0 Title:File42 Spooler:LaserJet 4
Queued:10/01/96 08:00:00 Spooled:10/01/96
08:20:00 Finished:10/01/96 09:24:00 Mes-
sages: Interrupted:
```

A quick summary of this entry:

The print job was submitted by **tjones**.
The user name associated with the login is **Tom Jones**.
The total pages are unknown since Page Accounting is disabled.
The start count and end count for the printer are also unknown.
The title of the print job was **File42**.
The spooler the job printed on was **LaserJet 4**.
The job was queued at **10/01/96 08:00:00**.
The job was sent to the spooler at **10/01/96 08:20:00**.
The job was completed at **10/01/96 09:24:00**.
There were no error messages from the output device.
The job was never interrupted.

4 – Drag & Drop and OPI

CanOPI's Drag & Drop capability enables users to move their high-resolution images to a network file server and have low-resolution OPI images automatically generated for use in page-layout and printing. This chapter discusses the steps involved in configuring a Drag & Drop folder, and discusses how to use Drag & Drop.

Configuring Drag & Drop

Configuring CanOPI Folders for Drag & Drop

Once you have configured your CanOPI server to publish a volume, you can specify certain folders within that will perform CanOPI's Drag & Drop low-resolution image generation for use with OPI. This requires the creation of a text file called **opiconfig** in the folder you wish to use for Drag & Drop. This file defines how CanOPI will create low-resolution images. To configure a folder:

1. Use the Mac OS Chooser to log in to your CanOPI file server.
2. Select the **MacApps** volume to mount on the Desktop.
3. Repeat step 2 to mount a volume you wish to use for Drag & Drop (multiple volumes can be configured).
4. In the **MacApps** volume, you will find a file called **opiconfig**. Drag a copy of this file to a folder within the CanOPI volume for which you wish to activate Drag & Drop.

5. This will be enough to activate low-resolution image generation for the entire volume. Low-resolution generation will occur for images copied in to any folder *below* this point. It is possible to copy an **opiconfig** file into a folder, then anything copied into this folder, or any subsequent folder, will generate low-resolution images, allowing multiple-format low-resolution files to be generated on a single volume. You can edit the **opiconfig** file you copied in step 4 to change the format and position of the low-resolution image file. If you prefer, you can create a new file called **opiconfig**, provided you follow the syntax of the example file. Use the TeachText or SimpleText tool provided with your Mac OS computer to edit this file. Table 4-1 on page 92 can be used to determine which attributes to set for this folder. Do not add extra spaces or characters to your entries. Comments excluded, (lines that beginning with #), your **opiconfig** file may look similar to this:

```
opi=true
hres=72
vres=72
pict=true
```

6. Save the file and repeat steps 3 through 5 as necessary.

Table 4-1: .opiconfig Attributes Table

Attribute	Description
opi=(true false)	If true , enables low-resolution image generation (drag and drop OPI). If false , then low-resolution image generation is disabled. The default is true .
pict=(true false)	If true , opistub creates a PICT preview in the resource fork of the low-resolution image file. When using all default opiconfig settings, this is the image viewed within the page layout application. If false , then no PICT preview is generated. Setting this to false is not recommended unless either the TIFF option has been set to true , or a viewable preview of the low-resolution image is not desired. The default is true .

Table 4-1: .opiconfig Attributes Table (Continued)

Attribute	Description
print-(false true)	This option only applies for EPS low-resolution images (eps=true). If true , then opistub creates a printable preview image. If false (or if eps=false), then no printable preview is generated. This option is used to support proof printing of EPS-formatted low-resolution images, when such an option is not available from the page layout application. Enabling this option causes the low-resolution image files to take up more disk space. The default is false .
printseps=(true false)	This option only applies for DCS images with printable low-resolution (for example, print=true) and single-file low-resolution disabled (for example, singlestub=false). If true , then opistub will create a printable preview for the master file and each color plate. Then it is possible to print the low-resolution as composite or separated. If false , then opistub will only create a printable preview for the master file (not the color plates). Then it is only possible to print the low-resolution as composite. The default is true .
vres=<num>	The value <num> defines the vertical resolution of low-resolution images in dots per inch. The default is 72 .
hres=<num>	The value <num> defines the vertical resolution of high-resolution images in dots per inch. The default is 72 .
FractTiffRes=(true false)	Allows the creation of TIFF stubs with a fractional resolution that is as close to the integer resolution as possible, while keeping the physical dimensions of the lores stub the same as the dimensions of the hires image. The default is true .

Table 4-1: .opiconfig Attributes Table (Continued)

Attribute	Description
printablehres= <resolution> printablevres= <resolution> tiffhres= <resolution> tiffvres= <resolution> picthres= <resolution> pictvres= <resolution>	<p>These options provide a mechanism to set the printable, TIFF and PICT resolutions independently.</p> <p>If any of the above resolutions is not present, the default is set to hres and vres as defined above.</p> <p>The default for all of these options is unset, so the hres and vres values are used for all images.</p>
lores=hires	<p>If lores=hires is enabled, opistub will use the format of the high-resolution image to determine the low-resolution image format. Specifically, if the high-resolution image format is EPS, then the low-resolution image format will be EPS; otherwise, the image format will default to a TIFF low-resolution image. Also note that the TIFF option (described below) still affects EPS high-resolution images (a setting of tiff=true will still cause a TIFF preview to be included within the data fork of the EPS image). The default for this setting is enabled. To disable, place a # character in front of the option.</p>
usephotodata=(true false)	<p>If true, then low-resolution image files generated from Adobe PhotoShop EPS and DCS images will use the data from the EPS/DCS (instead of using the PICT resource). If false, then the low-resolution image is generated from the PICT resource as is always done for all other EPS and DCS files. Setting this option to true makes it possible to have low-resolution images at > 72 dpi (not possible when set to false) as well as supporting clipping paths in the printable preview of the low-resolution image (not possible when set to false).</p> <p>The default is true.</p>

Table 4-1: .opiconfig Attributes Table (Continued)

Attribute	Description
eps=(true false)	<p><i>NOTE: This option has no effect if the lores=hires option is set.</i></p> <p>If true, then opistub uses an EPS file format for all low-resolution image generation (unless lores=hires is set). If eps=false and tiff=false option is also false, then the EPS file format is used for low-resolution images. If both eps=true and tiff=true then, still using an EPS file format, a TIFF preview image is added. This configuration is suggested when support is required for both Mac OS clients and PC clients. The default is true.</p>
tiff=(false true)	<p><i>NOTE: Enabling this option in conjunction with eps=false will cause incompatibilities for some image formats and is not recommended.</i></p> <p>Low-resolution stubs generated from EPS or DCS high-resolution formats have many limitations. This option only remains for backwards compatibility, and for use with eps=true, which provides PC-compatible low-resolution images.</p> <p>If true, opistub creates a TIFF preview in the data fork of the file. If false, then no TIFF image is created. The default is false.</p>
singlestub=(true false)	<p>If true, then a single-file DCS low-resolution image will be created from DCS high-resolution images. If false, then a five-file DCS low-resolution image will be created. The default is true.</p>
keepsrc=(false true)	<p>If true, then the resource fork of the high-resolution image is preserved (copied) in the low-resolution image (excluding such desktop information as date, file size and icon location). This is useful if the resource fork of the high-resolution image contains information necessary for a specific application. If false, then the resource fork of the high-resolution image is not preserved. The default is true.</p>
creator=<string>	<p>If defined to hires, then the creator will be preserved from the high-resolution image; otherwise, this string defines which creator to assign to the low-resolution image (for example: creator=8BIM for Adobe PhotoShop OR creator=ART5 for Adobe Illustrator). The default is hires.</p>

Table 4-1: .opiconfig Attributes Table (Continued)

Attribute	Description
usetiffpict=(false true)	This option only affects TIFF high-resolution images. If true , then opistub will attempt to use the PICT image(s) in the resource fork of the high-resolution TIFF file for low-resolution image generation. If false , opistub will NOT attempt to use the PICT data, but instead will always generate a low-resolution image from the high-resolution TIFF data. Setting this option to true is not recommended, as some applications create PICT resource images that have different dimensions (for example, a thumbnail) than the actual high-resolution image data. The default is false .
printgray=(false true)	This option only applies for EPS low-resolution images with printable previews (for example, 'eps=true AND print=true'). If true , then a grayscale preview will be included in the low-resolution image. If false , then no grayscale image is generated. This option is useful when printing low-resolution images to a non-color Level 1 PostScript output device. The default is false .
binary=(false true)	This option only applies for EPS low-resolution images with printable previews (for example, eps=true AND print=true). If true , then opistub will use a binary representation of printable preview image data. If false , then ASCII (hex) is used to represent the image data. Although using binary data results in smaller-size low-resolution images, it causes problems with devices (such as some printers) that do not support binary data. The default is true .
pathname=<path>	Specifies the pathname of the low-resolution directory. This path can be a relative or absolute pathname (see also the pathtype and pathformat options). The default for this option is LowRes .

Table 4-1: .opiconfig Attributes Table (Continued)

Attribute	Description
pathtype= (relative absolute mirror)	<p>Specifies the type of path specified in the “pathname” option (above). This option may be set to relative, absolute or mirror.</p> <p>relative specifies that the low-resolution image directory should be built in the location pathname relative to the pathname of the high-resolution image.</p> <p>absolute specifies that the low-resolution image directory should be built in the absolute location pathname (relative to '/') regardless of the pathname of the high-resolution image. This results in all low-resolution images being placed in a single directory.</p> <p>mirror specifies that the low-resolution image directory should be built in the absolute location pathname, AND appends the relative pathname of the high-resolution image. This results in a duplicated directory structure where the high-resolution directory structure starts at the location “pathname”.</p> <p>The default is relative.</p>
pathformat=(mac unix)	<p>This value specifies the format of the path specified in the pathname option. This option may be set to either mac or unix. If a mac path format is specified, the Mac OS volume portion of the pathname must exist in the global volumes description file (the default location of this file is <code>/ushare/etc/afp.dirs</code>). The default is unix.</p>
prefix=<string>	<p>Specifies the string to prepend to the name of the low-resolution image name to generate the low-resolution image name. The default is an empty prefix (none).</p>
suffix=<string>	<p>Specifies the string to append to the name of the high-resolution image name to generate the low-resolution image name. The default is an empty suffix (none).</p>
loresfromlores= (false true)	<p>If true, then a second low-resolution image may be generated from the first low-resolution image (by copying the low-resolution image file to another volume). If false, then a second low-resolution image may not be generated. The default is false.</p>

Table 4-1: .opiconfig Attributes Table (Continued)

Attribute	Description
keepimagepathcmnts =(true false)	If true , then the path names of both the original high-resolution image and the first low-resolution image are stored in the second low-resolution image. This makes it possible to obtain high-resolution output from both low-resolution images. If false , then only the pathname to the first low-resolution image will be stored in the second low-resolution image. Note that this option is only relevant when loresfromlores is set to true . The default is false .
DecompressJpeg= (true false)	Allows the user to disable decompressing of JPEG-encoded EPS files, to save time. If DecompressJpeg=false , the JPEG data in EPS files will not be decompressed to build the printable, PICT, and TIFF previews. The default is true .
jpeg=(false true)	If true , then opistub will generate a JPEG low resolution image for use with Web publishing applications. These images are not guaranteed to work with page layout applications and will not be replaced by docman . The resolution of the JPEG low resolution image can be controlled by setting JpegHRes and JpegVres to desired values. If JpegHRes or JpegVres are not defined, the resolution(s) will default to the values given by hres and vres . The default is set to false .
jpeghres= <resolution> jpegvres= <resolution>	Vertical and horizontal resolution for the JPEG low resolution image. If not defined, then the default is set to the values given by hres and vres .
gif=(false true)	If true , then opistub will generate a GIF low resolution (72 dpi) image for use with Web publishing applications. These images are not guaranteed to work with page layout applications and will not be replaced by docman . The default is set to false .
4tiffs=(true false)	If true , then 8 bit grayscale and 1 bit black and white TIFF images with file names ending with strings specified in 4Tifssect are treated as pre-separated TIFF images. Based on the setting of singlestub , either a single EPS stub or 5 EPS stubs are generated. A "dummy" master file is also created in the hires directory, that is a composite representation of the four color separated TIFF images. The default is set to false .

Table 4-1: .opiconfig Attributes Table (Continued)

Attribute	Description
4tiffsext= <Cyan Plate extension>, <Magenta Plate extension>, <Yellow Plate extension>, <Black Plate extension>	These strings (extensions) at the end of TIFF images are used to identify pre-separated TIFF images. The default values are: .C, .M, .Y, .K .
4tiffsmasterres=<res olution>	The resolution of the "dummy" hires master file. The default is set to 72 dpi.

Using Drag & Drop

After this target folder has been set up, users can drag image files to this folder, whereupon low-resolution images are automatically created.

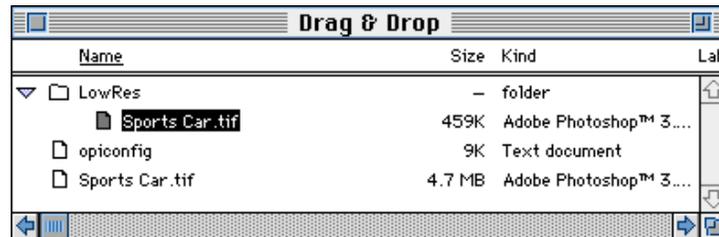
Note – *In the case of DCS files (which include four-color separations and a composite), all five files must be dragged into the target folder for low-resolution generation to take place.*

Low-resolution file generation is a fully automated task, so if a high-resolution file within the target folder is duplicated, renamed or modified, and resaved, a new low-resolution file will be created. If the high-resolution file is deleted (dragged to the Trash), the low-resolution file will be deleted automatically.

You can also drag an entire folder of images into a **Drag & Drop** folder. CanOPI will create the **LowRes** folder, containing the low-resolution images, within the folder that contains the original high-resolution images, depending on the option **path-type**.

Drag & Drop In Action

In the picture below, after a 4.7-Mb high-resolution TIFF file was dragged to the **Drag & Drop** folder, a 459-k low-resolution TIFF For Placement Only (FPO) image was generated automatically and placed in the **LowRes** folder.



It is this file that should be used in the page layout application instead of the high-resolution TIFF.

CanOPI's OPI Processor

OPI (Open Prepress Interface) is a set of PostScript comments developed by Aldus Corporation that describe the placement, cropping, and adjustment of images within a document. By using CanOPI's OPI processor, you can perform page layout with low-resolution images from CanOPI's image-generating folders. This improves both the performance of your page layout software and the printing process because of the relatively small size of the placement images.

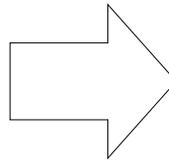
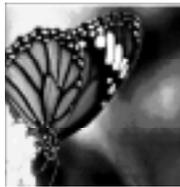
The documents you have prepared with easily handled low-resolution images will automatically have these low-resolution versions replaced with the original high-resolution images when the documents are printed through a CanOPI print spooler.

CanOPI's OPI processor has been tested with most common desktop publishing applications for the Mac OS client, PC, and in some cases, UNIX. To use the OPI process, you simply print

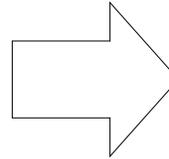
the pages created using low-resolution images through an OPI spooler created using the ScriptableAdmin utility. High- and low-resolution files can be mixed on a page.

Note – *If you intend to use imposition, you should first print the ‘low-resolution’ pages to a file and import these into the imposition package. For output from Ultimate’s Imposstrip and Adobe PressWise, if you are using TIFF high- or low-resolution, it is necessary to use the Azalea PrePress Xtension. If this is not used, the position of the high-resolution images after OPI will be incorrect.*

How OPI works

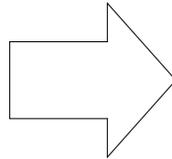


An image is scanned in and is stored as a high-resolution image. When it is dragged and dropped to the CanOPI server, a low-resolution image is created. Users can then include this low-resolution version in their page layouts.



The file that is sent over the network when the user wants to print the document is much smaller than it would have been if the high-resolution image had been included directly in the page layout. In addition, screen refresh and scrolling rates are much

faster when using the low-resolution versions in page-layout applications. When the page is sent to a printer via a CanOPI spooler, the low-resolution images are automatically stripped out and replaced with the original high-resolution images, producing the intended document:



5 – *PrintQMgr*

PrintQMgr lets you monitor and control the print queues for all available printers on your CanOPI server. PrintQMgr can be used only if your CanOPI key has enabled this service. To add this service to your existing key, contact your local CanOPI reseller, or IPT directly (if you don't have a reseller).

This chapter gives instructions for:

- installing the PrintQMgr application,
- starting the PrintQMgr application,
- changing your user authentication,
- monitoring and controlling printer queues, and
- performing administrative tasks as the “root” user.

Installing the PrintQMgr Application

The PrintQMgr application consists of server software that runs on your Sun host and a client application that runs on MacOS clients. Before using PrintQMgr, you must install both the server and client software.

Installing the Server Software

Your “PrintQMgr Server” disk contains files that you must install on your server:

- several new files:
 - `/uShare/bin/IPTPrintServ`
 - `/uShare/bin/setserv`
 - `/uShare/etc/services`
- new versions of several uShare files:

```
/ushare/bin/usstart  
/ushare/bin/usstop  
/ushare/bin/startsplr
```

To install these files, insert the “PrintQMgr Server” disk in your Sun host’s floppy drive, and issue the following commands:

```
# cd /  
# /ushare/bin/usstop SPLR  
# tar xpf /dev/rfd0c  
# /ushare/bin/usstart splr
```

Installing the Mac OS Client Application

Your PrintQMgr Client disk contains the PrintQMgr application for Mac OS systems. To install this file, copy it from the “PrintQMgr Client” disk to the hard disk of all Mac OS clients.

Starting the PrintQMgr Application

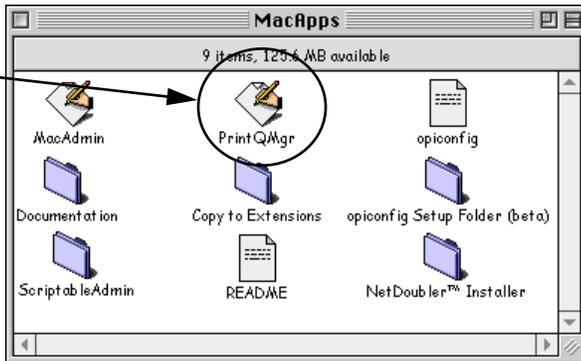
After installing and starting CanOPI, you will find a server listed in the Mac OS Chooser called **<hostname>-CanOPI**, where **<hostname>** represents the name of your CanOPI host. This is a default server that is published automatically. If your network consists of many zones, you will find your CanOPI server resides in the zone associated with the host’s physical subnet (if you do not know the zone, select each zone until you find the server). If you chose to follow the steps in the section “Advanced Configuration of uShare” to use your host as an AppleTalk “seed” router, you will find your server published in the *default zone* that you indicated during configuration.



Once you have located your new server with the Chooser, log-in with your UNIX username and password, or as the “root” user. In either instance, you will see the **MacApps** volume is available to mount. Users who do not log in as the “root” user also will see their UNIX home directory published as a volume called “YourHome” (<username>@<hostname>). The “root” user’s home directory is not published by default.

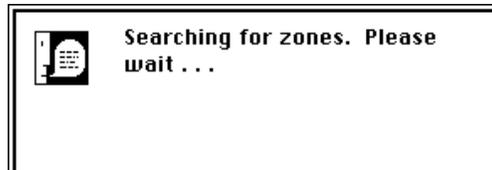
Double-click the **MacApps** volume that appears on the desktop. Within is the PrintQMgr application. You must copy this application to your local machine before proceeding with the following steps:

Copy this file to your local machine before launching it.

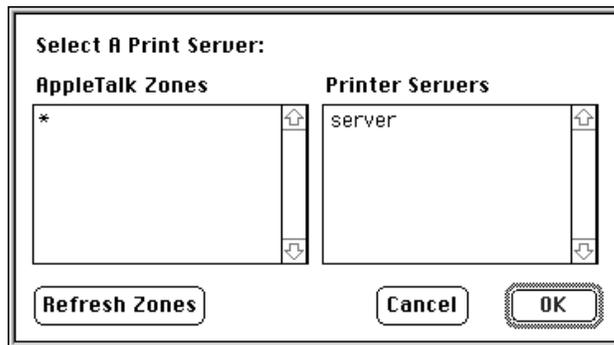


Note – *Your CanOPI Authorization Key must enable the PrintQMgr service on your Sun host for PrintQMgr to function.*

1. After copying it to your local machine, launch the PrintQMgr application by double-clicking its icon. A window appears, asking you to wait while the PrintQMgr searches your network for AppleTalk zones:

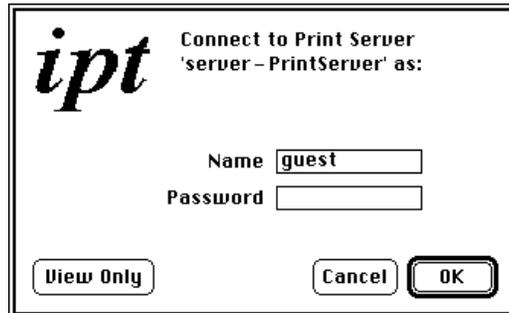


When the PrintQMgr has completed its search for AppleTalk zones, the print server selection screen appears:



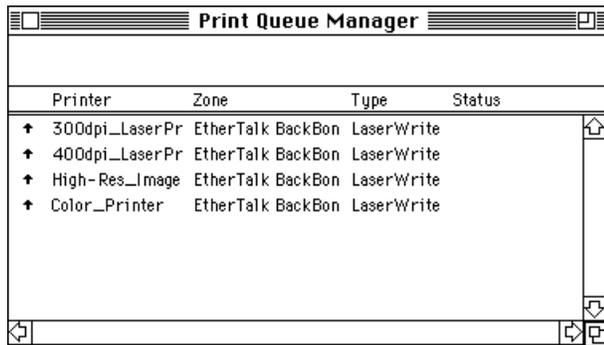
2. Select from the **Printer Servers** list the name of the print server to which you want to connect and click **OK**. If your AppleTalk network consists of zones, you must first select an entry from the **AppleTalk Zones** list. (If you do not know your server's name and zone, ask your CanOPI administrator.)

After clicking **OK**, the user authentication window appears:



3. Enter your name and password and click **OK**. If you do not know your name or password, or if you want only to monitor print queues without making changes to them, click **View Only**. (To obtain your log-in name and password, ask your CanOPI administrator.)

After you click **OK**, the PrintQMgr window appears. You can now monitor and control the print queues of your network's printers as described in the remainder of this chapter, beginning on page 109.



Exiting the PrintQMgr

You can exit the PrintQMgr application at any time by choosing **Quit** from the **File** menu. If you want to disconnect from your CanOPI print server without quitting the PrintQMgr application,

choose **Close Connection** from the **Network** menu; to reconnect to a print server, choose **Open Connection** from the **Network** menu.

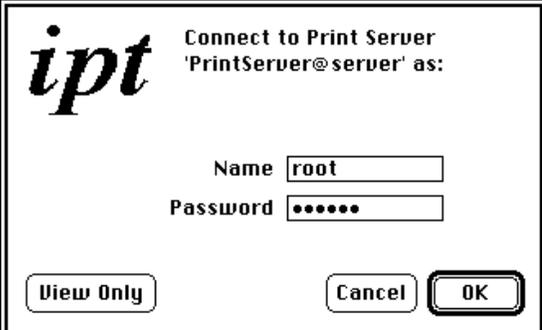
Using the Window Menu

As you work with the PrintQMgr application, you can have several windows open at one time. Choose items from the **Window** menu to bring needed windows to the front of your screen.

Changing Your User Authentication

You can change your user authentication at any time — for instance if you clicked the **View Only** button during your initial authentication, and you later decide that you want to make changes to the print queues. To change your user authentication:

1. Choose **Reauthenticate** from the **Network** menu. The user authentication window appears:



The image shows a dialog box for user authentication. The title bar reads "Connect to Print Server" and the subtitle is "'PrintServer@server' as:". On the left side, there is a logo for "ipt". The main area contains two input fields: "Name" with the text "root" and "Password" with seven dots. At the bottom of the dialog, there are three buttons: "View Only", "Cancel", and "OK".

2. Enter your name and password and click **OK**. If you do not know your name or password, or if you want only to monitor print queues without making changes to them, click **View Only**.

Note – By default, you must log in as the “root” user to start and stop queues, and to control other user’s print jobs. If you want to enable these privileges for a particular user (or users),

you must create a group called "PQMAdmin", then add the user(s) to the group. For details on creating a group and adding users to a group, see "Creating & Editing CanOPI (UNIX) User & Group Accounts" on page 47.

Monitoring and Controlling Printer Queues

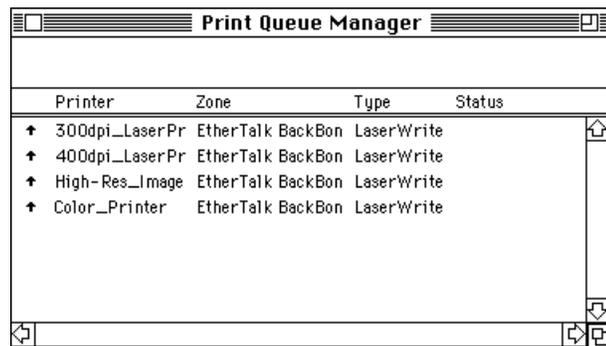
As you send print jobs to CanOPI spoolers, you may want to monitor the status of your jobs, or you may want to exercise control over your jobs.

The PrintQMgr provides tools for:

- viewing a list of available printers
- identifying the state of printers
- viewing a printer's queue
- suspending and resuming jobs in print queues
- deleting jobs in print queues
- moving jobs between print queues.

Viewing a List of Available Printers

After you log in to a CanOPI print server, the PrintQMgr window appears and displays a list of all available printers:



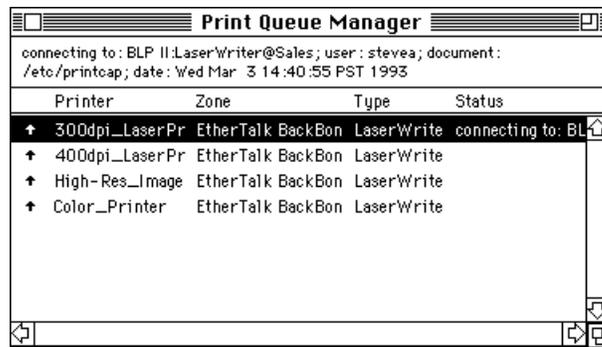
The screenshot shows a window titled "Print Queue Manager" with a table of printer information. The table has four columns: Printer, Zone, Type, and Status. There are four rows of printer data, each with a small upward-pointing arrow to its left. The window also features standard window controls (minimize, maximize, close) and a scroll bar on the right side.

Printer	Zone	Type	Status
300dpi_LaserPr	EtherTalk BackBon	LaserWrite	
400dpi_LaserPr	EtherTalk BackBon	LaserWrite	
High-Res_Image	EtherTalk BackBon	LaserWrite	
Color_Printer	EtherTalk BackBon	LaserWrite	

In the window above, the PrintQMgr window lists four available printers. The up arrows (⬆) and the black color of the printer names indicate that queuing and printing are enabled for all four printers (read “Identifying the State of Printers” on page 111 for an explanation of these symbols and terms).

For each printer, several attributes also appear:

- **Zone** - The AppleTalk zone in which the print spooler resides, that is, the zone that a Mac OS user must select when using the Chooser to select the spooler. This zone may be different than the zone in which the destination device resides.
- **Type** - The AppleTalk device type of the printer. This type is generally “LaserWriter”, which indicates that the printer is available when a Mac OS user selects the “LaserWriter” icon in the Chooser.
- **Status** - An abbreviated report of the printer’s status. To see the printer’s full status message, select the printer’s name.



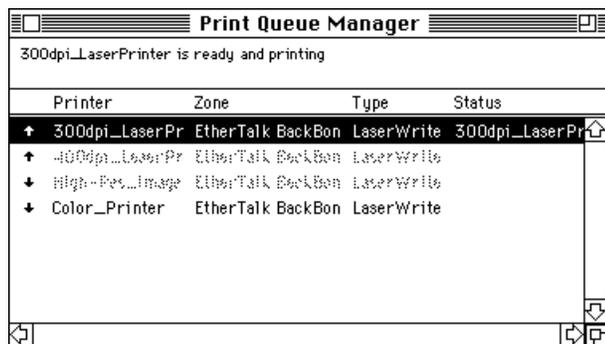
In the window above, the full status message for the selected printer, “300dpi_LaserPrinter”, appears at the top of the PrintQMgr window.

Note – You can force the PrintQMgr to update its list of printers (for example, if your CanOPI administrator has made changes to the printer list, but your PrintQMgr window has not yet reflected the changes) by choosing **Refresh Printer List** from the **File** menu.

Identifying the State of Printers

Your printer administrator controls the state of printers by **enabling** and **disabling** two print spooler characteristics, **queuing** and **printing**. When queuing is disabled, a spooler will not queue new jobs; when printing is disabled, the spooler will queue new jobs, but will not send the queued jobs to the destination device. The appearance of entries in the PrintQMgr's printer list reflects each spooler's current state:

- if queuing and printing are enabled, the printer's name is black and an arrow (↕) appears next to the printer's name
- if queuing is disabled, the printer's name is dimmed
- if printing is disabled, a down arrow (↓) appears next to the printer's name.



In the window above, the states of the printers are:

- 300dpi_LaserPrinter—queuing enabled, printing enabled
- 400dpi_LaserPrinter—queuing disabled, printing enabled

- High_Res_ImageSetter—queuing disabled, printing disabled
- Color_Printer—queuing enabled, printing disabled.

Note – To change a printer's state, you must be logged in as the "root" user, or a user that is a member of the group "PQMAAdmin" (this group must be created and the users added for this ability to be enabled). For details on defining a group, and adding a user to that group, see "Creating & Editing CanOPI (UNIX) User & Group Accounts" on page 47.

Viewing a Printer's Queue

To view a printer's job queue, select the printer's name in the Print Queue Manager's list of printers and choose **Show Queue** from the **Edit** menu, or double-click the printer's name. The **Queue for Printer** window appears:

The **Queue for Printer** window indicates if the printer is **Local** or **Remote**. A **Local** printer is any printer whose final spool directory resides on the CanOPI print server. If the printer is **Remote**, you can delete print jobs but you cannot suspend them or move them from the queue.

Status	Document	Job#	Owner	Size	Time
1	/tmp/logo1	194	stevea	1053	04:07:0
2	/tmp/tabs1	195	stevea	1053	04:07:0
3	/tmp/toc1	196	stevea	1053	04:07:0

The **Queue for Printer** window above lists three queued jobs. For each queued job, several attributes are shown:

- **Status** - the current position of the job within the queue — a status of "1" indicates that the job is first in the queue, a status of "2" indicates that the job is second, and so on.
- **Document** - the names of input files comprising the job; if the name is unavailable, the **Document** attribute indicates "standard input."

- **Job#** - a numeric ID by which the job is referred to by UNIX commands such as **lprm**.
- **Owner** - the name of the user who sent the print job. For Mac OS print jobs, the “User Name” as specified in the Chooser (for System 6 Mac OS clients) or in the **Owner Name** field of the **Sharing Setup** Control Panel (for Mac OS System 7) is compared to the list of registered UNIX users on the print server. If the Mac OS user name matches a UNIX user name, that name is the owner of the print job. Otherwise, the owner of the print job is the “root” user.
- **Size** - the total size (in bytes) of the print job.
- **Time** - the time and date when the print job entered the queue.

The **Queue for Printer** window displays three categories of jobs in a printer’s queue:

- **Active Jobs** - jobs that are waiting in the printer’s queue.
- **Completed Jobs** - jobs that have recently finished printing (either successfully or unsuccessfully) and that are stored in the **.finished** directory within the spool directory.
- **Suspended Jobs** - jobs that have been temporarily suspended as described in “Suspending and Resuming Jobs in Print Queues” on page 114 and that are stored in the **.suspended** directory within the spool directory.

The list of a printer’s completed jobs appears at the top of the **Queue for Printer** window; the list of suspended jobs appears at the bottom:

Queue for Printer '300dpi_LaserPrinter'					
Delete		Printing: Enabled, Queuing: Enabled			
Suspend		Total Jobs: 4 Total Size: 5157			
< Local Printer >					
Status	Document	Job#	Owner	Size	Time
Completed	/tmp/toc1	179	stevea	1053	03:00:5
1	/tmp/tabs1	187	stevea	1053	03:06:5
2	/tmp/toc1	188	stevea	1053	03:06:5
Suspended	/tmp/logo1	183	stevea	1998	03:06:2

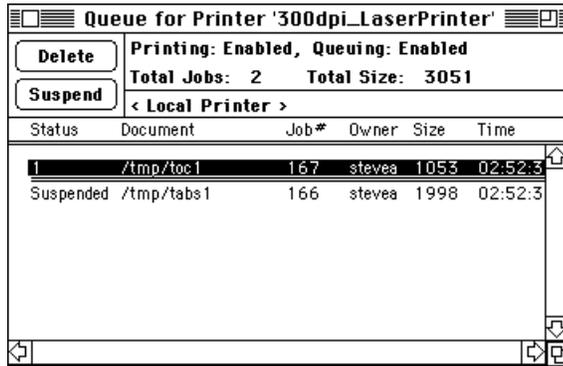
In the window above, the **Queue for Printer** window lists one completed job, two active jobs, and one suspended job.

You can choose to hide or show the contents of the finished and suspended queues by selecting items from the PrintQMgr's **View** menu:

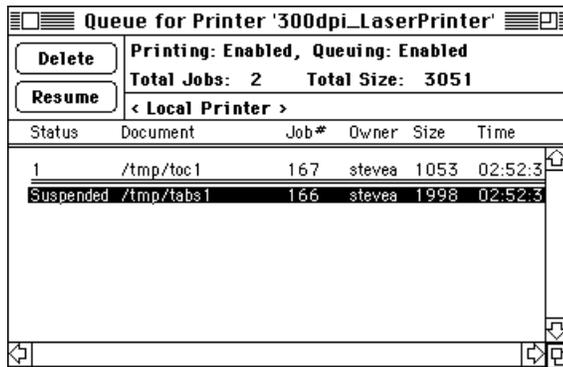
- Choose **Hide Completed Jobs** from the **View** menu to hide the printer's list of finished jobs. When you choose this item, a new item – **Show Completed Jobs** – takes its place in the **View** menu.
- Choose **Hide Suspended Jobs** from the **View** menu to hide the printer's list of suspended jobs. When you choose this item, a new item – **Show Suspended Jobs** – takes its place in the **View** menu.

Suspending and Resuming Jobs in Print Queues

To temporarily suspend an entry in a print queue (for example, if you want to delay printing of a job until you have confirmed that the destination printer has the proper paper), select an entry in the list of print jobs and click **Suspend**. The selected entry is moved to a list of suspended jobs:



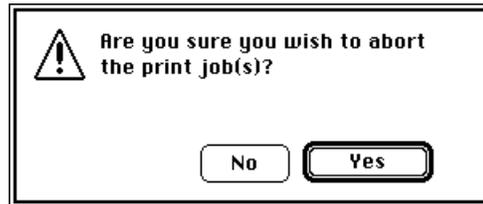
To resume printing of a suspended job, select the suspended job in the list of print jobs and click **Resume**:



Note – You can suspend only those print jobs that you own. You cannot suspend jobs from a Remote printer's queue, for example, a UNIX printer connected to another UNIX host.

Deleting Print Jobs in Print Queues

To delete an entry in a print queue (for example, if you sent the wrong document to print), select an entry in the list of print jobs and click **Delete**. An alert appears prompting you to confirm deletion of the selected entry:

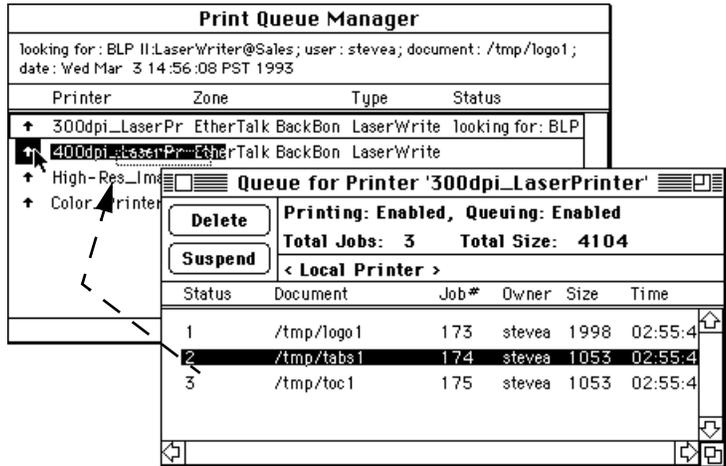


Click **Yes** to confirm deletion of the print job. The deleted entry is removed from the list of print jobs, and the status of remaining print jobs is updated (if necessary) to close the gap left by the deleted job.

Note – *You can delete only those print jobs that you own. You can delete jobs from the queues of both local and remote printers.*

Moving Jobs Between Print Queues

To move a print job from one queue to another (for example, if your print job is in a queue that is moving slowly or if the destination printer malfunctions), select an entry in a printer's queue and drag it on top of another printer in the **Print Queue Manager** window:



In the window above, a job from the 300dpi_LaserPrinter's queue is being dragged on top of the "400dpi_LaserPrinter" in the **Print Queue Manager** window. When you release the mouse button, an alert appears informing you that the job is being moved:

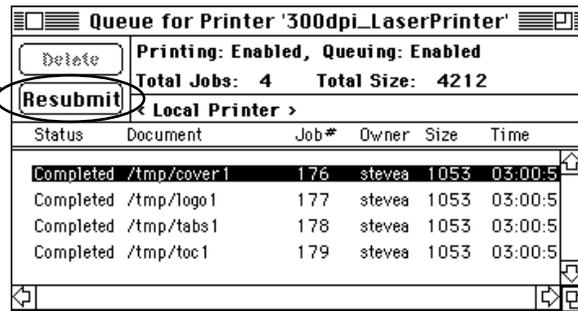


Note – You can move only those active print jobs that you own. You cannot move jobs from a Remote printer's queue. Moving a job from one queue to another may yield unexpected results if the destination printers are different types. For example, if a QuarkXPress file is moved from the queue for a Fiery RIP to a queue for an Apple LaserWriter Plus, the job may not print correctly.

Resubmitting Completed Jobs

To resubmit a print job (for example, if another copy of a completed job is required), select an entry in a printer's **Completed** queue and click **Resubmit**:

Click *Resubmit*

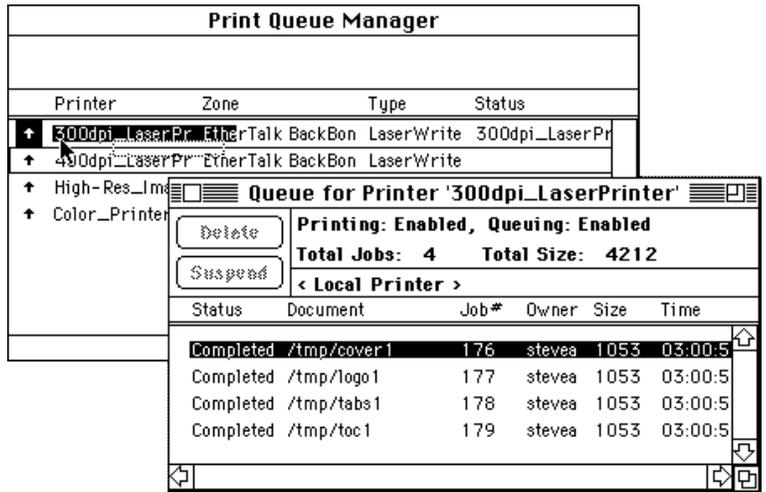


In the example above, a job from the 300dpi_LaserPrinter's **Completed** queue is being resubmitted.

Note – You may only resubmit print jobs that you own. Also note that if a **Completed** job is to be moved between queues, it must first be Resubmitted to the original queue.

Reprinting Completed Jobs

To reprint a print job (for example, if it was originally sent to the wrong printer), select an entry in a printer's **Completed** queue and drag it on top of a printer in the **Print Queue Manager** window (you can drag the job on top of the same printer whose completed queue you are viewing):



In the window above, a job from the 300dpi_LaserPrinter's queue is being dragged on top of the "300dpi_LaserPrinter" in the **Print Queue Manager** window. When you release the mouse button, an alert appears informing you that the job is being moved:



Note – You may only reprint jobs that you own. To reprint other print jobs, you must be logged in as the "root" user or a user that is a member of the **PQAdmin** group. (For details on defining a group and adding a user to it, see "Creating & Editing CanOPI (UNIX) User & Group Accounts" on page 47.) Also, to move a completed job between queues, you must first resubmit it to the original queue.

Performing Administrative Tasks

By logging in to your CanOPI print server as the “root” user, you gain authority to perform several administrative tasks in addition to the standard queue management tasks. Users other than the “root” user may perform the same administrative tasks if they belong to the **PQMAdmin** group (do not use **PQMAdmin** as a user’s primary group). For details on defining a group and adding a user to that group, see “Creating & Editing CanOPI (UNIX) User & Group Accounts” on page 47.

CanOPI’s PrintQMgr provides tools for performing the following administrative tasks:

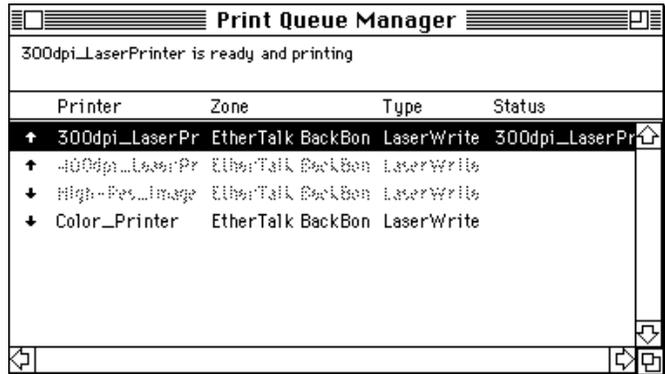
- controlling the state of printers
- reordering jobs in a print queue from any user
- reprinting any completed jobs from any user.

Controlling the State of Printers

You control the state of printers by **enabling** and **disabling** two spooler characteristics, **queuing** and **printing**. When queuing is disabled, a spooler will not queue new jobs; when printing is disabled, the spooler will queue new jobs, but it will not send the queued jobs to the destination device.

The appearance of entries in the PrintQMgr’s printer list reflects each print spooler’s current state:

- if queuing and printing are enabled, the printer’s name is black and an up arrow (↕) appears next to the printer’s name;
- if queuing is disabled, the printer’s name is dimmed;
- if printing is disabled, a down arrow (⇩) appears next to the printer’s name.



In the window above, the states of the printers are:

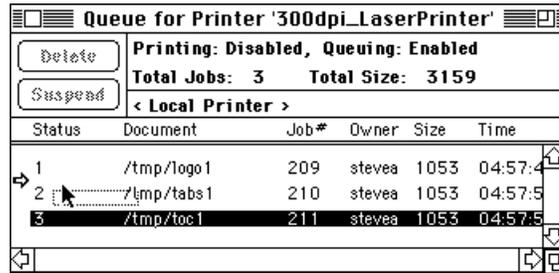
- 300dpi LaserPrinter - queuing enabled, printing enabled
- 400dpi LaserPrinter - queuing disabled, printing enabled
- High ResImageSetter - queuing disabled, printing disabled
- Color Printer - queuing enabled, printing disabled.

To change the state of a printer, select the printer's name in the PrintQMgr's printer list and choose **Enable Printing**, **Enable Queuing**, **Disable Printing**, or **Disable Queuing** from the **Network** menu.

Note – To change a printer's state, you must be logged in as the "root" user or a user that is a member of the **PQMAdmin** group (do not use **PQMAdmin** as a user's primary group). For details on defining a group and adding a user to that group, see "Creating & Editing CanOPI (UNIX) User & Group Accounts" on page 47.

Reordering Jobs in a Print Queue

To reorder jobs in a print queue (for example, if a job at the bottom of the queue is urgently needed), select an entry in the queue and drag it to a different position in the queue:



In the window above, job #211 is being dragged from the bottom of the print queue to a position above job #210. When the mouse button is released, the job queue is reordered.

Note – To reorder print jobs, you must be logged in as the “root” user, or a user that is a member of the **PQMAdmin** group (do not use **PQMAdmin** as a user’s primary group). For details on defining a group, and adding a user to that group, see “Creating & Editing CanOPI (UNIX) User & Group Accounts” on page 47.

6 – Using uShare Manager for OpenLook

If you are running OpenLook on your Sun host, you can use the uShare Manager to manage some of CanOPI's services. This chapter describes uShare Manager procedures and provides a summary of uShare Manager menus and windows.

It is generally preferable to perform these administrative tasks by using CanOPI's Mac OS client GUI ScriptableAdmin, as discussed in "Chapter 3 – ScriptableAdmin".

uShare Manager Procedures

This section gives instructions for starting uShare Manager and using it to manage the following items:

- CanOPI's Authorization Key
- CanOPI processes
- CanOPI file servers
- CanOPI print spoolers
- UNIX user accounts and groups.

Read "uShare Manager Menus and Windows" on page 124 for a summary of uShare Manager's menus and windows.

Starting uShare Manager

uShare Manager comprises several tools that let you configure individual CanOPI services. For example, to control CanOPI's processes, you use the Process Manager tool. You must be logged in as the "root" user to start uShare Manager tools. You can start these tools in several ways:

- by choosing items from the **uShare Manager** menu item in the **Open Windows Workspace** menu,
- by clicking buttons in the **uShare Manager** Control Panel (which is started by choosing its related item from the **uShare Manager** menu), or
- by executing programs at a UNIX command line. For example, to start the Process Manager, issue the following command at a UNIX command line:

