File Manager

Contents

File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	About the File Manager 2-5
Volume Manipulation 2-11 Volume Searching 2-13 Shared Environments 2-14 Shared File Access Permissions 2-15 Directory Access Privileges 2-18 Remote Volume Mounting 2-20 Privilege Information in Foreign File Systems 2-20 File ID Reference Routines 2-23 Identifying Files, Directories, and Volumes 2-23 File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	File Manipulation 2-7
Volume Searching 2-13 Shared Environments 2-14 Shared File Access Permissions 2-15 Directory Access Privileges 2-18 Remote Volume Mounting 2-20 Privilege Information in Foreign File Systems 2-20 File ID Reference Routines 2-23 Identifying Files, Directories, and Volumes 2-23 File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Directory Manipulation 2-10
Shared Environments 2-14 Shared File Access Permissions 2-15 Directory Access Privileges 2-18 Remote Volume Mounting 2-20 Privilege Information in Foreign File Systems 2-20 File ID Reference Routines 2-23 Identifying Files, Directories, and Volumes 2-23 File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Volume Manipulation 2-11
Shared File Access Permissions 2-15 Directory Access Privileges 2-18 Remote Volume Mounting 2-20 Privilege Information in Foreign File Systems 2-20 File ID Reference Routines 2-23 Identifying Files, Directories, and Volumes 2-23 File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Volume Searching 2-13
Directory Access Privileges 2-18 Remote Volume Mounting 2-20 Privilege Information in Foreign File Systems 2-20 File ID Reference Routines 2-23 Identifying Files, Directories, and Volumes 2-23 File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Shared Environments 2-14
Remote Volume Mounting 2-20 Privilege Information in Foreign File Systems 2-20 File ID Reference Routines 2-23 Identifying Files, Directories, and Volumes 2-23 File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Shared File Access Permissions 2-15
Privilege Information in Foreign File Systems 2-20 File ID Reference Routines 2-23 Identifying Files, Directories, and Volumes 2-23 File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Directory Access Privileges 2-18
File ID Reference Routines 2-23 Identifying Files, Directories, and Volumes 2-23 File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Remote Volume Mounting 2-20
File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Privilege Information in Foreign File Systems 2-20
File System Specifications 2-24 File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	File ID Reference Routines 2-23
File IDs 2-24 Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	dentifying Files, Directories, and Volumes 2-23
Directory IDs 2-25 Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	File System Specifications 2-24
Volume Reference Numbers 2-26 Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	File IDs 2-24
Working Directory Reference Numbers 2-26 Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Directory IDs 2-25
Names and Pathnames 2-27 HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Volume Reference Numbers 2-26
HFS Specifications 2-28 Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Working Directory Reference Numbers 2-26
Search Paths 2-31 Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Names and Pathnames 2-27
Using the File Manager 2-32 Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	HFS Specifications 2-28
Determining the Features of the File Manager 2-32 Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Search Paths 2-31
Creating File System Specification Records 2-34 Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Using the File Manager 2-32
Manipulating the Default Volume and Directory 2-35 Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Determining the Features of the File Manager 2-32
Deleting Files and File Forks 2-37 Searching a Volume 2-38 Constructing Full Pathnames 2-44	Creating File System Specification Records 2-34
Searching a Volume 2-38 Constructing Full Pathnames 2-44	Manipulating the Default Volume and Directory 2-35
Constructing Full Pathnames 2-44	Deleting Files and File Forks 2-37
g .	Searching a Volume 2-38
Determining the Assessment of Europe Courses and National 2	Constructing Full Pathnames 2-44
Determining the Amount of Free Space on a volume 2-4	Determining the Amount of Free Space on a Volume 2-4
Sharing Volumes and Directories 2-48	Sharing Volumes and Directories 2-48

Contents 2-1

Locking and Unlocking File Ranges 2-50
Data Organization on Volumes 2-52
Disk and Volume Organization 2-54
Boot Blocks 2-57
Master Directory Blocks 2-59
Volume Bitmaps 2-62
B*-Trees 2-63
Nodes 2-64
Node Records 2-66
Header Nodes 2-67
Map Nodes 2-69
Index Nodes 2-69
Leaf Nodes 2-70
Catalog Files 2-70
Catalog File Keys 2-71
Catalog File Data Records 2-72
Extents Overflow Files 2-74
Data Organization in Memory 2-76
The File I/O Queue 2-77
Volume Control Blocks 2-77
File Control Blocks 2-81
B*-Tree Control Blocks 2-83
The Drive Queue 2-84
File Manager Reference 2-86
Data Structures 2-86
File System Specification Record 2-86
Basic File Manager Parameter Block 2-87
HFS Parameter Block 2-91
Catalog Information Parameter Blocks 2-100
Catalog Position Records 2-104
Catalog Move Parameter Blocks 2-104
Working Directory Parameter Blocks 2-106
File Control Block Parameter Blocks 2-107
Volume Attributes Buffer 2-109
Volume Mounting Information Records 2-110
High-Level File Access Routines 2-112
Reading, Writing, and Closing Files 2-112 Manipulating the File Mark 2-115
1 0
1 0
Allocating File Blocks 2-118 Low-Level File Access Routines 2-120
Reading, Writing, and Closing Files 2-121
Manipulating the File Mark 2-125
Manipulating the End-of-File 2-126
Allocating File Blocks 2-128
Updating Files 2-131
High-Level Volume Access Routines 2-132

