
Audio File Services Reference

[Audio](#) > [Carbon](#)



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Audio File Services Reference

Framework:	AudioToolbox/AudioToolbox.h
Declared in	AudioFile.h

Overview

This document describes Audio File Services, a C programming interface in the Audio Toolbox framework, which is part of Core Audio.

Audio file objects enable you to read or write a wide variety of audio data to or from a disk or a buffer.

Audio File Services enables you to:

- Create and initialize audio files
- Open and close audio files
- Optimize audio files
- Read and write audio files
- Work with user data
- Work with global information

Audio File Services is a pure C interface that you can use in Cocoa and Carbon applications as well as in Mac OS X command-line tools. This document describes Audio File Services for iPhone OS 2.0 and Mac OS X v10.5.

Functions by Task

Creating and Initializing Audio Files

[AudioFileCreateWithURL](#) (page 9)

Creates a new audio file, or initializes an existing file, specified by a URL.

[AudioFileCreate](#) (page 8)

Creates a new audio file specified by a file system reference.

[AudioFileInitialize](#) (page 15)

Deletes the content of an existing audio file to let you write over it.

[AudioFileInitializeWithCallbacks](#) (page 15)

Deletes the content of an existing file and assigns callbacks to the audio file object.

Opening and Closing Audio Files

[AudioFileOpenURL](#) (page 17)

Open an existing audio file specified by a URL.

[AudioFileOpen](#) (page 16)

Opens an existing audio file specified by a file system reference.

[AudioFileOpenWithCallbacks](#) (page 18)

Opens an existing file with callbacks you provide.

[AudioFileClose](#) (page 7)

Closes an audio file.

Getting and Setting Audio File Properties

[AudioFileGetProperty](#) (page 12)

Gets the value of an audio file property.

[AudioFileGetPropertyInfo](#) (page 13)

Gets information about an audio file property, including the size of the property value and whether the value is writable.

[AudioFileSetProperty](#) (page 22)

Sets the value of an audio file property

[NumBytesToNumAudioFileMarkers](#) (page 27)

A macro that returns the number of audio file markers represented by a specified number of bytes.

[NumAudioFileMarkersToNumBytes](#) (page 26)

A macro that returns the number of bytes corresponding to a specified number of audio file markers.

[NextAudioFileRegion](#) (page 26)

Finds the next audio file region in a region list.

Optimizing Audio Files

[AudioFileOptimize](#) (page 19)

Consolidates audio data and performs other internal optimizations of the file structure.

Reading and Writing Audio Files

[AudioFileReadBytes](#) (page 19)

Reads bytes of audio data from an audio file.

[AudioFileWriteBytes](#) (page 24)

Writes bytes of audio data to an audio file.

[AudioFileReadPackets](#) (page 20)

Reads packets of audio data from an audio file.

[AudioFileWritePackets](#) (page 24)

Writes packets of audio data to an audio data file.

Working with User Data

[AudioFileCountUserData](#) (page 8)

Gets the number of chunks (user data items) with a specified ID in a file.

[AudioFileGetUserDataSize](#) (page 14)

Gets the size of a chunk in an audio file.

[AudioFileRemoveUserData](#) (page 22)

Removes a chunk of data from an audio file.

[AudioFileSetUserData](#) (page 23)

Sets a chunk in an audio file.

[AudioFileGetUserData](#) (page 13)

Gets a chunk from an audio file.

Working with Global Information

[AudioFileGetGlobalInfoSize](#) (page 11)

Gets the size of a global audio file property.

[AudioFileGetGlobalInfo](#) (page 10)

Copies the value of a global property into a buffer.

Functions

AudioFileClose

Closes an audio file.

```
OSStatus AudioFileClose (  
    AudioFileID inAudioFile  
);
```

Parameters

inAudioFile

The file you want to close.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Availability

Available in Mac OS X v10.2 and later.

Related Sample Code

AudioQueueTools

ExtractMovieAudioToAIFF

QTAudioExtractionPanel

QTExtractAndConvertToAIFF

SCAudioCompress

Declared In

AudioFile.h

AudioFileCountUserData

Gets the number of chunks (user data items) with a specified ID in a file.

```
OSStatus AudioFileCountUserData (
    AudioFileID inAudioFile,
    UInt32      inUserDataID,
    UInt32      *outNumberItems
);
```

Parameters*inAudioFile*

The audio file whose chunks are to be counted.

inUserDataID

The four-character code (such as COMM) of the chunk.

outNumberItems

On output, a pointer to the number of chunks of this type in the file.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Discussion

In the context of this function, *user data* refers to chunks in AIFF, CAF, and WAVE files, to resources in Sound Designer II files, and possibly to other types of information in other files.

Availability

Available in Mac OS X v10.4 and later.

Declared In

AudioFile.h

AudioFileCreate

Creates a new audio file specified by a file system reference.

```
OSStatus AudioFileCreate (
    const struct FSRef          *inParentRef,
    CFStringRef                 inFileName,
    AudioFileTypeID             inFileType,
    const AudioStreamBasicDescription *inFormat,
    UInt32                      inFlags,
    struct FSRef                *outNewFileRef,
    AudioFileID                 *outAudioFile
);
```

Parameters*inParentRef*

A pointer to the directory where the new file should be created.

inFileName

The name of the file to be created.

inFileType

The type of audio file to create. See “[Built-In Audio File Types](#)” (page 36) for constants that can be used.

inFormat

A pointer to the structure that describes the format of the data.

inFlags

Relevant flags for creating or opening the file. Currently set to 0.

outNewFileRef

On output, a pointer to the location of the newly created file.

outAudioFile

On output, a pointer to the newly created audio file.

Return Value

A result code. See “[Audio File Result Codes](#)” (page 50).

Discussion

This function uses an `FSRef` type rather than the `CFURLRef` type used by the `AudioFileCreateWithURL` (page 9) function.

Availability

Available in Mac OS X v10.2 and later.

See Also

[AudioFileCreateWithURL](#) (page 9)

Related Sample Code

`ExtractMovieAudioToAIFF`

`QTAudioExtractionPanel`

`QTEExtractAndConvertToAIFF`

`SCAudioCompress`

Declared In

`AudioFile.h`

AudioFileCreateWithURL

Creates a new audio file, or initializes an existing file, specified by a URL.

```
OSStatus AudioFileCreateWithURL (
    CFURLRef                inFileRef,
    AudioFileTypeID         inFileType,
    const AudioStreamBasicDescription *inFormat,
    UInt32                  inFlags,
    AudioFileID             *outAudioFile
);
```

Parameters*inFileRef*

The fully specified path of the file to create or initialize.

inFileType

The type of audio file to create. See “[Built-In Audio File Types](#)” (page 36) for constants that can be used.

inFormat

A pointer to the structure that describes the format of the data.

inFlags

Relevant flags for creating or opening the file. If `kAudioFileFlags_EraseFile` (page 38) is set, it erases an existing file. If the flag is not set, the function fails if the URL is an existing file.

outAudioFile

On output, a pointer to a newly created or initialized file.

Return Value

A result code. See “[Audio File Result Codes](#)” (page 50).

Discussion

This function uses a `CFURLRef` type rather than the `FSRef` type used by the `AudioFileCreate` (page 8) function.

Availability

Available in Mac OS X v10.5 and later.

See Also

[AudioFileCreate](#) (page 8)

Related Sample Code

`AudioQueueTools`

Declared In

`AudioFile.h`

AudioFileGetGlobalInfo

Copies the value of a global property into a buffer.

```
OSStatus AudioFileGetGlobalInfo (
    AudioFilePropertyID inPropertyID,
    UInt32               inSpecifierSize,
    void                 *inSpecifier,
    UInt32               *ioDataSize,
    void                 *outPropertyData
);
```

Parameters

inPropertyID

The property whose value you want to get. For possible values, see “[Audio File Global Info Properties](#)” (page 47).

inSpecifierSize

The size of the specifier data.

inSpecifier

A pointer to a *specifier*, which, in this context, is a pointer to a buffer containing some data that is different for each property. The type of the data required is described in the description of each property.

ioDataSize

On input, a pointer to the size of the buffer specified in the *outPropertyData* parameter. On output, a pointer to the number of bytes written to the buffer.

outPropertyData

A pointer to the buffer in which to write the property data.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Discussion

This function can be used to get information about the capabilities of Audio File Services data types, for example, to determine which file types can take which data formats, what file types are supported, what file type can hold a particular data type, and so forth. This function cannot be used to get information about the properties of particular files. So the properties whose information you are obtaining are global to the Audio File Services programming interface, not properties specific to any file.