```
/ushare/bin/processes.ow &
```

A complete list of the executable files associated with uShare Manager appears in the file:

```
/ushare/etc.local/openwin-menu-ushare
```

Note – You must be logged in as the “root” user to start uShare Manager tools.

uShare Manager Menus and Windows

uShare Manager Menu Item

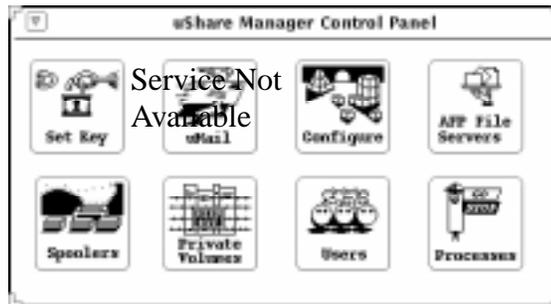
To start a uShare Manager tool, choose its related menu item from the **uShare Manager** item in the **Open Windows Workspace** menu:



In the window above, the **uShare Manager** menu displays a list of uShare Manager tools. To start the Process Manager, choose **Process Manager** from this menu.

uShare Manager Control Panel

The uShare Manager Control Panel is used to select your CanOPI Administrative tools. To start it, choose the **CanOPI Control Panel** item from the **uShare Manager** item in the **Open Windows Workspace** menu. The following screen appears:

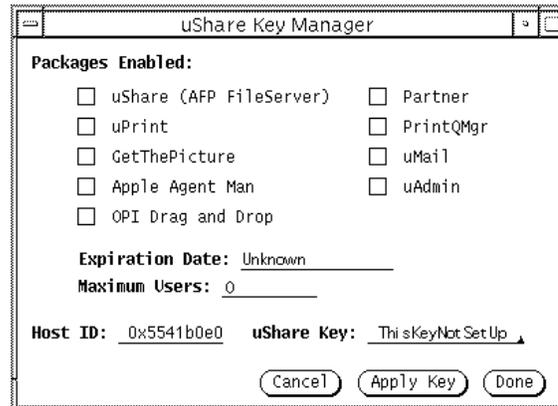


CanOPI Key Manager

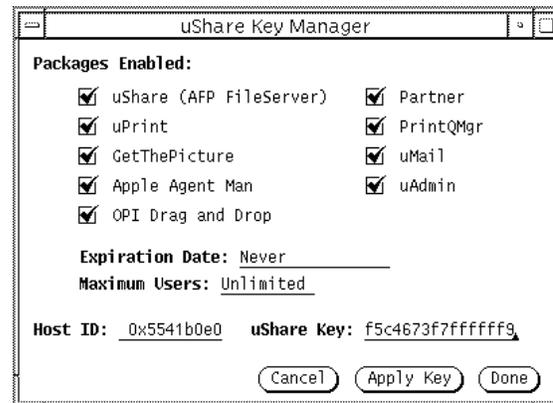
Your CanOPI Authorization Key is unique to your Sun host and governs what CanOPI services you can provide. The CanOPI Key Manager lets you register your CanOPI key, and determine your key's expiration date, the maximum number of users permitted by your key, and what CanOPI services your key permits you to use.



Launch the CanOPI Key Manager by clicking the control panel's **Set Key** button or by running the **CanOPI Key Manager** command from the uShare Manager in the **Workspace** menu. If your CanOPI key is not set, the Key Manager looks like this:



To set your CanOPI Authorization Key, edit the CanOPI **Key** field and click **Apply Key**. Then your Key Manager will look much like this:



Click **Done** to close the Key Manager.

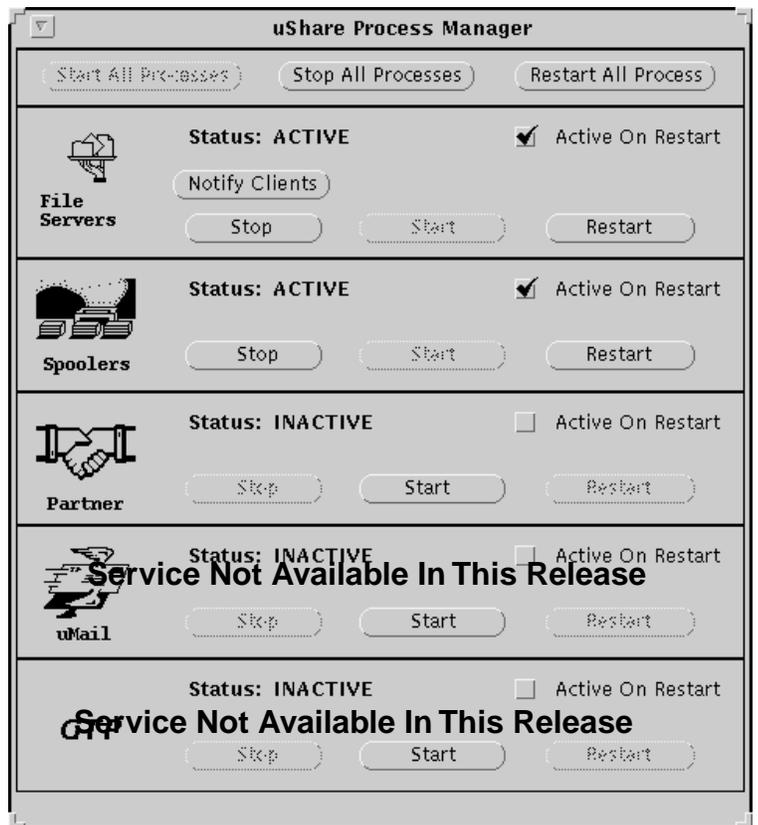
Note – Whenever you change your CanOPI key, you must restart all CanOPI processes as described in “Process Control Commands” on page 128.

CanOPI Process Manager



Each CanOPI service has a related process that runs on your Sun host. The CanOPI Process Manager lets you start, stop, and restart CanOPI processes. Read “Chapter 7 – Processes” for instructions for controlling CanOPI processes from a UNIX command line and configuring your Sun host to start CanOPI automatically when you start your system.

Launch the CanOPI Process Manager by clicking the control panel’s **Processes** button or by executing the **Process Manager** command from the **uShare Manager** item in the **Workspace** menu. The CanOPI **Process Manager** window appears:



In the window above, control panels for CanOPI's services are displayed. Each control panel displays the status of its related process.

Note – *The **Spoolers** process will be reported as **Active** only if it has been started up with AppleTalk to UNIX or AppleTalk to UNIX to AppleTalk spoolers defined. If only UNIX to AppleTalk spoolers have been defined, the **Spooler** process will not be reported as **Active**.*

Process Control Commands

The **Process Manager** lets you control CanOPI processes severally or individually. The top portion of the window has buttons that let you control processes severally:

- **Start All** - click this button to start CanOPI processes that are specified as “Active on Restart” as described below
- **Stop All** - click this button to stop all CanOPI processes (including CanOPI's AppleTalk Router service)
- **Restart All** - click this button to restart CanOPI processes that are specified as “Active on Restart” as described below

The remainder of the **Process Manager** window displays control panels for each CanOPI service. These control panels display the processes' current status and have buttons that let you control each service's processes individually:

- **Stop** - click this button to stop the service's processes
- **Start** - click this button to start the service's processes
- **Restart** - click this button to stop and then start the service's processes

You can monitor the output of these commands by opening a **Console** window.

The “Active on Restart” Checkbox

Each control panel in the **Process Manager** window includes the **Active on Restart** checkbox. This checkbox is used to select which CanOPI processes will be active after stopping then starting (or restarting) your software. This box *does not* affect the **Stop All Processes** button, which will always stop any currently running CanOPI processes. Processes specified as “Active on Restart” are also started if you have configured your Sun host to start CanOPI automatically when you start your computer, as described in “Autostarting Processes” on page 151.

Note – Clicking the process manager’s **Stop All** button stops *all* of CanOPI’s processes (including CanOPI’s AppleTalk Router service) without regard for the **Active on Restart** checkbox. Only the **Start All** and **Restart All** buttons are aware of this checkbox.

The Notify Clients Button

The **File Servers** control panel in the **Process Manager** includes the **Notify Clients** button that lets you stop CanOPI’s AppleShare File Server service and notify logged-in users that the server is shutting down. Clicking this button produces the **Fileserver Shutdown** window:



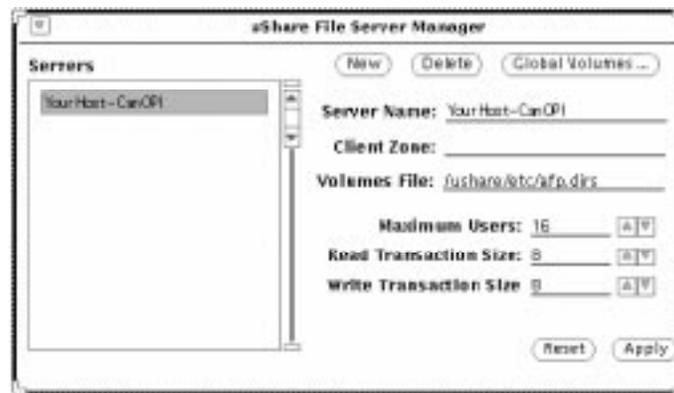
Enter the number of minutes until shutdown and the interval (in minutes) between warning messages and click **Apply** to broadcast warnings to logged-in users and shut down the file server.

CanOPI File Server Manager

CanOPI's File Server service lets you define file servers that publish portions of your Sun host's file system as AppleShare volumes. The File Server Manager lets you modify, create, and remove CanOPI file servers and their global volumes. Read "Chapter 8 – AppleShare File Server Service" for instructions for managing CanOPI file servers by editing configuration files.



Launch the File Server Manager by clicking the control panel's **AFP File Servers** button or by executing the **File Server Manager** command from the **uShare Manager** item in the **Work-space** menu. The File Server Manager appears and the names of CanOPI's file servers are displayed in the **Servers** list:



In the window above, CanOPI's default file server is selected in the **Servers** list, and the file server's attributes are displayed in the **File Server Manager**'s fields.

Note – *If you are configuring your file server to work in conjunction with products like Groupwise, ccMail, EPOCH file migration, or any other product that handles files on both the UNIX server and Mac OS client sides, read the "Compatibilities" chapter before proceeding with your configuration.*

Modifying a File Server

1. Select the file server's name in the **Servers** list.
2. Modify the file server's attributes by editing the appropriate fields. Make sure you enter a **Return** or **Tab** after editing a text field. Table 6-1 on page 132 describes these attributes.
3. If you want to define the file server's global volumes (that is, directories that are available to all Mac OS clients), click **Global Volumes** and follow the steps described in "Defining Global Volumes" on page 132.
4. Save your changes to the server by clicking **Apply**. To cancel your changes, click **Reset**.

Creating a File Server

1. Click **New**.
2. Modify the file server's default attributes by editing the appropriate fields. Make sure you enter a **Return** or **Tab** after editing a text field. Table 6-1 on page 132 describes these attributes.
3. If you want to define the file server's global volumes (that is, directories that are available to all Mac OS clients), click **Global Volumes** and follow the steps described in "Defining Global Volumes" on page 132.
4. Click **Apply**. To cancel creation of the server, click **Reset**.

Deleting a File Server

1. Select from the **Servers** list the name of the file server you want to delete.
2. Click **Delete**.
3. Click **Apply**. To cancel deletion of the server, click **Reset**.

Table 6-1: File Server Attributes

Attributes	Description
Name	The name registered with NBP that appears in the Mac OS client Chooser. It must be unique on your network and no more than 32 characters long.
Client Zone	<i>This value is only valid when using EtherTalk Phase I Protocol. By setting this value, the file server is available to clients residing in this zone; default = "*" (all). Only "*" or a single zone name are valid. Specifying a zone name causes the file server to be invisible to all Mac OS clients except those residing in the specified zone.</i>
Volumes File	The pathname of the file that contains the list of global volumes (directories that are available to all Mac OS clients).
Maximum Users	The maximum number of Mac OS client users that can simultaneously log in to the server; default = 64. It must be set to no more than 128 (as defined by AppleTalk protocol—theoretical limit is ≤ 253 sockets/machine); your CanOPI Authorization Key may restrict usage to a smaller number of users.
Read Transaction Size	<i>This value should not be changed unless you are requested to do so by an IPT Support Technician. It is included only for old or very slow routers on the network. Values 1-8 define the number of 576-byte packets per transaction; values above 16 define the number of bytes per transaction (setting a value of 1 is the same as setting a value of 576).</i>
Write Transaction Size	<i>This value should not be changed unless you are requested to do so by an IPT Support Technician. It is included only for old or very slow routers on the network. Values 1-8 define the number of 576-byte packets per transaction; values above 16 define the number of bytes per transaction (setting a value of 1 is the same as setting a value of 576).</i>

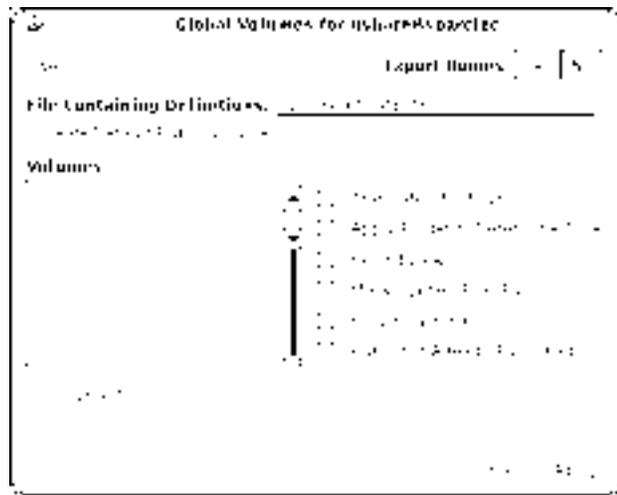
Defining Global Volumes

When modifying or creating a file server, you can also define the file server's global volumes (directories that are available to all Mac OS clients).

Note – If you are configuring your CanOPI server to work in conjunction with products like GroupWise, ccMail, EPOCH file migration, or any product that handles files on both the UNIX and Mac OS client sides, read “Chapter 12 – Compatibilities” before proceeding with your configuration.

Select from the File Server Manager’s **Servers** list the name of the file server whose global volumes you want to define and click **Global Volumes**.

The **Global Volumes** window appears and the names of the file server’s global volumes are displayed in the **Volumes** list:



In the window above, no global volumes appear in the **Volumes** list. The **Create Default Public Volume** button is available (read “Default Public Volume” on page 134 for an explanation of this button). The **File Containing Definitions** field displays the pathname of the file that contains the list of global volumes—to specify a different pathname, modify the file server’s attributes as described in “Modifying a File Server” on page 131. The **Export Homes** field is explained in “Export Homes” on page 134.

Default Public Volume

When defining a file server's global volumes, click **Create Default Public Volume** if you want CanOPI to automatically define a global volume. When you click this button, CanOPI creates the directory `us_public` in your Sun host's local file system with the most available space and makes an entry in the **Global Volumes** window:



In the window above, the global volume “Public Volume” appears in the **Volumes** list, and the volume's attributes are displayed. The **Create Default Public Volume** button is gone, because only one default public volume can be created.

Export Homes

When defining a file server's global volumes, you can determine if the file server will export your Sun host users' home directories as private volumes. When **Yes** is selected, then your file server is configured to publish the home directories of your Sun host's users. When **No** is selected, then your file server is not configured to publish home directories. To toggle your file server's current configuration, click **Yes** or **No** and save your changes by clicking **Apply**.

Modifying a Global Volume

1. Select the volume's name in the **Volumes** list.
2. Modify the volume's attributes by editing the appropriate fields and clicking checkboxes. Make sure you enter a **Return** or **Tab** after editing a text field. Table 6-2 on page 136 describes these attributes.

When entering data in the **UNIX Path Name** field, you can click the field's corresponding  button to open a window that lets you select the name of a directory from a list.

3. Save your changes to the volume by clicking **Apply**. To cancel your changes, click **Cancel**. If you modify more than one volume before clicking **Apply**, all modified volumes are saved.

Creating a Global Volume

1. Click **New**.
2. Modify the volume's default attributes by editing the appropriate fields and clicking checkboxes. Make sure you enter a **Return** or **Tab** after editing a text field. Table 6-2 on page 136 describes these attributes.
3. Save your changes to the volume by clicking **Apply**. To cancel your changes, click **Cancel**.

Deleting a Global Volume

1. Select from the **Volumes** list the name of the volume to delete.
2. Click **Delete**.
3. Click **Apply**. To cancel deletion of the server volume, click **Cancel**.

Note – *Deleting a volume has no effect on the directories or files residing in the volume. Only the volume definition is deleted, not the contents of the volume.*

Table 6-2: Volume Attributes

Attribute	Description
Volume Name	The name of the volume seen by AppleShare clients; must be no greater than 27 characters in length.
UNIX Path Name	The pathname of the UNIX directory you want to publish as an AppleShare volume.
Translate CRs to LFs	Mac OS text files have Carriage Return characters at line ends, while UNIX text files have Line Feed characters at line ends. Setting this attribute enables automatic translation of these characters when a text file is written to or read from the volume.
Apply Binder to Determine Type	Setting this attribute enables CanOPI's Binder program that reads the first 64 bytes and the file names of untyped files to determine their AFP Finder information (type and creator).
Record Locking	Disabling this attribute prevents CanOPI from passing Mac OS record-locking calls to the UNIX system. This is helpful when file systems do not support record locking, when record locking works poorly (for example, some versions of NFS), or if you are using ccMail in conjunction with a CanOPI volume (see "Chapter 12 – Compatibilities").

Private Volumes Manager

In addition to defining a file server's global volumes (directories that are available to all Mac OS clients), you can define private volumes that are available to a user when they log in to any CanOPI file server. The Private Volumes Manager lets you modify, create, and remove private volumes for CanOPI file servers. Read "Defining Private Volumes" on page 160 for instructions for managing private volumes by editing configuration files.

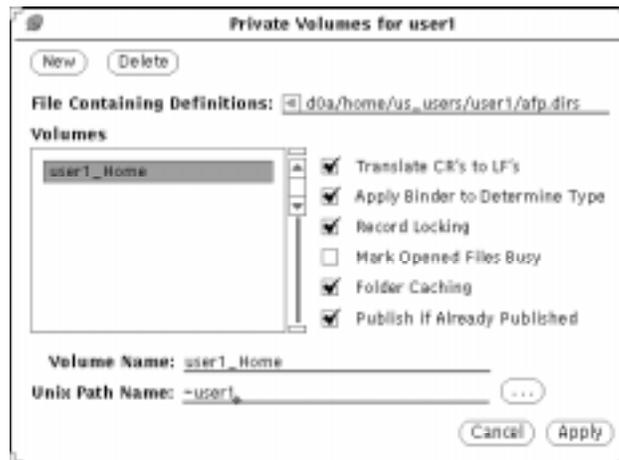


Launch the Private Volumes Manager by clicking **Private Volumes** on the control panel or by executing the **Private Volumes Manager** command from the **uShare Manager** item in the **Workspace** menu. The **Private Volumes Manager** window appears and the names of your Sun host's users are displayed in the **Users** list:



In the window above, a list of all registered users appears. The triangle symbol next to a user name indicates that at least one private volume was defined for the user after the Private Volumes Manager was started (the triangle symbol will not appear the next time you start the Private Volumes Manager).

Select from the **Users** list the name of the user whose private volumes you want to define and click **Private Volumes**. The **Private Volumes** window appears:



In the window above, a private volume **user1_Home** is selected in the **Volumes** list, and its attributes are displayed in the **Private Volumes** window's fields. The **File Containing Definitions** field displays the pathname of the file that contains the list of private volumes and cannot be edited — this file will always be **afp.dirs** in the user's home directory.

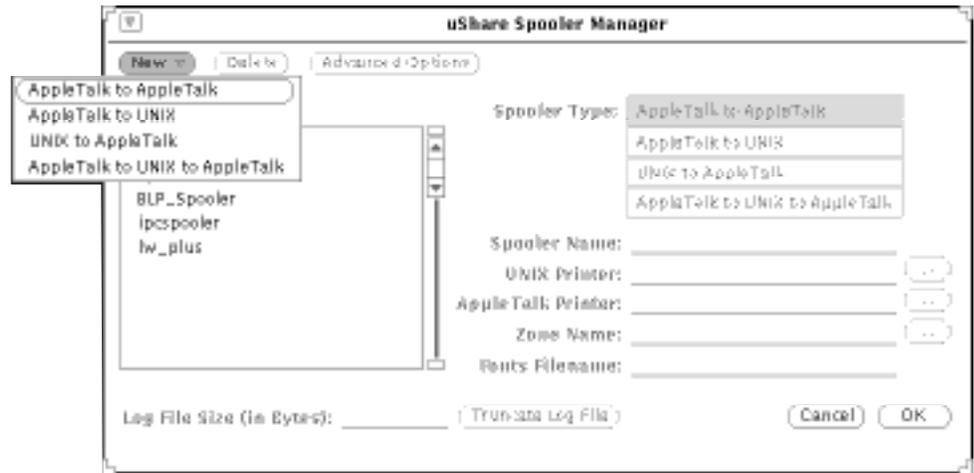
The **Private Volumes** window behaves much as the **Global Volumes** window. Read "Defining Global Volumes" on page 132 for details about modifying, creating and deleting volumes.

CanOPI Print Spooler Manager

CanOPI's Print Spooler Manager lets Mac OS client and UNIX users share PostScript printers on your AppleTalk and UNIX networks. The Print Spooler Manager lets you create, modify, and remove four types of print spoolers. Read "Chapter 9 – Print Spooler Service" for instructions for managing CanOPI print spoolers by editing configuration files.



Launch the Print Spooler Manager by clicking the control panel's **Spoolers** button or by executing the **Spooler Manager** command from the **uShare Manager** item in the **Work-space** menu. The Spooler Manager appears and the names of CanOPI's print spoolers are displayed in the **Spoolers** list:



The window above shows the print spooler manager with the **New** menu displayed. The **Truncate Log File** button is explained in “Truncate Log File” on page 140.

Creating a Print Spooler

1. Choose the appropriate spooler type from the **New** menu.
2. Modify the print spooler’s default attributes by editing the appropriate fields (click **Advanced Options** to access more attributes). Make sure you enter a **Return** or **Tab** after editing a text field. Read “Print Spooler Types” on page 141 for an explanation of print spooler attributes.
3. Click **Apply**. To cancel creation of the print spooler, click **Reset**.

Note – After creating or modifying a new spooler, you must restart CanOPI’s print spooler service as described in “CanOPI Process Manager” on page 127.

Modifying a Print Spooler

1. Select from the **Spoolers** list the name of the print spooler you want to modify.
2. Modify the print spooler's attributes by editing the appropriate fields (click **Advanced Options** to access more attributes). Make sure you enter a **Return** or **Tab** after editing a text field. Read "Print Spooler Types" on page 141 for an explanation of print spooler attributes.
3. Click **Apply**. To cancel modification of the print spooler, click **Reset**.

Note – *After creating or modifying a new spooler, you must restart CanOPI's print spooler service as described in "CanOPI Process Manager" on page 127.*

Deleting a Print Spooler

1. Select from the **Spoolers** list the name of the print spooler you want to delete.
2. Click **Delete**.
3. Click **Apply**. To cancel deletion of the server, click **Reset**.

Truncate Log File

Each spooler you define has a log file (usually located within the spooler's spool directory) to which informational and error messages are written. Because these log files grow larger over time, you should monitor their sizes and truncate them occasionally. When you select a CanOPI spooler using the Spooler Manager, the size of its log file is displayed in the "Log File Size" field. When this file grows large, click **Truncate Log File** to restore the log file to an empty file.

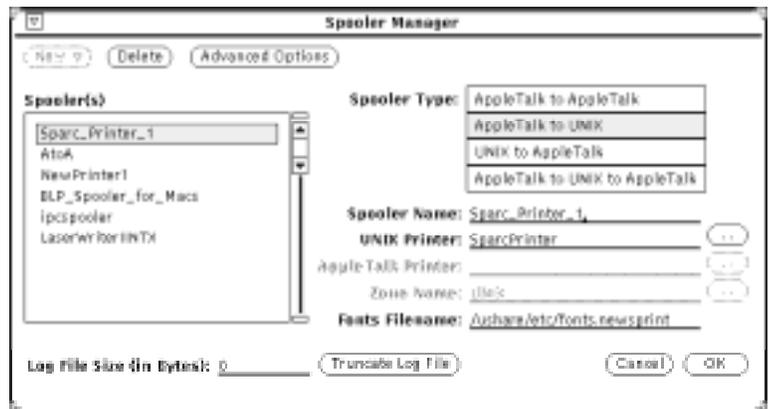
Print Spooler Types

You can define three types of print spoolers with the Spooler Manager: AppleTalk to UNIX to AppleTalk, AppleTalk to UNIX, and UNIX to AppleTalk. (Users of earlier versions of uShare may recall AppleTalk to AppleTalk spoolers; however, this spooler type is obsolete and should no longer be used. Instead, define an AppleTalk to UNIX to AppleTalk spooler, as discussed on “AppleTalk to UNIX to AppleTalk Spooler” on page 145.) Each spooler type has a unique set of attributes that you must set when defining or modifying a spooler.

AppleTalk to UNIX Spooler

This spooler appears in the Chooser. Mac OS client print jobs sent to this spooler pass through CanOPI’s spooler to a UNIX printer. The editable fields for this type of spooler are:

- **Spooler Name** - the name registered through NBP that appears in the Mac OS client Chooser;
- **UNIX Printer** - the name of a printer you have defined in the `/etc/printcap` file; make sure you can print a Post-Script file to this printer;
- **Fonts Filename** - the pathname of the file that contains the list of resident fonts. CanOPI creates this file automatically.



The window above shows the attributes of an AppleTalk to UNIX spooler named “Sparc_Printer_1” that sends Mac OS client print jobs to a UNIX printer “SparcPrinter” whose resident fonts are listed in the `/ushare/etc/fonts.newsprint` file.

When entering data in the “UNIX Printer” field, you can click the field’s corresponding button to open a window that lets you select the required data from a list. For example, instead of typing in the “UNIX Printer” field the name of a printer defined in the `/etc/printcap` file, click the field’s button to open the **UNIX Printers** window:



When the **UNIX Printers** window is opened, it builds a list of printers already defined on your UNIX machine. Select the name of a printer and click **OK** to make an entry in the print spooler manager’s **UNIX Printers** field.

The advanced options for this type of spooler are:

- **Printer Type** - Indicates if the destination printer is a PostScript printer (a printer that can accept standard Mac OS client PostScript including a PostScript dictionary) or a NeWSPrint printer (a printer driven by Sun Microsystems’ NeWSPrint interpreter).
- **Dequeue Program** - The program that processes Mac OS client PostScript and passes print jobs to the destination printer.
- **Conversions** - Controls the processing of Mac OS client PostScript; you can assign combinations of the four values below, but “Permanent Dictionary” cannot be combined with other values:

- **Encapsulate Dictionary** - Causes the PostScript Dictionary (LaserWriter Prep file) to be prepended to each job in an encapsulated form; this is the default conversion.
- **Convert CR to LF** - Activates the translation of carriage return characters to line feed characters. This translation causes problems if the PostScript contains binary encoded images.
- **Wordwrap Limit (240 chars)** - Causes CanOPI to limit the maximum line length to 240 characters; this modification causes problems if the PostScript contains binary encoded images.
- **Permanent Dictionary** - Causes the PostScript Dictionary to be sent to the printer as a permanent dictionary when the spooler is started.

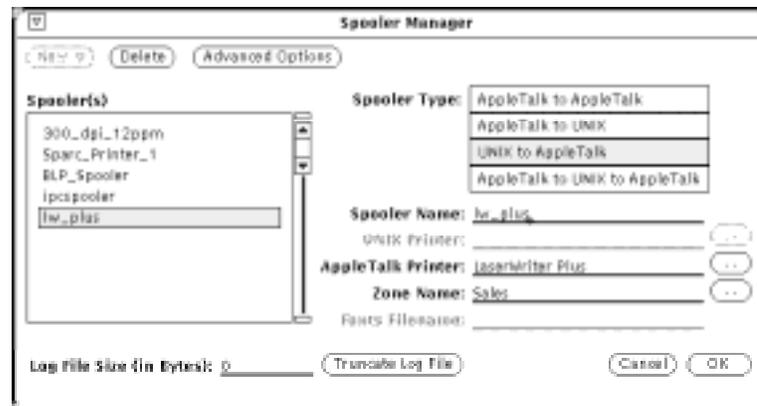


The previous window shows the advanced options for an AppleTalk to UNIX spooler. The **Printer Type** field is set to NeWS because the destination printer is a SparcPrinter with NeWS-Print.

UNIX to AppleTalk Spooler

This spooler does not appear in the Mac OS client Chooser. UNIX users' print jobs sent to this spooler pass through a UNIX spooler to a LaserWriter on your network. Both text files and PostScript files can be sent to this spooler. The editable fields for this type of spooler are:

- **Spooler Name** - the spooler name that will be used to define the UNIX printer
- **AppleTalk Printer** - the name of a destination AppleTalk printer
- **Zone Name** - the name of the AppleTalk zone in which the destination printer resides; if your network has no zones, enter an asterisk (*).



The window above shows the attributes of a UNIX to AppleTalk spooler named “lw_plus” that sends UNIX print jobs to an AppleTalk printer LaserWriter Plus that resides in the **Sales** zone.

When entering data in the AppleTalk Printer and Zone fields, you can click the field’s corresponding (...) button to open a window that lets you select the required data from a list.

The advanced options for this type of spooler are:

- **Device Type** - the type of the destination AppleTalk printer. Most AppleTalk printers are type “LaserWriter”
- **Text to PS Conversion** - the program that converts text to PostScript; you can specify an alternative to CanOPI’s `/ushare/bin/ps0` program, for example, MP (MakePretty), Adobe’s TranScript filters, or NeWSprint’s text to PostScript converter

- **PS Conversion Flags** - the flags to be passed to the conversion program
- **Spooling Directory** - the pathname of the directory in which spooled files are stored.



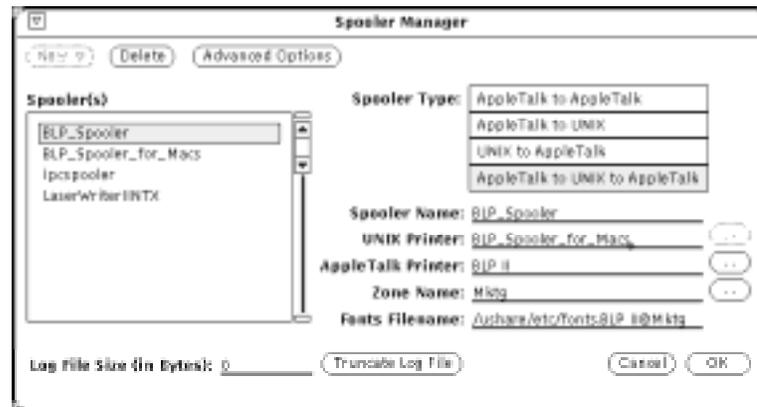
The window above shows the advanced options for a UNIX to AppleTalk spooler. All attributes are set to their default values.

AppleTalk to UNIX to AppleTalk Spooler

This spooler appears in the Mac OS client Chooser. Mac OS client print jobs sent to this spooler pass through CanOPI's spooler to a UNIX printer and then to a LaserWriter on your network. This is the recommended method for printing to an AppleTalk printer via a CanOPI spooler. The editable fields for this type of spooler are:

- **Spooler Name** - the name registered through NBP that appears in the Mac OS client Chooser.
- **UNIX Printer** - the name of the UNIX printer through which print jobs are passed and whose queue can be controlled. You must supply a name that is unique in the `/etc/printcap` file (this UNIX printer will be available to UNIX users as a UNIX to AppleTalk spooler).
- **AppleTalk Printer** - the name of a destination AppleTalk printer

- **Zone Name** - the name of the AppleTalk zone in which the destination printer resides. If your network has no zones, enter an asterisk (*).
- **Fonts Filename** - the pathname of the file that contains the list of the printer's resident fonts. CanOPI creates this file automatically.



The window above shows the attributes of an AppleTalk to UNIX to AppleTalk spooler named “BLP_Spooler” that sends Mac OS client print jobs through a UNIX spooler “BLP_Spooler_for_Macs” to an AppleTalk printer BLP II that resides in the Mktg zone.

Note – When entering data in the AppleTalk Printer and Zone Name fields, you can click the field's corresponding (...) button to open a window that lets you select the required data from a list.

The advanced options for this type of spooler are:

- **Printer Type** - indicates if the destination printer is a “PostScript” printer or a “NeWSPrint” printer; this should always be set to “PostScript”
- **Dequeue Program** - the program that processes Mac OS client PostScript and passes print jobs to the UNIX printer

- **Device Type** - the type of the destination AppleTalk printer. Most AppleTalk printers are type "LaserWriter"
- **Text to PS Conversion** - the program that converts text to PostScript; you can specify an alternative to CanOPI's `/uShare/bin/ps0` program, for example, MakePretty or NeWSPrint's text-to-PostScript converter
- **PS Conversion Flags** - the flags to be passed to the conversion program
- **Spooling Directory** - the pathname of the directory in which spooled files are stored
- **Conversions** - control the processing of Mac OS client PostScript. You can assign combinations of the four values below, but "Permanent Dictionary" cannot be combined with other values.
 - **Encapsulate Dictionary** - causes the PostScript Dictionary (LaserWriter Prep file) to be prepended to each job in an encapsulated form; this is the default conversion
 - **Convert CR to LF** - activates the translation of **carriage return** characters to **line feed** characters. This translation causes problems if the PostScript contains binary encoded images
 - **Wordwrap Limit (240 chars)** - causes CanOPI to limit the maximum line length to 240 characters. This modification causes problems if the PostScript contains binary encoded images
 - **Permanent Dictionary** - causes the PostScript Dictionary to be sent to the printer as a permanent dictionary when the spooler is started.



The window above shows advanced options for an AppleTalk to UNIX to AppleTalk spooler. Attributes are set to their default values.

7 – Processes

You provide CanOPI's services to your network by controlling processes on your Sun host and configuring each service for your particular needs. This chapter gives instructions for using UNIX commands to control CanOPI processes.

Note – *It is generally preferable to perform these administrative tasks by using CanOPI's Mac OS client GUI ScriptableAdmin, as discussed in the "ScriptableAdmin" chapter.*

Controlling Processes

Each CanOPI service that you have licensed from IPT or your CanOPI reseller has a related process that you must control. This section gives instructions for manually and automatically starting and stopping CanOPI processes.

Starting Processes

1. Edit the `/ushare/etc/packages` file and uncomment the abbreviation for each process you want to start. For example, to start CanOPI's File Server, Spooler and OPI processes, make the `packages` file look like this:

<i>Apple File service (enabled)</i>	afp
<i>Spooling service (enabled)</i>	splr
<i>OPI services (enabled)</i>	opi

Process abbreviations preceded by a pound sign (#) are commented out and are ignored by the `usstart` command. "Process Abbreviations" on page 150 describes these process abbreviations.

2. Issue the following command at a UNIX command line:

```
# /ushare/bin/usstart
```

This command starts all CanOPI processes whose abbreviations are uncommented in `/ushare/etc/packages`.

Stopping Processes

To stop CanOPI processes, issue the following command at a UNIX command line:

```
# /ushare/bin/usstop
```

This command stops all CanOPI processes.

Process Abbreviations

These abbreviations are used as arguments to the `usstart`, `usstop`, and `usrestart` commands and as entries in `/ushare/etc/packages`.

Abbreviation	Service
afp (AFP)	AppleShare File Server Service
splr	uPrint-Print Spooler Service
opi	OPI Drag & Drop Image Generation

Warning – The abbreviations “afp” and “AFP” are substantially different. Performing a `usstop` on “afp” stops the file server process, while performing a `usstop` on “AFP” stops the file server process and all existing connections as well.

How it Works

The `usstart`, `usstop`, and `usrestart` commands are shell scripts. The `usstart` script performs the following steps:

1. loads CanOPI device drivers, if necessary,
2. starts CanOPI's essential processes (**nbpd**, **atnbpd**, and **epd**), if necessary,
3. starts service processes passed as arguments or listed in **/ushare/etc/packages**.

The **usstop** script kills CanOPI's essential processes and service processes passed as arguments (when no arguments are passed, **usstop** kills all service processes).

The **usrestart** script runs **usstop** and **usstart** in succession.

Autostarting Processes

To configure your Sun host to autostart CanOPI processes each time it is started up, issue the appropriate command listed below:

To Enable Autostarting CanOPI

1. SOLARIS Users:

Issue the following command at a UNIX command line:

```
/ushare/bin/usautostart on
```

1. SunOS Users:

- a. Edit the **/etc/rc** file. Place the following entry at the end of this file:

```
if [ -f /ushare/bin/usstart ]; then  
    /ushare/bin/usstart & fi
```

- b. Edit the **/ushare/etc/packages** file and uncomment the abbreviation for each process you want to autostart. For example, to automatically start CanOPI's File Server and Spooler processes, make the **packages** file look like this:

Apple File service (enabled) **afp**
Spooling service (enabled) **splr**
OPI services (enabled) **opi**

Process abbreviations preceded by a pound sign (#) are commented out and are ignored by the **usstart** command.

To Disable Autostarting CanOPI

1. SOLARIS Users:

Issue the following command as the “root” user at a UNIX prompt:

```
/ushare/bin/usautostart off
```

2. SunOS Users:

Comment out the **if/then** statement (described in step 1.a above) from your **/etc/rc** file.

Process Control Commands

You can manually start, stop, and restart CanOPI processes individually or severally with the **usstart**, **usstop**, and **usrestart** commands in the form:

```
# command <abbrev> <abbrev>...
```

where **<command>** is **usstart**, **usstop**, or **usrestart** and **<abbrev>** is a CanOPI process abbreviation.

For example, to start CanOPI's File Server and Print Spooler processes, issue the following command at a UNIX command line:

```
# /ushare/bin/usstart afp splr
```

When you issue the **usstart** command without arguments, it determines what processes to start by reading the **/ushare/etc/packages** file. For example, to start all pro-

cesses whose abbreviations are uncommented in the `/ushare/etc/packages` file, issue the following command at a UNIX command line:

```
# /ushare/bin/usstart
```

When you issue the `usstop` command without arguments, it stops all CanOPI processes without consulting the `/ushare/etc/packages` file.

The `usrestart` command executes the `usstop` and `usstart` commands in succession. For example, to restart CanOPI's Print Spooler process, issue the following command at a UNIX command line:

```
# /ushare/bin/usrestart splr
```

When you issue the `usrestart` command without arguments, it stops all CanOPI processes and then starts those processes whose abbreviations are uncommented in the `/ushare/etc/packages` file.

Notifying Clients of File Server Shutdown

To stop CanOPI's AppleShare File Server service and notify logged-in users that the server is shutting down, issue the following command at a UNIX command line:

```
# /ushare/bin/usstop AFP
```

This command immediately stops the File Server process (`afpd`) and sends a special signal to the user login processes (`afpsess.x`). The login processes are killed after a period of time specified in the `/ushare/etc/shutdowntime` file. The `/ushare/etc/shutdowntime` file is a single-line file containing shutdown time data in the form:

```
<TIME>, <INTERVAL>
```

where `<TIME>` is the number of minutes until shutdown and `<INTERVAL>` is the interval (in minutes) between warning messages sent to logged-in clients.

8 – AppleShare File Server Service

CanOPI includes the AppleShare File Server service, which lets you define AppleShare (AFP) file servers and publish portions of your UNIX file system as AppleShare volumes. This chapter gives instructions for managing and using CanOPI's AFP file servers from the UNIX command line. It is generally preferable to perform these administrative tasks by using the Mac OS client GUI ScriptableAdmin, as discussed in “Chapter 3 – ScriptableAdmin”.

Make sure you start the AppleShare File Server service as described in “Chapter 7 – Processes”.

Managing CanOPI's AFP File Servers

This section describes how to manage CanOPI's AFP file servers by editing configuration files and issuing UNIX commands. It is generally preferable to perform these administrative tasks by using CanOPI's Mac OS client GUI ScriptableAdmin, as discussed in “Chapter 3 – ScriptableAdmin”.

CanOPI configuration files should not be edited while either uShare Manager or ScriptableAdmin is running.

Note – *If you are configuring your CanOPI server to work in conjunction with products like GroupWise, ccMail, EPOCH file migration, or any product that handles files on both the UNIX and Mac OS client sides, read “Chapter 12 – Compatibilities” before proceeding with your configuration.*

Configuring Your File Servers

When you install and start CanOPI, a default file server “server-CanOPI” is available to AppleShare clients on your network. This file server allows up to 64 AppleShare clients to log in simultaneously. To change the name and maximum users setting for this default file server, complete the following steps:

1. Find the line of the `/ushare/etc/afp.servers` file that looks like this:

```
nm=server-CanOPI:mx=64:
```

2. Change this line to set your file server’s name and maximum number of users:

```
nm=server-CanOPI:mx=128 (128 is the recommended maximum)
```

3. Restart CanOPI’s file server process by issuing the command:

```
# /ushare/bin/usrestart afp
```

How It Works

For each file server defined in `/ushare/etc/afp.servers`, the `start afp` script starts an `afpd` (Apple Filing Protocol Daemon). Each time a client logs in to a server, the server’s `afpd` starts an `afpsess.x` (AFP session) process that is owned by the client. File system calls from AppleShare clients are converted to analogous UNIX calls by means of the `afpsess.x`, resulting in a remote file subsystem under UNIX for AppleShare files.

Advanced Configuration

You can define any number of file servers by making entries in `/ushare/etc/afp.servers` and assign a different set of attributes to each file server by means of parameter assignments in this form:

param1=val1:param2=val2: ... :paramN=valN:

For example, to define a file server that is available to only one zone of your network, make an entry like this:

nm=server-CanOPI:mx=12:zn=EtherTalkZone:

The complete set of parameters appears in the following table (you must set the **mx** and **nm** parameters; all other parameters are optional).

Table 8-1: File Server Attributes

Attribute	Description
auth	What sort of authentication will be allowed during password entry, and whether or not guest accounts are allowed. Default is “guest, clear, 1way, 2way”. Eliminate any of these fields to disallow the associated function.
-I	By appending the -s attribute (see below) to a server definition, you may also use the -I attribute to set the following AFP server flags: 0x0001 - Supports FPCopyFile call. 0x0002 - Supports FPChangePassword call. 0x0004 - If set, the workstation should not allow the user to save a password. Do not change this unless instructed to by an IPT Technical Support representative. 0x0008 - Sets server message support. Do not change this unless instructed to by an IPT Technical Support representative. 0x8000 - Supports ASP multiple GetRequests. Do not change this unless instructed to by an IPT Technical Support representative. This flag can only be used in conjunction with the -s flag, above (otherwise a ./startafp: -s: not found error will occur). The syntax of the entry is: -I 9 -s /ushare/bin/afpsess.x
mx	The maximum number of Mac OS clients that can simultaneously log on to the server; default = 64. The limit is 64K connections, these include printers and administration as well as AFP connected users.; your CanOPI Authorization Key may restrict usage to a smaller number of users.

Table 8-1: File Server Attributes (Continued)

Attribute	Description
nm	The name registered with NBP that appears in the Mac OS client Chooser. It must be unique on your network and no more than 32 characters long.
rts	<i>This value should not be changed unless you are requested to do so by an IPT Support Technician. They are included only for old or very slow routers on the network. Values 1-8 define the number of 576-byte packets per transaction; values above 16 define the number of bytes per transaction (setting a value of 1 is the same as setting a value of 576).</i>
-S	By appending the -s to a server definition, you can use an alternate afpsess.x file to publish your CanOPI server. This is necessary when using an alternate afpsess.x for TurboTalk (network transport enhancer), or when using the 3.07 afpsess.x to maintain compatibility with a particular software package (see the Compatibilities section for more detail). The syntax of the entry is: -s /ushare/bin/<afpsessalternate> , where <afpsessalternate> is the afpsess.x file you want to use in place of the standard daemon.
vers	It is only necessary to set this value when it is used in conjunction with the -s entry described above, while using the 3.07 style afpsess.x daemon (usually to maintain compatibility with other software; see the “Compatibilities” chapter for more detail). It dictates whether the 3.07 afpsess.x will use AFP version 1.0, AFP version 2.0, or AFP version 2.01. Unless you are using an old Mac OS application that cannot communicate using AFP version 2.01, you should set this value to 21 . The syntax is vers=<#> , where <#> is the value 1 , 2 , or 21 , which represent AFP version 1.0, AFP version 2.0, and AFP version 2.01 respectively.
vl	The pathname of the file that contains the list of global volumes (directories that are available to all Mac OS clients).

Table 8-1: File Server Attributes (Continued)

Attribute	Description
wts	<i>This value should not be changed unless you are requested to do so by an IPT Support Technician. They are included only for old or very slow routers on the network. Values 1-8 define the number of 576-byte packets per transaction; values above 16 define the number of bytes per transaction (setting a value of 1 is the same as setting a value of 576).</i>
zn	<i>This value is only valid when using EtherTalk Phase I Protocol. By setting this value, the file server is available to clients residing in this zone; default = "*" (all). Only "*" or a single zone name is valid. Specifying a zone name causes the file server to be invisible to all Mac OS clients except those residing in the specified zone.</i>

Defining Public and Private AFP Volumes

When clients log in to an AFP file server, they see a list of available public and private volumes. Public volumes are available to any user who logs in to your file server. Private volumes are available only to the user who owns them. You can define any number of public and private volumes, although the operating systems of client machines may limit the number of volumes they see. To publish a portion of your Sun host's file system as an AppleShare volume, you must specify:

- the pathname of a UNIX directory to be published
- a volume name up to 27 characters long.

Note – *In order to access a volume, the user logging in to a file server must have read and execute permission to the entire pathname of the UNIX directory. For example., if you want to make the UNIX directory `/home/users/public_folder` available to all Mac OS clients all three directories (`/home`, `/home/users`, and `/home/users/public_folder`) must be readable and executable by all users.*

Defining Public Volumes

You define public volumes by making entries in `/ushare/etc/afp.dirs` (if, when defining your file server, you used the `v1` argument to specify a global volumes file, edit that file instead of `afp.dirs`).

1. Choose a directory of your Sun host's file system to be published as an AFP volume.
2. Set the directory's permissions so everyone has read and execute permissions:

```
# chmod 755 <DIRECTORY NAME>
```

3. Edit the `/ushare/etc/afp.dirs` file, and add an entry for each volume you want to publish by typing on a single line the pathname of a chosen UNIX directory followed by a colon (:) and a volume name:

```
/applications/bin.macs:Mac Applications
```

This entry publishes the UNIX directory `/applications/bin.macs` as a public volume "Mac Applications."

Warning – *Do not create volumes that are contained in other volumes. For example, the following entries define two volumes that publish the same UNIX directory:*

```
/home/docs  
/home/docs:MacDocs  
/home/docs/Word_docs:WordDocs
```

Defining Private Volumes

You define private volumes the same way that you define public volumes, except you must create and make entries in the `~username/afp.dirs` file.

Note – Each file server user has a private volume, “YourHome (hostname-username)”, even if no **afp.dirs** exists in the user’s home directory. This volume is automatically defined by CanOPI and can be removed by making a special entry in the **/ushare/etc/afp.dirs** file. See “Default Private Volumes” on page 165 for instructions for removing this default volume.

1. Choose a directory of your Sun host’s file system to be published as an AppleShare volume.
2. Set the directory’s ownership so that the user for whom you are defining a private volume is the directory’s owner:

```
# chown <USERNAME> <DIRECTORY NAME>
```

3. Set the directory’s permissions so the owner has full permissions:

```
# chmod u+rwX <DIRECTORY NAME>
```

4. Create a file, **afp.dirs**, in the home directory of the user for whom you are defining a private volume, and add an entry for each volume you want to publish by typing on a single line the pathname of a chosen UNIX directory followed by a colon (:) and a volume name:

```
/applications/bin.macs/games:MyGames
```

This entry publishes the UNIX directory **applications/binmacs/games** as the private volume “MyGames.”

How It Works

When a client logs in to a file server, the **afpd** process starts an **afpsess.x** process that is owned by the client. The **afpsess.x** process determines the number and nature of volumes to publish by consulting the server’s list of global volumes (by default **/ushare/etc/afpdirs**) and the user’s private volume list (**~username/afp.dirs**).

Advanced Configuration

You can define any number of volumes by making entries in `/ushare/etc/afp.dirs` and `~username/afp.dirs`, and each volume can have a different set of attributes. If, when defining your file server, you used the `v1` argument to specify a global volumes file, edit the specified file instead of `afp.dirs`. All changes to `afp.dirs` take effect the next time a client logs in to a CanOPI file server.

Entries in `afp.dirs` are made in the form:

`path:name:sort:bits:field #5:field #6:field #7`

- **path** is the pathname of a UNIX directory to be published. When defining private volumes, you can use shortcut notations: `~username` specifies a user's home directory. Pathnames without a preceding slash (`/`) are relative to the user's home directory.

Note – *Symbolic links and NFS mount points within a published volume are discouraged because they may appear invisible to Mac OS clients.*

- **name** is the volume name seen by clients. If you omit the name, CanOPI uses the last 27 characters of the path.
- **sort** is the sorting value. Lower numbers are given to users first. A value of `-2` prevents a volume from appearing to clients. Values other than `-2` are ignored by the System 7 Mac OS client Chooser, which always sorts volume names alphabetically.

Note – *If the global and private volume lists define identically named volumes, the private list's definition is used. If the global and private volume lists define volumes that publish the same UNIX directory, the public list's definition is used.*

- **bits** is the volume attribute bits (Table 8-2 on page 163 describes these bits). To specify more than one attribute for a volume, (Boolean operator) OR together the bits of

the attributes (that is, add the hexadecimal numbers). For example, to turn off text translation and record locking, enter: **0x0011**.

- **field #5**, if specified, is the number of cache records to preallocate. The default is 1000. Users who maintain file systems with many files may want to allocate a larger number of cache records.
- **field #6**, if specified, contains a comma-separated list of group names. Only members of these groups will see this volume at log-in time. If not specified, any user will see the volume in the list. For details on defining a group and adding a user to that group, see “Users & Groups” on page 47.
- **field #7**, if specified, should contain either **adf** or **asf**. If **asf** is specified, the volume file format for writing is set to “AppleSingle”. If **adf** is specified, the volume file format is set to Apple-Double format. Otherwise, it is set to **IPT** format. If the files are in “EtherShare” format, CanOPI will be able to read them automatically, but will write any changes in the format specified in this field.
- **field #8**, if specified, contains a comma-separated list of user names. Only these users will see this volume at log-in time. If not specified, any user will see the volume in the list. For details on adding a user, see “Users & Groups” on page 47.

Table 8-2: Volume Bit Settings

Attribute	Description
0x0001	Disable translation of end-of-line characters - Mac OS client text files have Carriage Return characters at line ends; UNIX text files have Line Feed characters. This attribute disables translation of these characters when a text file is written to or read from the volume (read “Automatic Assignment of Finder Information” on page 169 for more information).

Table 8-2: Volume Bit Settings (Continued)

Attribute	Description
0x0002	Do not allow this volume to be mounted. (Apple Sort Value)
0x0004	Disable reading and writing of Finder Information - Setting this attribute prevents CanOPI from reading and writing Finder information to the resource forks of Mac OS client files on the volume. Because this attribute results in all Mac OS client files having generic document icons, it is useful only in rare cases and should not be set unless you first contact IPT.
0x0008	Deactivate the Binder - Setting this attribute disables CanOPI's Binder program that reads the first 64 bytes and the file names of un-typed files to determine their AFP Finder information (for example, type and creator); read "Automatic Assignment of Finder Information" on page 169 for more information.
0x0010	Disable Record Locking - Setting this attribute prevents CanOPI from passing Mac OS client record-locking calls to the UNIX system. This is helpful when file systems do not support record locking or when record locking works poorly (for example, some versions of NFS).
0x0080	Do not count the offspring of subdirectories - This will speed up opening a folder that has subfolders with a large number of items in them. However, this flag is incompatible with some applications, for example, DiskTop.

Table 8-2: Volume Bit Settings (Continued)

Attribute	Description
0x0100	<p>Large file system support - Mac OS computers, since System 7.5, have been able to address file systems up to 4 GB in size. The default for a new install of CanOPI is to set this flag to 0x0000. This setting manipulates the Available and In Disk fields to allow for file systems greater than 4 GB to be published and used by Mac OS systems. If you are performing an upgrade installation, this field may remain set to 0x0100, reporting a maximum size of 2 GB, even for volumes that may be larger.</p> <p>When this flag is set to 0x0000, the Mac OS client will display the volume as a 4 GB disk even if it is actually larger than 4 GB. When the actual used space on the volume comes within 4 GB of the total available space, the Available field will reflect this.</p> <p>When set to 0x0100, or for Mac OS systems prior to System 7.5, which can only address file systems of 2 GB, the reported size will be 2 GB; all other functionality will remain unchanged.</p>

Default Private Volumes

Each of your file server's users will have a private volume by default, "YourHome(server-username)". This volume is automatically defined by CanOPI and can be removed only by editing **/ushare/etc/afp.dirs**.

To remove the default private volume for a single user, make the following entry in the **/ushare/etc/afp.dirs** file:

```
~username/.:HOME:-2
```

This entry defines a sorting value of **-2** for a volume **HOME** that publishes the specified user's home directory. Because a sorting order of **-2** causes a volume to be invisible, this entry effectively removes the default volume for the specified user.

To remove the default private volume for all users, make the following entry in the **/ushare/etc/afp.dirs** file:

```
~/.:HOME:-2
```

This entry defines a sorting value of **-2** for a volume **HOME** that publishes any user's home directory. Because a sorting order of **-2** causes a volume to be invisible, this entry effectively removes the default volume for all users.

You can make similar entries to change the attributes of the default private volume; for example, to disable record locking for the default private volume for all users, make the following entry in the `/usshare/etc/afp.dirs` file:

```
~/.:HOME::0x0010
```

Setting a Volume Password

In order to control access to published volumes, you can set passwords for public and private volumes. When a Mac OS client attempts to mount a volume that has a password, the client must enter the volume password. To set a password for a volume, issue the following command at a UNIX command line:

```
# vpasswd <VOLDIR>
```

where `<VOLDIR>` is the directory of your UNIX file system published as the AFP volume whose password you want to set. You are prompted to enter a password for the volume. The password you enter is stored in encrypted form in the `.password` file in `<VOLDIR>`.

To remove a volume password, simply remove the `.password` file:

```
# rm <VOLDIR>/password
```

Read-Only Volumes

To make a Mac OS client volume read-only, it is not enough to set Mac OS client privileges to disallow writing to the volume's files and folders. You must also make the volume's desktop read-only by issuing the following command at a UNIX command line:

```
# chmod ugo -w <VOLDIR>/desktop
```

where **<VOLDIR>** is the pathname of the UNIX directory that is published as an AFP volume.

Deleting Mac OS Files

To delete a Mac OS file from a UNIX command line, you must delete both the file's data fork (residing in **<PATH>**) and the file's resource fork (residing in **<PATH>/rsrc**); for example, to delete a file named **myfile**, issue the following commands at a UNIX command line:

```
# rm <PATH>/myfile
# rm <PATH>/rsrc/myfile
```

CanOPI's **usrm** command removes both forks; for example, to delete a file named **myfile**, issue the following command at a UNIX command line:

```
# /ushare/bin/usrm <PATH>/myfile
```

UNIX Permissions and Mac OS Privileges

When working with files residing on AFP volumes published with CanOPI, you must deal with the differences between UNIX permissions and Mac OS client (AFP) privileges:

- All UNIX files (including directories) have ownership and permissions, but under AFP only directories (folders) have privileges, and
- AFP folders have three privileges (See Folders, See Files, Make Changes) while UNIX files have three permissions (Read, Write, Execute). Only the AFP privilege "Make Changes" and the UNIX permission "Write" correspond exactly.

In order to maintain UNIX permissions while representing proper AFP privileges, CanOPI stores the AFP privileges of a Mac OS folder in the header of the folder's resource fork (**./rsrc/<FOLDER>**). CanOPI does a bitwise (Boolean operator) AND of the stored AFP privileges and the UNIX permissions, thereby honoring the UNIX permissions if they are more

restrictive than the AFP privileges. Therefore, if a UNIX user changes a directory's permissions to be less restrictive, the AFP privileges do not change.

A file residing on a CanOPI-published AFP volume inherits the ownership and permissions of the file's parent directory. This is only true, however, of files that are operated upon by AFP commands. CanOPI does not change the ownership/permissions of a pre-existing file, or a file modified only by a UNIX user, unless an action caused by an AFP client specifically sets the file's attributes. For example if a UNIX user, User1, changes the permissions of a file **<FILE>** so that they no longer match the AFP privileges of **<FILE>**'s parent directory, CanOPI honors the new permissions of **<FILE>** and does not change them unless:

- the "root" user, User1, or a member of User1's group overwrites **<FILE>**
- the "root" user logs on from a Mac OS client and changes the privileges of **<FILE>**'s parent directory
- User1 logs on from a Mac OS client and changes the privileges of **<FILE>**'s parent directory, and `/ushare/bin\ /uscog` is SUID to root and executable by User1.

Note – *Make sure that `/ushare/etc.local/passwd` is owned by `root` and that its permissions are set to `rw-----` - (that is, only root can read the file or write to it). You may need to use the `chmod` command to set the file permissions. Use the command: `ls -l /ushare/etc.local/passwd` to see the file's ownership and permissions.*

Setting up AppleShare Passwords - Random Number Exchange

If you want to use password authentication, edit or create the `/ushare/etc.local/passwd` file (see "passwd" on page 207). When using password authentication (either one-way or two-way random-number exchange), you must make entries in this file for all users who are going to be using the file server.

If you do not use password authentication, cleartext passwords will be transmitted over the network when users log in to a CanOPI server.

If you are going to use one-way random-number exchange, in which the Mac OS client sends the server a random number and then uses that random number to encrypt the password before transmitting it, entries should be of the form:

username:0x0000:

where **username** is the log-in name of the user on the file system.

If you are going to use two-way random-number exchange with cleartext passwords in the **passwd** file, in which the Sun server and the Mac OS client agree on a random number with which the password is encrypted before being transmitted, entries should be of the form:

username:0x0000:password

where **username** is the log-in name of the user on the file system, and **password** is that user's cleartext password for that file system.

Automatic Assignment of Finder Information

When a UNIX file is created in a directory that is available to Mac OS clients through a CanOPI volume, the file lacks a Mac OS resource fork (in which CanOPI stores the file's Finder Information, including the type and creator). When the directory is enumerated by a Mac OS client (that is, when a Mac OS client does a **getvolinfo** request, for example, when a Mac OS client closes and opens the folder), CanOPI determines if the file is a text file or a data file. If CanOPI determines that the file is a text file, it creates a resource fork for the file and assigns the type and creator TEXTUNIX. If CanOPI determines that the file is a data file, it uses the Binder program to determine the type and creator; if the Binder fails to find an appropriate pattern, CanOPI assigns the type and creator DATAUNIX.

UNIX users can assign Finder Information from a UNIX command line by building a resource fork for an untyped file. For example, if a UNIX file `doc1` resides in a directory `/folder1`, issue the following command to build a resource fork:

```
# echo -n <TYPECREA> > /folder1/.rsrc/doc1
```

where `<TYPECREA>` is the Mac OS type and creator. For example, to make a UNIX file look like a Microsoft Word text file, issue the following command:

```
# echo -n TEXTMSWD > /folder1/.rsrc/doc1
```

Note – *CanOPI performs end-of-line character conversion for a text file only if it has a corresponding resource fork (located in the `.rsrc` directory) that types the file as “TEXT.” One known limitation with this conversion appears when applications by Microsoft (for example, Word, Excel) create a new text file, they write the data fork before creating the file’s resource fork; CanOPI is therefore unable to recognize the file as text until it is too late to perform translation.*

Using CanOPI’s AppleShare File Servers

CanOPI’s AppleShare File Server service lets Mac OS clients access files that reside on a Sun host by running Apple Computer’s AppleShare software. This section gives instructions for:

- preparing your Mac OS client
- logging in to a CanOPI file server
- working with AppleShare volumes
- disconnecting from a file server.

Preparing Your Mac OS client

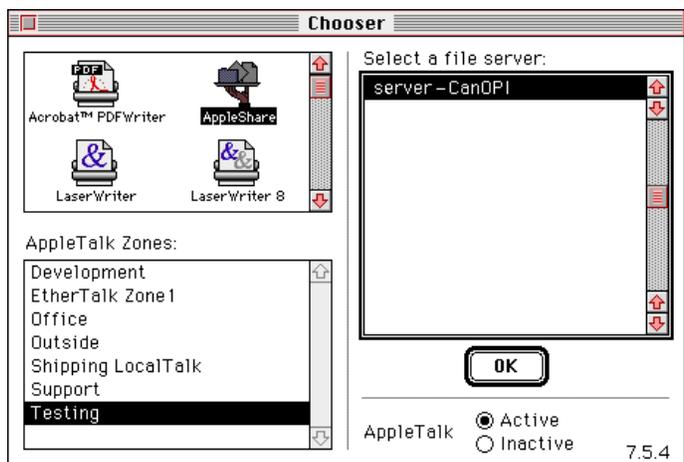
To use CanOPI’s File Server service, you must first do the following:

- Use your Mac OS System installation disks to install AppleShare Workstation software.
- Ask your network administrator for your Username and Password.
- Ask your network administrator for the name of a CanOPI file server to which you will log in. The default name of CanOPI's file server is **YourHost-CanOPI**, but your network administrator may have changed the file server's name as described in "Configuring Your File Servers" on page 156.
- If your network has AppleTalk zones, ask your administrator for the name of the zone in which the CanOPI file server resides.

Logging in to a CanOPI File Server

Use the Chooser desk accessory to log in to a CanOPI file server and mount AppleShare volumes.

1. Click on the "Apple" (Apple) menu and select the **Chooser** option. This will display the **Chooser** window.
2. Click on the **AppleShare** icon and locate your Sun host.

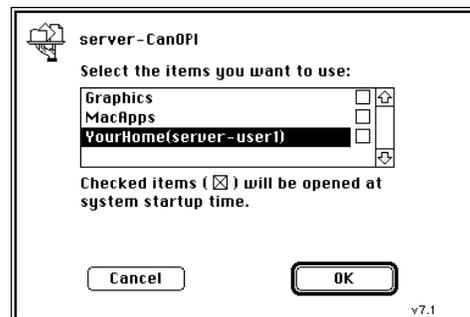


You will find the server listed as **<hostname>-CanOPI** (where **<hostname>** represents the name of your Sun host). If your network consists of many zones, you will find that your Sun host server resides in the zone associated with its physical subnet. (If you are not sure which zone your server is in, select each zone until you find the server.)

When you have found your Sun host, select it and click **OK**.

Note – *If the default CanOPI server cannot be located in the Mac OS Chooser, see “Chapter 13 – Troubleshooting & FAQs” for suggestions.*

3. You will be asked to log in with your UNIX username and password, or you may log in as the “root” user.
4. Enter your user name and password (your password appears as dots so no one else can read it) and click **OK**. A dialog box appears and presents a list of available volumes:



5. Select the volume(s) you want to mount and click **OK**. Hold the **Command** key while clicking to select multiple volumes. The number of volumes you can access at one time depends on how much memory your Mac OS client has.

You can also click checkboxes of volumes to mount automatically when you start up your Mac OS client. If you click a checkbox, two additional choices appear, **Save My Name Only** and **Save My Name and Password**. If you select **Save**

My Name Only, entering your password upon system start-up will automatically mount the checked volume. If you select **Save My Name and Password**, the checked volume will automatically mount upon system start-up. With this option, however, anyone who starts up your Mac OS client will have access to your files.

6. Close the **Chooser** window.

For each volume you selected, an **AppleShare Volume** icon appears on your desktop. Use these icons like any other Mac OS disk:



Working with AppleShare Volumes

This section provides a brief introduction to working with AppleShare volumes. Read Apple Computer's *AppleShare User Guide* for detailed instructions. Each AppleShare volume, and each folder on an AppleShare volume, has separate access privileges for its owner, for its group, and for everyone else. Folders on a volume have distinct appearances, depending on the access privileges you have:

- If you own a folder, a black line appears on its tab.



- If you can add things to a folder but cannot see its contents, the folder is dimmed with an arrow above it



Drop Folder

- If you have no privileges, the folder is dimmed.

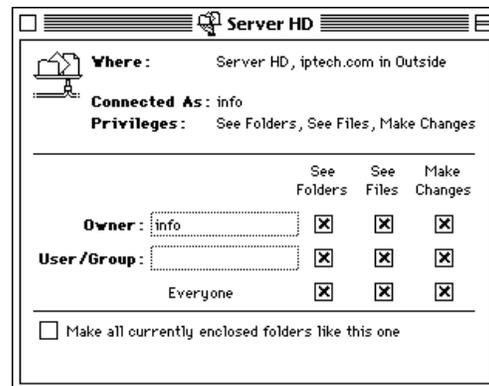


No Privileges

By default, when you create a folder on an AppleShare volume, only you, the owner, can See Folders, See Files, and Make Changes. You can view the access privileges of any folder, and change them if you are the folder's owner, by choosing **Get Privileges** from the **File** menu (on a System 7 Mac OS client, you must choose **Sharing** from the **File** menu).

Perform the following steps to modify a folder's access privileges:

1. Select the folder for which you wish to change privileges.
2. Select **File Sharing** from the **File** menu. Your Mac OS client will display the Privileges window:



3. Set the privileges as desired.

4. Close the window and click **Save**.

Note that only the owner of a folder or volume can permanently rearrange the position of icons or change the default view for the folder or volume.

Disconnecting from a File Server

To disconnect from a CanOPI file server, drag the icon for each volume you have mounted into the Trash. You can also disconnect by restarting your Mac OS client.

9 – *Print Spooler Service*

CanOPI's Print Spooler service allows Mac OS and UNIX users to share PostScript printers on your AppleTalk and TCP/IP networks. This chapter describes how to create and edit CanOPI print spoolers from a UNIX command line.

Note – *It is generally more convenient to create these spoolers using the ScriptableAdmin tool on the Mac OS client (see “Creating & Editing CanOPI Print Spoolers” on page 69).*

Preparing Your Mac OS client

To use CanOPI's print spooler service, you must first do the following:

- Make sure you have LaserWriter version 5.2 or higher and LaserPrep version 6.0 or higher in your Mac OS computer's System Folder.
- Ask your Administrator for the name of the CanOPI print spooler you should use.
- If your network has multiple AppleTalk zones, ask your administrator for the name of the zone in which the spooler resides.

Make sure you start the Print Spooler service as described in “Controlling Processes” on page 149.

Managing CanOPI Print Spoolers

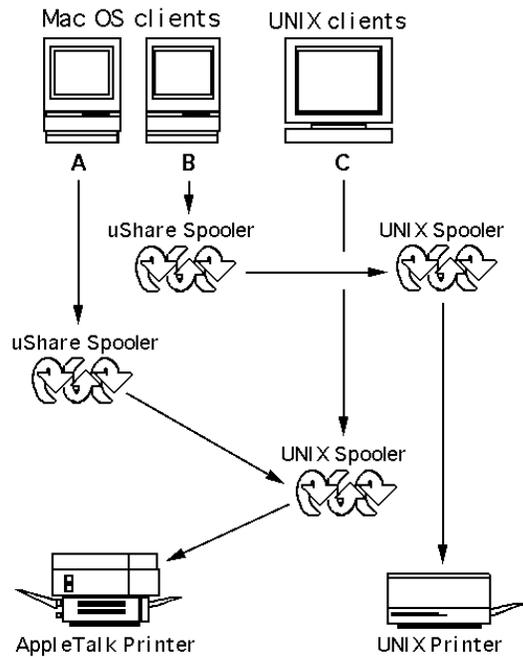
CanOPI print spoolers let UNIX users print to AppleTalk printers and Mac OS users print to UNIX printers. By combining these two capabilities (that is, passing Mac OS print jobs to a UNIX queue and back out to an AppleTalk printer), you can

make your Mac OS users' print jobs accountable. This section describes how to manage CanOPI's print spoolers by editing configuration files and issuing UNIX commands. It is generally preferable to perform these administrative tasks by using CanOPI's Mac OS GUI ScriptableAdmin, as discussed in "Chapter 3 – ScriptableAdmin". See "Print Spooling" on page 69 for more detail.

CanOPI configuration files should not be edited while either the CanOPI Manager or ScriptableAdmin is running.

PPD Files and the LaserWriter 8.x Driver

Note that for the LaserWriter 8.x, the printer can be queried, giving valuable information to the querying application (for example, whether the printer is black and white or color, or what the status of the print trays are). To take advantage of this capability using CanOPI, copy the printer's PPD file (this file should come with the software accompanying the printer, or alternately can be found as part of some software packages such as Aldus PageMaker) to the spooler directory `/usr/spool/uShare/<Spooler>` and rename it `ppd`. Then use the Chooser to select the LaserWriter 8.x and configure it to query the printer.



This illustration shows the three basic types of spooler configurations that will be discussed in detail in this section:

(A) AppleTalk to UNIX to AppleTalk;

(B) AppleTalk to UNIX;

(C) UNIX to AppleTalk.

(Users of earlier version of CanOPI may recall AppleTalk to AppleTalk spoolers. This spooler type is obsolete; an AppleTalk to UNIX to AppleTalk spooler should be used instead.)

Spooler definitions are discussed in the following sections:

- “AppleTalk to UNIX to AppleTalk Spooler — Solaris 2.3 & Higher” on page 180
- “AppleTalk to UNIX to AppleTalk Spooler — Sun OS 4.1.x” on page 181
- “AppleTalk to UNIX Spooler” on page 182
- “UNIX to AppleTalk Spooler — Solaris 2.3 & Higher” on page 184

- “UNIX to AppleTalk Spooler — Sun OS 4.1.x” on page 186.

Note – For a flowchart describing the order in which print jobs are handled by CanOPI’s print daemons and scripts, see “Appendix C - CanOPI’s File Tree & Printing Paths”.

AppleTalk to UNIX to AppleTalk Spooler — Solaris 2.3 & Higher

Note – These instructions are for Sun hosts running Solaris. If your Sun host is running Sun OS, refer to “AppleTalk to UNIX to AppleTalk Spooler — Sun OS 4.1.x” on page 181.

This spooler appears in the Mac OS Chooser. Print jobs sent to this spooler pass through uPrint’s spooler to a UNIX spooler and then to an AppleTalk printer on your network. This is the recommended method for printing to an AppleTalk printer through a uPrint spooler.

Note – LaserWriter 8.x printers can be queried, giving valuable information to the querying application. To take advantage of this capability using CanOPI, see “PPD Files and the LaserWriter 8.x Driver” on page 178.

To define an AppleTalk to UNIX to AppleTalk spooler:

1. Follow the instructions for “UNIX to AppleTalk Spooler — Solaris 2.3 & Higher” on page 184. Remember the name of the spooler.
2. Follow the instructions for “AppleTalk to UNIX Spooler” on page 182, and at Step 2 place the name of the UNIX to AppleTalk spooler that you defined above into the `-LLpr` and `-LLn` fields, for example:

```
SPN=MySpooler4:-Lp /ushare/bin/us2np:\
-LLpr <UNIX Spoolername>:-LLn <UNIX Spooler-
name>:\
-LLz UNIX:-LLpt ts:
```

AppleTalk to UNIX to AppleTalk Spooler — Sun OS 4.1.x

Note – *These instructions are for Sun hosts running Sun OS. If your Sun host is running Solaris, please refer to “AppleTalk to UNIX to AppleTalk Spooler — Solaris 2.3 & Higher” on page 180*

This spooler appears in the Mac OS Chooser. Print jobs sent to this spooler pass through uPrint’s spooler to a UNIX spooler and then to an AppleTalk printer on your network. This is the recommended method for printing to an AppleTalk printer through a uPrint spooler.

Note – *LaserWriter 8.x printers can be queried, giving valuable information to the querying application. To take advantage of this capability using CanOPI, see “PPD Files and the LaserWriter 8.x Driver” on page 178.*

To define an AppleTalk to UNIX to AppleTalk spooler:

1. Follow the instructions for “UNIX to AppleTalk Spooler — Solaris 2.3 & Higher” on page 184 and remember the **<UNIX Spoolername>** you set. For example, in the following printer definition **<UNIX Spoolername>** = “proof_printer”:

```
proof_printer|LaserWriter2:\
:lp=/dev/null.3:\
:sd=/usr/spool/proof_printer:\
:if=/ushare/bin/uspsif:\
:lf=/usr/spool/proof_printer/log:\
:sb:sh
```

2. Follow the instructions for “AppleTalk to UNIX Spooler” on page 182, and at Step 2 place the **<UNIX Spoolername>** (remembered from Step 1) into the **-LLpr** and **-LLn** fields:

```
SPN=MySpooler4:-Lp /ushare/bin/us2np:\
-LLpr proofprinter:-LLn proofprinter:\
-LLz UNIX:-LLpt ts:
```

AppleTalk to UNIX Spooler

This spooler appears in the Mac OS Chooser. Mac OS print jobs sent to this spooler pass through uPrint's spooler to a printer defined in the `/etc/printcap` file. Before defining your spooler, make sure you print a PostScript file to the printer. Remember the name of your printer, because you must use the same name when defining your spooler.

Note – *LaserWriter 8.x printers can be queried, giving valuable information to the querying application. To take advantage of this capability using CanOPI, see “PPD Files and the LaserWriter 8.x Driver” on page 178.*

To define an AppleTalk to UNIX spooler:

1. Create in the `/ushare/etc` directory a unique file that will contain your printer's resident fonts, by issuing

```
# touch /ushare/etc/<font_filename>
```

This file will be updated automatically when the spooler is started.

2. Edit `/ushare/etc/qcap`, and find near the end of the file the sample entry for an AppleTalk to UNIX spooler:

```
SPN=<atlk Spoolername>:-Lp /ushare/bin/\
us2np:-LLpr <UNIX Spoolername>:-LLn <UNIX
Spoolername>:\-LLz UNIX:-LLpt ts:
```

Using this sample entry as a model, make a new entry to define your spooler:

- a. Replace `<atlk Spoolername>` with the name you want Mac OS users to see in the Chooser; make sure the spooler name contains no spaces.

- b. Replace the two occurrences of `<UNIX Spoolername>` with your UNIX printer's name as defined in the `/etc/printcap` file.

You will need to remember this name to use in the UNIX to AppleTalk portion of an AppleTalk to UNIX to AppleTalk spooler.

- c. If your UNIX printer uses NeWSPrint, change the `-LLpt` parameter from `ts` to `np`, so that it appears: `-LLpt np`.

You must put single quotes around any names that contain spaces. If your entry does not fit on one line, use the backslash (`\`) to indicate continuation on the next line. Make sure the `-LLpr` argument is the third parameter in your entry. Your new `qcap` entry should look like this:

```
SPN=MySpooler2:-Lp /ushare/bin/us2np:\
-LLpr <UNIX Spoolername>:-LLn <UNIX Spool-
ername>:\-LLz UNIX:-LLpt ts:
```

3. Edit `/ushare/etc/lw`, and find the sample entry:

```
# np@UNIX
# /ushare/etc/fonts.np
```

Using this entry as a model, make a new, two-line entry that points to the fonts file you created in Step 1. The first line of your entry is the name of your UNIX printer followed by “@UNIX.” The second line of your entry is the pathname of the fonts file you created in Step 1. Your new `lw` entry should look like this:

```
MyLaserWriter@UNIX
/ushare/etc/<font_filename>
```

Do not put single quotes around names that contain spaces, and do not use the backslash (`\`) to indicate continuation on the next line.

4. Restart the spooler process:

```
# /ushare/bin/usrestart splr
```

This command kills CanOPI's spooler process if it is running and then starts the process. DO NOT restart the spooler process while a client's job is printing, because the print job will die with the process.

UNIX to AppleTalk Spooler — Solaris 2.3 & Higher

Note – *These instructions are for Sun hosts running Solaris. If your Sun host is running Sun OS, refer to “UNIX to AppleTalk Spooler — Sun OS 4.1.x” on page 186.*

This spooler does not appear in the Mac OS Chooser. UNIX user's print jobs sent to this spooler pass through a UNIX spooler to an Apple printer on your network. Both text files and PostScript files can be sent to this spooler.

To define a UNIX to AppleTalk spooler:

1. Determine your AppleTalk printer's name and zone (if any). The easiest way to do this is to use a Mac OS Chooser to select your printer; note the printer's name and the zone in which it resides. You can also use the `nbp1kup` command as described in the **NOTE** on page 198.
2. Make sure you can print directly to the printer.
 - Create a PostScript file with CanOPI's `pso` command:

```
# /ushare/bin/pso /etc/passwd >
/tmp/passwd.ps
```

This command converts your Sun host's `passwd` file to a PostScript file, `/tmp/passwd.ps`.

- Print this PostScript file with CanOPI's `lwdq.x` command:

```
# /ushare/bin/lwdq.x -n '<printer>' \
-z '<ZONE>' < /tmp/passwd.ps
```

where **<printer>** is your printer's name and **<ZONE>** is the zone in which your printer resides. If your AppleTalk network has no zones, use an asterisk (*) as the zone name, enclosing the asterisk in quotes.

3. Define your new spooler and create its spool directory by issuing the following command:

```
/usr/lib/lpadmin -p<UNIX Spoolername>\
-v/dev/null -Isimple,postscript -i\
/etc/lp/interfaces/<UNIX Spoolername>
-onobanner
```

where **<UNIX Spoolername>** is the name of the spooler you are defining.

When creating an AppleTalk to UNIX to AppleTalk spooler, be sure that the **<UNIX Spoolername>** matches the **<UNIX Spoolername>** defined in the AppleTalk to UNIX spooler.

4. Create an interface script for your spooler by issuing the following commands at a UNIX command line:

```
# cd /etc/lp/interfaces
# cp /ushare/bin/iptmodel ./<UNIX Spooler-
name>
# chmod 5555 <UNIX Spoolername>
```

where **<UNIX Spoolername>** is the name of the spooler you are defining.

5. Modify your new spool directory by issuing the following commands:

```
# cd /etc/lp/printers/<UNIX Spoolername>
# cp /ushare/bin/alert.sh ./alert.sh
# chmod 555 ./alert.sh
# cp /ushare/bin/usps_options .
```

6. Edit the `/ushare/bin/usps_options` file you created in Step 5 and find these lines near the bottom of the file:

```
LWN='Laserwriter Name'
```

```
LWZ='Laserwriter Zone'
```

Replace `'Laserwriter Name'` with your printer's name and `'Laserwriter Zone'` with the zone in which your printer resides. If your AppleTalk network has no zones, use an asterisk (*) as the zone name, enclosing the asterisk in quotes.

7. Complete the definition of your spooler by issuing the following commands:

```
# /usr/lib/lpsched
```

```
# /usr/lib/accept <UNIX Spoolername>
```

```
# enable <UNIX Spoolername>
```

8. Test your new spooler by sending a print job:

```
# lp -d<UNIX Spoolername> /etc/passwd
```

This command sends the `/etc/passwd` file to your printer via your new spooler.

UNIX to AppleTalk Spooler — Sun OS 4.1.x

Note – *These instructions are for Sun hosts running Sun OS. If your Sun host is running Solaris, refer to “UNIX to AppleTalk Spooler — Solaris 2.3 & Higher” on page 184.*

This spooler does not appear in the Mac OS Chooser. UNIX users' print jobs sent to this spooler pass through a UNIX spooler to an Apple printer on your network. Both text files and PostScript files can be sent to this spooler.

To define a UNIX to AppleTalk spooler:

1. Determine your AppleTalk printer's name and zone (if any). The easiest way to do this is to use a Mac OS Chooser to select your printer; note the printer's name and the zone in which it resides. You can also use the `nbplookup` command as described in the *NOTE* on page 198.

2. Make sure you can print directly to the printer.

- Create a PostScript file with CanOPI's `pso` command:

```
# /ushare/bin/pso/etc/passwd > /tmp/passwd.ps
```

This command converts your Sun host's `passwd` file to a PostScript file `/tmp/passwd.ps`.

- Print this PostScript file with CanOPI's `lwdq.x` command:

```
# /ushare/bin/lwdq.x -n '<printer>' -z
'<ZONE>' < /tmp/passwd.ps
```

where `<printer>` is your printer's name and `<ZONE>` is the zone in which your printer resides. If your AppleTalk network has no zones, use an asterisk (*) as the zone name, enclosing the asterisk in quotes.

Many AppleTalk printers have a trailing space in their names. If the `lwdq.x` command fails to find the destination printer, put an extra space at the end of the `<printer>` field.

3. Create a unique null device for your spooler:

- List all existing null devices:

```
ls -la /dev/null*
```

```
crw-rw-rw- 1 root 3, 2 Jun 20 13:19 null
crw-rw-rw- 1 root 3, 2 May 15 14:50 null.1
crw-rw-rw- 1 root 3, 2 Apr 15 11:33 null.2
```

Note the two numbers that appear before the date; these are the major and minor device numbers.

- Create a new null device with the following command:

```
# mknod /dev/null.<NUM> c <MAJ> <MIN>
```

where <NUM> is a unique number (for example, null.3), <MAJ> is the major device number, <MIN> is the minor device number. For example:

```
# mknod /dev/null.3 c 3 2
```

- Set the permissions of your new null device:

```
# chmod 666 /dev/null.<NUM>
```

4. Prepare a spool directory for your spooler:

- Create a spool directory (this directory typically resides in `/usr/spool`; if you create it within another directory, substitute that directory name wherever you find `/usr/spool` in the following instructions):

```
# mkdir /usr/spool/<UNIX Spoolername>
```

where <UNIX Spoolername> is the name of the spooler to which UNIX users will print.

When creating an AppleTalk to UNIX to AppleTalk spooler, be sure that the <UNIX Spoolername> matches the <UNIX Spoolername> defined in the AppleTalk to UNIX spooler.

- Set the ownership and permissions of the spool directory:

```
# chown daemon.daemon /usr/spool/<UNIX Spoolername>
```

```
# chmod 755 /usr/spool/<UNIX Spoolername>
```

```
# chmod g+s /usr/spool/<UNIX Spoolername>
```

- Create several files in the spool directory by issuing the following commands at a UNIX command line:

```
# cd /usr/spool/<UNIX Spoolername>
```

```
# cp /ushare/bin/usps_options .
```

```
# touch log
```

```
# touch status
```

```
# chown daemon.daemon log
# chown daemon.daemon status
# chmod 664 log
# chmod 664 status
```

5. Edit the copy of the `/ushare/bin/usps_options` file you created in Step 4, and find these lines:

```
LWN='LaserWriter Name'
LWT='LaserWriter'
LWZ='Laserwriter Zone'
```

Replace `'LaserWriter Name'` with your printer's name and `'LaserWriter Zone'` with the zone in which your printer resides. If your AppleTalk network has no zones, use an asterisk (*) as the zone name. Make sure to enclose the asterisk in quotes, for example, `LWZ = '*'`.

Other modifiable characteristics of your spooler are presented in Table 9-2 on page 193.

6. Edit the `/etc/printcap` file and make a new entry:

```
<Spooler>|<Alias1>:lp=/dev/null.<NUM>:\
:sd=/usr/spool/<UNIX Spoolername>:\
:if=/ushare/bin/uspsif:\
:lf=/usr/spool/<UNIX Spoolername>/log:\
:sb:sh
```

where `<NUM>` is the unique number you used in Step 3; `<UNIX Spoolername>` is the spooler name you chose in Step 4, and `<Alias1>` is an alternate spooler name (only one spooler name is required). For example:

```
proof_printer|LaserWriter2:\
```

```
:lp=/dev/null.3:\
:sd=/usr/spool/proof_printer:\
:if=/ushare/bin/uspsif:\
:lf=/usr/spool/proof_printer/log:\
:sb:sh
```

7. Enable your new spooler by issuing the following commands:

```
# lpc enable <UNIX Spoolername>
queuing enabled

# lpc start <UNIX Spoolername>
printing enabled
```

8. Test your new spooler by sending a print job:

```
# lpr -P<Spooler> /etc/passwd
```

This command sends the `/etc/passwd` file to your printer via your new spooler.

How It Works

The `startsplr` script consults `/ushare/etc/qcap` to determine the nature and number of `lwq` daemons to start. When a print job is sent, `lwq` invokes the `lwp` program to process the job. `lwp` converts the printer access protocol (PAP) to a two-way byte that `lws` scans for interactive commands that require additional information exchange with the client computer. (Often this information involves the location of font information and the need to transfer fonts to the printer when the job runs. If a font is needed, `lws` passes a request back to PAP to forward to the client computer). After the byte stream is parsed, it is either stored in a temporary file or made the standard input for a spooler or printer process defined in `qcap`.

Advanced Configuration

You can define various types of print spoolers by using a few basic building blocks:

- to present print spoolers to Mac OS users, make entries in the `/usshare/etc/qcap` file.
- to pass Mac OS print jobs to a UNIX spooler, use the `us2np` script.
- to print from your Sun host to an AppleTalk printer, define a spooler that uses CanOPIs input and output filters.

Making Entries in the `/usshare/etc/qcap` File

The syntax for entries in the `/usshare/etc/qcap` file is:

- a spooler definition must begin a new line (use a backslash (\) to indicate continuation on another line);
- colons (:) separate parameters.

When you make entries in `/usshare/etc/qcap`, you do not have to use the entire parameter set, but you should always set the `SPN=`, `-LP`, `-LLn`, `-LLz`, and `-LLpt` parameters. Table 9-1 gives the complete set of modifiable parameters.

Table 9-1: Parameters for Entries in `/usshare/etc/qcap`

Parameter	Description
SPD=	Directory for temporary files; must be unique for each spooler; default = <code>/usr/spool/usshare/<SPOOLERNAME></code>
SPQ=	Program to run as the spooler; default = <code>lwg</code>
SPN=	Name of the spooler as it appears in the Mac OS Chooser (up to 32 characters long). It must contain <u>no</u> spaces.
-d	Debugging level for the spooler (0-99)
-n	Maximum number of simultaneous jobs; default = 16
-p	Program to run when job starts; normally <code>lwp</code>
-s	Program to run to scan for DCS in job; normally <code>lws</code>
-t	Entity type of spooler; default = LaserWriter

Table 9-1: Parameters for Entries in /ushare/etc/qcap (Continued)

Parameter	Description
-z	<i>This option is only effective when using EtherTalk Phase II Protocol.</i> It sets the zone the spooler serves; default = * (all). Entering a zone name causes the spooler to be invisible to all AppleShare clients except those residing in the specified zone.
-Ld	Debugging level for the job process (0-99)
-Lp	Program to dequeue the job to the printer; default = lwdq.x
-LLcvs	Conversion(s) performed by the us2np script; combinations of 1, 2, and 3; or 4; default = 1. When making entries in the /ushare/etc/qcap file, you can use the -LLcvs argument to specify the conversion(s) performed by the us2np script. You can assign four values to the -LLcvs argument: “1” This value causes the PostScript Dictionary (that is, LaserWriter Prep file) to be prepended to each job in an encapsulated form. “2” This value activates the translation of carriage return characters to line feed characters. This translation causes problems if the PostScript contains binary encoded images. “3” This value causes the /ushare/bin/wordwrap program to limit the maximum line length to 240 characters. This modification causes problems if the PostScript contains binary encoded images. “4” This value causes the PostScript Dictionary to be sent to the printer as a <u>permanent</u> dictionary when the spooler is started. Do not combine this value with other cvs values. You can assign combinations of these values, but “4” cannot be combined with other values; that is, the only valid assignments are: -LLcvs 1, -LLcvs 2, -LLcvs 3, -LLcvs 12, -LLcvs 13, -LLcvs 23, -LLcvs 123, -LLcvs 4 The default cvs value “1” is optimum in almost all cases, and you should not assign other values without good cause.
-LLd	Debugging level for lwdq (0-99)
-LLg	Name of the file where accounting information for the LaserWriter goes
-LLn	Name of the printer to which jobs are sent
-LLpr	Name of the printer to which jobs are sent (matches entry in the lw file)

Table 9-1: Parameters for Entries in /ushare/etc/qcap (Continued)

Parameter	Description
-LLpt	Type of destination printer; np for NeWSPrint printers, ts for PostScript printers; default = ts
-LLt	Entity type of destination device; default = LaserWriter
-LLz	AppleTalk zone in which the destination device resides

Editing the usps options File

You can customize your UNIX to AppleTalk spoolers by modifying parameters in CanOPI's **usps_options** file, for example, to control the behavior of a spooler's **.finished** queue. The complete set of modifiable parameters is presented in Table 9-2.

Table 9-2: Parameters in the usps_options File

Parameter	Description
LWN	Name of the destination printer.
LWZ	AppleTalk zone in which the destination printer resides.
LWT	Entity type; default = 'LaserWriter'.
PSDMAN	PSDMAN defines the program used to convert text on stdin to PostScript on stdout . The default is /ushare/bin/pso .
PSDMAN_FLAGS	Flags to pass to the text-to-PostScript converter.

Table 9-2: Parameters in the `usps_options` File (Continued)

Parameter	Description
<code>comm</code>	<p>Program that parses, or otherwise ‘delivers’ the PostScript file to the destination printer.</p> <p>For the Fiery, or any AppleTalk printer, use: <code>comm=/ushare/bin/lwdq</code> (this is the default).</p> <p>For the IPU, use: <code>comm=usr/lib/NextPrinter/Server/prserver</code></p> <p>For applications, such as Hyphen’s RIP, that expect to read PostScript output from a file before sending it to a printer, use: <code>comm=/ushare/bin/pr2file</code> and set the parameters as defined below:</p> <pre>dest_dir=/tmp/ dest_name='\${tt}_\${uu}\$\$' dest_path=\$dest_dir/\$dest_name' temp_dir='\$dest_dir' export tt uu dest_dir dest_name dest_path temp_dir</pre> <p>where:</p> <ul style="list-style-type: none"> <code>dest_dir</code> is the directory that you want the file to appear in upon completion. Default is: <code>/tmp</code> <code>dest_name</code> is the output name format that you want the file to have, where <code>\${tt}</code> is the title, <code>\${uu}</code> is the username, and <code>\$\$</code> is a unique number (that is, the process ID). Format is: <code>'\${tt}_\${uu}\$\$'</code>. <code>temp_dir</code> is a directory in the same file system as <code>\$dest_dir</code> so that if the file needs to be copied, it is not moved into the <code>dest_path</code> until it is completely written.
<code>debug</code>	<p>true or false. If true, verbose messages are sent to the debug device. In the case of Solaris OS, errors will be reported to the user via email. For SunOS, errors will be reported to the file <code>/usr/spool/<spoolername>/log</code>. The default is false.</p>
<code>minfree</code>	<p>Specifies the minimum available disk space required for activation of the <code>.finished</code> queue, in megabytes (to be used in conjunction with the PrintQMgr). The default value is 100.</p>

Table 9-2: Parameters in the `usps_options` File (Continued)

Parameter	Description
<code>maxjobs</code>	Determines how many finished print jobs will be held in the spooler's <code>.finished</code> queue, so that they may be resubmitted by the PrintQMgr application. When the number of finished print jobs matches the value for this field, subsequent finished jobs will "push" the oldest saved job out of the <code>.finished</code> queue (see "Chapter 5 – PrintQMgr" for more details). The default value is <code>30</code> .
<code>maxentries</code>	Determines how many completed print jobs will be held in the list of finished jobs, as reported by PrintQMgr. When used in conjunction with the Max Jobs entry, it is a convenient way to keep track of many finished jobs, while only actually saving the most recent jobs for resubmission. The default value is <code>30</code> .
<code>maxspc</code>	Specifies the maximum disk space consumed by the <code>.finished</code> queue in megabytes (to be used in conjunction with the PrintQMgr). The default value is <code>100</code> .
<code>do_docman</code>	<code>true</code> or <code>false</code> . This value must be set to <code>true</code> to enable CanOPI's OPI Processor for replacement of low-res images before printing. The default is <code>false</code> .
<code>do_docpipe</code>	Set to <code>true</code> to enable a pipeline between <code>docman</code> and the spooling process. This option will allow color separated jobs to start printing faster. Set to <code>false</code> to disable the docpipe feature. The default is <code>true</code> .
<code>do_docmem</code>	When using this option, <code>docmemflags</code> (below) must be defined. Set to <code>true</code> to enable shared memory communication between <code>docman</code> and the spooling process. Enabling this feature greatly reduces disk requirements for OPI printing. The default is <code>true</code> .
<code>docmemflags</code>	<p>These flags must be defined when <code>do_docmem=true</code> (above). These flags set the number and size of shared memory windows to use. By default, two 512-k buffers are used.</p> <p>To change this setting, use the syntax: <code>docmemflags='-S windows=<num>,size=<num bytes>'</code> where <code><num></code> is the number of shared memory windows to use, and <code><num bytes></code> is the number of bytes to use for each window. The default is: <code>docmemflags='-S windows=2,size=524288'</code></p>

Table 9-2: Parameters in the `usps_options` File (Continued)

Parameter	Description
<p>docflags; special flags to pass to the <code>docman</code> program (the program that handles low-res image replacement)</p>	<p>-a Enables support for Scitex APR (Automatic Picture Replacement) PSMage, version 1.2. If you are using a Scitex RIP in conjunction with the Adobe PhotoShop plug-in “PSImage Exporter v2.5”, use this flag. It is important to also specify the search directory with the -s command (described below). This is necessary because, although APR does include image path information, this version of the PhotoShop plug-in does not pass this information to the image replacement engine (<code>docman</code>).</p> <p>-b Enables binary representation of image data. This option should be used unless your printer cannot handle binary data.</p> <p>-c Enables <code>docman</code>’s internal caching feature. This feature provides for faster OPI processing and should only be removed for debugging purposes.</p> <p>-s <search_directory1> <search_directory2> ... This flag provides a method of specifying alternate search directories for <code>docman</code> to use when locating replacement images during the OPI substitution process. Multiple search directories may be specified.</p> <p>-m Enables <code>docman</code>’s DCS merge feature. This allows for color separated jobs to be printed to a composite only device.</p> <p>WARNING: This option (-m) does not work with PostScript Level 1 devices.</p>

Table 9-2: Parameters in the `usps_options` File (Continued)

Parameter	Description
docflags (continued)	<p>-M Enables support for MultiAd Creator(tm).</p> <p>A sample <code>docflags</code> line would look similar to: <code>docflags='-b -c -t -m -M'</code> (in most cases).</p> <p>Or, more like: <code>docflags='-b -c -s /home/images -s /home/archivedir'</code>, if an added flag needs to be passed (<code>-s</code> in this instance).</p> <p>NOTE: More docflags are available; see “docman” on page 215.</p>
lognotice	This is the facility and level to report printing errors to. The default is <code>local0.err</code> .
includefonts	Enables the CanOPI server’s ability to insert pre-cached fonts (pre-cached by using the <code>extractfonts</code> command, below, with <u>any</u> spooler) into a document sent through the spooler you are configuring, if they are not permanently downloaded to the output device already. This saves time by eliminating the need for the Mac OS client to download the font description with the print job once the font has been cached. The default is <code>false</code> .
extractfonts	<p>This box enables the CanOPI server’s ability to extract, or “learn about,” fonts that the output device does not have permanently downloaded.</p> <p>When a print job is sent to the spooler, the server determines which fonts need to be downloaded from the Mac OS client to the printer and caches this font information. By doing this, subsequent print jobs using the same fonts (even using different spoolers) that have the <code>include</code> option checked, above, will print without having to download the same font information from the Mac OS client again. The default is <code>false</code>.</p>

Table 9-2: Parameters in the `usps_options` File (Continued)

Parameter	Description
<code>pshdrfn</code>	This field is used to define a PostScript file that is to be prepended to each print job as it passes through the spooler. This is helpful when you need to pass specific printer options via PostScript to the printing device. To set the value, enter the absolute path to the PostScript header file you wish to use.
<code>txtacct</code>	This option controls CanOPI's job accounting feature. Can be set to either true or false . If set to true , jobs will be logged in the accounting logfile specified in the variable <code>acctfile</code> . Setting this option to true requires a file to be entered in the <code>acctfile</code> variable.
<code>pageacct</code>	This option controls CanOPI's page accounting feature. Can be set to either true or false . If the value for both the <code>txtacct</code> AND <code>pageacct</code> variables are set to true , then the number of pages for every job will be accounted and logged in the accounting logfile specified in the variable <code>acctfile</code> . The value for <code>pageacct</code> will be ignored if <code>txtacct</code> is set to false .
<code>acctfile</code>	The absolute path and name for the accounting log file. If the value for <code>txtacct</code> is set to true , then this variable MUST BE set. It is recommended that the accounting files be located in: <code>/etc/lp/printers/<spoolername>/accountfile</code> (for Solaris systems), and <code>/usr/spool/printers/<spoolername>/accounfile</code> (for SunOS systems).
<code>pac_admin</code>	Specifies whom to notify (by email) in case there is a problem with the accounting system. Multiple users should be listed in double quotes and delimited with spaces. Example: <code>pac_admin="user1@server" "user2@server"</code>

Note – To confirm that your Sun host can see a printer on your AppleTalk network, use CanOPI's `nbplkup` command:

```
/ushare/bin/nbplkup -z ZoneName -t LaserWriter
```

The output of this command should look something like this:

```
Name:                Type           @ Zone,           Address,   Skt
LaserWriter Plus: LaserWriter @ EtherTalk, 9.181.185, 218
```

Working With an 8-bit Data Stream

In some cases in which Mac OS print jobs are sent via CanOPI's AppleTalk to UNIX spooler to a serially connected printer, special characters such as bullets and trademarks are not printed correctly. This problem arises because many printers' serial ports cannot accept an 8-bit data stream (for example, they might use the 8th bit for flow control). For information on resolving this problem, see "Working With an 8-bit Data Stream" on page 245.

Printing PostScript to a File

It is sometimes necessary to send a print job to a file as opposed to an actual output device. With CanOPI, you have the ability to create an AppleTalk to UNIX to AppleTalk, or UNIX to AppleTalk, print spooler that sends the print job to a directory. This is useful when a spooled print job needs to be handled by another application (such as an OPI or a software RIP), before being sent off to the print device. If your OPI or RIP can be set to look for print jobs in a certain directory, you can configure your CanOPI spooler to 'drop off' these print jobs.

To set this option, use ScriptableAdmin's Print Spooling administration tool. Choose **More Options** from the **Edit Spooler Options** window. Then, under "UNIX spooler", set the Print Program to `pr2file`. The **path to print** the file should be set to your destination path for the print jobs. **Print file name** should be set to a name pattern you prefer. Use a `$` to represent a unique integer in the pattern of the file name. Use the pattern `<desired string>_$$` to write a file with a name `<desired string>` followed by a unique two-digit integer. For a complete description, see "Print Spooling" on page 69.

Moving CanOPI's Spool Directory

If you need to move CanOPI's spool directory to a location with more space available, you can do so by creating a symbolic link in `/usr/spool` that points to the new location. To do this:

1. Stop your CanOPI spooling:

```
# /ushare/bin/usstop splr
```

2. Check to see whether your CanOPI spool directory is a symbolic link or a physical directory by issuing the commands below and checking the response. Depending on the result, proceed to the appropriate section.