2-2 Contents

II (° 17.1 0.100	
Unmounting Volumes 2-132	
Updating Volumes 2-133	
Manipulating the Default Volume 2-134	
Obtaining Volume Information 2-137	
Low-Level Volume Access Routines 2-138	
Mounting and Unmounting Volumes 2-139	
Updating Volumes 2-142	
Obtaining Volume Information 2-144	
Manipulating the Default Volume 2-150	
File System Specification Routines 2-154	
Opening Files 2-154	
Creating and Deleting Files and Directories 2-156	
8	2-159
Moving Files or Directories 2-163	
Exchanging the Data in Two Files 2-165	
Creating File System Specifications 2-166	
High-Level HFS Routines 2-169	
Opening Files 2-169	
Creating and Deleting Files and Directories 2-172	
8	2-175
Moving Files or Directories 2-179	
Maintaining Working Directories 2-180	
Low-Level HFS Routines 2-182	
Opening Files 2 192	
Opening Files 2-183	
Creating and Deleting Files and Directories 2-186	
Creating and Deleting Files and Directories 2-186	2-190
Creating and Deleting Files and Directories 2-186	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories 2	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories 2 Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories 2 Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories 2 Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories 2 Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories 2 Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories 2 Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories 2 Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219 Controlling Login Access 2-222	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219 Controlling Login Access 2-222	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219 Controlling Login Access 2-222 Copying and Moving Files 2-226	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219 Controlling Login Access 2-222 Copying and Moving Files 2-226 File ID Routines 2-229	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219 Controlling Login Access 2-222 Copying and Moving Files 2-226 File ID Routines 2-229 Resolving File ID References 2-229	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219 Controlling Login Access 2-222 Copying and Moving Files 2-226 File ID Routines 2-229 Resolving File ID References 2-220 Creating and Deleting File ID References 2-230	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219 Controlling Login Access 2-222 Copying and Moving Files 2-226 File ID Routines 2-229 Resolving File ID References 2-229 Creating and Deleting File ID References 2-230 Foreign File System Routines 2-232	2-190
Creating and Deleting Files and Directories 2-186 Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219 Controlling Login Access 2-222 Copying and Moving Files 2-226 File ID Routines 2-229 Resolving File ID References 2-229 Creating and Deleting File ID References 2-230 Foreign File System Routines 2-232 Utility Routines 2-235	2-190
Creating and Deleting Files and Directories Accessing Information About Files and Directories Moving Files or Directories 2-199 Maintaining Working Directories 2-201 Searching a Catalog 2-204 Exchanging the Data in Two Files 2-206 Shared Environment Routines 2-208 Opening Files While Denying Access 2-208 Locking and Unlocking File Ranges 2-211 Manipulating Share Points 2-213 Controlling Directory Access 2-217 Mounting Volumes 2-219 Controlling Login Access 2-222 Copying and Moving Files 2-226 File ID Routines 2-229 Creating and Deleting File ID References 2-230 Foreign File System Routines 2-235 Obtaining Queue Headers 2-199	2-190

Contents 2-3

Completion Routines 2-238 Summary of the File Manager 2-240 Pascal Summary 2-240 Constants 2-240 Data Types 2-242 Internal Data Types 2-251 2-253 High-Level File Access Routines 2-254 Low-Level File Access Routines High-Level Volume Access Routines 2-255 Low-Level Volume Access Routines 2-255 File System Specification Routines 2-256 High-Level HFS Routines 2-257 Low-Level HFS Routines 2-259 **Shared Environment Routines** 2-261 File ID Routines 2-263 Foreign File System Routines 2-263 **Utility Routines** 2-264 **Application-Defined Routine** 2-264 C Summary 2-264 Constants 2-264 2-267 Data Types **Internal Data Types** 2-278 High-Level File Access Routines 2-280 Low-Level File Access Routines 2-280 High-Level Volume Access Routines 2-281 Low-Level Volume Access Routines 2-282 File System Specification Routines 2-283 High-Level HFS Routines 2-284 Low-Level HFS Routines 2-285 **Shared Environment Routines** 2-287 File ID Routines 2-290 Foreign File System Routines 2-290 **Utility Routines** 2-291 Application-Defined Routine 2-291 Assembly-Language Summary 2-291 Constants 2-291 **Data Structures** 2-292 Trap Macros 2-299 Global Variables 2-301 Result Codes 2-301

2-4 Contents