Availability

Available in Mac OS X v10.3 and later.

Related Sample Code

AudioQueueTools

Declared In

AudioFile.h

AudioFileGetGlobalInfoSize

Gets the size of a global audio file property.

```
OSStatus AudioFileGetGlobalInfoSize (
    AudioFilePropertyID inPropertyID,
    UInt32               inSpecifierSize,
    void                 *inSpecifier,
    UInt32               *outDataSize
);
```

Parameters

inPropertyID

The property whose data size you want to get. For possible values, see [“Audio File Global Info Properties”](#) (page 47).

inSpecifier

A pointer to a *specifier* (a pointer to a buffer containing some data which is different for each property. The type of the data required is described in the description of each property.)

outDataSize

A pointer to the size in bytes of the current value of the property. To get the size of the property value, you need a buffer of this size.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Discussion

This function can be used to get information about the capabilities of Audio File Service data types, for example, to determine which file types can take which data formats.

Availability

Available in Mac OS X v10.3 and later.

Related Sample Code

AudioQueueTools

Declared In

AudioFile.h

AudioFileGetProperty

Gets the value of an audio file property.

```
OSStatus AudioFileGetProperty (
    AudioFileID          inAudioFile,
    AudioFilePropertyID inPropertyID,
    UInt32               *ioDataSize,
    void                 *outPropertyData
);
```

Parameters*inAudioFile*

The audio file you want to obtain a property value from.

*inPropertyID*The property whose value you want. See [“Audio File Properties”](#) (page 43) for possible values.*ioDataSize*On input, the size of the buffer passed in the `outPropertyData` parameter. On output, the number of bytes written to the buffer. Use the [AudioFileGetPropertyInfo](#) (page 13) function to obtain the size of the property value.*outPropertyData*On output, the value of the property specified in the `inPropertyID` parameter.**Return Value**A result code. See [“Audio File Result Codes”](#) (page 50).**Availability**

Available in Mac OS X v10.2 and later.

See Also[AudioFileGetPropertyInfo](#) (page 13)[AudioFileSetProperty](#) (page 22)**Related Sample Code**

AudioQueueTest

AudioQueueTools

PlayAudioFileLite

SCAudioCompress

Declared In

AudioFile.h

AudioFileGetPropertyInfo

Gets information about an audio file property, including the size of the property value and whether the value is writable.

```
OSStatus AudioFileGetPropertyInfo (
    AudioFileID      inAudioFile,
    AudioFilePropertyID inPropertyID,
    UInt32           *outDataSize,
    UInt32           *isWritable
);
```

Parameters

inAudioFile

The audio file you want to obtain property value information from.

inPropertyID

The property whose value information you want. See [“Audio File Properties”](#) (page 43) for possible values.

outDataSize

On output, the size in bytes of the property value.

isWritable

On output, equals 1 if the property is writable, or 0 if it is read-only.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Availability

Available in Mac OS X v10.2 and later.

See Also

[AudioFileGetProperty](#) (page 12)

Related Sample Code

AudioQueueTest

AudioQueueTools

PlayAudioFileLite

SCAudioCompress

Declared In

AudioFile.h

AudioFileGetUserData

Gets a chunk from an audio file.

```
OSStatus AudioFileGetUserData (
    AudioFileID inAudioFile,
    UInt32      inUserDataID,
    UInt32      inIndex,
    UInt32      *ioUserDataSize,
    void        *outUserData
);
```

Parameters*inAudioFile*

The audio file whose chunk you want to get.

inUserDataID

The four-character code of the designated chunk.

*inIndex*An index specifying which chunk with the four-character code specified in the *inUserDataID* parameter you want to query.*ioUserDataSize*

On input, a pointer to the size of the buffer containing the designated chunk. On output, a pointer to the size of bytes copied to the buffer.

outUserData

A pointer to a buffer in which to copy the chunk data.

Return ValueA result code. See [“Audio File Result Codes”](#) (page 50).**Availability**

Available in Mac OS X v10.4 and later.

See Also[AudioFileSetUserData](#) (page 23)**Declared In**

AudioFile.h

AudioFileGetUserDataSize

Gets the size of a chunk in an audio file.

```
OSStatus AudioFileGetUserDataSize (
    AudioFileID inAudioFile,
    UInt32      inUserDataID,
    UInt32      inIndex,
    UInt32      *outUserDataSize
);
```

Parameters*inAudioFile*

The audio file whose chunk size you want to find out.

inUserDataID

The four-character code of the designated chunk.

inIndex

An index specifying which chunk with the four-character code specified in the `inUserDataID` parameter you want to query.

outUserDataSize

On output, a pointer the size of the user data chunk.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Availability

Available in Mac OS X v10.4 and later.

Declared In

AudioFile.h

AudioFileInitialize

Deletes the content of an existing audio file to let you write over it.

```
OSStatus AudioFileInitialize (
    const struct FSRef          *inFileRef,
    AudioFileTypeID            inFileType,
    const AudioStreamBasicDescription *inFormat,
    UInt32                      inFlags,
    AudioFileID                 *outAudioFile
);
```

Parameters*inFileRef*

A pointer to the audio file you want to initialize.

inFileType

The type of audio file to initialize the file to.

inFormat

A pointer to the structure that describes the format of the data.

inFlags

Flags for creating or opening the file. Currently set to 0.

outAudioFile

On output, a pointer to the newly created audio file.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Availability

Available in Mac OS X v10.2 and later.

Declared In

AudioFile.h

AudioFileInitializeWithCallbacks

Deletes the content of an existing file and assigns callbacks to the audio file object.

```

OSStatus AudioFileInitializeWithCallbacks (
    void                                *inClientData,
    AudioFile_ReadProc                  inReadFunc,
    AudioFile_WriteProc                 inWriteFunc,
    AudioFile_GetSizeProc                inGetSizeFunc,
    AudioFile_SetSizeProc                inSetSizeFunc,
    AudioFileTypeID                     inFileType,
    const AudioStreamBasicDescription *inFormat,
    UInt32                               inFlags,
    AudioFileID                          *outAudioFile
);

```

Parameters*inClientData*

A pointer to a constant passed to your callbacks. The constant should contain any information you use to manage the state for reading data from the file.

inReadFunc

A callback function invoked when the audio file object wants to read data.

inWriteFunc

A callback function invoked when the audio file object wants to write data.

inGetSizeFunc

A callback function invoked when the audio file object wants to know the size of the file.

inSetSizeFunc

A callback function invoked when the audio file object wants to set the size of the file.

inFileType

The type of audio file to initialize

inFormat

The format for the the audio data in the file.

inFlags

Flags for creating or opening the file. Set to 0.

outAudioFile

On output, a pointer to the newly initialized audio file.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Availability

Available in Mac OS X v10.3 and later.

See Also

[AudioFileOpenWithCallbacks](#) (page 18)

Declared In

AudioFile.h

AudioFileOpen

Opens an existing audio file specified by a file system reference.


```
OSStatus AudioFileOpen (
    const struct FSRef *inFileRef,
    SInt8               inPermissions,
    AudioFileTypeID     inFileTypeHint,
    AudioFileID         *outAudioFile
);
```

Parameters*inFileRef*

A pointer to the audio file you want to open.

inPermissions

The read-write permissions you want to assign to the file. Use the permission constants in “Audio File Permission Flags.”

inFileTypeHint

A hint to indicate the file type of the designated file. For files without filename extensions and with types not easily or uniquely determined from the data (such as ADTS,AC3), use this hint to indicate the file type. Otherwise, pass 0. Only use this hint in OS X versions 10.3.1 or greater. In all earlier versions, any attempt to open these files fails.

outAudioFile

On output, a pointer to the newly opened file.