```
cd /usr/spool
ls -l | grep ushare
```

- If the output of the `ls` command above looks similar to:

```
2 lrwxrwxrwx 1 root other 4 Mar 22 04:26
ushare -> /<oldpath>/ushare.spool
```

An “l” indicates that
/usr/spool/ushare
is a symbolic link .

where <oldpath> is a UNIX path (to the existing spooler location), then /usr/spool/ushare is a symbolic link. Proceed to “Spool Directory Is a Symbolic Link” on page 200.

- If the output of the `ls` command above looks similar to:

```
2 drwxr-xr-x 12 root other 512 Mar 2
10:52 ushare/
```

A “d” indicates that
/usr/spool/ushare
is a directory.

then the path reflects a physical directory. Proceed to “Spool Directory Is a Physical Directory” on page 201.

Spool Directory Is a Symbolic Link

To move a spooling directory when the path is a symbolic link, perform the following steps as the “root” user:

```
# cd /<newpath>
```

where <newpath> is the desired location for your new CanOPI spool directory.

```
# mkdir ushare.spool
# chmod 755 ushare.spool
# cd /usr/spool/ushare
# tar cpf - . | (cd/<newpath>/ushare.spool && tar xvpf -)
# cd /<oldpath>
```

```
# rm -r ushare.spool
# cd /usr/spool
# rm ushare
# ln -s /<newpath>/ushare.spool ushare
```

Start your CanOPI spooler by issuing the following command:

```
# /ushare/bin/usstart splr
```

Spool Directory Is a Physical Directory

To move a spooling directory when the path is to a physical directory, perform the following steps as the “root” user:

```
# cd /<newpath>
```

where <newpath> is the desired location for your new CanOPI spool directory.

```
# mkdir ushare.spool
# chmod 755 ushare.spool
# cd /usr/spool/ushare
# tar cpf - . | (cd/<newpath>/ushare.spool && tar xvpf -)
# cd /usr/spool
# rm -r ushare
# ln -s /<newpath>/ushare.spool ushare
```

Start your CanOPI spooler by issuing the following command:

```
# /ushare/bin/usstart splr
```

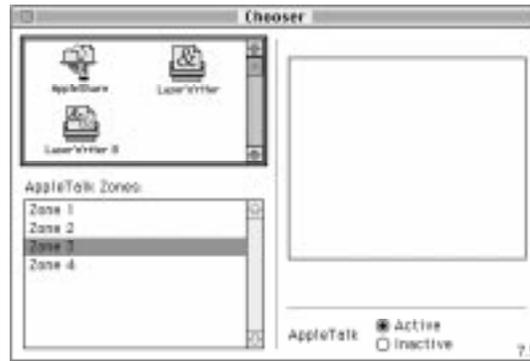
Using CanOPI Print Spoolers

Selecting a CanOPI Print Spooler

You select a CanOPI print spooler by using the Mac OS Chooser.

1. Select **Chooser** from the  menu.

The Chooser window appears, with icons for LaserWriter, AppleShare and possibly for other network services. AppleTalk zones may also appear.



2. Select a LaserWriter icon and an AppleTalk zone (if necessary). A list of available LaserWriters appears.
3. From the list of available LaserWriters, select the name of a CanOPI spooler, and close the **Chooser** window.

Now that you have chosen the CanOPI spooler, your print jobs will automatically spool each time you choose **Print** from the **File** menu of any application.

10 – CanOPI Files

When you install CanOPI software on your Sun host, a number of files are placed on your UNIX file system. This chapter describes those files and lists their locations.

You should not execute or modify most of these files, because they are reserved for use by CanOPI software. You must, however, edit some of CanOPI's files in order to configure CanOPI's services. Other CanOPI files are executable programs and shell scripts that let you control CanOPI processes, configure CanOPI services, and diagnose network problems.

Note – “*Chapter 11 – CanOPICommands*” provides detailed descriptions of CanOPI's executable files.

Location of CanOPI Files

Most CanOPI-related files are contained in the `/ushare` directory, while other files are contained in directories modified by CanOPI. The files described in this chapter reside in

- subdirectories of `/ushare` (`bin`, `etc`, and `etc.local`),
- Mac OS client users' home directories, or
- directories published as AppleShare volumes.

Files in `/ushare/bin`

This directory contains all of CanOPI's executable files (programs and shell scripts). Most of the files in this directory are used by CanOPI processes and you should not directly execute them. The following files may, however, be executed during troubleshooting, configuration, or process control operations:

atping	lwstatus	usiface
build_cache.x	mkaddr	usrestart
cached	nbplkup	usrm
cachevol	opistub	ussetkey
docman	pso	usstart
es2us.sh	rmfolderrsrc.sh	usstop
fontqry	sendattn.x	usvolmgr.sh
lwdq.x	usafpatr	vpassw
lwpr	usgz	

Files in /ushare/etc

This directory contains CanOPI configuration files. All users must have read and search access to this directory.

afp.dirs

This file contains entries that define AppleShare volumes. Any file name can be used if it matches the **v1** parameter of an entry in **afp.servers**. Read “Chapter 8 – AppleShare File Server Service” for instructions for making entries in this file.

afp.servers

This file contains entries that define CanOPI file servers and their attributes. Read “Chapter 8 – AppleShare File Server Service” for instructions for making entries in this file.

fonts.newsprint

This file contains a list of the standard resident fonts on a NeWSprint printer. Read the instructions for defining an Apple-Talk to UNIX Spooler in “Chapter 9 – Print Spooler Service” for information about managing fonts files.

fonts.plus

This file contains a list of all fonts resident on an Apple Laser-Writer Plus. Read the instructions for defining an AppleTalk to UNIX Spooler in “Chapter 9 – Print Spooler Service” for information about managing fonts files.

lw

This file contains entries used by CanOPI print spoolers to obtain a list of a printer's resident fonts. CanOPI automatically makes entries in this file for spoolers that print to printers on an AppleTalk network. You must make entries in this file manually for spoolers that use printers not on an AppleTalk network, for example, any PostScript or NeWSprint printer connected to your Sun host via a serial or parallel interface. Read the instructions for defining an AppleTalk to UNIX Spooler in “Chapter 9 – Print Spooler Service” for information about making entries in this file.

networks

This file, with several other files `/ushare/etc/networks`, `/ushare/etc.local/config`, `/ushare/etc.local/phase<1 or 2>`, and `/ushare/etc.local/flags`, controls CanOPI's AppleTalk Router service. Entries in this file consist of interface names and their corresponding addresses, in the form:

```
<interface>:<number>
```

where `<interface>` is CanOPI's name for an available interface (for example, `et0`, `et1`, `lt0`), and `<number>` is a network number you determine. For example:

```
et0:9.219  
lt0:53
```

Read “Defining CanOPI's AppleTalk Driver Configuration” on page Appendix B - viii for instructions for making entries in this file.

packages

This file contains the list of CanOPI process abbreviations used by the **usstart**, and **usrestart** commands when they are issued with no parameters. Read “Chapter 7 – Processes” for details about editing this file.

qcap

Entries in this file define CanOPI print spoolers and their attributes. Read “Chapter 9 – Print Spooler Service” for instructions for making entries in this file.

zones

This file, with several other files (**/ushare/etc/networks**, **/ushare/etc.local/config**, **/ushare/etc.local/phase<1 or 2>**, and **/ushare/etc.local/flags**), controls CanOPI's AppleTalk Router service. Entries in this file consist of zone names and their corresponding interfaces in the form:

<zone>:<interface>

where **<zone>** is a zone name you select, and **<interface>** is CanOPI's name for an available interface (for example, **et0**, **et1**, **lt0**). For example:

```
EtherTalk Zone:et0  
LocalTalk Zone:lt0
```

Read “Configuring CanOPI's AppleTalk Router” on page Appendix B - x for instructions for making entries in this file.

Files in /ushare/etc.local

This directory contains your Sun host's local configuration information. This directory should never be shared (for example, exported with NFS). All users must have read and search permissions for this directory.

config

This file is associated with CanOPI's AppleTalk Driver configuration. Entries in this file consist of one of five abbreviations that correspond to the five driver options. Read "How Are Network Numbers Expressed?" on page Appendix B - vi for instructions for making entries in this file.

interfaces

This file is associated with CanOPI's AppleTalk Driver configuration. Entries in this file determine the network interface(s) over which CanOPI provides services. Read "Activating Network Interfaces for CanOPI" on page Appendix B - ix for instructions for making entries in this file.

flags

This file is associated with CanOPI's AppleTalk Driver and Router configuration. This file is used by CanOPI's startup script, **usstart**, to pass flags to the **atnbpd** process that governs CanOPI's router service and CanOPI's default interface.

keys

This file contains your CanOPI Authorization Key. You can edit this file with the Key Manager, manually, or by using the **ussetkey** command.

passwd

This file exists to support password authentication. If you want to use password authentication, edit or create the **/etc/local/passwd** file (see "Setting up AppleShare Passwords - Random Number Exchange" on page 168), making entries in this file for everyone who is going to be using the file server, in the form:

```
username:flags:password
```

where **username** is the login name of the user on the file system, and **password** is that user's (potentially encrypted) password for that file system. If you are not using random-number exchange, leave the **password** field blank.

If you are going to use password authentication (either one-way or two-way random-number exchange), you must make entries in this file for all users who will use the file server.

phase1 or phase2

This file is associated with CanOPI's AppleTalk Driver configuration. One of these files must exist in the `/ushare/etc.local` directory. The file name must agree with the entry in the `/ushare/etc.local/config` file. If either **et1** or **ltet1** appears in the `config` file, **phase1** must exist. If either **et2** or **ltet2** appears in the `config` file, **phase2** must exist. If **lt** appears in the `config` file, then either **phase1** or **phase2** must exist.

Files in Mac OS Users' Home Directories

If you use CanOPI's File Sharing administration tool, you may work with some files in Mac OS users' home directories (a user's home directory is referred to in this guide as `~username`).

afp.dirs

Entries in this file define a user's private AppleShare volumes.

Files in Directories Published as AppleShare Volumes

Any directory of your UNIX file system that you publish as an AppleShare volume with CanOPI's AppleShare File Server service contains several CanOPI-related files.

.desktop

This directory contains the desktop database file. uShare uses this file to associate icons with file type and creator information for files stored on this volume.

.dirids/cache

This directory contains a volume-wide shared cache of files denoted by UNIX inode number.

.rsrc

This directory contains the resource forks of files in the parent directory of **.rsrc**.

.volrsrc

This file contains a volume's FinderInfo.

11 – CanOPICommands

CanOPI provides a number of user-level commands that let you control CanOPI processes, configure CanOPI services, and diagnose network problems.

This chapter summarizes the syntax of the following commands:

atping	lwstatus	usgz
build_cache.x	mkaddr	usiface
cached	nbplkup	usrestart
cachevol	opistub	usrm
docman	pso	ussetkey
es2us.sh	rmfolderrsrc.sh	usstart
fontqry	shmemclean	usstop
lwdq.x	sendattn.x	usvolmgr.sh
lwpr	usafpatr	vpassw

Syntax of CanOPI Commands

When you issue a CanOPI command at a UNIX command line, you must prepend the path `/ushare/bin` to each command (for example, to start CanOPI, you must type `/ushare/bin/usstart`) unless you have added `/ushare/bin` to your C Shell environment's path (the `$PATH` variable).

atping

This command is the equivalent for AppleTalk devices of the UNIX `ping` command and is used to test whether AppleTalk devices are alive on your network.

Syntax

```
atping [option...] [address]
```

Options

-b	disable packet comparisons to get a truer benchmark (default=enabled)
-c <count>	specifies the number of packets to send (default=1)
-C	sends another packet as soon as one is received, rather than sending packets once per second; prevents message with every packet
-l <length>	specifies packet data length (default=16 bytes)
-m	causes maximum-length packets to be sent (585 bytes)
-p	causes all packets to be sent at once
-w <timeout>	specifies time to wait for reply (default=1 sec)
-a <address>	address to ping; if none is specified, the broadcast address is pinged. Using this option is the same as using the [address] argument
-f <filename>	specifies file of data to send
-d <level>	sets debugging level (0-99) (default = 0)

Example

```
atping 9.219.56
Received 16 bytes from 9.219.56, delay=
10.00ms
Received 16 bytes from 9.219.56, delay=
0.00ms
```

build_cache.x

build_cache.x is used to update or rebuild an existing cache to an entire CanOPI volume. If you have created a new volume that is publishing directories that already have files in them, it is a good idea to build the cache before publishing the volume. To build the cache file for all volumes that do not yet have one defined, see the command “cachevol” on page 214.

Before using this command, make sure that no Mac OS client has mounted the CanOPI volume that you are rebuilding the cache for, as they will be attempting to write to the cache as you are attempting to rebuild it. Either make sure that everyone unmounts the volume, or disable (and then re-enable) file sharing by using the **usstop** and **usstart** commands before and after the **build_cache.x** command, as the following example reflects.

Syntax

To use this command, issue the following at a UNIX command prompt, while logged in as the “root” user:

```
# /ushare/bin/usstop AFP
# /ushare/bin/build_cache.x -v <volume path> -i 2 -r
# /ushare/bin/usstart AFP
```

where **<volume path>** is the path to the root level of the CanOPI volume.

Example

```
# /ushare/bin/usstop AFP
# /ushare/bin/build_cache.x -v /usr/workspace \
/files -i 2 -r
# /ushare/bin/usstart AFP
```

This will build a cache file for the CanOPI volume whose UNIX path is **/usr/workspace/files**.

cached

cached is a handy tool for forcing CanOPI to update the cache file for an existing directory. It may be used in conjunction with UNIX shell scripts that place files in CanOPI volume directories, so that Mac OS clients will recognize the updated contents immediately.

Syntax

To use this command, follow the instructions below for the appropriate file system:

1. # `cd <directory path>`
where `<directory path>` is the path of the directory for which you would like to update the cache file.
2. # `touch`
3. # `/ushare/bin/cached <directory path>`

Example

```
# cd /macvols/Applications/Word_Docs
# touch .
# /ushare/bin/cached /macvols/Applications \
/Word_Docs
```

This will update the cache file for the CanOPI volume subdirectory “Word_Docs”, whose UNIX path is:
`/macvols/Applications/Word_Docs.`

cachevol

cachevol is used to create a cache file for any CanOPI volume that has been defined, but not yet published. It is handy when you are publishing a volume whose directories already contain many files. This gives CanOPI the opportunity to build a cache before users begin to use the volume, which will improve performance significantly.

Syntax

To use this command, issue the following while logged in as the “root” user at a UNIX prompt:

```
# /ushare/bin/cachevol
```

docman

docman is CanOPI’s OPI processor, responsible for replacing low-resolution-image PostScript information with its high-resolution counterpart in OPI documents. **docman** is generally called only when printing to a CanOPI spooler that has been configured to perform image replacement (that is, **docman=true** in the spooler’s **usps_options** file; see Table 9-2 on page 193). However, **docman** may also be executed so that it will replace low-resolution-image PostScript information and write the output to a file.

Flags set by default are: **-b -c -t -m -M**

Syntax

To have **docman** perform image replacement in a file, issue the following at a UNIX command prompt:

```
docman <docflags> < <inputfilename> > <outputfilename>
```

where **<inputfilename>** represents the name of the file you wish to convert, and **<outputfilename>** represents the name of the resulting file.

Example:

```
# docman -b -c -t -m -M < newsletter.low > newsletter.high
```

This will create a file called **newsletter.high**, which is a PostScript file containing the same information as **newsletter.low**, plus the high resolution image data necessary to print to a high resolution output device.

The values for **<docflags>** are described below:

-a	Enables support for Scitex APR (Automatic Picture Replacement) version PSImage 1.2. If you are using a Scitex RIP in conjunction with the Adobe PhotoShop plug-in “PSImage Exporter v2.5”, use this flag. It is important to also specify the search directory with the -s command (described below). This is necessary because although APR includes image path information, this version of the PhotoShop plug-in does not pass this information.
-b	Enables binary representation of image data. This option should be used unless your printer cannot handle binary data.
-B	Forces docman to ignore the binary count given in %%EndBinary and search for %%EndBinary that marks the end of the binary data.
-c	Enables docman 's internal caching feature. This feature provides for faster OPI processing and should be removed only for debugging purposes.
-d <debug level>	Sets the debug level (values range from 0 to 99). Do not use this flag unless instructed to do so by an IPT Technical Support representative.
-D <dictionary directory>	Specifies the pathname to a directory where PostScript dictionaries can be found.

-E	This option separates the four color plates of CMYK Encapsulated PostScript (EPS) images when performing OPI replacement of images within documents that are printed with the Color Separation option selected from the page layout application (QuarkXPress, Adobe PageMaker).
-f 	Specifies the pathname to a directory in which fonts are stored.
-Fi	Includes fonts into the PostScript stream. See Table 3-4 on page 78.
-Fe	Extracts fonts from the PostScript stream. See Table 3-4 on page 78.
-h	Using this option instructs docman to parse images in page layout application files to determine if they are high resolution originals and if so, disable image replacement. Otherwise, a high resolution file will be removed and subsequently replaced by itself. This option is useful when a user places a high resolution grayscale TIFF image in Quark and colorizes it.
-H <host name>	If the host name is present, this flag will return the host's IP address or host name of the machine which receives the docman output. If the -H flag is not set, but a port number is still given, the host is assumed to be 'localhost'.
-i <input file name>	Specifies the name of a file from which input is read. If the -i flag is not set, the input is taken from stdin .

-k	<p>The default behavior of docman (without the -k option) is to resolve the path names given by a document's OPI comments first, and then look for high-resolution images in the search path(s) given by the -s option (see below) if the document's OPI comments do not yield a valid image.</p> <p>The -k option forces docman to search for high-resolution images in the search path(s) given by the -s option first, before resolving the OPI path names specified in the document.</p> <p>The -k option is ignored if the no search paths are given by the -s option.</p>
-l <lw directory>	Specifies the name of an alternate directory containing font files for output devices (/ushare/etc/lw being the default directory).

-L <level number>	<p>Allows the user to choose between different levels of low resolution images for different purposes. For example, a user may have one low resolution stub file for screen proofing (72 dpi) and another for print proofing (144 dpi). Consider the following workflow: a 144-dpi image is generated from the original, high-resolution image, and a 72-dpi image is generated from the 144-dpi image. In this case, the original image would be considered Level 0, the 144-dpi image would be considered Level 1, and the 72-dpi image would be considered Level 2.</p> <p>Using the option -L 1 causes CanOPI to substitute the Level 1 image upon output (to a print proofer, for instance). The high-resolution image (Level 0) must be specified to cause it to be substituted upon final output.</p>
-m	<p>Enables docman's DCS merge feature. This enables you to print color-separated jobs to a composite-only device.</p> <p>WARNING: This option does not work with PostScript Level 1 devices.</p>
-M	<p>Enables support for MultiAd Creator©.</p>

-n	Enables docman to remove OPI comments from PostScript files that contain low-resolution stub files once these PostScript files have been processed by docman for high-resolution image replacement. This is required for PostScript files that will be processed by TrapWise. If the OPI comments are left in the file, TrapWise assumes that the images pointed to by the leftover OPI comments are not in the file, and displays them in the 'Images Link' window.
-o <output file>	Specifies the name of the file where the output of docman will be placed. If the -o flag is not set, the output file is assumed to be stdout .
-p <print job>	Allows the user to set the title of the print job.
-P <TCP port number>	Specifies the port number to which the output of docman is sent.
-r <input=InResolution>, <output=OutResolution>	<p><input=InResolution> This portion of the flag applies to PhotoCD images only. It specifies what resolution of an image to be picked from a PhotoCD file, since a single PhotoCD file usually contains several resolutions of the same image.</p> <p><output=OutResolution> This portion of the flag gives the resolution of images to be down-sampled when the high resolution image is placed into the document by docman.</p>

<p><code>-q</code> <code><[-q {unix</code> <code> mac}]></code></p>	<p>Allows the user to specify the format of the path in %ALDImageFileName: comment. The syntax for this option is: <code><[-q {unix mac}]></code>. If this option is omitted, the path format defaults to mac.</p>
<p><code>-R</code></p>	<p>This flag tells docman to parse EPS images, instead of including them as is, into the document. This means that if you generate a low-resolution image from a low-resolution image (and so on), docman will recursively search back through all the low-resolution images until it finds the original, high-resolution image. It is this image that will be substitute back into the document upon final output. Usage: <code>docflags='-b -c -R'</code></p>
<p><code>R</code></p>	<p>This flag, used in conjunction with the -s flag below, tells docman to search recursively for the original image starting from the specified search directory. This flag must be entered for each search directory for which you want to enable recursive image searching. Usage: <code>docflags='-b -c -s /home/images,R -s /home/archivedir'</code></p>
<p><code>-s <search directory></code></p>	<p>This flag provides a method of specifying alternate search directories for docman to use when locating replacement images during the OPI substitution process. Multiple search directories may be specified. Usage: <code>-s <search_directory1> <search_directory2></code> etc.</p>

-t	Enables support for %ALDImageTransparency. This allows images to be printed with background set to None. This option is provided because some versions of QuarkXPress (and other page layout programs) do not support this operator correctly (in such cases all images print with background set to None). Default is true .
-u <user name>	The user name flag is useful for converting names of private Mac OS volumes to UNIX directories.
-v	When performing the docman -v command from the UNIX command line, this option will display the current docman version number.

es2us.sh

This script is run when performing a conversion from Helios EtherShare to IPT CanOPI. Refer to “Updating from Helios EtherShare to IPT CanOPI” on page 247 for more information.

fontqry

This command queries an AppleTalk printer and builds a file containing a list of the printer’s resident fonts. This command is automatically executed when you start CanOPI’s Print Spooler process, but you can use it manually to build font lists for your printers.

Syntax

```
fontqry -z <zone> -n <name> -t <type> -l <file> -q <query>
```

Options

-z <zone>	zone in which the printer resides
-n <name>	name of the printer to query

-t <type>	type of printer, usually "LaserWriter"
-l <file>	file to which the font list is written
-q <query>	PostScript file that queries the printer, usually / <i>ushare/etc/fontsqry</i>

Example

```
fontqry -z EtherZone -n LaserWriter\  
-t LaserWriter -l /ushare/etc/fonts.LW\  
-q /ushare/etc/fontsqry
```

lwdq.x

This command prints a PostScript file to an AppleTalk printer. This command assumes the file is on standard input, so you must use redirection to print a file.

Syntax

```
lwdq.x -n <name> [option...]
```

Options

-A <retry value>	The number of times the printer's name is looked at when initially unsuccessful.
-d <debug level>	Sets the debug level. Do not set this unless instructed to do so by an IPT Technical Support representative.
-g	This flag indicates whether page accounting is enabled or not.
-i <docman's file>	Specifies the name of <i>docman</i> 's pipe output file.
-I <init_file>	Specifies a file containing PostScript code to initialize a printer.

Options

-m <#>	Specifies the number of bytes from docman before starting to process the job.
-n <name>	Specifies the name of the printer.
-o <spool directory>	Allows the user to specify a spooling directory. Default is set to /usr/spool/ushare .
-P <query file>	Specifies a file containing query for the dictionary.
-r <#>	Number of packets sent per transaction, otherwise known as local/response flow quantum. Possible values range from 1 to 8 (inclusive). Do not change the default setting unless specifically instructed to by an IPT Technical Support representative.
-t <type>	Specifies type of printer, usually LaserWriter.
-T <timeout value>	The timeout value (in seconds) for looking up the printer's name using NBP.
-u <uid>	User's ID.
-U <name>	User's name.
-w <#>	Number of seconds to wait for the printer to close the connection (default will cause printer to remain connected until successful completion of job).
-x <pid>	The pid of docman used in shmem (shared memory) mode.
-y	This flag indicates that the dictionary is inside the PostScript file.
-z <zone>	Zone in which the printer resides.

Example

```
lwdq.x -n 'MyLaserWriter' -z 'MyZone' < MyFile
```

This command prints the file **MyFile** to “MyLaserWriter” in “MyZone.”

Note – If the parameters **LWN**, **LWT**, and **LWZ** have previously been set in the **usps_options** file, these will be used in the absence of the **-n**, **-t**, **-z** flags described here.

lwpr

This command converts text files to PostScript and prints them to an AppleTalk LaserWriter. Before issuing this command, you must edit the **/ushare/bin/lwpr** file and enter your LaserWriter's name and zone as indicated in the script.

Syntax

```
lwpr filename(s)
```

lwstatus

This command reports the status of a LaserWriter.

Syntax

```
lwstatus [option...]
```

Options

-z <zone>	zone in which the printer resides; default is the local zone
-n <name>	name of the printer; the default is all names
-t <type>	type of printer, usually “LaserWriter”

Example

```
lwstatus -n 'LaserWriter Plus' -z 'MyZone'
```

```
job: jean; document: salesletter; status:
printing
```

nbplkup

This command displays AppleTalk Name Binding Protocol information to standard output. This information includes the name of the AppleTalk device, the type of AppleTalk device (for example, LaserWriter or AFPServer), the AppleTalk zone, the AppleTalk address, and the socket number.

Syntax

```
nbplkup [option...]
```

Options

-z <zone>	zone in which the devices reside; default is the local zone
-n <name>	name of the device; the default is all devices
-t <type>	type of device; the default is all types
-g <gateaddr>	the gateway address to display information for; the default is all gateways
-o <interval>	where <interval> represents the number of milliseconds to wait between nbp requests (default=20ms, there are 5 requests made per lookup).

Example

```
nbplkup -z officenet
```

```

Name      :      Type      @ Zone      , Address , Skt
  iptM122 :      Echo-er @ officenet, 9.181.144, 4
uShare@iptM122-2 :      APServer @ officenet, 9.181.144, 253
uShare@iptM122-1 :      AFPServer @ officenet, 9.181.144, 254
  iptM122AFP1.1 :      AFPServer @ officenet, 9.181.144, 250
  iptM122 :      UNIX @ officenet, 9.181.144, 128
  iptM122 :      Echo-er @ officenet, 9.181.144, 4
LaserWriter Plus :      LaserWriter @ *, 9.181.185, 138
  Oli :      Macintosh SE @ *, 9.181.62, 253
```

Return of a zone name is optional within the AppleTalk Name Binding Protocol, so not all devices will return a zone name.

opistub

This CanOPI daemon is used to create low-resolution representations of high-resolution images. These are used for placement in documents that will be printed in conjunction with CanOPI's OPI processor **docman**.

opistub is normally executed when performing a Drag & Drop to a folder configured for low-resolution image generation. However, **opistub** also can be executed manually for the same purpose.

opistub locks the low-resolution image file while it is being generated, providing a means of notifying the user that the low-resolution file is not yet completely processed by **opistub**, and should not yet be used. Any application attempting to place such low-resolution image files in a document will get the following error message:

File <name of low-resolution file> is locked

You can also configure the settings governing low-resolution image generation by changing the values in the **opiconfig** file. This file resides in the folder where you place high-resolution images for low-resolution image generation. For more information, see "Configuring Drag & Drop" on page 91.

Syntax

To generate a low-resolution representation of a high-resolution image file, issue the following at a UNIX command prompt:

```
/ushare/bin/opistub <options>
```

(All options must be defined).

-a <address of Mac client (use 0)>	Specifies the AppleTalk address of the Mac OS client to associate errors with. When issuing this command manually, use “0”.
-d <debug level>	Sets the debug level. Do not set this unless instructed to do so by an IPT Technical Support representative.
-e	Allows the user to exchange the contents of two low-resolution stub files.
-i <user id>	Specifies the user ID to use when creating the placement image. This is used to locate the user’s home volume list (the afp.\ dirs file in the user’s home directory), as well as to set the ownership of the placement image. Unless opistub is run as the “root” user, this should reflect the ID of the user running the opistub program.
-l <UNIX path to Mac volume>	Specifies the full UNIX pathname that is the ‘root’, or top level of the AFP volume, as defined in the volumes description file afp.dirs .
-o <old file name>	This flag is used only when renaming or moving a file. The full UNIX path name of the old file will be used to build a path name to the EPS stub file.

-p <prefix for the LowRes directory>	By default, the opiconfig file is located in the same volume where the high resolution images are. This works for most cases, but causes problems when images are on read-only media such as CD-ROM. In this case, the opiconfig file cannot be created on the CD-ROM so it must be created elsewhere. The -p option allows the user to give a path name to a directory where the opiconfig file is residing.
-r	This flag causes the stub file to be removed when the original, high-resolution file is removed.
-R	This option instructs opistub to recursively build low-resolution stub files for images in a directory. In other words, images in the selected directory, and all directories below it, will have stub files generated.
-u <UNIX path to hi-res image>	Specifies the full UNIX pathname to the hi-res source image.

Example

```
opistub -l /usr/images -u /usr/images/cowimage-i 12 -a 0
```

This will create a low-resolution version of the image **cowimage** in the Mac OS volume with the UNIX path is **/usr/images**, for user id **12** (no Mac address is specified (**0**)).

pso

This command converts files to PostScript and prints them to standard output. To print to a file, you must redirect the output.

Syntax

```
pso <file>... [option...]
```

Options

-f <name>	name of file to print in header
-fh <header>	the entire header to print
-tn <spaces>	number of spaces to expand tabs into (default=8)
-nn	turns off line numbering (off by default)
-n	turns on line numbering (off by default)
-npr	turns off the pr filter
-l <lines>	specifies number of lines per page (default=76)
-w <chars>	specifies number of characters per line (default=96)
-tp <converter>	specifies text-to-PostScript converter (default= /ushare/bin/text2ps)

Example

```
pso MyFile > MyFilePS
```

rmfolderrsrc.sh

This script is run to remove the resource fork from files during a conversion from Helios EtherShare to IPT CanOPI. Refer to “Updating from Helios EtherShare to IPT CanOPI” on page 247 for more information.

sendattn.x

This command sends a message string to an alert box on a Mac OS client on the network. The Mac OS client must have the Alert Driver extension installed before it will receive messages from the **sendattn.x** command. The volume “MacApps” contains a copy of this extension. The Alert Driver may be installed on the Mac OS client’s local machine by dragging it to the System Folder.

When the command is executed, a message appears on the Mac OS client and the user must click the alert box's **OK** button to dismiss the alert.

Syntax

```
sendattn.x "<message>" <net>.<node>,68
```

Options

<message> is an ASCII string of 255 or fewer characters.

<net>.<node> is the AppleTalk address of the Mac OS client.

68 is the appropriate socket number to use for this command.

Example

```
sendattn.x "Server going down" 9.219.56,68
```

shmemclean

This command executes a script to remove the contents of the shared memory.

Syntax

```
shmemclean
```

Options

-v appending a -v to the **shmemclean** command returns executes the **shmemclean** command and returns the version number of the shmemclean script.

Example

```
shmemclean -v
```

usafattr

This command lets you view or modify the Finder information for a file or folder within a CanOPI volume.

Syntax

```
usafattr [flags] <volume path> pathname ...
```

Options

<volume path> is the pathname to the root of the **afp** volume; if your current directory is the parent of the Mac OS file you are manipulating, you can use dot (.) instead of supplying the volume path; **pathname** is the pathname of the Mac OS file you are manipulating; **[flags]** can be:

```
-s [icmrslnb] : set flag bits
-u [icmrslnb] : clear flag bits

  i : invisible bit
  c : copy protect bit
  m : multiuser bit
  r : read only bit
  s : system bit
  d : delete-inhibit bit
  l : lock/protect bit
  n : rename-inhibit bit
  b : last backup bit

-c <creator> : set icon creator name
-t <type> : set icon type name
-v <view> : print Finder info
-p <mode> : set privilege of Folder

  mode = [ugo][+-][rwx] or octal mode
  u:user g:group o:other
  +:set -:clear
  r:see files
  w:make changes
  x:See folders
```

Examples

To view the Finder information for a file in your current directory:

```
usafpatrr -v . filename
```

To copy-protect a file in your current directory:

```
usafpatrr -s c . filename
```

To set the Type and Creator for a file in your current directory:

```
usafpatrr -c MSWD -t WDBN . filename
```

usgz

This command queries gateways about your network's topology.

Syntax

```
usgz [option...]
```

With no option, **usgz** queries the first gateway it finds and makes a list of zones and the nets associated with them. This command is useful for debugging gateway, zone, and routing problems.

Options

-z <netnum>	limits the query to the zone to which the specified network number belongs
-g <gateaddr>	gateway to query; the address may be in decimal or dotted decimal notation. the default is all gateways

Example

```
# usgz
gateway at 9.200.10 reports 3 zones:
zone (IPTEtherNet) has nets:
  9.200 (2504, 0x09c8) hops= 0
zone (IPTEtherTalk) has nets:
  9.217 (2521, 0x09d9) hops= 1
zone (IPTOfficeNet) has nets:
  9.181 (2485, 0x09b5) hops= 1
```

usiface

This command displays information about your Sun host's CanOPI interfaces.

Syntax

```
usiface
```

Example

```
# usiface
Number of Interfaces registered : 3
=====
AT_if  UNIX_if  Address  Protocol
=====
  lt0   ---      35.90  LocalTalk
  lt1   ---      37.90  LocalTalk
*  et0   le0     2523.253 EtherTalk Phase1
=====
```

This output indicates that three interfaces (two LocalTalk boards and one built-in Ethernet board) are configured for CanOPI and shows each interface's AppleTalk name (**AT_if**), UNIX name (**UNIX_if**), network address (**Address**), and protocol.

usrestart

This command executes the **usstop** and **usstart** commands in succession.

Syntax

```
usrestart <abbrev> <abbrev>...
```

where **<abbrev>** is a CanOPI process abbreviation. Read "Process Abbreviations" on page 150 for the complete list of uShare process abbreviations.

Example

To restart CanOPI's Print Spooler process, issue the following command at a UNIX command line:

```
usstart splr
```

When you issue the **usrestart** command without arguments, it stops all CanOPI processes and then starts those processes whose abbreviations are uncommented in the **/ushare/etc/packages** file.

usrm

This command is the equivalent for Mac OS files of the UNIX **rm** command. This command removes a file's data and resource forks.

Syntax

```
usrm [-rif] <file>...
```

Options

-r	indicates to recursively delete the contents of a directory, its subdirectories, and the directory itself
-i	indicates to ask whether to delete each file, and, under -r , whether to examine each directory
-f	indicates to remove specified file(s) without displaying permissions, asking questions or reporting errors

Example

```
usrm <path>/myfile
```

This command deletes a file named **<path>myfile** and the file's resource fork, **<path>/.rsrc/myfile**.

ussetkey

This command places your key in the **/ushare/etc.local/keys** file.

Syntax

```
ussetkey key=<YOUR KEY>
```

where **<YOUR KEY>** = your IPT-supplied Authorization Key code.

Example

```
ussetkey key=37f38ac36bd44d871
```

usstart

This command starts CanOPI processes.

Syntax

```
usstart <abbrev> <abbrev>...
```

where **<abbrev>** is a CanOPI process abbreviation. Read “Process Abbreviations” on page 150 for the complete list of uShare process abbreviations.

Example

To start CanOPI's File Server and Print Spooler processes, issue the following command at a UNIX command line:

```
usstart afp splr
```

When you issue the **usstart** command without arguments, it starts all processes whose abbreviations are uncommented in the **/ushare/etc/packages** file.

usstop

This command stops CanOPI processes.

Syntax

```
usstop <abbrev> <abbrev>...
```

where **<abbrev>** is a CanOPI process abbreviation. Read “Process Abbreviations” on page 150 for the complete list of CanOPI process abbreviations.

Example

To stop CanOPI's File Server and Print Spooler processes, issue the following command at a UNIX command line:

```
usstop afp splr
```

When you issue the **usstop** command without arguments, it stops all CanOPI processes without consulting the **/ushare/etc/packages** file.

usvolmgr.sh

This command starts a shell script that allows you to rebuild caches (for either an entire volume or just the root of that volume), and update caches (for either an entire volume or just the root of that volume). You can then archive, restore or delete these caches.

This script allows you to perform certain administrative functions that cannot be accomplished with ScriptableAdmin, without using the UNIX command line.

Syntax

```
/ushare/bin/usvolmgr.sh
```

Usage

Typing in the above command will bring up three questions that you must answer before you see the Main Menu. You will be asked whether you want to:

1. include private volumes,
2. include the home directory of all users, and
3. disconnect active connections to the server (this is strongly recommended).

If you answer Yes to questions 1 or 2 and are running NIS (Network Information System), **usvolmgr** will not work properly.

After you answer these questions, the Main Menu will appear and you can select volumes upon which to work.

vpasswd

This command sets an AppleShare volume password for a directory that is a CanOPI volume.

Syntax

```
vpasswd <directory>
```

If no directory is specified, the current working directory is assumed.

Example

```
vpasswd /mnt/Lee/notes  
Setting volume password for /mnt/Lee/notes  
Enter password: secret  
Re-enter password: secret
```

12 – Compatibilities

Adjusting CanOPI to Work With Other Products

Many products allow users to open their documents on multiple platforms. With CanOPI, you have the ability to use a common storage area (a UNIX directory published as a CanOPI volume) to keep these shared files. To maintain compatibility with these products, CanOPI sometimes requires specific configuration settings. This chapter describes the necessary configurations for CanOPI to work with the products listed below:

- Aldus FreeHand
- ccMail
- GroupWise
- EPOCH File migration software
- Microsoft Excel (when sharing files with PC users)
- Microsoft Windows (when printing to a UNIX spooler).

This chapter also includes a section regarding the steps you can perform to work with an 8-bit stream, and a procedure to convert your system from Helios EtherShare to IPT's CanOPI.

Using CanOPI with Aldus FreeHand Documents

When using Aldus FreeHand documents, it is necessary to turn off the **CR to LF** translation on the CanOPI volume where this information is being stored. This is because the FreeHand software writes files to a volume as type TEXT, until the file is complete, then changes the type to what is appropriate for the document. This causes CanOPI to perform a carriage return to line feed translation when the file is written initially, but not during subsequent reads of the file, after the type has been altered. To configure a volume to support this type of file:

Create a new volume using ScriptableAdmin

1. Launch the ScriptableAdmin application, either from your hard drive or from the MacApps volume that is published by your default file server. See “Chapter 3 – ScriptableAdmin” for more detail).
2. Select the **File Sharing** icon.
3. Select the file server you would like to publish this new volume for you, and click **Global Volumes**.
4. Create a new volume, and click **Properties**.
5. If the **CR to LF**'s checkbox is checked, click it to uncheck it.
6. Save your new volume definition.
7. You can now use the newly defined volume as usual. When FreeHand files are written to the UNIX directory being published as a CanOPI volume, Mac OS clients will be able to access them without errors.

Note – *This installation must take place on a newly defined volume to avoid difficulties with existing Mac OS files. The **CR to LF**'s option must be turned off before using the volume to store files from the Mac OS client side.*

Using CanOPI with ccMail

By using a CanOPI volume as a storage facility, ccMail users have the ability to share a Post Office between Mac OS client computers, and PC compatibles using PCNFS. The following steps must be taken to ensure compatibility among platforms.

Create a new volume using ScriptableAdmin

1. Launch the ScriptableAdmin application, either from your hard drive, or from the MacApps volume that is published by your default file server. See “Chapter 3 – ScriptableAdmin” for more details.

2. Select the **File Sharing** icon.
3. Select the file server you would like to publish this ccMail volume for you, and click **Global Volumes**.
4. Create a new volume, and click **Properties**.
5. If the **CR to LF's** checkbox is checked, click it to uncheck it.
6. Save your new volume definition.
7. You now can mount the newly defined volume and install your ccMail software.

Note – *PCTCP users: PCTCP v1.3 for OS/2 does not support record locking, which is required by ccMail.*

*This installation must take place on a newly defined volume to avoid difficulties with existing Mac OS client files. The **CR to LF's** option must be turned off before installing the ccMail Post Office; instructions are below:*

When using a ccMail PO with CanOPI and PCNFS:

1. When mounting a drive (**NET USE <drive> <host path>**), it is necessary to use the **/MS** switch at the end of the command line so the command would appear: **NETUSE <drive> <host path> /MS**
2. The **SHARE.EXE** DOS executable must be loaded to provide DOS-level file and record locking.

Using CanOPI with GroupWise

In order for the GroupWise product to recognize incoming mail and attachments, it is necessary to install the Post Office on a server that is using CanOPI daemons. This version of CanOPI provides a different method of file caching that appropriately recognizes when new information is written to a CanOPI volume. You can change the configuration of an existing server, or

create a new server using ScriptableAdmin, then follow the steps below. (See “Chapter 3 – ScriptableAdmin” for more information on how to create a new server).

1. Login as the “root” user on your CanOPI host and issue the following command at a prompt:

```
# cd /ushare/etc
```

2. Using a file editor (such as **vi**), edit the **afp.servers** file (for more information on **vi**, type **man vi** at the command prompt or see your Network Administrator).
3. Toward the bottom of the file, you will see a line describing the server you plan to set up for GroupWise, which will look something like:
nm=CanOPI@server:mx=64:
(Some servers will have more fields defined than others; the order is irrelevant.)

4. Append **-s /ushare/bin/afpsess_3.07.x:vers=2:** so that your entry now looks like:

```
nm=CanOPI@server:mx=64:-s  
/ushare/bin/afpsess_3.07.x\ :vers=2:
```

5. Write and quit the file.
6. Restart CanOPI file sharing by issuing:
/ushare/bin/usrestart afp
7. GroupWise will now function properly.

Using CanOPI with EPOCH File Migration

EPOCH file migration can be used on a UNIX host running CanOPI software if the EPOCH software is prevented from “stubby” CanOPI cache files. To prevent this:

For each published local CanOPI volume, issue the following command at a UNIX prompt:

```
epochmod -l '<volume path>/dirids/cache'
```

where **<volume path>** is the full path to the root level of the CanOPI volume. (The **epchmod** command stands for “epoch change mode”.)

To effect all “remote” (for example, NFS) caches at once, issue:

```
epchmod -l /ushare/etc.local/caches/*
```

with the options:

- r -- recursive
- l -- lock a file onto magnetic media so it will never be staged (copied to optical media).

If necessary, you can prevent an entire volume or subfolder from being staged by issuing:

```
epchmod -rl '<volume-path>'
```

or,

```
epchmod -rl '<directory>'
```

Using CanOPI with Microsoft Excel Documents Created by PC Computers

When using MS Excel documents created by PC computers, it is necessary to turn off the **CR to LF**'s translation on the CanOPI volume where this information is being stored. To do this:

Create a new volume using ScriptableAdmin

1. Launch the ScriptableAdmin application, either from your hard drive or from the volume MacApps that is published by your default file server. (See “Chapter 3 – ScriptableAdmin” for more detail.)
2. Select the **File Sharing** icon.
3. Select the file server you would like to publish this new volume for you, and click **Global Volumes**.
4. Create a new volume, and click **Properties**.

5. If the **CR to LF's** checkbox is checked, click it to uncheck it.
6. Save your new volume definition.
7. You now can use the newly defined volume as usual. When MS Excel files are written to the UNIX directory being published as a CanOPI volume (from a PC), Mac OS clients will be able to access them without errors.

Note – *This installation must take place on a newly defined volume to avoid difficulties with existing Mac OS client files. The **CR to LF's** option must be turned off before using the volume to store files from the Mac OS client side.*

Using UNIX to AppleTalk Print Spoolers With Microsoft Windows

If your Windows machine has been configured so that it can directly access a UNIX printer, it will have the ability to print to a CanOPI UNIX to AppleTalk spooler as well. However, it is necessary to configure the Windows machine so that it does not send Control-D (^D) characters at the beginning of print jobs. This character will flush a print job that is being received by an AppleTalk printer. To prevent this:

1. On the Windows machine, edit the file `/win/win.ini`.
2. Search for the word **postscript**. Following this word, there will be an entry that reads:
`CtrlD=x`, where `x=1` (default) or `0`.
3. Change the entry to read `CtrlD=0`.
4. Save and close the file.

This will prevent print jobs that originate from the Windows machine from sending the Control-D character when printing to a UNIX spooler.

Working With an 8-bit Data Stream

In some cases in which Mac OS client print jobs are sent via CanOPI's AppleTalk to UNIX spooler to a serially connected printer, special characters (for example, bullets or trademarks) are not printed correctly. This problem arises because many printers' serial ports can not accept an 8-bit data stream (for example, they might use the 8th bit for flow control). When a Mac OS client sends PostScript data to a LaserWriter (or a CanOPI spooler), special characters are encoded in eight-bit binary form (if the PostScript is saved to disk, the special characters are encoded in an ASCII Octal form, so the problem does not occur when the PostScript is sent to a printer).

The best solution to this problem is to configure the printer to support an 8-bit data stream. Many printers have a DIP switch setting that achieves this support. Other printers require software configuration (downloading of PostScript code) to achieve this support. A possible solution is to create and download to the printer a PostScript file that may allow the printer to accept an 8-bit data stream:

1. Restart the printer.
2. Create a text file `/usr/spool/ushare/high_bit_fix` that contains the following text:

```
%!  
0000000000  
serverdict begin exitserver  
statusdict begin  
25 9600 3  
setscbatch  
end
```

3. Send this file to the printer by issuing the following command at a UNIX command line:

```
lpr -P<PRINTER> /usr/spool/ushare\  
/high_bit_fix
```
4. Try printing a Mac OS client job with problematic characters through the CanOPI spooler.

Another possible solution is to incorporate into CanOPI's spooler a program that converts the high-bit characters to a digestible form. This procedure may allow Mac OS print jobs to include special characters, but because it will cause CanOPI's spooler to expand high-bit set bytes into escaped-octal ASCII, Mac OS client print jobs containing binary-encoded images will probably fail to print (binary encoding of images is an application-specific procedure, so the frequency of problems printing to the modified CanOPI spooler is unpredictable):

1. Edit the `/ushare/bin/us2np` file and find a line resembling the line in boldface below. You should see lines like this:

```
370 # Sometimes, software RIPS need cr<->lf translation.
371 # But this does not work if the PostScript contains
372 # any Binary encoded images.
373 tr '\015' '\012' <$t1 >>$t7
374 mv $t7 $t1
```

2. Modify that line to incorporate CanOPI's `ex8` program:

```
370 # Sometimes, software RIPS need cr<->lf translation.
371 # But this does not work if the PostScript contains
372 # any Binary encoded images.
373 tr '\015' '\012' <$t1 |/ushare/bin/ex8 >>$t7
374 mv $t7 $t1
```

3. Edit the `/ushare/bin/qcap` file and modify the entry for your AppleTalk to UNIX spooler so that the `cvs` value is **12**:

```
SPN=LaserWriter@gop32:-Lp /ushare/bin/us2np\
-LLpr PostScript:\-LLn PostScript:-LLz gop32\
-LLpt ts:-LLcvs 12:
```

4. Restart CanOPI's print spooler, and try printing a Mac OS client job that contains problematic characters.

Updating from Helios EtherShare to IPT CanOPI

This section describes the steps you can perform to convert your system from using Helios EtherShare to IPT's CanOPI. The entire procedure must be performed for each volume that you wish to convert to CanOPI format.

Note – *Even though some of the steps below may look redundant, it is important to follow them in order outlined here for the most reliable result. (You should be logged in as the “root” user to perform all procedures.)*

1. Un-install EtherShare and install CanOPI as usual.
2. If CanOPI is running, stop all AFP system services by issuing the **usstop** command (see “usstop” on page 236).
/ushare/bin/usstop AFP
3. Double-check the stoppage of all AFP system services by issuing the following **grep** commands:
ps -ef | grep afpsess
ps -ef | grep afpd

If these commands return anything other than a reference to the **grep afpsess** or **grep afpd** commands themselves, indicating an AFP service still running, repeat step 2, above.

4. Define each volume that you wish to publish as a CanOPI volume by using CanOPI's ScriptableAdmin feature (see “Defining Global Volumes” on page 132).
5. Run the CanOPI conversion script (**es2us.sh**, located in the **ushare/bin** directory) on each volume you wish to convert to CanOPI format. This script will recursively convert all folders and files within the volume.
For example, to convert all files in the **/data** volume to uShare format, issue the following command:
find /data/. -exec es2us.sh "{}" \;

6. Build the cache by issuing the `build_cache.x` command (see “build_cache.x” on page 213):


```
usshare/bin/build_cache.x -v <absolute path
to root of volume> -i 2 -r
```
7. Start all system services by issuing the `usstart` command (see “usstart” on page 236):


```
/usshare/bin/usstart
```
8. Mount each volume to force the creation of all necessary uShare support files (`.desktop`, `.volrsrc`, et cetera).
9. Stop all AFP system services by issuing the `usstop` command (see “usstop” on page 236).


```
/usshare/bin/usstop AFP
```
10. Double check the stoppage of all AFP system services by issuing the following `grep` commands:


```
ps -ef | grep afpssess
ps -ef | grep afpd
```

 If these commands return anything other than a reference to the `grep afpssess` or `grep afpd` commands themselves, indicating an AFP service still running, repeat step 9, above.
11. Use the script `rmfolderrsrc.sh` (available in the `usshare/bin` directory) to remove the resource forks for all folders within the volume.
12. Remove the following files/directories from the root of each converted volume:


```
<absolute path to root of volume>/.dirids
<absolute path to root of volume>/.volrsrc
<absolute path to root of volume>/.Desktop
```

Warning – This refers to an EtherShare File, not the `.desktop`, CanOPI’s desktop Directory)

```
<absolute path to root of volume/Network\
Trash Folder
<absolute path to root of volume>\
```

```
/.rsrc/::volrsrc  
<absolute path to root of volume>/  
.rsr\ c/Network Trash Folder
```

13. Repeat steps 6 and 7.

You are now ready to use this volume with IPT's CanOPI.

13 – Troubleshooting & FAQs

This chapter provides a troubleshooting guide, answers frequently asked questions about CanOPI and its services, and gives instructions for getting help from IPT.

“Diagnostic Tools” on page 252 lists the UNIX and CanOPI commands you should be familiar with.

Common problems and questions related to specific categories are covered in the following tables:

- Installing and starting CanOPI Table 13-1 on page 252
- AppleShare – Table 13-2 on page 255
- Print Spooling – Table 13-3 on page 259
- Drag & Drop and OPI – Table 13-4 on page 261.

If you cannot find the answer to your question, “Technical Support” on page 261 tells you how to contact IPT Technical Support.

For information on configuring your CanOPI software to work with UNIX-dependent products (for example, software that manipulates data both in the UNIX and Mac OS client environments), see “Chapter 12 – Compatibilities”.

Troubleshooting Guide

This section briefly describes the diagnostic tools that you may use when troubleshooting your network and provides solutions to problems you might encounter when using CanOPI services.

Diagnostic Tools

When you attempt to diagnose a CanOPI problem, and before contacting IPT's technical support, you should be familiar with basic UNIX commands such as: **cd**, **ls**, **chown**, **chmod**, **ps**, **ping**, **ifconfig**, and **netstat**. In addition to these UNIX commands, you should be prepared to use the following CanOPI commands that reside in **/ushare/bin**:

```
atping
lwstatus
nbplkup
usgz
usiface
```

Read "Chapter 11 – CanOPICommands" for a detailed description of these commands.

Table 13-1: While Getting Started

Symptom/Question:	Solution:
When you enter your key, you receive a malformed key error message	You have entered a key of incorrect length. Make sure you have a key appropriate for your version of CanOPI.
When you test CanOPI, your default file server's name is " server-DemoOfCanOPI ".	You have entered an invalid key or no key when configuring your network.

Table 13-1: While Getting Started (Continued)

Symptom/Question:	Solution:
<p>While trying to start your CanOPI GUI in OpenWindows, an error is reported:</p> <pre>ld.so.1:\ /ushare bin/app_launch : fatal: libview.so: can't open file: errno=\ 2... and nothing appears.</pre>	<p>In some instances, the <code>\$LD_LIBRARY_PATH</code> variable is not set for the “root” user, or others who need access to CanOPI’s GUI. To correct the problem, the appropriate line below must be added to environment settings after the <code>OPENWINHOME</code> variable is defined.</p> <ul style="list-style-type: none"> • If you are using a CSHELL: In the <code>./cshrc</code> directory: <pre>setenv LD_LIBRARY_PATH \$OPENWINHOME/lib:/usr/lib</pre> • If you are using a BOURNE SH: In the <code>./profile</code> directory: <pre>LD_LIBRARY_PATH=\$OPENWINHOME/lib:/usr/lib export LD_LIBRARY_PATH</pre> <p>To verify the entry for <code>LD_LIBRARY_PATH</code> issue the command: <pre># echo \$LD_LIBRARY_PATH</pre> </p> <p>Once you have made the appropriate change, you will need to completely log out and log back in again for the changes to take effect. If you are using OpenWindows, this means exiting, logging out, then logging back in and restarting OpenWindows. You should now be able to access your CanOPI GUI.</p> <p>Note – <i>If you are not sure which shell you are using, issue: <code>echo \$shell</code>, and use the output to confirm your shell type.</i></p>

Table 13-1: While Getting Started (Continued)

Symptom/Question:	Solution:
<p>“During start-up of my CanOPI software, some unfamiliar messages appear. Should I be concerned?”</p>	<p>Although your CanOPI software has the ability to report errors in order to diagnose problems, some messages during start-up may appear alarming, but are in fact only a report of status. Some common messages are:</p> <p>/usr/lib/libc.so.1.7 has older revision than expected 8 This is simply stating that libc.so.1.7 is older than the “current” version. This message may be ignored.</p> <p>killng syslogd..... During start-up, CanOPI temporarily stops syslogd, the UNIX error manager, so that it may initialize a pipe that provides you with messages about CanOPI services during operation, error logging, etc. syslogd will be restarted.</p> <p>errmgr..... This message states the CanOPI’s error manager is being started. It is not an indication that there are problems during start-up.</p> <p>syslog err broken pipe error This message is displayed because syslog is started before CanOPI is started, so the pipe has not been created yet. When CanOPI starts, it creates the pipe and re-initializes syslog. This message may be ignored.</p>

Table 13-2: AFP

Symptom/Question:	Solution:
Mac OS clients (and other AppleShare clients) can't see your file server.	<p>Make sure your Mac OS client and Sun host are using the same protocol (for example, EtherTalk Phase I, or EtherTalk Phase II).</p> <p>Check your network's physical connections. If a gateway or router lies between your Sun host and Mac OS client, connect your Mac OS client directly to your Sun host (to bypass the router) and look for your spooler in the Mac OS client's Chooser. If your Mac OS client can see the host while directly connected, check to see that the router is capable of handling AFP, and that that ability is enabled (some routers can be configured to turn off a particular protocol).</p>
Mac OS clients (and other AppleShare clients) can't mount your file server's volumes.	<p>Make sure the clients have access privileges to the file server's volumes. Make sure clients attempting to log in have a valid UNIX user account. In the event you are using the <code>/ushare/etc.local/passwd</code> file to define your CanOPI user accounts, make sure there is an entry defined for each desired user.</p>
Mac OS clients (and other AppleShare clients) can't see files residing on a volume.	<p>Make sure the volume's privileges permit your Mac OS clients to "See Folders" and "See Files."</p> <p>Another possibility is that CanOPI's cache files may be corrupted or out of date. Make sure no clients have mounted the volume, then remove all <code>cache</code> files from the volume by issuing the following command at a UNIX command line: <code>cd <volume path></code>, where <code><volume path></code> is the UNIX path to the root level of the CanOPI volume. <code>rm ../rsrc/cache</code></p> <p>Repeat this step for any CanOPI volume experiencing this behavior, then remount the volume(s) on the Mac OS client side and confirm that the missing files have returned.</p>

Table 13-2: AFP (Continued)

Symptom/Question:	Solution:
Icons within a window are stacked on each other, and Mac OS clients can't rearrange the position of icons within the volume.	In Mac OS System 7 operating environments, you may separate icons that are stacked on top of each other by holding down the option key, and selecting Clean Up Window from the Special pull-down menu in the Finder. Only the owner of a volume/folder can permanently change the arrangement of icons.
"My file server performance seems slow. What should I do?"	If an AppleShare volume publishes a directory that contains an NFS mount point, you can adjust several volume attributes to affect performance. "Advanced Configuration" on page 156 describes these modifiable attributes. If no NFS mount points are published as CanOPI volumes and performance is slow, get a topological map of your network. See if there is any correlation between the speed deficiency and a particular subnet. This may indicate that there is a routing conflict. Make sure that if you have more than one "seed" router on your network, they are not seeding the same cable with conflicting zone information.
"Can my file server publish itself in more than one AppleTalk zone?"	No. Your CanOPI server may only be published in one zone. If you have multiple servers defined, they must also reside in the same zone.

Table 13-2: AFP (Continued)

Symptom/Question:	Solution:
<p>"My Network Trash Folder won't empty. Now what?"</p>	<p>If you are having trouble removing trash from a CanOPI directory:</p> <ol style="list-style-type: none"> 1. Unmount all CanOPI volumes from your Mac Os Client computers. 2. Login as the "root" user on your UNIX host, then while at the root level of each directory that is published as a CanOPI volume (<code>cd <CanOPI volume path></code>), issue: <pre>rm -R Network\ Trash\ Folder cd /ushare/bin ls -als grep .dafp</pre> Confirm that the files <code>.dafp</code> and <code>.dafp.sh</code> have ownership and permissions set to match those listed below: <p>Solaris:</p> <pre>.dafp: r-sr-xr-T, root, nobody .dafp.sh: r-xr--r--, root, root</pre> If these setting are incorrect, log in as the "root" user and issue: <pre>chown root /ushare/bin/.dafp chgrp nobody /ushare/bin/.dafp chmod 5550 /ushare/bin/.dafp chown root /ushare/bin/.dafp.sh chgrp root /ushare/bin/.dafp.sh chmod 544 /ushare/bin/.dafp.sh</pre> <p>SunOS:</p> <pre>.dafp: r-sr-xr-T, root, nogroup .dafp.sh: r-xr--r--, root, wheel</pre> If these setting are incorrect, issue: <pre>chown root /ushare/bin/.dafp chgrp nogroup /ushare/bin/.dafp chmod 5550 /ushare/bin/.dafp chown root /ushare/bin/.dafp.sh chgrp wheel /ushare/bin/.dafp.sh chmod 544 /ushare/bin/.dafp.sh</pre> <p>Then, remount your CanOPI volume, and see if the problem persists.</p>

Table 13-2: AFP (Continued)

Symptom/Question:	Solution:
<p>Occasionally, IPT's technical support staff may ask you to collect debugging data to help them analyze your CanOPI file server. To collect debugging data from CanOPI's afpsess.x process (in these instructions, "afpclient" refers to the username of a Mac Os client) follow the steps to the right:</p>	<ol style="list-style-type: none"> 1. Make sure the afpclient is NOT logged in to the CanOPI file server. 2. Issue the following commands at a UNIX command line: <pre>touch ~afpclient/afp.log touch ~afpclient/afp.bug chown afpclient ~afpclient/afp.???</pre> 3. Have afpclient log in to the CanOPI server from a Mac Os client. 4. Have afpclient prepare to recreate the problem. 5. Issue the following command at a UNIX command line: <pre>echo 16 > ~afpclient/afp.bug</pre> These steps cause the ~afpclient/afp.log file to grow. 6. Wait 15 seconds. 7. Have afpclient recreate the problem. 8. Wait 15 seconds. 9. Issue the following command at a UNIX command line: <pre>echo 0 > ~afpclient/afp.bug</pre> 10. Have afpclient log out of the CanOPI server. 11. Send the ~afpclient/afp.log file to IPT. 12. Remove both the ~afpclient/afp.bug file and the ~afpclient/afp.log file by issuing the following commands: <pre>rm ~afpclient/afp.log rm ~afpclient/afp.bug</pre>
<p>To collect debugging data from CanOPI's afpd process:</p>	<ol style="list-style-type: none"> 1. Issue the following command at a UNIX command line: <pre>echo 16 > /ushare/etc/afp.bug</pre> 2. Restart CanOPI's File Server service by issuing the command: <pre>/ushare/bin/usrestart afp</pre> These steps cause the /ushare/etc.local/afpd1.bug file to grow. 3. Recreate the problem 4. Issue: # <pre>echo 0 > /ushare/etc/afp.bug</pre> 5. Repeat step 2.

Table 13-2: AFP (Continued)

Symptom/Question:	Solution:
“I’m running Solaris 2.x, and my ‘guest’ user account access doesn’t work.”	Edit the <code>/etc/shadow</code> file to remove the characters NP or LK from the password field.

Table 13-3: Print Spooling

Symptom/Question:	Solution:
Mac OS clients (and other AppleShare clients) can't see your spooler.	<p>Make sure you have started the Print Spooler process. Make sure your Mac OS client and Sun host are using the same protocol (for example, EtherTalk Phase I or EtherTalk Phase II).</p> <p>Check your network’s physical connections. If a gateway or router lies between your Sun host and Mac OS client, connect your Mac OS client directly to your Sun host (to bypass the router) and look for your spooler in the Mac OS client’s Chooser. If your Mac OS client can see the spooler while directly connected, check to see that the router is capable of handling AFP, and that ability is enabled (some routers can be configured to turn off a particular protocol).</p>

AppleTalk to UNIX Spoolers

Mac OS clients (and other AppleShare clients) can see your spooler, but print jobs are not printed.	<p>Make sure you can print a PostScript file to your printer with a UNIX <code>lpr</code> command.</p> <p>Make sure you have specified the correct printer name in your spooler definition.</p>
---	---

Table 13-3: Print Spooling (Continued)

Symptom/Question:	Solution:
Errors are reported that look similar to: "Times Roman not licensed, using Courier", "Helvetica not licensed, using Courier", etc.	Use ScriptableAdmin's Print Spooling administration tool to confirm that the fonts file for AppleTalk printer has been defined correctly. Use this definition to locate the actual fonts file, and use a text editor to confirm that there is an entry for each permanently downloaded font on your printer. If this file does not appear to be correct, remove it and restart spooling (<code>/usshare/bin/usrestart splr</code>) to rebuild the file. Also, try selecting the option Unlimited Downloadable Fonts in the Page Setup menu of the application you are printing from on the Mac OS client.
Fonts are printed as bitmaps instead of scaled fonts.	Make sure you have created a fonts file that lists your printer's resident fonts and that you have correctly referenced this fonts file in your spooler definition. See the instructions for the appropriate spooler type in "Chapter 9 – Print Spooler Service" for more details.
Special characters such as bullets are not printed correctly.	If the fonts file for the printer contains fonts that are not permanently downloaded, some fonts may not print correctly. Confirm that the fonts file is accurate for the printer. In some cases, the printer may not be able to accept an 8-bit data stream. If you are using a serially connected printer and special characters print incorrectly, see "Working With an 8-bit Data Stream" on page 245.
UNIX to AppleTalk Spoolers	
UNIX clients' print jobs are not printed.	Make sure you have specified the correct LaserWriter name and zone in your spooler definition. Make sure that you can print directly to the LaserWriter by using CanOPI's <code>lwdq.x</code> program. See "Chapter 11 – CanOPICommands" for more information.
AppleTalk to UNIX to AppleTalk Spoolers	
How do I treat AppleTalk to AppleTalk spoolers?	These spoolers, for troubleshooting purposes, can be treated as a combination of an AppleTalk to UNIX and a UNIX to AppleTalk spooler.

Table 13-4: Drag & Drop and OPI

Symptom/Question:	Solution:
<p>When I try to use Drag & Drop, my high-resolution image appears in the folder I have dragged it to, but no "LowRes" folder and/or low resolution image appears.</p>	<p>Make sure that you have configured your folder for Drag & Drop, as described in "Chapter 4 – Drag & Drop and OPI". An opicconfig file must exist in the folder for which you want to activate Drag & Drop, or in a folder that contains the folder you are dragging images to).</p> <p>Make sure the opicconfig file contains the entry opi=true, along with all other options you want to define for the type of low-resolution image generation that is to be performed. See Table 4-1 on page 92 for more details.</p> <p>Make sure the processes iptopisrsvrd and iptevtlogd are running by issuing one of the following commands: Solaris: ps -ef grep ipt SunOS: ps -aux grep ipt Confirm that these processes appear in the list. If not, make sure the line opi is uncommented in the /ushare/etc/packages file, then issue: /ushare/bin/usrestart.</p>
<p>When I try to print an OPI document, all I get is the low-resolution image in the output.</p>	<p>Make sure that the usps_options file for the print spooler in question contains the entry docman=true, and docflags=<appropriate flags>. This can be controlled by using ScriptableAdmin and defining the OPI options for your print spooler. See Table 3-5 on page 83 for more details.</p>

Technical Support

If you have qualified for 30 days of free support, or if you have purchased a maintenance program from IPT, you can call IPT's technical support line:

(805) 541-3076

between 9:00 AM and 5:00 PM Pacific Time. In addition, after hours Emergency Support is available for a fee of \$100 per hour (weekdays), \$200 per hour (weekends - defined as 5:00 PM Friday to 9:00 AM Monday Pacific Time). Billing by credit card is preferred.

You can also contact the IPT technical support staff via email at

support@iptech.com.

When you contact IPT technical support, please be prepared to provide the following information:

- a description of your Sun host, that is, the hostid, model, and operating system version
- your version of CanOPI as indicated in the `/ushare/bin/VERSION` file, and
- a description of your problem.

Appendix A - Suggested Reading

This appendix provides information regarding:

- Minimum UNIX Knowledge Prerequisites
- Minimum AppleTalk Knowledge Prerequisites
- A Brief Introduction to AppleTalk Networking

Minimum UNIX Knowledge Prerequisites

In order to successfully install and configure CanOPI software, you should have the following knowledge of UNIX and your Sun host:

- You should be familiar with the concepts of “logging in” and the “login prompt.” You must know how to log in as the “root” user and must have the proper password.
- You should know what a “UNIX command line” is and how to enter simple commands at a UNIX command line.
- You should know how to list and change directories with the “**ls**” and “**cd**” commands and examine text files with the “**more**” command.
- If you plan to use **OpenWindows**, you should be familiar with how to start OpenWindows, use the mouse, and access pull-down menus. You should also be able to start a “shell tool” or “command tool” from the OpenWindows **Workspace** menu.

Suggested Reading Regarding UNIX and OpenWindows

For basic information about UNIX commands, read Sun Microsystems Inc.’s *Sun System User’s Guide* (part # 800-4826-10).

For a complete description of OpenWindows, read the following documents from Sun Microsystems Inc.:

- **for OpenWindows Version 2:**
OpenWindows Version 2 Installation & Start-Up Guide
(part # 800-4899-10)
OpenWindows Version 2 User's Guide (part # 800-4930-10)
- **for OpenWindows Version 3:**
OpenWindows Installation and Start-Up Guide
(part # 800-6029-10)
OpenWindows User's Guide (part # 800-6618-10)

For information related to TCP/IP networking and system administration in the Sun OS environment, read Sun Microsystems Inc.'s System & Network Administration (part # 800-3805-10).

Minimum AppleTalk Knowledge Prerequisites

In order to successfully install and configure CanOPI software, you should have the following knowledge of AppleTalk and Mac OS client computers:

- You should be familiar with the terms “EtherTalk” and “LocalTalk” and know how to determine what protocol(s) your Mac OS client computers are using.
- You should know how to physically connect your Mac OS client computer(s) and other AppleTalk devices to your Sun host.

Note – *If your Mac OS client computers are using their built-in LocalTalk interfaces, you must connect them to your Sun host by using an Ethernet to LocalTalk gateway (e.g., Shiva FastPath, Cayman GatorBox). If your Mac OS client computers are using Ethernet interfaces, they must be attached to the same Ethernet cable as your Sun host, or they must be connected to a cable that is connected to your Sun host's cable via an EtherTalk router.*

- If your Mac OS client computers have Ethernet interfaces, you should know how to use the Mac OS client Network Control Panel to select the EtherTalk driver.

Note – *There are two versions of EtherTalk; Phase I and Phase II. Phase II is the most widely used version, but devices on your network may use Phase I. Make sure all your Mac OS client computers use the same version by selecting the proper EtherTalk driver in each Mac OS client's Network Control Panel (the Phase I icon has two single-headed arrows and the Phase II icon has two doubleheaded arrows):*



A Brief Introduction to AppleTalk Networking

This section briefly introduces the basic terminology and concepts with which you should be familiar to successfully configure CanOPI's AppleTalk router. For detailed information about AppleTalk networking, protocols, and routing, read Apple Computer, Inc.'s *Planning and Managing AppleTalk Networks*.

Basic Terminology and Concepts

An AppleTalk network consists of network devices, and **nodes** (e.g., Mac OS client computers, laser printers, AppleTalk PCs), connected with network **cables**. Nodes communicate with each other by sending **packets** of data over the cables. In order for nodes to understand each others packets, the format of the packets conforms to one or more **protocols** (a protocol is like a language spoken by network devices). To insure delivery of packets to the proper destination, each node has a unique address consisting of two parts: the **network number** (the network's address) and the **node number** (the node's address within the network).

Network Cables and AppleTalk Protocols

The most common types of network cables used to connect AppleTalk nodes are **LocalTalk** and **Ethernet**. LocalTalk is the native hardware of Mac OS client computers (a Mac OS client

printer port is also its LocalTalk port). Ethernet is the native hardware of a Sun host (all Sun hosts have a built-in Ethernet port). The protocol used by nodes on an AppleTalk network is determined in part by the type of network cables connecting the nodes. When AppleTalk packets travel over LocalTalk cables, they conform to the **LocalTalk** protocol. When AppleTalk packets travel over Ethernet cables, they conform to the EtherTalk protocol (there are two versions of the EtherTalk protocol: **EtherTalk Phase I** and **EtherTalk Phase II**). Each node on an AppleTalk network must be equipped with hardware or software that allows it to use the correct protocol—this hardware or software is called an **AppleTalk Driver**.

Internets and Routers

Two or more AppleTalk networks can be combined to form one large **internet**. The individual networks within an internet are called **subnets**. Subnets are connected to the internet by devices called **routers**. If the subnets are using different protocols, routers translate the protocols when passing packets between subnets. To insure delivery of packets throughout the internet, routers assign a unique network number (or range of numbers) to each subnet. The complete list of network numbers assigned to an internet's subnets is called the **routing table**. AppleTalk routers can also assign to each subnet one or more **zone names** that provide a means for logically organizing nodes within the internet.

Seed and Non-Seed Routers

If a subnet has more than one router attached to it, only one of the attached routers need assign a network number to the subnet; all other attached routers can acquire the network number from this router. A router that actively assigns a network number to a subnet is called a **seed router**; a router that acquires a network number from a seed router is called a **non-seed router**. Each subnet in an internet must have at least one attached seed router. If a subnet has two or more attached seed routers, these routers must assign the same network number to their common subnet.

Router Configuration

When a seed router connects a subnet to an internet, it must assign to the subnet a unique network number and one or more AppleTalk zone names. The list of network numbers and zone names assigned by a seed router to its attached subnets is called the **router's configuration**. A seed router's configuration is dependent, in part, upon what protocols are being used on the attached subnets. Under the LocalTalk and EtherTalk Phase I protocols, a router can assign to a subnet only one network number and one zone name. Under the EtherTalk Phase II protocol, a router can assign to a subnet a range of network numbers (**cable range**) and a list of zone names (**zone list**).

Network Numbers and AppleTalk Zones

If there are no routers on an AppleTalk network, the network has a **default network number**. The default network number of an AppleTalk network is dependent upon what protocol is being used on the network. Under the LocalTalk and EtherTalk Phase I protocols, the default network number is 0 (zero). Under the EtherTalk Phase2 protocol, the default network number is the cable range 65280 through 65534. In the absence of a router, an AppleTalk network has no associated zone names.

When there are routers on an AppleTalk network, they must assign to each subnet of the internet a unique network number or cable range (valid network numbers are 1 to 65279). The routers can optionally assign to each subnet one or more AppleTalk zone names. Zone names provide a logical organization to the internet making it easier for users to locate particular nodes. For instance, when a Mac OS client user selects a LaserWriter printer with the Chooser application, the Chooser displays a list of the internet's zones; by selecting an entry from the list of zones, the user can view only those printers that reside in the selected zone. Without the assignment of zones, the user would have to view a list of *all* printers on the internet.

When a node is added to an AppleTalk internet with multiple zones (e.g., when you start a Mac OS client computer), it must determine its **default zone** (the zone in which it resides). If the

subnet to which the node is attached is using the LocalTalk or EtherTalk Phase I protocol, the node's default zone is the zone name assigned to the subnet (because under these protocols, only one zone name can be assigned to a subnet). If the attached subnet is using the EtherTalk Phase II protocol, and the subnet has been assigned a list of zones by an EtherTalk Phase II router, the node must select its default zone from the subnet's zone list.

Node Addresses and NBP

When a node is added to an AppleTalk network, it must acquire a unique address consisting of a network number and a node number. A node determines the network number (or cable range) of the network to which it is attached by broadcasting packets that request this data of the nearest router. If no router responds to the node's request, the node acquires the default network number. If a router responds, the node acquires an appropriate network number. After a node acquires the proper network number, it must acquire a node number that is unique within its network. A node acquires a unique number by randomly choosing a number and broadcasting packets that inform other devices on the network of this randomly chosen number. If another device has already acquired this number, the node chooses another number and repeats its broadcast. Eventually, the node chooses a number that is unique within its network, and that number becomes the node's address.

Generally, people using AppleTalk nodes do not have to deal with network numbers and node numbers — only when configuring an AppleTalk router does a user have to be sensitive to these numeric addresses. Instead, users can refer to nodes by **name**. A portion of the AppleTalk protocol known as **NBP** (Name Binding Protocol) handles the association of node names with numeric addresses. A single node can have more than one name, in which case each name is referred to as an **entity**.

AppleTalk Nodes and Entity Types

In addition to having a name, each AppleTalk node has a **type** that identifies its role within the network (for instance, a device of type "LaserWriter" is recognized by other nodes on the net-

work as a printing device). When a single node has more than one name, each entity has its own type (for instance, a Macintosh 2fx computer running File Sharing appears to the network as an entity of type “AFPServer” and an entity of type “Macintosh 2fx”). When your Sun host is running CanOPI software, it typically appears to your network as several entities depending on what CanOPI services you are using (for instance, if you’re using CanOPI’s File Server and Print Spooler services, your Sun host appears as one or more entities of type “AFP Server” and one or more entities of type “LaserWriter”).

Appendix B - Advanced Configuration of CanOPI

This appendix provides advanced configuration instructions for CanOPI including:

- Issues to be considered before configuring CanOPI's AppleTalk router.
- The steps involved in creating an advanced configuration
 - defining CanOPI's AppleTalk driver configuration,
 - activating network interfaces for CanOPI,
 - configuring CanOPI's AppleTalk router,
 - activating CanOPI's AppleTalk router, and
 - configuring CanOPI's default interface and zone.
- Tables describing the modifiable parameters of the following ScriptableAdmin files
 - group defaults,
 - users defaults,
 - AFP server defaults,
 - AF volumes defaults, and
 - `.iptadminrc` preferences.

Advanced Configuration of CanOPI

To allow your Sun host to communicate with your AppleTalk network, CanOPI loads an AppleTalk driver into your Sun host's kernel. The type of AppleTalk driver loaded depends upon what protocol CanOPI will use over your Sun host's network interface(s) (only one protocol can be used at a time). CanOPI can

use either the EtherTalk Phase I or EtherTalk Phase II (default) protocol over your Sun host's Ethernet interface(s). If your Sun host has more than one network interface (including any combination of Ethernet interfaces), you must decide what interface(s) to activate for CanOPI (by default your Sun host's built-in Ethernet interface is active). If you decide to activate two or more network interfaces for CanOPI, you may have to configure CanOPI's AppleTalk router.

Warning – To configure CanOPI's drivers and AppleTalk router, you must edit several CanOPI configuration files. If you use this feature, take great care to ensure that CanOPI's router configuration does not conflict with your network's existing routing table.

Before you configure CanOPI's drivers and AppleTalk router, you need to answer the following questions:

- Does CanOPI have to be a router?
- Are there AppleTalk routers on your network?
- What is your network's routing table?
- How are network numbers expressed?

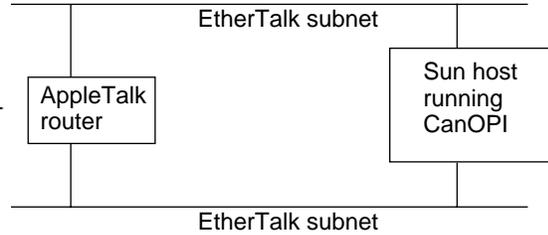
Does CanOPI Have to be a Router?

If your Sun host has only one network interface over which you want to provide CanOPI services, you do not have to configure CanOPI as a router. You do have the option of configuring CanOPI as a router over a single Ethernet interface if your AppleTalk network is using the EtherTalk Phase II protocol, for example, if you want to define multiple AppleTalk zones for organizational purposes, or if you have more than 254 AppleTalk devices on your network.

If your Sun host has more than one network interface over which you want to provide CanOPI services, you **must** configure CanOPI as a router unless another AppleTalk router has already connected the subnets to which your Sun host is attached. For example, if your Sun host has two Ethernet interfaces connected

to independent AppleTalk networks, CanOPI must be configured as a seed router unless another AppleTalk router has connected the two subnets and is the seed router:

If an AppleTalk router has connected multiple subnets to which your Sun host is attached, CanOPI does not have to be configured as a seed router.

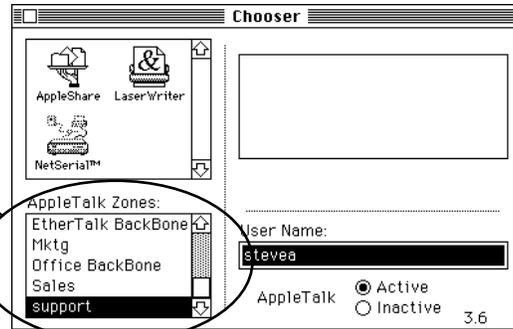


Are There AppleTalk Routers on Your Network?

When adding a router to your AppleTalk network, you must determine if there are other AppleTalk routers on the network. If a Network Administrator is responsible for this information, contact this person. If you are responsible for managing your AppleTalk network, there are several methods you can use to determine if there are AppleTalk routers on your network:

- **Method 1** - Open the Chooser on a Mac OS client. If you see a list of AppleTalk zones, your network definitely has one or more AppleTalk routers:

If the Mac OS client Chooser displays a list of AppleTalk zones, your network definitely has one or more AppleTalk routers.



If the Mac OS client Chooser does not display a list of zones, this fact does not prove the absence of AppleTalk routers on your network —your network’s AppleTalk routers

might be assigning a single zone name to the entire network, in which case the Mac OS client Chooser does not display the zone name.

- **Method 2** - Perform an analysis of the AppleTalk traffic on your network and look for packets of type RTMP (Routing Table Maintenance Protocol). If you see RTMP packets, your network definitely has one or more AppleTalk routers. This method is suitable only for experts in network traffic analysis, so you should talk to your network administrator.
- **Method 3** - Look at CanOPI's network address using a CanOPI command. Because this method reports the network address that CanOPI has acquired from your network, its accuracy depends on the integrity of CanOPI's physical and logical connection to your network—this method can be misleading if CanOPI has failed to communicate with your network because of a bad physical connection or improper AppleTalk driver configuration. Make sure CanOPI is running and issue the following command:

```
/ushare/bin/usiface
```

- The output of this command looks like this:

```
Number of Interfaces registered : 1
=====
  AT_if  UNIX_if  Address(Net.Node)  Protocol
=====
* et0    1e        6.253              EtherTalk Phase 2 (range: 6-9)
=====
```

In the output above, CanOPI's network address is 6, indicating that the attached network has one or more AppleTalk routers. If CanOPI's AppleTalk address is any number other than default network numbers reserved for networks that have no router, your network definitely has one or more AppleTalk routers.

Note – *The default network number of an AppleTalk network is dependent upon what protocol is being used on the network. Under the LocalTalk and EtherTalk Phase I protocols, the default network number is 0 (zero). Under the EtherTalk Phase II protocol, the default network number is the cable range 65280 through 65534.*

What Is Your Network's Routing Table?

If your network has one or more AppleTalk routers, the complete list of network numbers assigned to the internet's subnets is called the **routing table**. When adding a router to your internet, you must properly configure the new router so that it does not conflict with the existing routing table. If someone else is responsible for this information, contact this network administrator. If you are responsible for managing your AppleTalk network, there are several methods you can use to determine your network's routing table:

- **Method 1** - The best way to determine your AppleTalk network's routing table is to document the configuration of each AppleTalk router. This method is preferred, because a careful analysis of each router's configuration is the only way to ensure that no conflict exists with your network's routing table:
 - Draw a schematic of your network and indicate the location of each AppleTalk router
 - Determine the configuration of each AppleTalk router. The procedure for determining a router's configuration differs according to the type of router. Shiva FastPath routers, for instance, are configured with the "FastPath Manager" application on a Mac OS client.
- **Method 2** - Another way to determine your network's routing table is to analyze the AppleTalk traffic on your network and decipher packets of type RTMP (Routing Table Maintenance Protocol). This method is suitable only for experts in network traffic analysis, so you should talk to your network administrator.
- **Method 3** - A third way to view your network's routing table is by using a CanOPI command that queries the nearest AppleTalk router for a routing table report. Because this method receives routing table data from only one router, it does not necessarily reveal conflicts that may exist in the routing table. With CanOPI running, issue the following command:

```
/ushare/bin/usgz
```

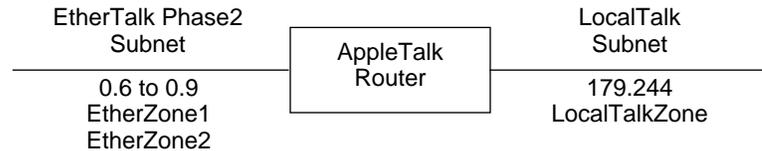
The output of this command looks like this:

```
gateway at 6.234 reports 3 zones:
  zone (EtherZone1) has nets:
    0.6 (6, 0x0006) to 0.9 (9, 0x0009) hops= 0
  zone (EtherZone2) has nets:
    0.6 (6, 0x0006) to 0.9 (9, 0x0009) hops= 0
  zone (LocalTalkZone) has nets:
    179.244 (46068, 0xb3f4) hops= 0
```

```
Flags: 0x00 <zone (EtherZone1) is valid,mul-
ticast,more than one zone>
Cable Range is 6(0x0006,0.6), 9(0x0009,0.9)
MultiCast address is 09:00:07:00:00:8 for
zone (EtherZone1)
```

```
Flags: 0x00 <zone (EtherZone2) is valid,mul-
ticast,more than one zone>
Cable Range is 6(0x0006,0.6), 9(0x0009,0.9)
MultiCast address is 09:00:07:00:00:a for
zone (EtherZone2)
```

In the output above, the routing table report indicates that three zone names are associated with the network, and the zone names' associated network numbers are displayed. This output describes a network with two subnets: an EtherTalk Phase II subnet (network address 0.6 to 0.9, zone names "EtherZone1" and "EtherZone2") and a LocalTalk subnet (network address 179.244, zone name "LocalTalkZone"). This network can be illustrated by the following schematic:



How Are Network Numbers Expressed?

There are three common ways to express AppleTalk network numbers:

- as **decimal** (base 10) numbers from 1 to 65279
- as **hexadecimal** (base 16) numbers from 0001 to FEFF
- as two-byte **dotted** numbers from 0.1 to 254.255

When configuring CanOPI's AppleTalk router, you will deal mainly with decimal and dotted notations. To convert a decimal number to its dotted form:

- divide the number by 256. The resulting whole number is the first byte in its dotted form.
- multiply the first byte of the dotted form (derived in the previous step) by 256 and subtract the resulting number from the original decimal number. The resulting number is the second byte in its dotted form.

For example, the decimal number 46068 is expressed in dotted notation as 179.244; the following calculation was performed to derive this dotted form:

$$46068 / 256 = 179.953\dots$$

(179 is the first byte of the dotted form.)

$$46068 - (179 * 256) = 244$$

(244 is the second byte of the dotted form.)

To convert a network address in dotted form to its decimal equivalent, multiply the first byte of the dotted form by 256 and add to the resulting number the second byte of the dotted form. For example, the dotted number 179.244 is expressed as 46068 in decimal notation; the following calculation was performed to derive this decimal form:

$$(179 * 256) + 244 = 46068$$

Advanced CanOPI Configuration Steps

The following steps are required to create an advanced configuration, and are explained in this subsection:

- defining CanOPI's AppleTalk driver configuration,
- activating network interfaces for CanOPI,

- configuring CanOPI's AppleTalk router,
- activating CanOPI's AppleTalk router, and
- configuring CanOPI's default interface and zone.

Warning – You must ensure that CanOPI's router configuration does not conflict with your network's existing routing table. A routing table conflict can interrupt network services for nodes throughout your internet. If you have any doubts about how CanOPI's AppleTalk router should be configured, contact your network administrator. If you are responsible for managing your AppleTalk network, read "Preparing to Install CanOPI" on page 18 before configuring CanOPI's AppleTalk router.

Defining CanOPI's AppleTalk Driver Configuration

To allow your Sun host to communicate with your AppleTalk network, CanOPI loads an AppleTalk driver into your Sun host's kernel. The type of AppleTalk driver loaded depends upon what protocol(s) CanOPI must use over your Sun host's network interface(s). To control what AppleTalk drivers CanOPI loads, complete the following steps:

1. Edit the `/ushare/etc.local/config` file, and make one of two possible entries:
 - **et1** - for EtherTalk Phase I only
 - **et2** - for EtherTalk Phase II only

For example, to load a driver for EtherTalk Phase2 only, enter **et2** in the `config` file.

2. Issue the following commands at a UNIX command line:

```
cd /ushare/etc.local
rm ./phase?
touch ./phaseX
```

where **x** is 1 or 2, depending upon whether you want to use the EtherTalk Phase I or EtherTalk Phase II protocol over your Ethernet interface(s).

If you will be making additional changes to your CanOPI configuration, you can skip this step until the configuration is complete.

Only users who have changed their AppleTalk Phase need to issue this command.

3. Restart all CanOPI processes by issuing the following commands:

```
/ushare/bin/usstop ALL
/ushare/bin/unload_drivers.sh
/ushare/bin/usstart
```

Read “Chapter 7 – Processes” for more information about CanOPI’s processes.

Activating Network Interfaces for CanOPI

By default, your Sun host’s built-in Ethernet interface is active for CanOPI. If you want to activate one or more other network interfaces for CanOPI, or plan to activate a FDDI, ATM or 100BaseT interface, perform the following steps:

1. Edit the `/ushare/etc.local/interfaces` file and make an entry for each interface over which you want to provide CanOPI services in the form:

```
<interfacename>:<serialnumber>:<protocol>
```

where `<interfacename>` is the name of the interface, for example, “`le`” or “`ie`”; `<serialnumber>` is the numeric identifier of the interface, for example, “`0`,” “`1`,” or “`2`”; and `<protocol>` is the EtherTalk protocol (I or II) CanOPI uses over the specified interface. For example, if your Sun host has two Ethernet interfaces (`le0` and `le1`) and you want CanOPI to use the EtherTalk Phase II protocol over both interfaces, make the following entries in the `interfaces` file:

```
le:0:2
le:1:2
```

FDDI, ATM & 100BaseT users will commonly find entries other than `lo` (loopback interface) or `le` (built-in Ethernet). Use the `netstat -in` command described on the following page to confirm you are using the correct interface name.

Note – Do not mix EtherTalk protocols—you must use the same EtherTalk protocol over all active Ethernet interfaces.

To find your network interface names, use the “**netstat -in**” command, which will generate an output similar to the one below:

Name	Mtu	Net/Dest	Address	Ipkts	Ierrs	Opkts	Oerrs	collis	Queue
le0	1500	192.9.200.0	192.9.200.109	554106	16	338702	0	3917	0
le1	1500	192.9.201.0	192.9.201.109	323285	1	270944	0	502	0
lo0	1536	127.0.0.0	127.0.0.1	49293	0	49293	0	0	0

If you will be making additional changes to your CanOPI configuration, you can skip this step until the configuration is complete.

Only users who have changed their AppleTalk Phase need to issue this command.

- Restart all CanOPI processes by issuing the following commands:

```
/ushare/bin/usstop ALL
/ushare/bin/unload_drivers.sh
/ushare/bin/usstart
```

Read “Chapter 7 – Processes” for more information about CanOPI’s processes.

Configuring CanOPI’s AppleTalk Router

To configure CanOPI’s AppleTalk router, you must assign a network number and zone name to each subnet for which CanOPI is to be a **seed** router. (Each subnet has at least one **seed** router, which is the router responsible for assigning a network number to that subnet.) If you have any doubts about how CanOPI’s AppleTalk router should be configured, contact your network administrator. If you are responsible for managing your AppleTalk network, read “Preparing to Install CanOPI” on page 18 before configuring CanOPI’s AppleTalk router. To configure CanOPI’s AppleTalk router, complete the following steps:

- Edit the `/ushare/etc/networks` file and make an entry for each active interface for which CanOPI is to be a **seed** router in the form:

Subnets using the LocalTalk or EtherTalk Phase I protocol can have only one network number.

```
<interface>:<number>
```

where `<interface>` is CanOPI’s name for an active interface (for example, `et0`, `et1`, `lt0`), and `<number>` is the network number for the interface’s attached subnet **in dotted notation** (you can see a list of CanOPI’s active interfaces by

Subnets using the EtherTalk Phase II protocol can have a range of network numbers.

issuing the **usiface** command as described in “usiface” on page 233). If an interface’s attached subnet is using the EtherTalk Phase II protocol, you can assign a range of network numbers (cable range) to the subnet by making an entry in the form:

→ **<interface>:<start>:<end>**

where **<start>** is the first number and **<end>** is the last number in the cable range.

Note – Network numbers entered in the `networks` file must be expressed in dotted notation. Read “How Are Network Numbers Expressed?” on page Appendix B - vi for instructions on converting network numbers to dotted notation.

Subnets using the LocalTalk or EtherTalk Phase I protocol can have only one zone number.

2. Edit the `/ushare/etc/zones` file and make an entry for each active interface for which CanOPI is to be a **seed** router in the form:

→ **<zone>:<interface>**

where **<interface>** is CanOPI’s name for an active interface (for example, `et0`, `et1`), and **<zone>** is a zone name for the interface’s attached subnet. (You can see a list of CanOPI’s active interfaces by issuing the **usiface** command as described in “usiface” on page 233.) If an interface’s attached subnet is using the EtherTalk Phase II protocol, you can assign a list of zones to the subnet by making multiple entries for that interface, for example:

Subnets using the EtherTalk Phase II protocol can have a list of zone names.

→ **EtherZone1:et0**
EtherZone2:et0
EtherZone3:et1

Note – The `zones` file can also contain an entry that selects CanOPI’s default zone. Read “Configuring CanOPI’s Default Interface and Zone” on page Appendix B - xii for more information about making entries in this file.

If you will be making additional changes to your CanOPI configuration, you can skip this step until the configuration is complete.

Only users who have changed their AppleTalk Phase need to issue this command.

3. Restart all CanOPI processes by issuing the following commands:

```
/ushare/bin/usstop ALL
/ushare/bin/unload_drivers.sh
/ushare/bin/usstart
```

Read “Chapter 7 – Processes” for more information about CanOPI’s processes.

Activating CanOPI’s AppleTalk Router

CanOPI’s AppleTalk router is not active until its `atnbpd` process is started with a `-g` flag. To activate CanOPI’s AppleTalk router, complete the following steps:

1. Edit the `/ushare/etc.local/flags` file and make the following entry:

```
-g
```

Note – The `flags` file can also contain an entry that selects CanOPI’s default interface. Read “Configuring CanOPI’s Default Interface and Zone” on page Appendix B - xii.

If you will be making additional changes to your CanOPI configuration, you can skip this step until the configuration is complete.

Only users who have changed their AppleTalk Phase need to issue this command.

2. Restart all CanOPI processes by issuing the following commands:

```
/ushare/bin/usstop ALL
/ushare/bin/unload_drivers.sh
/ushare/bin/usstart
```

Read “Chapter 7 – Processes” for more information about CanOPI’s processes.

Configuring CanOPI’s Default Interface and Zone

Each node on an AppleTalk internet resides in one of the internet’s zones—the zone in which an AppleTalk node resides is referred to throughout this guide as the node’s **default zone**. Most AppleTalk nodes have a single active network interface, so the node’s default zone is the zone assigned to the interface’s

attached subnet—the interface whose attached subnet contains the node’s default zone is referred to throughout this guide as the node’s **default interface**. If a node is functioning as an AppleTalk router and has more than one active network interface, the node must select one of its active interfaces as its default interface, so the node’s default zone is the zone assigned to the default interface’s attached subnet.

If a node’s default interface is attached to a subnet using the LocalTalk or EtherTalk Phase I protocol, the node resides in the zone assigned to that subnet (because under these protocols, only one zone name can be assigned to a subnet). If a node’s default interface is attached to a subnet using the EtherTalk Phase II protocol and a list of zones has been assigned to the subnet by an EtherTalk Phase II router, the node must select the zone in which it resides.

There are two conditions under which you may have to set CanOPI’s default interface/zone:

- your Sun host has multiple interfaces activated for CanOPI
- CanOPI’s default interface is attached to a subnet that has been assigned a list of zones by an EtherTalk Phase II router

Note – *After setting CanOPI’s default interface/zone, you must restart all CanOPI processes for the change to take affect.*

Steps for Configuring CanOPI’s Default Interface and Zone

To configure CanOPI’s default interface and zone, perform the following steps:

1. Edit the `/ushare/etc.local/flags` file and set CanOPI’s default interface by making an entry in the form:

```
-i <interface>
```

where `<interface>` is CanOPI’s name for an active interface (for example, `et0`, `et1`, `lt0`). (You can see a list of CanOPI’s active interfaces by issuing the `usiface` command as described in “usiface” on page 233.)

The **flags** file also can contain an entry that activates CanOPI's AppleTalk router as described in "Activating CanOPI's AppleTalk Router" on page Appendix B - xii. If the **flags** file contains a "-g" to activate the router, make your entry in the form:

```
-g -i <interface>
```

Note – If the default interface's attached subnet is using the LocalTalk or EtherTalk Phase I protocol, setting CanOPI's default interface also sets CanOPI's default zone, so you can skip to step 3 (because under these protocols, only one zone name can be assigned to a subnet). If the default interface's attached subnet is using the EtherTalk Phase II protocol, and the subnet has been assigned a list of zones by an EtherTalk Phase II router, you must complete step 2 to select CanOPI's default zone from the subnet's list of zones.

2. Edit the **/ushare/etc/zones** file and set CanOPI's default zone by making an entry in the form:

```
<zone>:<interface>:*
```

where **<interface>** is CanOPI's name for the default interface you set in step 1, and **<zone>** is the name of a zone assigned to the default interface's attached subnet.

The **zones** file can also contain entries related to CanOPI's AppleTalk router, as described in "Configuring CanOPI's AppleTalk Router" on page Appendix B - x. If you have previously configured CanOPI as a seed router for an EtherTalk Phase II subnet attached to the default interface and you have assigned a list of zones to the attached subnet, you select one of these zones as CanOPI's default zone by appending ":*" to an entry in the **zones** file; for example, if CanOPI is a seed router for two subnets using EtherTalk Phase II, each attached to an Ethernet interface on your Sun host, and CanOPI's default zone is "EtherZone3", the **zones** file might look like this:

When CanOPI's AppleTalk router is assigning a zone list to an EtherTalk Phase2 subnet attached to the default interface, set CanOPI's default zone by appending ":*"

```
EtherZone1:ed0
EtherZone2:et0
EtherZone3:et1:*
EtherZone4:et1
```

In this example, ":*" is appended to an entry in the `zones` file, so the "EtherZone2" zone is set as CanOPI's default zone.

If you will be making additional changes to your CanOPI configuration, you can skip this step until the configuration is complete.

3. Restart all CanOPI processes by issuing the following commands:

```
/ushare/bin/usstop ALL
/ushare/bin/unload_drivers.sh
/ushare/bin/usstart
```

Only users who have changed their AppleTalk Phase need to issue this command.

Read "Chapter 7 – Processes" for more information about CanOPI's processes.

If this is a new installation, you can proceed to "Chapter 3 – ScriptableAdmin" for details on how to customize your CanOPI files servers and volumes.

Modifiable Parameters for ScriptableAdmin Files

The following tables describe the parameters and give the default settings of the five ScriptableAdmin files:

- Group Defaults
- Users Defaults
- AFP Server Defaults
- AFP Volumes Defaults
- `.iptadminrc` Preferences.

The defaults can be changed to customize your ScriptableAdmin settings.

Table 13-5: Group Defaults File

Parameter	Description
Name	<p>“Name” specifies a default name to be applied to any group that is created without a name being specified. The name will be enumerated if the named group already exists.</p> <p>Default Name: group</p>
StartGID	<p>“StartGID” is the minimum Group ID for new groups.</p> <p>Default StartGID: 1000</p>
Password	<p>“Password” specifies the default password for new groups. If left empty, then no password will be used. CanOPI is fully AppleShare-compliant, and supports login by group. For this reason it is recommended that all group accounts have passwords.</p> <p>Default Password: (blank, no password)</p>

Table 13-6: User Defaults File

Parameter	Description
Name	<p>“Name” is the base name of any new user that is created without a name being specified.</p> <p>Default Name: user</p>
InitialName	<p>“InitialName” indicates which name (either first or last) will be initialized when creating a new user with a specified full name, that is, with “first” as the default, then “Tom Jones” will translate to “tjones”, and with “last” to “tomj”.</p> <p>Default InitialName: last</p>
StartUID	<p>“StartUID” indicates minimum User ID for new users.</p> <p>Default StartUID: 1000</p>
DefaultGroup	<p>“DefaultGroup” specifies the name of the user’s default group. New files created by the user will have this as the owning group. You must guarantee that this group always exists. IPT’s administrative tools guarantee that the group “nogroup” always exists.</p> <p>Default DefaultGroup: nogroup</p>

Table 13-6: User Defaults File (Continued)

Parameter	Description
Shell	“Shell” specifies the user’s default shell. Default Shell: <code>/bin/false</code> (no UNIX log-in allowed)
Home	“Home” is the default directory of all new users. Default Home: (no directory specified)
Password	“Password” specifies the default password for new users. Default Password: * (User will be unable to log-in.)

Table 13-7: AFP Server Defaults

Parameter	Description
Name	“Name” is the default name of new CanOPI servers. Default Name: Server
AllowGuests	“AllowGuests” if set to true will allow guests to log in. Note: A user “guest” must also exist in the <code>/etc/passwd</code> file with no password. Default AllowGuests: true
AFPFlags	“AFPFlags” sets various AFP flags for the CanOPI server. This is a bitfield. See Table 8-1 on page 157 for more information. Default AFPFlags: 11
MaxUsers	“MaxUsers” sets the maximum number of CanOPI users allowed on the server at any one time. Note: This value is still restricted by the number of users on your CanOPI license. Default MaxUsers: 64
AFPSessProg	“AFPSessProg” is the program that the user connects to when logging in to a CanOPI server. You should not modify this field unless directed to by an IPT technical support representative. Default AFPSessProg: <code>/ushare/bin/afpsess.x</code>
ReadXSize	“ReadXSize” is the read transaction size. You should not modify this field unless directed to by an IPT technical support representative. Default ReadXSize: 8

Table 13-7: AFP Server Defaults (Continued)

Parameter	Description
WriteXSize	“WriteXSize” is the read transaction size. You should not modify this field unless directed to by an IPT technical support representative. Default WriteXSize: 8
AFPVersion	“AFPVersion” is the AFP version to emulate. You should not modify this field unless directed to by an IPT technical support representative. Default AFPVersion: 21
PasswordExchange	“PasswordExchange” specifies the method of password exchange for the server. The following values are legal: Clear - Normal <code>/etc/passwd</code> accounts are used, and passwords are passed by clear text from client to server. 1way - Utilizes the uShare password file, and implements a 1-way random number password exchange. 2way - Utilizes the CanOPI password file, and implements a 2-way random number password exchange. Default PasswordExchange: clear
ExportHomes	“ExportHomes” specifies whether users’ home directories will be published by CanOPI servers. Default ExportHomes: true

Table 13-8: AFP Volume Defaults

Parameter	Description
Name	“Name” is the name that new shared folders will be given. Default Name: untitled shared folder
Password	“Password” is the password that must be entered when a user attempts to access this shared folder. If this is left blank, then no password is required. Default Password: (blank, no password)
UserAccessList	“UserAccessList” is a comma-delimited list of users who have access to this shared folder. If this is not blank, then only the users listed will be able to see the volume. Default UserAccessList: (blank, no access restrictions)

Table 13-8: AFP Volume Defaults (Continued)

Parameter	Description
GroupAccessList	“GroupAccessList” is a comma-delimited list of groups whose members have access to this shared folder. If this is not blank, then only members of the groups listed will be able to see the volume. Default GroupAccessList: (blank, no access restrictions)
Flags	“Flags” is a bitfield that specifies certain flags for this volume. See Table 8-2 on page 163 for details. Default Flags: 0
MultiFormatAware	“MultiFormatAware” sets whether CanOPI will be able to read other file types, for example, AppleSingle or AppleDouble. If false, then only the IPT format is recognized. Note: Setting this flag to true could degrade the performance of your CanOPI server. Default MultiFormatAware: false
WriteFormat	“WriteFormat” specifies the format that CanOPI will use to write resource information. The following are valid values: adf - AppleDouble format asf - AppleSingle format ipt - IPT format Default WriteFormat: ipt

Table 13-9: .iptadminrc Preferences

Parameter	Description
GENERAL PREFERENCES	
PPCTimeOut	“PPCTimeOut” is the number of seconds that the scripting daemon will remain active while it is idle. After this amount of time has expired, the user will be required to re-authenticate before any more changes can be made. Default PPCTimeOut: 600 (10 minutes)
SynSecs	“SynSecs” is the number of seconds between updates of the configuration files. Any writes still to be performed after this many seconds will take place, and any changed files will be re-read. Default SynSecs: 1

Table 13-9: .iptadminrc Preferences (Continued)

Parameter	Description
AdminGroup	“AdminGroup” is the group that is granted administrative access. All users in this group will be able to modify administrative data. Default AdminGroup: IPTAdmin
ProtectedDirs	“ProtectedDirs” is a comma-delimited list of protected directories. Listed directories ending in a slash are considered recursively protected. Default ProtectedDirs: /, /usr, /etc/, /dev/, /lost+found/, /var/, /bin/, /usr/bin/, /usr/lpp/.
USERS AND GROUPS PREFERENCES	
UserSpecFile	“UserSpecFile” is the path to the file that contains the user specifiers. This file will be created if it does not exist. Default UserSpecFile: /ushare/Admin/data/UserSpecFile.
GroupSpecFile	“GroupSpecFile” is the path to the file that contains the group specifiers. This file will be created if it does not exist. Default GroupSpecFile: /ushare/Admin/data/GroupSpecFile.
UserGroupStringFile	“UserGroupStringFile” points to a location where the users and group administrative daemons will look for their strings. Default UserGroupStringFile: /ushare/Admin/iptugadmind.strings.
UserGroupSocket-Path	“UserGroupSocketPath” is the path to where iptugadmind will make its UNIX socket connection. Default UserGroupSocketPath: /ushare/Admin/data/iptugadmind.socket.
IPTPasswdFile	“IPTPasswdFile” specifies the location of the IPT Password file which will keep the clear text password so that CanOPI can handle 1-way/2-way encryption. This file should be owned by “root” with the following permissions: rw-----. Default IPTPasswdFile: /ushare/etc.local/passwd.
UserDefaults	“UserDefaults” specifies the path to the user defaults file. Default UserDefaults: /ushare/Admin/UserDefaults.

Table 13-9: .iptadminrc Preferences (Continued)

Parameter	Description
GroupDefaults	“GroupDefaults” specifies the path to the group defaults file. Default GroupDefaults: <code>/ushare/Admin/GroupDefaults</code> .
FILE SHARING PREFERENCES	
AFPServerSpecFile	“AFPServerSpecFile” is the path to the file that contains the AFP server specifiers. This file will be created if it does not exist. Default AFPServerSpecFile: <code>/ushare/Admin/data/AFPServerSpecFile</code> .
BindingSpecFile	“BindingSpecFile” is the path to the file that contains the binding specifiers. This file will be created if it does not exist. Default AFPServerSpecFile: <code>/ushare/Admin/data/BindingSpecFile</code> .
FileSharingString-File	“FileSharingStringFile” points to the location where the file sharing administrative daemon will look for its strings. Default FileSharingStringFile: <code>/ushare/Admin/iptfsadmind.strings</code> .
FileSharingSocket-Path	“FileSharingSocketPath” is the path to where <code>iptfsadmind</code> will make its UNIX socket connection. Default FileSharingSocketPath: <code>/ushare/Admin/data/iptfsadmind.socket</code> .
AFPServers	“AFPServers” is the path to the CanOPI <code>afp.server</code> file, which contains a list of all the AFP servers. Default AFPServers: <code>/ushare/etc/afp.servers</code> .
DefaultVolume	“DefaultVolume” specifies the default <code>afp.dirs</code> file that will be copied for each new CanOPI server created.
BindingFile	“BindingFile” is the path to the file that contains the list of bindings to use for those files that have no resource fork. Default BindingFile: <code>/ushare/etc.local/binder</code> .
uShareInfo	“uShareInfo” is a pointer to a file that contains information about the CanOPI server currently running on this machine. Default uShareInfo: <code>/ushare/bin/VERSION</code> .
uShareKeyPath	“uShareKeyPath” is the path to the CanOPI Authorization Key. Default uShareKeyPath: <code>/ushare/etc.local/keys</code> .

Table 13-9: .iptadminrc Preferences (Continued)

Parameter	Description
AFPServerDefaults	“AFPServerDefaults” is the path to the AFP server preference file. Default AFPServerDefaults: <code>/ushare/Admin/AFPServerDefaults</code> .
AFPVolumeDefaults	“AFPVolumeDefaults” is the path to the AFP volume preference file. Default AFPVolumeDefaults: <code>/ushare/Admin/AFPVolumeDefaults</code> .
AFPVolumesDir	“AFPVolumesDir” specifies the directory in which to place the volume files and specifier data for the AFP volumes. Default AFPVolumesDir: <code>/ushare/Admin/data</code> .
CreationMask	“CreationMask” specifies the read/write permissions of folders created using remote folders. Default CreationMask: <code>0777 (rwxrwxrwx)</code>

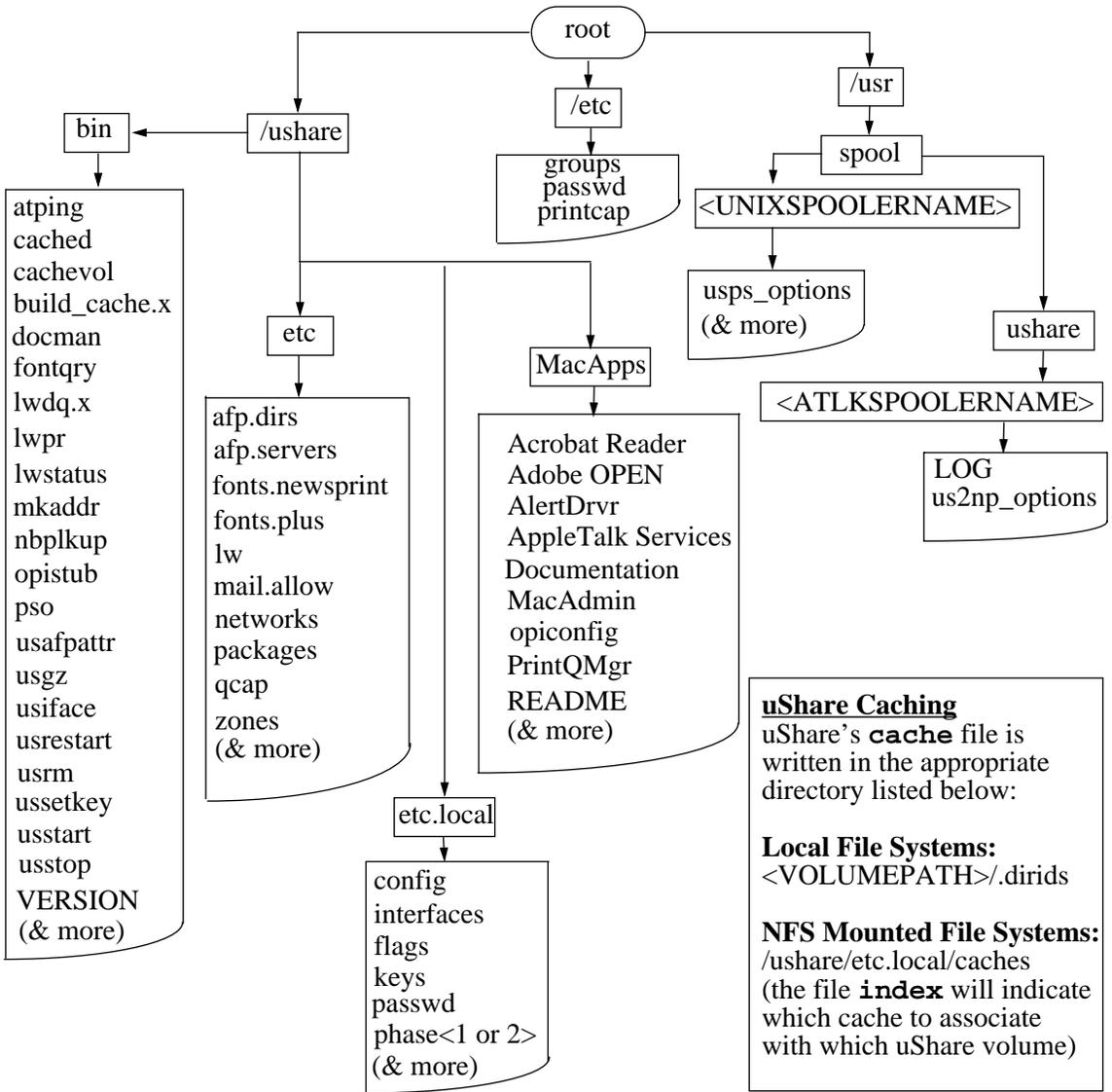
Appendix C - CanOPI's File Tree & Printing Paths

This appendix provides information regarding:

- A file system tree describing the location of commonly used, CanOPI-related files and directories,
- A flowchart describing the order in which an AppleTalk to UNIX to AppleTalk print job is handled by a CanOPI spooler,
- A flowchart describing the order in which an AppleTalk to UNIX print job is handled by a CanOPI spooler, and
- A flowchart describing the order in which a UNIX to AppleTalk print job is handled by a CanOPI spooler.

uShare & CanOPI's File Tree

This tree describes the location of commonly used CanOPI/uShare-related directories and files



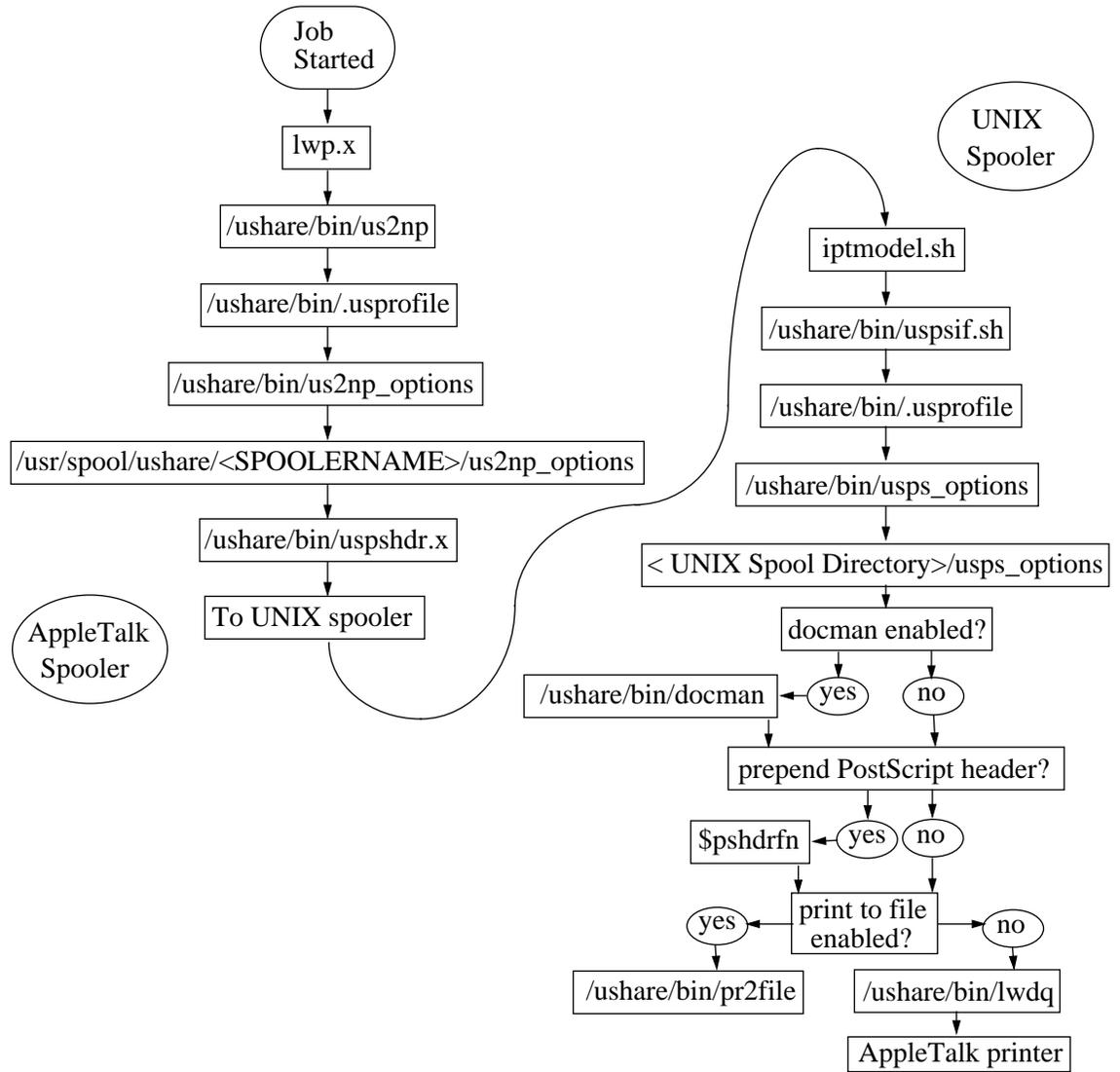
uShare Caching
 uShare's **cache** file is written in the appropriate directory listed below:

Local File Systems:
 <VOLUMEPATH>/dirids

NFS Mounted File Systems:
 /uShare/etc.local/caches
 (the file **index** will indicate which cache to associate with which uShare volume)

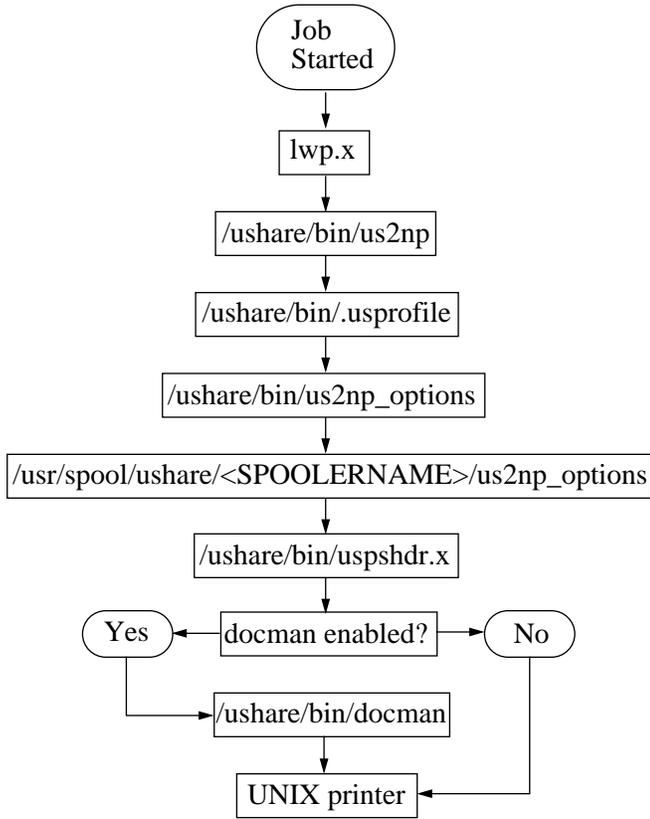
AppleTalk to UNIX to AppleTalk Printing

This chart describes the order in which an AppleTalk to UNIX to AppleTalk print job is handled by CanOPI/uShare's daemons and shell scripts.



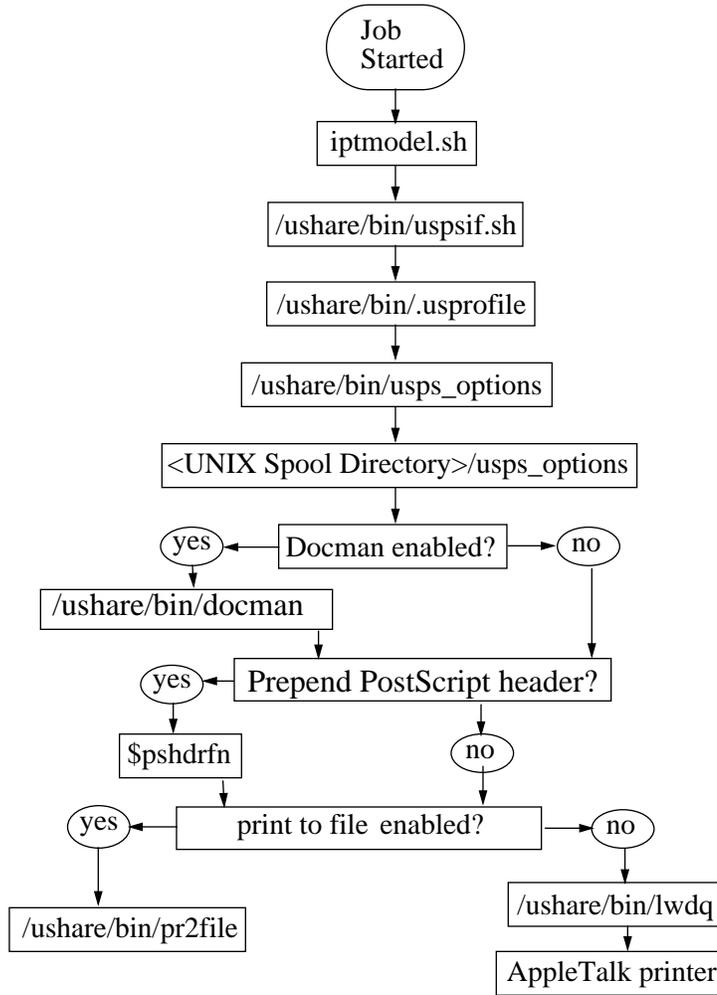
AppleTalk to UNIX Printing

This chart describes the order in which an AppleTalk to UNIX print job is handled by CanOPI and uShare's daemons and shell scripts.



UNIX to AppleTalk Printing

This chart describes the order in which a UNIX to AppleTalk print job is handled by CanOPI or uShare's daemons and shell scripts.



Appendix D - CanOPI Related Processes

Your CanOPI system consists of server processes that run on a Sun host and client applications for Mac OS clients. The majority of CanOPI's server processes run for a brief time — they are active just long enough to perform a specific task. Some of the server processes, however, run continuously. Each of CanOPI's client applications communicates with one or more of these continuous server processes. The following table shows the relationship between CanOPI's client applications and server processes:

Client Application	Server Process(es)
Drag & Drop	iptopisrvrd iptevtlogd
PrintQMgr	IPTPrintServ
AlertDriver	errmgr
MacAdmin	adm_serv.x

Server Processes

All of the following server processes start automatically when you complete the installation and start-up steps described in the "Installing and Starting CanOPI" chapter, and each time you restart your CanOPI software:

- **IPTPrintServ** - This process handles requests from the PrintQMgr application.

- **adm_serv.x** - This process handles requests from the ScriptableAdmin application.
- **epd, nbpd, atnbpd** - These processes, along with the EtherTalk driver kernel module, provide basic AppleTalk connectivity for your Sun host.
- **afpd** - This process publishes an AppleShare file server for Mac OS clients (uShare).
- **afpsess.x** - This process, a child process of **afpd**, performs AppleShare transactions and maintains the connection to Mac OS clients (uShare).
- **lpq** - This process provides a print spooler to Mac OS clients.

Appendix E - Installation Examples

This appendix contains several CanOPI installation examples.

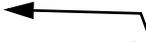
CanOPI Installation Examples

Local Floppy

This is a sample installation of CanOPI on a Solaris machine called **server**, which has a floppy device attached. An example of a remote-tape installation can be found on page Appendix E - i, and a local-CD example can be found on page Appendix E - x.

Note – Remember to use your “Installation Checklist” on page 21 as both a guide to and a record of your responses to the questions during installation.

```
(server) /export/home/testing # csh -f /dev/rfd0c
```

 If you are performing a remote installation, remember to append the “to <hostname>” portion to the **csh** command. It should follow the syntax:
csh -f <device path> to <HOSTNAME>
(See “Installation Checklist” on page 21).

CanOPI 1.5 requires 42730K free

Here is a list of file systems with enough free space:

- 1) /export/home (on /dev/dsk/c0t3d0s7) with 160826K free
- 1) /usr (on /dev/dsk/c0t3d0s6) with 34483K free

You may pick a number or enter a path.

Where would you like to create ushare for CanOPI 1.5? 1

Okay to create directory "canOPI" in "/export/home"? y

```
Please wait...
Preparing to extract media...

Reading floppy 1 header...data...Done

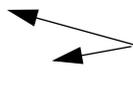
Insert floppy 2 of 5 into /dev/rfd0c...
Reading floppy 2 header...data...Done

Insert floppy 3 of 5 into /dev/rfd0c...
Reading floppy 3 header...data...Done

Insert floppy 4 of 5 into /dev/rfd0c...
Reading floppy 4 header...data...Done

Insert floppy 5 of 5 into /dev/rfd0c...
Reading floppy 5 header...data...Done
Please wait...
Getting file list.....Comparing files.....
mkdir "/export/home/ushare/MacApps"
.....
Installing MacApps/.desktop/desktop...
.....
```

At this point, you will see a long list of directories and files that are being installed on your machine.



The print system is already in the largest available partition (/export/home). If 143Mb is not sufficient to accomodate your printing environment then it is strongly recommended that another partition be made available for this purpose.

Relocate print system anyway? {y/N} n

If you are upgrading from CanOPI or Partner version 3.07 or older OR from CanOPI version 1.3 or older then it is recommended that you build CanOPI caches for all published file server volumes before starting CanOPI services. This is recommended because this procedure may take a considerable period of time for large volumes. If you have not yet defined file server volumes or wish to perform this task at another time, then run the command `"/ushare/bin/cachevol"` as root. This procedure is also performed automatically when the file server is started. Once built, caches will be automatically maintained by the server.

Would you like to build CanOPI caches now? [Y/n] y

No volumes to process

Checking system configuration...

*If you are upgrading from an earlier version of CanOPI (GTP 1.3x or earlier), it is **strongly recommended** that you select "yes" to this option.*

If you would like CanOPI to automatically start every time the machine is rebooted, then answer yes to the following question. Regardless of what you choose now, you can enable or disable autostarting later simply by running

`/ushare/bin/usautostart on`

or

`/ushare/bin/usautostart off`

Automatically start CanOPI at boot time? [Y/n] y

Start CanOPI now? (Y/N) y

Only users who have selected "yes" to this option will see these final messages.

```
Running usstart...
hostid 0x5500235d
You do not have a key set.
Without a proper CanOPI key,
this copy of CanOPI will NOT work.
```

See the README file and/or the release notes for details.

This message will not be repeated.

```
If you wish to enter a key later, you may do so
by running /ushare/bin/ussetkey 'key=<value>' and
then restarting CanOPI via /ushare/bin/usrestart.
Do you wish to enter a key for hostid 0x5500235d now?  y
Enter key:  b61015557fff27f9
Loading AppleTalk Protocol Driver...
Loading EtherTalk Stream Driver...
Phase 2
Starting CanOPI daemons....
nbpd.
eTalkd.24623
atnbpd.flags=
24659
epd.24680
errmgr.
splr.afp.No volumes to process
CanOPI:  Starting AFP server 'server-CanOPI'.Looking for (server-CanOPI)
```

Installation of CanOPI 1.5 successful

At this point, your installation of CanOPI is complete. If you have any CanOPI patches to install, do so now. For advanced configuration adjustments see the appropriate section below:

- **To use multiple interfaces, ie: for AppleTalk Routing see “Appendix B - Advanced Configuration of CanOPI”.**
- **To use the older Phase I AppleTalk network protocol see “Advanced Configuration of CanOPI” on page Appendix B - i.**
- **To use a FDDI, ATM or 100BaseT interface see “Activating Network Interfaces for CanOPI” on page Appendix B - ix.**

Otherwise, your CanOPI software will start, and you will be asked to enter your new key. To customize your newly installed software, refer to “Chapter 3 – ScriptableAdmin”.

Remote Tape

This is a sample installation of CanOPI on a Solaris machine called **server**. The installation is being executed remotely from another machine named **remote**, which has a tape device attached. See “Local Floppy” on page Appendix E - i for an example of a local floppy installation or “Local CD” on page Appendix E - x for a local-CD example.

Note – Remember to use your “Installation Checklist” on page 21 as both a guide to and a record of your responses to the questions during installation.

(remote) /export/home/testing # csh -f /dev/rmt to server

Local installations will not need the "to <hostname>
portion of the csh command. Instead, use only:
csh -f <device path>

To continue CanOPI 1.5 installation please enter
the following command:

/tmp/iptinstall

Only tape installations on a Solaris
machine will see this request.

(remote) /export/home/testing # /tmp/iptinstall

Copying to server

Are you sure that you want to install CanOPI 1.5
for Sun's running Solaris_2.x onto server [Y/n] ? y

CanOPI 1.5 requires 42730K free

Here is a list of file systems with enough free space:

1) /export (on /dev/dsk/c0t3d0s7) with 143531K free

You may pick a number or enter a path.

Where would you like to create ushare for CanOPI 1.5? 1

Okay to create directory "CanOPI" in "/export"? y

Preparing to extract media...

Reading tape 1 header...data...Done

Getting file list.....Comparing files.....

mkdir "/export/ushare/MacApps"

.....

At this point, you will see a long list
of directories and files that are being
installed on your machine.

Installing MacApps/.desktop/desktop...

.....

Default Solaris 2.x installations usually do not provide sufficient disk space for uPrint spooling. Currently there are 2MB available to the print system. It is strongly advised that the print system be given at least 100MB of disk space for normal printing, and as much as 1GB may be required for printing with OPI. Relocating the print system will require current print services to be temporarily halted. Would you like to select an alternate location for the print system now? [Y/n] y

Here is a list of available file systems:

- 1) /export (on /dev/dsk/c0t3d0s7) with 126MB free

You may pick a number or enter a path, or enter 'q' to quit.

The path may begin with . or /.

Where would you like to place the print system? [/export] 1

Temporarily halting print services... done.

Relocating "/var/spool/lp" to "/export/var/spool/lp"... done.

Resuming print services... done.

A CanOPI Manager menu has been installed in root's

OpenWindows menu file: "/.openwin-menu".

This menu will appear the next time you start OpenWindows.

If you are upgrading from CanOPI or Partner version 3.07 or older OR from CanOPI version 1.3 or older then it is recommended that you build CanOPI caches for all published file server volumes before starting CanOPI services. This is recommended because this procedure may take a considerable period of time for large volumes. If you have not yet defined file server volumes or wish to perform this task at another time, then run the command `"/ushare/bin/cachevol"` as root. This procedure is also performed automatically when the file server is started. Once built, caches will be automatically maintained by the server.

Would you like to build CanOPI caches now? [Y/n] n



*If you are upgrading from an earlier version of CanOPI (GTP 1.3x or earlier), it is **strongly recommended** that you select "yes" to this option.*

Checking system configuration...

If you would like CanOPI to automatically start every time the machine is rebooted, then answer yes to the following question. Regardless of what you choose now, you can enable or disable autostarting later simply by running

`/ushare/bin/usautostart on`

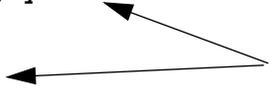
or

`/ushare/bin/usautostart off`

Automatically start CanOPI at boot time? (Y/N) y

Start CanOPI now?(Y/N) y

Running usstart...



Only users who have selected "yes" to this option will see these final messages.

hostid 0x5500235d
You do not have a key set.
Without a proper CanOPI key,
this copy of CanOPI will NOT work.

See the README file and/or the release
notes for details.

This message will not be repeated.

If you wish to enter a key later, you may do so
by running /ushare/bin/ussetkey 'key=<value>' and
then restarting CanOPI via /ushare/bin/usrestart.
Do you wish to enter a key for hostid 0x5500235d now? y
Enter key: b61015557fff27f9
Loading AppleTalk Protocol Driver...

Loading EtherTalk Stream Driver...
Phase 2

Starting CanOPI daemons....

nbpd.
etalkd.24623

atnbpd.flags=
24659

epd.24680
errmgr.

IPT

Appendix E - ix

```
splr.afp.No volumes to process
```

```
CanOPI: Starting AFP server 'server-CanOPI'.Looking for (server-CanOPI)
```

```
Installation of CanOPI 1.5 successful
```

At this point, your installation of CanOPI is complete. If you have any CanOPI patches to install, do so now. For advanced configuration adjustments see the appropriate section below:

- **To use multiple interfaces, ie: for AppleTalk Routing see “Appendix B - Advanced Configuration of CanOPI”.**
- **To use the older Phase I AppleTalk network protocol see “Advanced Configuration of CanOPI” on page Appendix B - i.**
- **To use a FDDI, ATM or 100BaseT interface see “Activating Network Interfaces for CanOPI” on page Appendix B - ix.**

Otherwise, your CanOPI software will start, and you will be asked to enter your new key. To customize your newly installed software, refer to “Chapter 3 – ScriptableAdmin”.

Local CD

This is a sample installation of “Local CD” on page Appendix E - x on a Solaris machine called **server**, which has a CD driver attached. An example of a remote-tape installation can be found in the section titled “Remote Tape” on page Appendix E - v.

Note – *Remember to use your “Installation Checklist” on page 21 as both a guide to and a record of your responses to the questions during installation.*

```
(server) # cd /cdrom/cdrom0
```

```
(server) # ./install
```

Please select a product to install:

1. uShare 4.1f for Solaris 2.x
2. CanOPI 1.5 for Solaris 2.x
3. uShare 4.1f for SunOS 4.1.x
4. CanOPI 1.5 for SunOS 4.1.x

Enter choice or 'q' to quit: 2

Are you sure that you want to install CanOPI 1.5

for Sun4's running Solaris_2.x onto server [Y/n]? y

Only users who have pre-existing IPT products installed will see this message.

An IPT product is already installed on this system

.

You may choose one of the following options:

1. Install new CanOPI 1.5 files in a new location.
Before installing you will be given the option to preserve existing configuration files.
2. Update current installation with new CanOPI 1.5 files.
Before updating the installation you will be given the option to backup the currently installed version.

Please select option '1' or '2': 1

CanOPI 1.5 requires 39328K free

Here is a list of file systems with enough free space:

1) /export/home (on /dev/dsk/c0t3d0s7) with 45104K free

You may pick a number or enter a path.

```

Where would you like to create ushare for CanOPI 1.5?
/export/home/newushare/
Okay to create directory "ushare" in "/export/home/newushare/"? y
Preparing to extract media...

```

```

Reading file 1 header...data...Done
Getting file list.....Comparing files.....
Would you like to preserve existing configuration files? n

```

Only users who have pre-existing IPT products installed will see this message.

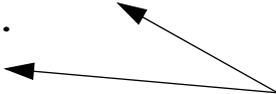


```

mkdir "/export/home/newushare//ushare/MacApps"
.....
Installing etc/services...
.....

```

At this point, you will see a long list of directories and files that are being installed on your machine.



```

Default Solaris 2.x installations usually do not provide sufficient
disk space for uPrint spooling. Currently there are 25MB
available to the print system. It is strongly advised that the
print system be given at least 100MB of disk space for normal
printing, and as much as 1GB may be required for printing with OPI.
Relocating the print system will require current print services
to be temporarily halted. Would you like to select an alternate
location for the print system now [Y/n]? n
To relocate the print system at a later time, run the
command "/ushare/bin/relocatelp.sh" as root.
Press return to continue...

```

If you are upgrading from uShare or Partner version 3.07 or older OR from GTP version 1.3 or older then it is recommended that you build CanOPI caches for all published file server volumes before starting CanOPI services. This is recommended because this procedure may take a considerable period of time for large volumes. If you have not yet defined file server volumes or wish to perform this task at another time, then run the command `"/ushare/bin/cachevol"` as root. This procedure is also performed automatically when the file server is started. Once built, caches will be automatically maintained by the server.

Would you like to build CanOPI caches now? [Y/n] n

*If you are upgrading from an earlier version of CanOPI (GTP 1.3x or earlier), it is **strongly recommended** that you select "yes" to this option.*

Checking system configuration...

If you would like CanOPI to automatically start every time the machine is rebooted, then answer yes to the following question. Regardless of what you choose now, you can enable or disable autostarting later simply by running

`/ushare/bin/usautostart on`

or

`/ushare/bin/usautostart off`

Automatically start CanOPI at boot time? [Y/n] n

Autostart already disabled

Start CanOPI now? (Y/N) y

Running usstart...

hostid 0x8002474d

Only users who have selected "yes" to this option will see these final messages.

You do not have a key set.
Without a proper CanOPI key,
this copy of CanOPI will NOT work.
See the README file and/or the release
notes for details.
This message will not be repeated.
If you wish to enter a key later, you may do so
by running /ushare/bin/ussetkey 'key=<value>' and
then restarting CanOPI via /ushare/bin/usrestart.
Do you wish to enter a key for hostid 0x8002474d now? y
Enter key: 60c85a537fff97d9
Loading AppleTalk Protocol Driver...
Loading EtherTalk Stream Driver...
Phase 2
Starting CanOPI daemons....
nbpd.
etalkd.1650
atnbpd.flags=
1664
epd.1677
errmgr.
afp.No volumes to process
CanOPI: Starting AFP server 'server-CanOPI'.Looking for (server-CanOPI)
splr.opi.Starting OPI Server processes:iptevtlogd
:iptopisrvrd
Installation of CanOPI 1.5 successful

Please select a product to install:
1. uShare 5.0 for Solaris 2.x

```
2. CanOPI 1.5 for Solaris 2.x
3. uShare 5.0 for SunOS 4.1.x
4. CanOPI 1.5 for SunOS 4.1.x
Enter choice or 'q' to quit: q
(server) /cdrom/ushare #q
```

At this point, your installation of CanOPI is complete. If you have any CanOPI patches to install, do so now. For advanced configuration adjustments see the appropriate section below:

- **To use multiple interfaces, ie: for AppleTalk Routing see “Appendix B - Advanced Configuration of CanOPI”.**
- **To use the older Phase I AppleTalk network protocol see “Advanced Configuration of CanOPI” on page Appendix B - i.**
- **To use a FDDI, ATM or 100BaseT interface see “Activating Network Interfaces for CanOPI” on page Appendix B - ix.**

Otherwise, your CanOPI software will start, and you will be asked to enter your new key. To customize your newly installed software, refer to “Chapter 3 – ScriptableAdmin”.

Glossary

AFP: (Apple Filing Protocol) Apple Computer, Inc.'s network file service protocol that allows remote access to data and applications on a server.

alert: a box that appears on the screen in a graphical user interface which warns the user of some condition or requests confirmation of a potentially destructive act.

AppleTalk: Apple Computer, Inc.'s network protocol provided with all Mac OS clients.

application: a computer program that performs a specific task, such as word processing.

archive: backup of a file, several files, or a whole system, often stored separately from that system on long-term external storage.

Authorization Key: an Authorization Key, available from IPT, that allows you to access the full range of CanOPI features.

autostart: to have a CanOPI process start automatically when the server is booted.

batch: to give a series of commands to a computer, which it receives all at once and then processes one by one.

Binder: the ScriptableAdmin tool that enables files stored on a UNIX workstation to have customized Mac OS Type and Creator information.

booting: the process whereby a computer loads its operating system into memory, or, more generally, starting or restarting a computer.

cable range: a range of network numbers assigned by a router under EtherTalk Phase II.

checkbox: in a graphical user interface, a small box that can be

blank or contain an X, the state of which can be changed by a mouse-click.

Chooser: a Mac OS desk accessory (or application under System 7) used to choose network services (for example, printers and file servers).

client: a computer that requests and receives a service (such as file or mail service) from a server.

command line: in UNIX systems, the state of a shell when it is waiting for a user command.

configure: the process of customizing computer hardware and software to suit a specific need (for example, configuration of a file server entails modification of several files that describe the file server and its volumes).

daemon: see “process.”

database: a structured collection of data.

data fork: Mac OS files have a data fork and a resource fork; UNIX files are not split in this manner.

default: a value that a program assumes in the absence of a user-assigned value.

dequeueing: the process of removing a print job from a queue and sending it to a device.

device: a peripheral such as a disk drive or printer that is attached to a computer.

device driver: software responsible for a computer’s input/output interface with a specific peripheral device (for example, a network interface board).

dialog: in a graphical user interface, a box or window in which the user enters data or answers questions.

directory: a file that contains other files. Within the Mac OS environment, a directory is called a Folder.

dotted notation: two numbers (between 0 and 255) separated by a dot, for example, 179.244. This is one way of expressing

a network number.

driver: see “device driver.”

drop folder: on the Mac OS client, a folder to which you can add files but which you cannot look inside of.

entity: a name of a node with more than one name.

Ethernet: a coaxial cable system for network communications.

EtherTalk: a variety of the AppleTalk protocol for communication over Ethernet hardware.

FastPath: a gateway product from Kinetics, Inc.

file server: a process, on a networked computer, that allows client computers to store and access files over the network; or, the networked computer itself.

flag: 1) A dash-prefixed command-line addition to a UNIX command that specifies some non-default action. 2) A notice attached to a file indicating that it has been checked out.

flock bit: “file lock bit” — a flag indicating that a file is in use.

folder caching: uShare places information about Mac OS files and folders in a temporary storage area, or cache, allowing for improved system performance.

gateway: a device that routes packets between networks, especially networks using dissimilar protocols.

global volume: a server volume available to all Mac OS clients.

GUI : Graphical User Interface.

hardware: a physical element of a computer or network, such as cables or keyboards.

home directory: the directory of a file system in which a user’s private files and directories are located.

host: a computer that provides services to a network.

Host ID: an eight-character machine identification.

hostname: a symbolic representation of a UNIX host’s address.

icon: a graphical representation of an element of a computer or network (for example, the Mac OS and OpenWindows environments use icons to represent files, disks, and so on).

incremental backup: a backup only of files that have been modified since a previous backup was performed.

interface: 1) The meeting point of two machines, networks or subsystems. 2) That part of a computer program that communicates directly with the user.

internet: the combination of two or more AppleTalk networks.

interoperability: a strategy of computer and network design that emphasizes adherence to the native environments of dissimilar computing platforms while enabling cross-platform

resource sharing (for example, CanOPI's print spooler service lets Mac OS clients and UNIX users share printing resources without having to abandon their familiar printing tools).

job: an encapsulated task or file in the process of having something done to it (for example, a script file being run, or a text file that has been sent to a printer or spooler).

kernel: the core of a UNIX host's operating system that executes low-level hardware control.

key: see "Authorization Key."

LaserWriter: a laser printer from Apple Computers, Inc.

LocalTalk: the native network hardware of Mac OS computers and other network devices from Apple Computers, Inc. Also the name of AppleTalk when implemented over this hardware.

log file: each spooler has a log file to which is written informational and error messages over time. These files can be truncated when they grow too large.

log in: the procedure by which a user establishes a work session on a computer (this procedure usually requires a name and password).

log out: the procedure by which a user terminates a work session on a computer.

media: refers to a method of external storage, such as tape, floppy disk or optical disk.

mount: to make a file system available for reading and writing.

NBP: (Name Binding Protocol) the AppleTalk protocol that specifies dynamic assignment of addresses to AppleTalk nodes.

network: a system of connected computers and other devices in communication with each other.

network address: (also "network number") the portion of an address that specifies the network as a whole rather than an individual node.

network number: see "network address."

node: a network device that sends or receives data.

node number: a node's address within a network.

OpenWindows: Sun Microsystems' implementation of the Open Look graphical interface.

OPI: Open Prepress Interface (low-resolution image generation and replacement).

packet: a structured group of bits sent as a meaningful unit.

PAP: (Printer Access Protocol) the AppleTalk protocol that manages interaction between print servers and clients.

Partner: IPT's family of software that allows a Sun host to be both host and client to an AppleTalk network.

path: a list of directories a UNIX shell examines when a command is issued at a command line.

pathname: the complete description of a UNIX file or directory, including what directory it is in, for example, `/usr/local/bin/xform` as opposed to `xform`.

permissions: in the UNIX file system, permissions determine who can read, write, or execute a file.

pixel: "picture element;" the smallest "dot" size on the screen.

polling: the act of periodically checking for something, for example, checking to see if new mail has arrived for a user.

PostScript: a programming language by Adobe for formatting printer output.

print spooler: see "spooler."

print queue: see "queue."

privileges: the AFP equivalent of UNIX permissions, privileges are a way of making a folder available to users other than the owner in three ways: See Folders, See Files, and Make Changes.

process: a program running on a UNIX host.

protocol: a set of rules governing the transmission of data over a network.

- queue:** a list of jobs, such as print jobs, that are processed in order.
- radio button:** in graphical user interfaces, a small circle that can be empty or can contain a black dot. The state of the button can be changed by a mouse-click on the button's location.
- resource fork:** Mac OS files have a resource fork and a data fork; UNIX files are not split in this manner.
- root:** the log-in ID for the system administrator of a UNIX machine.
- router:** routers connect subnets to an internet and translate between the protocols of different subnets.
- routing table:** the complete list of network numbers assigned to the internet's subnets.
- RTMP:** (Routing Table Maintenance Protocol) packets on the AppleTalk network, which are evidence of one or more AppleTalk routers.
- script:** in UNIX, a set of commands in a programming-language-like structure that are executed together as previously prepared in a script file.
- sed:** in UNIX, a batch editor that uses a script to modify textual input.
- seed router:** the router in a subnet that assigns a network number to that subnet. Each subnet has at least one seed router.
- server:** a host computer running software to serve clients.
- shell:** a UNIX program that accepts and interprets user commands (for example, a C shell).
- Shell Tool:** allows an OpenWindows user to access a UNIX command line.
- software:** a set of instructions carried out by computing hardware (for example, programs, scripts).
- spooler:** a program that queues print requests and forwards them to a printer as it becomes available.

subnet: an individual network within an AppleTalk internet.

symbolic link: in the UNIX file system, an entry in a directory that resembles a file, but that points to an actual file or directory in another directory path.

system administrator: a computer user with administrative privileges and responsibilities.

System Folder: a special folder on a Mac OS computer that contains the System and other files that provide basic Mac OS functionality.

terminal emulation: behavior by a remote node as though it were a specific type of terminal connected directly to a host.

UNIX: a multiuser, multitasking operating system.

uShare: IPT's family of software that allows a Sun host to provide services to an AppleTalk network.

vi: (Visual Display Editor) a standard UNIX text processing program.

volume: a file system within the Mac OS environment, usually an entire storage device (for example, a hard disk). CanOPI's File Server service lets users publish directories in a UNIX file system as AppleShare volumes.

watch cursor: when the Mac OS client is busy and cannot accept input from the user, it displays the watch cursor, an icon resembling a wristwatch.

zone: a group of AppleTalk networks within an internet.

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