

# File

|               |        |
|---------------|--------|
| INHERITS FROM | Object |
| DECLARED IN   | File.h |

## CLASS DESCRIPTION

The File class can be used to open a file, read information from it, write information to it, and move around within it. These facilities are, however, generic and not very rich in features. Therefore, most commonly, specialized classes will be subclassed from it.

After allocating a File object, one can ask it to open a particular file in the file system (this initializes the object). Since a File object can work with a single file, all messages directed at it will affect the file it has opened. If asked to open a second file while it has one opened, the File object will return an error. Closing the File will free the object.

An open file in a File object has a current position, which is where any reading or writing can occur. Reading or writing can occur in byte sized, or arbitrarily sized chunks. One can move the current position forward or backward by a specified number of bytes, or to an absolute position in the file. Writing at the end of the file will increase the file's size. All these methods that manipulate the file's contents return `ErrorInfo` objects when errors occur.

One can also obtain certain information about the File, including the full pathname, just the file name, or just the basename of the file it has opened, and its total size.

***This is 'beta', in so far as all the things described here are not implemented, and nothing is set in stone.***

***NOTE that methods return Reply objects, not plain-jane id's as suggested here!***

## INSTANCE VARIABLES

*Inherited from Object*

Class

isa;

*Declared in File*

Cstring

fileName;

long int

accessType;

FILE\*

theFile;

Integer

state;

fileName

The full pathname of the file being opened

accessType

Indicates what kind of file access we are doing

theFile

The file that the object makes use of.

state

A flag indicating what 'state' the file is in.

## METHOD TYPES

Creating/Initializing, and Freeing

- openFile:For:
- openFile:
- closeFile

Accessing info about the file name

- getPathname

|                                     |  |
|-------------------------------------|--|
|                                     | <ul style="list-style-type: none"> <li>- getPath</li> <li>- getFilename</li> <li>- getBasename</li> <li>- getExtension</li> </ul>                            |
| Accessing info about the file state | <ul style="list-style-type: none"> <li>- getCurrentPosition</li> </ul>   |
| Changing position in the file       | <ul style="list-style-type: none"> <li>- moveTo:</li> <li>- advanceBytes:</li> <li>- backupBytes:</li> </ul>   |
| Performing I/O on the file          | <ul style="list-style-type: none"> <li>- readByte</li> <li>- writeByte:</li> <li>- read:bytesInto:retrieving:</li> <li>- write:bytesFrom:writing:</li> </ul> |

## CLASS METHODS

None

## INSTANCE METHODS

### **advanceBytes:**

- (id) **advanceBytes:** (FilePosDelta) *byteLoc*

Moves the current position in the file forward *byteLoc* number of bytes. If an attempt is made to move beyond the end of the file, the current position is not moved, and an error is returned.

### **backupBytes:**

- (id) **backupBytes:** (FilePosDelta) *byteLoc*

Moves the current position backwards *byteLoc* number of bytes. If one attempts to back up beyond the beginning of the file, an error is generated, and the current position is not moved.

## **closeFile**

- **closeFile**

Closes the files, disposes of the instance values of the method and frees the object.

## **fileSize**

- (id) **fileSize**

Returns the size of the file in a Reply object. Gads. this means one has to know that the underlying data type is a unsigned long.....

## **getBasename**

- (CString) **getBasename**

Returns the name of the file without a path or an extension. Thus, if the file name is `/usr/djb/super.eps` this will return `super`. The string that is generated must be disposed by the caller.

## **getCurrentPosition**

- (FilePos) **getCurrentPosition**

This returns the position in the file as a byte count.

## **getDirectory**

- (CString) **getDirectory**

Returns the path to the file, without including the file name itself. Note that it does include the final / in the pathname (e.g. `/usr/djb/super.eps` returns `/usr/djb/`). The string that is generated must be disposed by the caller.

### **getExtension**

- (Cstring) **getExtension**

Like `getFilename`, but this returns only the extension of the file name. Thus, the file `/usr/djb/super.eps` returns merely `eps`. The string that is generated must be disposed by the caller.

### **getFilename**

- (Cstring) **getFilename**

Returns a new string that contains the name of the file without its full path. E.g. if the full name is `/usr/djb/super.eps`, this returns just `super.eps`. The string that is generated must be disposed by the caller.

### **getPathname**

- (Cstring) **getPathname**

Returns the full pathname to the file the object has open. This provides a new string which the recipient is responsible for disposing.