Return Value

A result code. See “[Audio File Result Codes](#)” (page 50).

Availability

Available in Mac OS X v10.2 and later.

See Also

[AudioFileOpenURL](#) (page 17)

Related Sample Code

AudioQueueTest

PlayAudioFileLite

SCAudioCompress

Declared In

AudioFile.h

AudioFileOpenURL

Open an existing audio file specified by a URL.

```
OSStatus AudioFileOpenURL (
    CFURLRef           inFileRef,
    SInt8              inPermissions,
    AudioFileTypeID    inFileTypeHint,
    AudioFileID        *outAudioFile
);
```

Parameters*inFileRef*

The URL of an existing audio file.

inPermissions

The read-write permissions you want to assign to the file. Use the permission constants in “Audio File Permission Flags.”

inFileTypeHint

A hint for the file type of the designated file. For files without filename extensions and with types not easily or uniquely determined from the data (such as ADTS or AC3), use this hint to indicate the file type. Otherwise, pass 0. Only use this hint in OS X versions 10.3.1 or greater. In all earlier versions, any attempt to open these files fails.

outAudioFile

On output, a pointer to the newly opened audio file.

Return Value

A result code. See “Audio File Result Codes” (page 50).

Availability

Available in Mac OS X v10.5 and later.

See Also

[AudioFileOpen](#) (page 16)

Related Sample Code

AudioQueueTools

Declared In

AudioFile.h

AudioFileOpenWithCallbacks

Opens an existing file with callbacks you provide.

```
OSStatus AudioFileOpenWithCallbacks (
    void *inClientData,
    AudioFile_ReadProc inReadFunc,
    AudioFile_WriteProc inWriteFunc,
    AudioFile_GetSizeProc inGetSizeFunc,
    AudioFile_SetSizeProc inSetSizeFunc,
    AudioFileTypeID inFileTypeHint,
    AudioFileID *outAudioFile
);
```

Parameters*inClientData*

A pointer to a constant passed to your callbacks. The constant should contain any information you use to manage the state for reading data from the file.

inReadFunc

A callback function invoked when the audio file object wants to read data.

inWriteFunc

A callback function called when the audio file object wants to write data.

inGetSizeFunc

A callback function called when the audio file object wants to know the file size.

inSetSizeFunc

A callback function called when the audio file object wants to set the file size.

inFileTypeHint

A hint about the type of the designated file. For files with no filename extension and without a type easily or uniquely determined from the data (ADTS,AC3), use this hint to indicate the file type. Otherwise, pass 0 for this parameter. The hint is only available on OS X versions 10.3.1 or greater. In versions prior to OS X 10.3.1, opening files such files fails.

outAudioFile

On output, a pointer to the newly opened file.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Availability

Available in Mac OS X v10.3 and later.

See Also

[AudioFileInitializeWithCallbacks](#) (page 15)

Declared In

AudioFile.h

AudioFileOptimize

Consolidates audio data and performs other internal optimizations of the file structure.

```
OSStatus AudioFileOptimize (
    AudioFileID inAudioFile
);
```

Parameters*inAudioFile*

The audio file you want to optimize.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Discussion

This function optimizes the file so additional audio information can be appended to the existing data. Typically, this function consolidates the file’s audio data at the end of the file. This improves performance, such as when writing additional data to the file.

Do not use this potentially expensive and time-consuming operation during time-critical operations. Instead, use the [kAudioFilePropertyIsOptimized](#) (page 44) property to check the optimization state of a file. You can then optimize when it won’t adversely affect your application.

Availability

Available in Mac OS X v10.2 and later.

Declared In

AudioFile.h

AudioFileReadBytes

Reads bytes of audio data from an audio file.

```
OSStatus AudioFileReadBytes (
    AudioFileID inAudioFile,
    Boolean      inUseCache,
    SInt64       inStartingByte,
    UInt32       *ioNumBytes,
    void         *outBuffer
);
```

Parameters*inAudioFile*

The audio file whose bytes of audio data you want to read.

inUseCache

Set to `true` if you want to cache the data. You should cache reads and writes if you read or write the same portion of a file multiple times. To request that the data not be cached, if possible, set to `false`. You should not cache reads and writes if you read or write data from a file only once.

inStartingByte

The byte offset of the audio data you want to be returned.

ioNumBytes

On input, a pointer to the number of bytes to read. On output, a pointer to the number of bytes actually read.

outBuffer

A pointer to user-allocated memory large enough for the requested bytes.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Discussion

In most cases, you should use [AudioFileReadPackets](#) (page 20) instead of this function.

This function returns `eofErr` when the read operation encounters the end of the file. Note that Audio File Services only reads one 32-bit chunk of a file at a time.

Availability

Available in Mac OS X v10.2 and later.

See Also

[AudioFileWriteBytes](#) (page 24)

Declared In

AudioFile.h

AudioFileReadPackets

Reads packets of audio data from an audio file.

```

OSStatus AudioFileReadPackets (
    AudioFileID          inAudioFile,
    Boolean              inUseCache,
    UInt32               *outNumBytes,
    AudioStreamPacketDescription *outPacketDescriptions,
    SInt64               inStartingPacket,
    UInt32               *ioNumPackets,
    void                 *outBuffer
);

```

Parameters*inAudioFile*

The audio file from which packets of audio data are to be read.

inUseCache

Set to `true` to cache the data. Otherwise, set to `false`.

outNumBytes

On output, a pointer to the number of bytes actually returned.

outPacketDescriptions

A pointer to an array of packet descriptions that have been allocated. The array must contain at least as many entries as have been requested to read. On output, these packet descriptions are filled out with the correct information if the format is VBR. Pass `NULL` if the data format is CBR. Packet descriptions are not necessary for CBR data and are not filled out even if passed.

inStartingPacket

The packet index of the first packet you want to be returned.

ioNumPackets

On input, a pointer to the number of packets to read. On output, the number of packets actually read.

outBuffer

A pointer to user-allocated memory. Its size is determined by multiplying the the number of packets requested times the maximum (or upper bound on) packet size of the designated audio file.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Discussion

For all uncompressed formats, this function equates packets with frames. When the `ioNumPackets` parameter returns fewer packets than requested, it indicates an end-of-file condition. Note that Audio File Services only reads one 32-bit chunk of a file at a time.

Availability

Available in Mac OS X v10.2 and later.

See Also

[AudioFileWritePackets](#) (page 24)

Related Sample Code

AudioQueueTest

AudioQueueTools

PlayAudioFileLite

SCAudioCompress

Declared In

AudioFile.h

AudioFileRemoveUserData

Removes a chunk of data from an audio file.

```
OSStatus AudioFileRemoveUserData (
    AudioFileID inAudioFile,
    UInt32      inUserDataID,
    UInt32      inIndex
);
```

Parameters

inAudioFile

The audio file whose chunk of data you want to remove.

inUserDataID

The four-character code such as COMM of the designated chunk.

inIndex

An index specifying which chunk with the four-character code specified in the *inUserDataID* parameter you want to query.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Availability

Available in Mac OS X v10.4 and later.

Declared In

AudioFile.h

AudioFileSetProperty

Sets the value of an audio file property

```
OSStatus AudioFileSetProperty (
    AudioFileID      inAudioFile,
    AudioFilePropertyID inPropertyID,
    UInt32           inDataSize,
    const void       *inPropertyData
);
```

Parameters

inAudioFile

The audio file that you want to set a property value for.

inPropertyID

The property whose value you want to set. See [“Audio File Properties”](#) (page 43) for possible values. Use the [AudioFileGetPropertyInfo](#) (page 13) function to determine whether the property value is writable.

inDataSize

The size of the value you are passing in the *inPropertyData* parameter.

inPropertyData

The new value for the property.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Availability

Available in Mac OS X v10.2 and later.

See Also

[AudioFileGetProperty](#) (page 12)

[AudioFileGetPropertyInfo](#) (page 13)

Related Sample Code

AudioQueueTools

ExtractMovieAudioToAIFF

QTAudioExtractionPanel

QTExtractAndConvertToAIFF

SCAudioCompress

Declared In

AudioFile.h

AudioFileSetUserData

Sets a chunk in an audio file.

```
OSStatus AudioFileSetUserData (
    AudioFileID inAudioFile,
    UInt32      inUserDataID,
    UInt32      inIndex,
    UInt32      inUserDataSize,
    const void *inUserData
);
```

Parameters

inAudioFile

The audio file whose chunk of data you want to set.

inUserDataID

The four-character code of the designated chunk.

inIndex

An index specifying which chunk with the four-character code specified in the *inUserDataID* parameter you want to query.

inUserDataSize

On input, the size of the data to copy. On output, the size of the bytes copied from the buffer.

inUserData

A pointer to a buffer from which to copy the chunk data.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Availability

Available in Mac OS X v10.4 and later.

See Also

[AudioFileGetUserData](#) (page 13)

Declared In

AudioFile.h

AudioFileWriteBytes

Writes bytes of audio data to an audio file.

```
OSStatus AudioFileWriteBytes (
    AudioFileID inAudioFile,
    Boolean      inUseCache,
    SInt64       inStartingByte,
    UInt32       *ioNumBytes,
    const void   *inBuffer
);
```

Parameters*inAudioFile*

The audio file to which you want to write bytes of data.

*inUseCache*Set to `true` if you want to cache the data. Otherwise, set to `false`.*inStartingByte*

The byte offset where the audio data should be written.

ioNumBytes

On input, a pointer the number of bytes to write. On output, a pointer to the number of bytes actually written.

inBuffer

A pointer to a buffer containing the bytes to be written.

Return ValueA result code. See [“Audio File Result Codes”](#) (page 50).**Discussion**In most cases, you should use [AudioFileWritePackets](#) (page 24) instead of this function.**Availability**

Available in Mac OS X v10.2 and later.

See Also[AudioFileReadBytes](#) (page 19)**Declared In**

AudioFile.h

AudioFileWritePackets

Writes packets of audio data to an audio data file.


```

OSStatus AudioFileWritePackets (
    AudioFileID          inAudioFile,
    Boolean              inUseCache,
    UInt32              inNumBytes,
    const AudioStreamPacketDescription *inPacketDescriptions,
    SInt64              inStartingPacket,
    UInt32              *ioNumPackets,
    const void          *inBuffer
);

```

Parameters*inAudioFile*

The audio file to write to.

*inUseCache*Set to `true` if you want to cache the data. Otherwise, set to `false`.*inNumBytes*

The number of bytes of audio data being written.

*inPacketDescriptions*A pointer to an array of packet descriptions for the audio data. Not all formats require packet descriptions. If no packet descriptions are required, for instance, if you are writing CBR data, pass `NULL`.*inStartingPacket*

The packet index for the placement of the first provided packet.

ioNumPackets

On input, a pointer to the number of packets to write. On output, a pointer to the number of packets actually written.

inBuffer

A pointer to user-allocated memory containing the new audio data to write to the audio data file.

Return ValueA result code. See [“Audio File Result Codes”](#) (page 50).**Discussion**

For all uncompressed formats, this function equates packets with frames.

Availability

Available in Mac OS X v10.2 and later.

See Also[AudioFileReadPackets](#) (page 20)**Related Sample Code**

AudioQueueTools

ExtractMovieAudioToAIFF

QTAudioExtractionPanel

QTExtractAndConvertToAIFF

SCAudioCompress

Declared In

AudioFile.h

NextAudioFileRegion

Finds the next audio file region in a region list.

```
#define NextAudioFileRegion (inAFRegionPtr) (
    (AudioFileRegion*) ((char*) (inAFRegionPtr) +
        offsetof(AudioFileRegion, mMarkers) +
        ((inAFRegionPtr)->mNumberMarkers) * sizeof (AudioFileMarker))
)
```

Parameters

inAFRegionPtr

A pointer to an audio file region in the region list.

Return Value

A pointer to the next region after the region pointed to by the *inAFRegionPtr* parameter. This value can be beyond the end of the list, so pay attention to the total number of regions in the list.

Discussion

Because audio file regions are of variable length, you cannot easily walk the list. Use this convenience function when you call the [AudioFileGetProperty](#) (page 12) function with the [kAudioFilePropertyRegionList](#) (page 46) property to walk through the list of regions returned.

Availability

Available in Mac OS X v10.3 and later.

See Also

[AudioFileSetProperty](#) (page 22)

Declared In

AudioFile.h

NumAudioFileMarkersToNumBytes

A macro that returns the number of bytes corresponding to a specified number of audio file markers.

```
#define NumAudioFileMarkersToNumBytes(inNumMarkers) (
    offsetof (AudioFileMarkerList, mMarkers) + (inNumMarkers) *
    sizeof(AudioFileMarker)
)
```

Parameters

inNumMarkers

The number of audio file markers for which you wish to know the equivalent number of bytes.

Return Value

The number of bytes required to contain the specified number of audio file markers.

Discussion

Use this convenience function when you call the [AudioFileSetProperty](#) function with the [kAudioFilePropertyMarkerList](#) (page 46) property to calculate the size of buffer needed to hold a specific number of audio file markers.

Availability

Available in Mac OS X v10.3 and later.

See Also[AudioFileSetProperty](#) (page 22)**Declared In**

AudioFile.h

NumBytesToNumAudioFileMarkers

A macro that returns the number of audio file markers represented by a specified number of bytes.

```
#define NumBytesToNumAudioFileMarkers (inNumBytes) (
    (inNumBytes) < offsetof (AudioFileMarkerList, mMarkers[0]) ? 0 :
    ((inNumBytes) - offsetof (AudioFileMarkerList, mMarkers[0])) / sizeof
    (AudioFileMarker)
)
```

Parameters*inNumBytes*

The number of bytes for which you wish to know the equivalent number of audio file markers.

Return Value

The number of audio file markers that can be contained in the specified number of bytes.

Discussion

Use this convenience macro when you call the [AudioFileGetProperty](#) (page 12) function with the [kAudioFilePropertyMarkerList](#) (page 46) property to calculate the number of markers that will be returned.

Availability

Available in Mac OS X v10.3 and later.

See Also[AudioFileGetProperty](#) (page 12)**Declared In**

AudioFile.h

Callbacks by Task

Reading and Writing Audio File Data

[AudioFile_ReadProc](#) (page 28)

Reads audio data when used in conjunction with the [AudioFileOpenWithCallbacks](#) (page 18) or [AudioFileInitializeWithCallbacks](#) (page 15) functions.)

[AudioFile_WriteProc](#) (page 29)

A callback for writing file data when used in conjunction with the [AudioFileOpenWithCallbacks](#) (page 18) or [AudioFileCreateWithURL](#) (page 9) functions.)

Getting the Size of Audio File Data

[AudioFile_GetSizeProc](#) (page 28)

Gets the size of the file data when used in conjunction with the [AudioFileOpenWithCallbacks](#) (page 18) or [AudioFileInitializeWithCallbacks](#) (page 15). functions.)

Callbacks

AudioFile_GetSizeProc

Gets the size of the file data when used in conjunction with the [AudioFileOpenWithCallbacks](#) (page 18) or [AudioFileInitializeWithCallbacks](#) (page 15). functions.)

```
SInt64 (*AudioFile_GetSizeProc)(
    void *inClientData);
```

If you name your function `MyAudioFile_GetSizeProc`, you would declare it like this:

```
SInt64 MyAudioFile_GetSizeProc (
    void *inClientData);
```

Parameters

inClientData

A pointer to the client data as set in the `inClientData` parameter to the [AudioFileOpenWithCallbacks](#) (page 18) or [AudioFileInitializeWithCallbacks](#) (page 15) functions.

Return Value

The callback should return the size of the data.

Availability

Available in Mac OS X v10.3 and later.