### **initFile:For:**

- (id) **initFile:** (const char \*) *filename* **For:** (long int) *operation*

This acts identically to `openFile:For:`, below, and is provided merely to remain compatible with what NeXT says one should provide (init methods that start with the characters ``init'`).

**moveTo:**

- (id) **moveTo:** (FilePos) *byteLoc*

Moves to the specified location in the file. If the *byteLoc* is out of range, an error is returned. If the file access method is FILE\_APPEND, then this method will always return an error. If one tries to move beyond the end of a file, an error is generated (note that because FilePos is an unsigned quantity, one can not move past the beginning).

**openFile:For:**

- (id) **openFile:** (const char \*) *filename* **For:** (long int) *operation*

Creates a new File object, opening the file *filename*, if possible, for the specified operation. The *operation* can be one of FILE\_READ, FILE\_WRITE, FILE\_READWRITE and FILE\_APPEND. In all cases save FileAPPEND, the file is opened with the current position at the beginning of the file. In the case of FileAPPEND, it is at the end of the file.

**openFile:**

- (id) **openFile:** (const char \*) *filename*

Calls **openFile:For:** using FileREADWRITE for the *operation* parameter. This, then, simply serves as a more common case wrapper around the preceding method.

**readByte:**

- (id) **readByte:** (byte\*) *theByte*

Reads a byte from the file, and returns it in *theByte*. If an error occurs, including detection of EOF and reads during FILE\_WRITE or FILE\_APPEND, an error is returned.

**read:bytesInto:retrieving:**

- (id) **read:** (long int) *numBytes* **bytesInto:** (byte\*) *buffer* **retrieving:** (long int\*) *bytesFound*

This reads up to *numBytes* into *buffer* from the file. If *buffer* is not of the proper size, the results are unpredictable. If any errors are encountered while reading, no further reading is done, and an error is returned. In all cases, the number of bytes actually read is returned in *bytesFound*.

### **writeByte:**

- (id) **writeByte:** (byte) *theByte*

writes a byte to the file at the current position, and advances the position one byte. If an error occurs, including writing during FILE\_READ, an error is returned.

### **write:bytesFrom:writing:**

- (id) **write:** (long int) *numBytes* **bytesFrom:** (byte\*) *buffer* **writing:** (long int\*) *bytesWrote*

This writes up to *numBytes* from *buffer* into the file. If *buffer* is not of the proper size, the results are unpredictable. If any errors are encountered while writing, no further writing is done, and an error is returned. In all cases, the number of bytes actually written is returned in *bytesWrote*.

## BUGS AND PROBLEMS

I suspect a lot of this will break when things other than plain old files are added.

there should probably be a free method corresponding to the close.

There should be a FILE\_MODIFY and a FILE\_READMODIFY. These are the same as write, except that write creates or clears a file to start with. Perhaps pick better terms overall.

Maybe FILE\_NEWWRITE, FILE\_NEWREADWRITE, FILE\_WRITE, FILE\_READWRITE. ?

That would not be backward compatible. But this isn't 'final' anyway. Tough luck on the macpaint and macpict converters! =) Also, the error diagnostics from the open routine should reflect error codes more accurately (tried to open, but it wasn't there!)

## ENHANCEMENT IDEAS

Add support for other types of streams

## CONSTANTS AND DEFINED TYPES

*/\* Types of ways to access a file \*/*

|                                     |                |
|-------------------------------------|----------------|
| <code>#define FILE_READ</code>      | <code>0</code> |
| <code>#define FILE_WRITE</code>     | <code>1</code> |
| <code>#define FILE_READWRITE</code> | <code>2</code> |
| <code>#define FILE_APPEND</code>    | <code>3</code> |

|                           |   |
|---------------------------|---|
| <code>FilePos</code>      | An unsigned number for specifying a byte position in a file.      |
| <code>FilePosDelta</code> | An unsigned number for specifying a change in position in a file. |

## MODIFICATION HISTORY

\$Log: File.rtf,v \$Revision 1.5 93/04/04 23:44:30 deathSun Apr 4 23:44:30 PDT  
1993Revision 1.4 93/01/10 15:07:57 deathSun Jan 10 15:07:56 PST 1993Revision 1.3  
92/07/26 13:58:16 deathprobably no changes here (sigh).Revision 1.2 92/04/05 22:52:03  
deathReflects some of the miscellaneous revisions that have taken place. Last version of  
version 1.Revision 1.1 92/03/29 12:19:01 deathInitial revision