Declared In

`AudioFile.h`

AudioFile_ReadProc

Reads audio data when used in conjunction with the [AudioFileOpenWithCallbacks](#) (page 18) or [AudioFileInitializeWithCallbacks](#) (page 15) functions.)

```
typedef OSStatus (*AudioFile_ReadProc)(
    void *inClientData,
    SInt64 inPosition,
    UInt32 requestCount,
    void *buffer,
    UInt32 *actualCount);
```

If you name your function `MyAudioFile_ReadProc`, you would declare it like this:

```
OSStatus MyAudioFile_ReadProc (
    void      *inClientData,
    Sint64    inPosition,
    UInt32    requestCount,
    void      *buffer,
    UInt32    *actualCount);
```

Parameters*inClientData*

A pointer to the client data as set in the `inClientData` parameter to [AudioFileOpenWithCallbacks](#) (page 18) or [AudioFileInitializeWithCallbacks](#) (page 15).

inPosition

An offset into the data from which to read.

requestCount

The number of bytes to read.

buffer

A pointer to the buffer in which to put the data read.

actualCount

On output, the callback should set this parameter to a pointer to the number of bytes successfully read.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Discussion

This callback function is called when Audio File Services needs to read data.

Availability

Available in Mac OS X v10.5 and later.

Declared In

AudioFile.h

AudioFile_WriteProc

A callback for writing file data when used in conjunction with the [AudioFileOpenWithCallbacks](#) (page 18) or [AudioFileCreateWithURL](#) (page 9) functions.)

```
OSStatus (*AudioFile_WriteProc) (
    void      *inClientData,
    Sint64    inPosition,
    UInt32    requestCount,
    const void *buffer,
    UInt32    *actualCount);
```

If you name your function `MyAudioFile_WriteProc`, you would declare it like this:

```
OSStatus (MyAudioFile_WriteProc)(
    void      *inClientData,
    Sint64    inPosition,
```

```

    UInt32    requestCount,
    void      *buffer,
    UInt32    *actualCount);

```

Parameters*inClientData*

A pointer to the client data as set in the *inClientData* parameter to [AudioFileOpenWithCallbacks](#) (page 18) or [AudioFileInitializeWithCallbacks](#) (page 15).

inPosition

An offset into the data from which to read.

requestCount

The number of bytes to write.

buffer

A pointer to the buffer containing the data to write.

actualCount

Upon completion, the callback should set this to a pointer to the number of bytes successfully written.

Return Value

A result code. See [“Audio File Result Codes”](#) (page 50).

Discussion

This callback function is invoked when Audio File Services needs to write data.

Availability

Available in Mac OS X v10.3 and later.

Declared In

AudioFile.h

Data Types

AudioFileID

Defines an opaque data type that represents an audio file object.

```
typedef struct OpaqueAudioFileID *AudioFileID;
```

Availability

Available in Mac OS X v10.2 and later.

Declared In

AudioFile.h

AudioFilePropertyID

A constant for an audio file property.

```
typedef UInt32          AudioFilePropertyID;
```

Availability

Available in Mac OS X v10.2 and later.

Declared In

AudioFile.h

AudioFile_SMPTE_Time

A data structure for describing SMPTE (Society of Motion Picture and Television Engineers) time.

```
struct AudioFile_SMPTE_Time
{
    SInt8  mHours;
    UInt8  mMinutes;
    UInt8  mSeconds;
    UInt8  mFrames;
    UInt32 mSubFrameSampleOffset;
};
typedef struct AudioFile_SMPTE_Time AudioFile_SMPTE_Time;
```

Fields

mHours

The hours.

mMinutes

The minutes.

mSeconds

The seconds.

mFrames

The frames.

mSubFrameSampleOffset

The sample offset within a frame.

Availability

Available in Mac OS X v10.3 and later.

Declared In

AudioFile.h

AudioFileMarker

An audio file marker annotates a position in an audio file with additional information.

```
struct AudioFileMarker
{
    Float64 mFramePosition;
```

```

    CFStringRef          mName;
    SInt32               mMarkerID;
    AudioFile_SMPTE_Time mSMPTETime;
    UInt32               mType;
    UInt16               mReserved;
    UInt16               mChannel;
};
typedef struct AudioFileMarker AudioFileMarker;

```

Fields

mFramePosition

The frame in the file counting from the start of the audio data.

mName

The name of the marker.

mMarkerID

A unique ID for the marker.

mSMPTETime

The SMPTE time for this marker.

mType

The marker type.

mReserved

A reserved field. Set to 0.

mChannel

The channel number referred to by the marker. Set to 0 if the marker applies to all channels.

Availability

Available in Mac OS X v10.3 and later.

Declared In

AudioFile.h

AudioFileMarkerList

A list of markers associated with an audio file, including their SMPTE time type, the number of markers, and the markers themselves.

```

struct AudioFileMarkerList
{
    UInt32          mSMPTE_TimeType;
    UInt32          mNumberMarkers;
    AudioFileMarker mMarkers[1];
};
typedef struct AudioFileMarkerList AudioFileMarkerList;

```

Fields

mSMPTE_TimeType

The SMPTE time type of the whole list of markers in an audio file.

mNumberMarkers

The number of markers in the list.

mMarkers

An array of mNumberMarkers elements, each of which is an audio file marker.

Availability

Available in Mac OS X v10.3 and later.

Declared In

AudioFile.h

AudioFileRegion

An audio file region specifies a segment of audio data.

```
struct AudioFileRegion
{
    UInt32          mRegionID;
    CFStringRef     mName;
    UInt32          mFlags;
    UInt32          mNumberMarkers;
    AudioFileMarker mMarkers[1];
};
typedef struct AudioFileRegion AudioFileRegion;
```

Fields

mRegionID

A unique ID associated with the audio file region.

mName

The name of the region.

mFlags

Audio File Services region flags. For details, see [“Audio File Region Flags”](#) (page 39).

mNumberMarkers

The number of markers in the array specified in the mMarkers parameter.

mMarkers

An array of mNumberMarkers elements describing where the data in the region starts. For details, see [“Audio File Marker Types”](#) (page 39).

Discussion

Typically, a region consists of at least two markers designating the beginning and end of the segment. Other markers might define additional meta information such as sync point.

Availability

Available in Mac OS X v10.3 and later.

Declared In

AudioFile.h

AudioFileRegionList

A list of the audio file regions in a file.

```

struct AudioFileRegionList
{
    UInt32          mSMPTE_TimeType;
    UInt32          mNumberRegions;
    AudioFileRegion mRegions[1];
};
typedef struct AudioFileRegionList AudioFileRegionList;

```

Fields

mSMPTE_TimeType

The SMPTE timing scheme used in the file. See Core Audio's `CAFFile.h` header file for the values used here. For more information, see *Core Audio Overview*.

mNumberRegions

The number of regions in the list specified in the `mRegions` parameter.

mRegions

A variable array of `mNumberRegions` elements containing a list of more than one audio file regions. For information on the `AudioFileRegion` data type, see [AudioFileRegion](#) (page 33).

Audio file markers are variable length, so this list cannot be accessed as an array. For details on the `AudioFileMarker` data type, see [AudioFileMarker](#) (page 31).

Use the [NextAudioFileRegion](#) (page 26) convenience macro for traversing the region list instead. This macro enables you to step to the next region in the data that Audio File Services returns.

Discussion

This structure is used by the [kAudioFilePropertyRegionList](#) (page 46) property.

Availability

Available in Mac OS X v10.3 and later.

Declared In

`AudioFile.h`

AudioFramePacketTranslation

A data structure used by the [kAudioFilePropertyPacketToFrame](#) (page 46) and [kAudioFilePropertyFrameToPacket](#) (page 46) properties.

```

struct AudioFramePacketTranslation
{
    SInt64 mFrame;
    SInt64 mPacket;
    UInt32 mFrameOffsetInPacket;
};
typedef struct AudioFramePacketTranslation AudioFramePacketTranslation;

```

Fields

mFrame

A frame number.

mPacket

A packet number.

mFrameOffsetInPacket

A frame offset in a packet.

Availability

Available in Mac OS X v10.3 and later.

Declared In

AudioFile.h

AudioFilePacketTableInfo

Contains information about the number of valid frames in a file and where they begin and end.

```
struct AudioFilePacketTableInfo
{
    SInt64  mNumberValidFrames;
    SInt32  mPrimingFrames;
    SInt32  mRemainderFrames;
};
typedef struct AudioFilePacketTableInfo AudioFilePacketTableInfo;
```

Fields

mNumberValidFrames

The number of valid frames in the file.

mPrimingFrames

The number of invalid frames at the beginning of the file.

mRemainderFrames

The number of invalid frames at the end of the file.

Discussion

Some data formats might have packets with contents that are not completely valid, but that represent priming or remainder frames not intended for playback. For example, a file with 100 packets of AAC is nominally $1024 * 100 = 102400$ frames of data. However, the first 2112 frames might be priming frames.

A number of remainder frames might be added to pad out to a full packet of 1024 frames. Discard the priming and remainder frames.

The total number of packets in the file times the frames per packet (or counting each packet's frames individually for a variable frames per packet format) minus mPrimingFrames, minus mRemainderFrames, should equal mNumberValidFrames.

Availability

Available in Mac OS X v10.3 and later.

Declared In

AudioFile.h

AudioFileTypeandFormat ID

A specifier for the constant `kAudioFileGlobalInfo_AvailableStreamDescriptionsForFormat` (page 48).

```

struct AudioFileTypeAndFormatID
{
    AudioFileTypeID  mFileType;
    UInt32          mFormatID;
};
typedef struct AudioFileTypeAndFormatID AudioFileTypeAndFormatID;

```

Fields

mFileType

A four-character code for the file type (for instance, the [kAudioFileAIFFType](#) (page 37) type).

mFormatID

A four-character code for the format ID such as `kAudioFormatLinearPCM`, `kAudioFormatMPEG4AAC`, and so forth. (See the `AudioFormat.h` header file for declarations.)

Discussion

This structure specifies a desired audio file type and data format ID so you can obtain a list of stream descriptions of available formats.

Availability

Available in Mac OS X v10.3 and later.

Declared In

`AudioFile.h`

Constants

Built-In Audio File Types

Operating system constants that indicate the type of file to be written or a hint about what type of file to expect from data provided.

```

enum {
    kAudioFileAIFFType           = 'AIFF',
    kAudioFileAIFCType          = 'AIFC',
    kAudioFileWAVEType          = 'WAVE',
    kAudioFileSoundDesigner2Type = 'Sd2f',
    kAudioFileNextType          = 'NeXT',
    kAudioFileMP3Type           = 'MPG3',
    kAudioFileMP2Type           = 'MPG2',
    kAudioFileMP1Type           = 'MPG1',
    kAudioFileAC3Type           = 'ac-3',
    kAudioFileAAC_ADTSType      = 'adts',
    kAudioFileMPEG4Type         = 'mp4f',
    kAudioFileM4AType           = 'm4af',
    kAudioFileCAFType           = 'caff',
    kAudioFile3GPType           = '3gpp',
    kAudioFile3GP2Type         = '3gp2',
    kAudioFileAMRType           = 'amrf'
};

```

```
typedef UInt32          AudioFileTypeID;
```

Constants

`kAudioFileAIFFFType`

An Audio Interchange File Format (AIFF) file.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFileAIFCType`

An Audio Interchange File Format Compressed (AIFF-C) file.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFileWAVEType`

A Microsoft WAVE file.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFileSoundDesigner2Type`

A Sound Designer II file.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFileNextType`

A NeXT or Sun Microsystems file.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileMP3Type`

An MPEG Audio Layer 3 (.mp3) file.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileMP2Type`

An MPEG Audio Layer 2 (.mp2) file.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

`kAudioFileMP1Type`

An MPEG Audio Layer 1 (.mp1) file.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

`kAudioFileAC3Type`

An AC-3 file.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileAAC_ADTSType`

An Advanced Audio Coding (AAC) Audio Data Transport Stream (ADTS) file.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileMPEG4Type`

An MPEG 4 file.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileM4AType`

An M4A file.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileCAFType`

A Core Audio File Format file.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

Declared In

`AudioFile.h`

Audio File Creation Flags

Flags for use with the [AudioFileCreateWithURL](#) (page 9) and [AudioFileCreate](#) (page 8) functions.

```
enum {
    kAudioFileFlags_EraseFile           = 1
    kAudioFileFlags_DontPageAlignAudioData = 2
};
```

Constants

`kAudioFileFlags_EraseFile`

If set, the `AudioFileCreateWithURL` function erases the contents of an existing file. If not set, then the function fails if the file already exists.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

`kAudioFileFlags_DontPageAlignAudioData`

Typically, the audio data in a file is page aligned. To make reading the file data as fast as possible, you can use page-aligned data to take advantage of optimized code paths in the file system. However, when space is at a premium, you might want to avoid the additional padding required to attain alignment. To do so, set this flag when calling [AudioFileCreate](#) (page 8) or [AudioFileCreateWithURL](#) (page 9).

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

Declared In

`AudioFile.h`

Audio File Loop Direction Constants

The playback direction of a looped segment of an audio file.

```
enum {
    kAudioFileLoopDirection_NoLooping = 0,
    kAudioFileLoopDirection_Forward = 1,
    kAudioFileLoopDirection_ForwardAndBackward = 2,
    kAudioFileLoopDirection_Backward = 3
};
```

Constants

`kAudioFileLoopDirection_NoLooping`
The segment is not looped.
 Available in Mac OS X v10.3 and later.
 Declared in `AudioFile.h`.

`kAudioFileLoopDirection_Forward`
Play the segment forward.
 Available in Mac OS X v10.3 and later.
 Declared in `AudioFile.h`.

`kAudioFileLoopDirection_Backward`
Play the segment backward.
 Available in Mac OS X v10.3 and later.
 Declared in `AudioFile.h`.

`kAudioFileLoopDirection_ForwardAndBackward`
Play the segment forward and backward.
 Available in Mac OS X v10.3 and later.
 Declared in `AudioFile.h`.

Declared In

`AudioFile.h`

Audio File Marker Types

A type of marker within a file used in the `mType` field of the [AudioFileMarker](#) (page 31) structure.

```
enum {
    kAudioFileMarkerType_Generic = 0,
};
```

Constants

`kAudioFileMarkerType_Generic`
A generic marker.
 Available in Mac OS X v10.3 and later.
 Declared in `AudioFile.h`.

Declared In

`AudioFile.h`

Audio File Region Flags

Flags that specify a playback direction for an [AudioFileRegion](#) (page 33) structure.

```
enum {
    kAudioFileRegionFlag_LoopEnable = 1,
    kAudioFileRegionFlag_PlayForward = 2,
    kAudioFileRegionFlag_PlayBackward = 4
};
```

Constants

`kAudioFileRegionFlag_LoopEnable`

If set, the region is looped. You must set one or both of the remaining flags must also be set for the region to be looped.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileRegionFlag_PlayForward`

If set, the region is played forward.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileRegionFlag_PlayBackward`

If set, the region is played backward.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

Discussion

You can set one or more of these flags. For example, if both `kAudioFileRegionFlag_LoopEnable` and `kAudioFileRegionFlag_PlayForward` are set, the region plays as a forward loop. If only `kAudioFileRegionFlag_PlayForward` is set, the region is played forward once. If both `kAudioFileRegionFlag_PlayForward` and `kAudioFileRegionFlag_PlayBackward` are set, the region plays forward then backward, then forward.

Declared In

`AudioFile.h`

Info String Keys

Key values of properties to get and set using Audio File Services functions and provide a common way to get the same information out of several different kinds of files.


```

#define kAFInfoDictionary_Artist           "artist"
#define kAFInfoDictionary_Album           "album"
#define kAFInfoDictionary_Tempo           "tempo"
#define kAFInfoDictionary_KeySignature    "key signature"
#define kAFInfoDictionary_TimeSignature   "time signature"
#define kAFInfoDictionary_TrackNumber     "track number"
#define kAFInfoDictionary_Year            "year"
#define kAFInfoDictionary_Composer        "composer"
#define kAFInfoDictionary_Lyricist        "lyricist"
#define kAFInfoDictionary_Genre           "genre"
#define kAFInfoDictionary_Title           "title"
#define kAFInfoDictionary_RecordedDate    "recorded date"
#define kAFInfoDictionary_Comments        "comments"
#define kAFInfoDictionary_Copyright       "copyright"
#define kAFInfoDictionary_SourceEncoder   "source encoder"
#define kAFInfoDictionary_EncodingApplication "encoding application"
#define kAFInfoDictionary_NominalBitRate  "nominal bit rate"
#define kAFInfoDictionary_ChannelLayout   "channel layout"
#define kAFInfoDictionary_ApproximateDurationInSeconds "approximate duration in seconds"

```

Constants

kAFInfoDictionary_Artist

An artist.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_Album

An album.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_Tempo

A tempo.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_KeySignature

A key signature.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_TimeSignature

A time signature.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_TrackNumber

A track number.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_Year

A year.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_Composer

A composer.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_Lyricist

A lyricist.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_Genre

A genre.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_Title

A title.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_RecordedDate

A recorded date.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_Comments

Comments.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_Copyright

Copyright.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_SourceEncoder

A source encoder.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_EncodingApplication

An encoding application.

Available in Mac OS X v10.3 and later.

Declared in AudioFile.h.

kAFInfoDictionary_NominalBitRate

A nominal bit rate.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

kAFInfoDictionary_ChannelLayout

A channel layout.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

kAFInfoDictionary_ApproximateDurationInSeconds

An approximate duration in seconds.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

Declared In

`AudioFile.h`

Audio File Properties

Properties used by the functions described in getting and setting pieces of data in audio files. See [“Working with Global Information”](#) (page 7) for details.

```

enum
{
    kAudioFilePropertyFileFormat          = 'ffmt',
    kAudioFilePropertyDataFormat          = 'dfmt',
    kAudioFilePropertyIsOptimized        = 'optm',
    kAudioFilePropertyMagicCookieData    = 'mgic',
    kAudioFilePropertyAudioDataByteCount = 'bcnt',
    kAudioFilePropertyAudioDataPacketCount = 'pcnt',
    kAudioFilePropertyMaximumPacketSize  = 'psze',
    kAudioFilePropertyDataOffset          = 'doff',
    kAudioFilePropertyChannelLayout       = 'cmap',
    kAudioFilePropertyDeferSizeUpdates    = 'dszu',
    kAudioFilePropertyDataFormatName      = 'fnme',
    kAudioFilePropertyMarkerList          = 'mkls',
    kAudioFilePropertyRegionList          = 'rgls',
    kAudioFilePropertyPacketToFrame       = 'pkfr',
    kAudioFilePropertyFrameToPacket       = 'frpk',
    kAudioFilePropertyChunkIDs             = 'chid',
    kAudioFilePropertyInfoDictionary      = 'info',
    kAudioFilePropertyPacketTableInfo     = 'pnfo',
    kAudioFilePropertyFormatList           = 'flst',
    kAudioFilePropertyPacketSizeUpperBound = 'pkub',
    kAudioFilePropertyReserveDuration     = 'rsrv',
    kAudioFilePropertyEstimatedDuration   = 'edur',
    kAudioFilePropertyBitRate              = 'brat'
};

```

Constants

`kAudioFilePropertyFileFormat`

The format of the audio data file.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyDataFormat`

An audio stream basic description containing the format of the audio data.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyFormatList`

To support formats such as AAC SBR in which an encoded data stream can be decoded to multiple destination formats, this property returns an array of audio format list item values (declared in `AudioFormat.h`) of those formats. Typically, this returns an audio format list item with the same audio stream basic description returned by `kAudioFilePropertyDataFormat`.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyIsOptimized`

Indicates whether a designated audio file has been optimized, that is, ready to start having sound data written to it. A value of 0 indicates the file needs to be optimized. A value of 1 indicates the file is currently optimized.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyMagicCookieData`

A pointer to memory set up by the caller. Some file types require that a magic cookie be provided before packets can be written to an audio file. Set this property before you call [AudioFileWriteBytes](#) (page 24) or [AudioFileWritePackets](#) (page 24) if a magic cookie exists.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyAudioDataByteCount`

Indicates the number of bytes of audio data in the designated file.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyAudioDataPacketCount`

Indicates the number of packets of audio data in the designated file.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyMaximumPacketSize`

Indicates the maximum size of a packet for the data in the designated file.

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyDataOffset`

Indicates the byte offset in the file of the designated audio data.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyChannelLayout`

An audio channel layout structure.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyDeferSizeUpdates`

The default value (0) always updates header. If set to 1, updating the files sizes in the header is not performed every time data is written. Instead, the updating is deferred until the file has been read, optimized, or closed. This process is more efficient, but not as safe. If an application crashes before the size has been updated, the file might not be readable.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyDataFormatName`

This constant is deprecated in Mac OS X v 10.5 and later. Do not use. Instead, use `kAudioFormatProperty_FormatName` (declared in the `AudioFormat.h` header file).

Available in Mac OS X v10.2 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyMarkerList`

Accesses the list of markers defined in the file and returns an audio file marker list. The CF string referencing the returned structures must be released by the client. See the [NumBytesToNumAudioFileMarkers](#) (page 27) and [NumAudioFileMarkersToNumBytes](#) (page 26) functions to convert between audio file markers and the equivalent number of bytes.

Available in Mac OS X v10.2.4 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyRegionList`

Accesses the list of regions defined in the file and returns an array of audio file region values. The CF string references in the returned structures must be released by the client. See the [NextAudioFileRegion](#) (page 26) function for a way to walk through the region list.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyPacketToFrame`

Passes an audio frame packet translation structure with the `mPacket` field filled out and returns the `mFrame` field. The `mFrameOffsetInPacket` field is ignored.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyFrameToPacket`

Passes an audio frame packet translation structure with the `mFrame` field filled out and returns the `mPacket` and `mFrameOffsetInPacket` fields.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyChunkIDs`

Returns an array of four-character codes for each kind of chunk in the file.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyInfoDictionary`

Returns a CF Dictionary with information about the data in the file. `AudioFileComponents` (declared in `AudioFileComponents.h`) are free to add keys to the dictionaries that they return for this property. The caller is responsible for releasing the `CFObject` (declared in the `AudioFileComponents.h` header file).

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyPacketTableInfo`

Gets or sets an audio file packet table information structure for its supporting file types. When setting the structure, the sum of the values of the `mNumberValidFrames`, `mPrimingFrames` and `mRemainderFrames` fields must be the same as the total number of frames in all packets. If not, a `paramErr` is returned. To ensure this result, get the value of the property and make sure the sum of the three values you set has the same sum as the three values you got.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyPacketSizeUpperBound`

The theoretical maximum packet size in the file. This value is obtained without actually scanning the whole file to find the largest packet, as could happen with `kAudioFilePropertyMaximumPacketSize`.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyReserveDuration`

The duration in seconds of the data expected to be written. Set this property before any data has been written to reserve space in the file header for a packet table and other information to appear before the audio data. Otherwise, the packet table might get written at the end of the file, preventing the file from being streamable.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyEstimatedDuration`

An estimated duration in seconds. If this duration can be calculated without scanning the entire file, or all the audio data packets have been scanned, the value accurately reflects the duration of the audio data.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

`kAudioFilePropertyBitRate`

Returns the actual bit rate (number of audio data bits in the file divided by the duration of the file) for some file types, and the nominal bit rate (which bit rate the encoder was set to) for others.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

Declared In

`AudioFile.h`

Audio File Global Info Properties

Properties used when [“Working with Global Information”](#) (page 7).

enum

```
{
    kAudioFileGlobalInfo_ReadableTypes           = 'afrf',
    kAudioFileGlobalInfo_WritableTypes           = 'afwf',
    kAudioFileGlobalInfo_FileTypeName            = 'ftnm',
    kAudioFileGlobalInfo_AvailableStreamDescriptionsForFormat = 'sdid',
    kAudioFileGlobalInfo_AvailableFormatIDs      = 'fmid',

    kAudioFileGlobalInfo_AllExtensions           = 'alxt',
    kAudioFileGlobalInfo_AllHFSTypeCodes        = 'ahfs',
    kAudioFileGlobalInfo_AllUTIs                = 'auti',
    kAudioFileGlobalInfo_AllMIMETypes           = 'amim',

    kAudioFileGlobalInfo_ExtensionsForType      = 'fext',
    kAudioFileGlobalInfo_HFSTypeCodesForType    = 'fhfs',
    kAudioFileGlobalInfo_UTIsForType            = 'futi',
    kAudioFileGlobalInfo_MIMETypesForType       = 'fmim',
```

```

kAudioFileGlobalInfo_TypesForMIMEType           = 'tmim',
kAudioFileGlobalInfo_TypesForUTI                = 'tuti',
kAudioFileGlobalInfo_TypesForHFSTypeCode       = 'thfs',
kAudioFileGlobalInfo_TypesForExtension         = 'text'
};

```

Constants

`kAudioFileGlobalInfo_ReadableTypes`

No specifier needed. (A *specifier* in this context is a pointer to a buffer containing some data which is different for each property. The type of the data required is described in the description of each property.) Must be set to `NULL`. Returns an array of `UInt32` values containing the file types (such as `AIFF`, `WAVE`, and so forth) that can be opened for reading.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileGlobalInfo_WritableTypes`

No specifier needed. Must be set to `NULL`. Returns an array of `UInt32` values containing the file types (such as `AIFF`, `WAVE`, and so forth) that can be opened for writing.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileGlobalInfo_FileTypeName`

A pointer to an audio file type ID containing a file type. Returns a `CFString` containing the name for the file type.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileGlobalInfo_AvailableFormatIDs`

A pointer to an audio file type ID containing a file type. Returns an array of format IDs for formats that can be read.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileGlobalInfo_AvailableStreamDescriptionsForFormat`

A pointer to an audio file type and format ID structure. Returns an array of audio stream basic description structures, which contain all the formats for a particular file type and format ID. The audio stream basic description structures have the following fields filled in: `mFormatID`, `mFormatFlags`, and `mBitsPerChannel` for writing new files.

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

`kAudioFileGlobalInfo_AllExtensions`

No specifier needed. Must be set to `NULL`. Returns a `CFArray` of `CFStrings` containing all recognized file extensions. You can use this array when creating an `NSOpenPanel` (declared in the AppKit's `NSOpenPanel.h` header file).

Available in Mac OS X v10.3 and later.

Declared in `AudioFile.h`.

- `kAudioFileGlobalInfo_AllHFSTypeCodes`
 No specifier needed. Must be set to NULL. Returns an array of HFS type codes containing all recognized HFS type codes. For more information on HFS type codes, see Audio Toolbox's `ExtendedAudioFile.h` header file.
 Available in Mac OS X v10.3 and later.
 Declared in `AudioFile.h`.
- `kAudioFileGlobalInfo_AllUTIs`
 No specifier needed. Must be set to NULL. Returns a `CFArray` of `CFString` of all UTIs (Universal Type Identifiers) recognized by Audio File Services. The caller is responsible for releasing the `CFArray`.
 Available in Mac OS X v10.5 and later.
 Declared in `AudioFile.h`.
- `kAudioFileGlobalInfo_AllMIMETypes`
 No specifier needed. Must be set to NULL. Returns a `CFArray` of CF strings of all MIME types are recognized by Audio File Services. The caller is responsible for releasing the `CFArray`.
 Available in Mac OS X v10.5 and later.
 Declared in `AudioFile.h`.
- `kAudioFileGlobalInfo_ExtensionsForType`
 A pointer to an audio file type ID containing a file type. Returns a `CFArray` of CF strings containing the recognized file extensions for the designated type.
 Available in Mac OS X v10.3 and later.
 Declared in `AudioFile.h`.
- `kAudioFileGlobalInfo_HFSTypeCodesForType`
 A pointer to an audio file type ID. Returns an array of HFS type codes corresponding to the designated file type. The first type in the array is the preferred one to use.
 Available in Mac OS X v10.3 and later.
 Declared in `AudioFile.h`.
- `kAudioFileGlobalInfo_UTIsForType`
 A pointer to an audio file type ID. Returns a `CFArray` of `CFString` of all Universal Type Identifiers recognized by the file type. The caller is responsible for releasing the `CFArray`.
 Available in Mac OS X v10.5 and later.
 Declared in `AudioFile.h`.
- `kAudioFileGlobalInfo_MIMETypesForType`
 A pointer to an audio file type ID. Returns a `CFArray` of `CFString` of all MIME types recognized by the designated file type. The caller is responsible for releasing the `CFArray`.
 Available in Mac OS X v10.5 and later.
 Declared in `AudioFile.h`.
- `kAudioFileGlobalInfo_TypesForExtension`
 A `CFStringRef` containing a file extension. Returns an array of all audio file type IDs that support the extension.
 Available in Mac OS X v10.5 and later.
 Declared in `AudioFile.h`.

`kAudioFileGlobalInfo_TypesForHFSTypeCode`

An `HFSTypeCode`. Returns an array of all audio file type IDs that support the designated `HFSTypeCode`.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

`kAudioFileGlobalInfo_TypesForUTI`

A `CFStringRef` containing a Universal Type Identifier. Returns an array of all audio file type IDs that support the UTI.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

`kAudioFileGlobalInfo_TypesForMIMETYPE`

A `CFStringRef` containing a MIME Type. Returns an array of all audio file type IDs that support the MIME type.

Available in Mac OS X v10.5 and later.

Declared in `AudioFile.h`.

Declared In

`AudioFile.h`

Result Codes

This table lists the result codes defined for Audio File Services.

Result Code	Value	Description
<code>noErr</code>	0	No error. Available in Mac OS X v10.0 and later.
<code>kAudioFileUnspecifiedError</code>	'wht?'	An unspecified error has occurred. Available in Mac OS X v10.2 and later.
<code>kAudioFileUnsupportedFileTypeError</code>	'typ?'	The file type is not supported. Available in Mac OS X v10.2 and later.
<code>kAudioFileUnsupportedDataFormatError</code>	"fmt?'"	The data format is not supported by this file type. Available in Mac OS X v10.2 and later.
<code>kAudioFileUnsupportedPropertyError</code>	'pty?'	The property is not supported. Available in Mac OS X v10.2 and later.
<code>kAudioFileBadPropertySizeError</code>	'!siz'	The size of the property data was not correct. Available in Mac OS X v10.2 and later.

Result Code	Value	Description
<code>kAudioFilePermissionsError</code>	'prm?'	The operation violated the file permissions. For example, an attempt was made to write to a file opened with the <code>kAudioFileReadPermission</code> constant. Available in Mac OS X v10.2 and later.
<code>kAudioFileNotOptimizedError</code>	'optm'	The chunks following the audio data chunk are preventing the extension of the audio data chunk. To write more data, you must optimize the file. Available in Mac OS X v10.2 and later.
<code>kAudioFileInvalidChunkError</code>	'chk?'	Either the chunk does not exist in the file or it is not supported by the file. Available in Mac OS X v10.2 and later.
<code>kAudioFileDoesNotAllow64BitDataSizeError</code>	'off?'	The file offset was too large for the file type. The AIFF and WAVE file format types have 32-bit file size limits. Available in Mac OS X v10.2 and later.
<code>kAudioFileInvalidPacketOffsetError</code>	'pck?'	A packet offset was past the end of the file, or not at the end of the file when a VBR format was written, or a corrupt packet size was read when the packet table was built. Available in Mac OS X v10.3 and later.
<code>kAudioFileInvalidFileError</code>	'dta?'	The file is malformed, or otherwise not a valid instance of an audio file of its type. Available in Mac OS X v10.3 and later.
<code>kAudioFileOperationNotSupportedError</code>	0x6F703F3F	The operation cannot be performed. For example, setting the kAudioFilePropertyAudioDataByteCount (page 45) constant to increase the size of the audio data in a file is not a supported operation. Write the data instead. Available in Mac OS X v10.3 and later.

Document Revision History

This table describes the changes to *Audio File Services Reference*.

Date	Notes
2008-07-08	Added new properties for packet to byte and byte to packet translations.
2007-05-29	New document describing a C programming interface for reading or writing audio files.

REVISION HISTORY

Document Revision History

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