Documentation

Language: **Swift**

Audio Toolbox / Audio Unit v2 (C) API

API Collection

Audio Unit v2 (C) API

Configure an Audio Unit and prepare it to render audio.

Topics

Initializing the Audio Unit

```
func AudioUnitInitialize(AudioUnit) -> OSStatus
```

Initializes an audio unit

```
func AudioUnitUninitialize(AudioUnit) -> OSStatus
```

Uninitializes an audio unit.

```
func AudioUnitProcess(AudioUnit, UnsafeMutablePointer<AudioUnitRenderActionFlags>?, UnsafePointer<AudioTimeStamp>, UInt32, UnsafeMutablePointer<AudioBufferList>) -> OSStatus
```

```
func AudioUnitProcessMultiple(AudioUnit, UnsafeMutablePointer<AudioUnitRenderActionFlags>?, UnsafePointer<AudioTimeStamp>, UInt32, UInt32, UnsafeMutablePointer<UnsafePointer<AudioBufferList>>, UInt32, UnsafeMutablePointer<UnsafeMutablePointer<AudioBufferList>>) -> OSStatus
```

```
func AudioUnitReset(AudioUnit, AudioUnitScope, AudioUnitElement) -> OSStatus
```

Resets an audio unit’s render state.

```
typealias AudioUnit
```

The data type for a plug-in component that provides audio processing or audio data generation.

Starting and Stopping Output

```
func AudioOutputUnitStart(AudioUnit) -> OSStatus
```

Starts an I/O audio unit, which in turn starts the audio unit processing graph that it is connected to.

```
func AudioOutputUnitStop(AudioUnit) -> OSStatus
```

Stops an I/O audio unit, which in turn stops the audio unit processing graph that it is connected to.

```
typealias AudioOutputUnitStartProc
```

```
typealias AudioOutputUnitStopProc
```

Rendering the Audio

```
func AudioUnitRender(AudioUnit, UnsafeMutablePointer<AudioUnitRenderActionFlags>?, UnsafePointer<AudioTimeStamp>, UInt32, UInt32, UnsafeMutablePointer<AudioBufferList>) -> OSStatus
```

Initiates a rendering cycle for an audio unit.

```
func AudioUnitAddRenderNotify(AudioUnit, AURenderCallback, UnsafeMutableRawPointer?) -> OSStatus
```

Registers a callback to receive audio unit render notifications.

```
func AudioUnitRemoveRenderNotify(AudioUnit, AURenderCallback, UnsafeMutableRawPointer?) -> OSStatus
```

Unregisters a previously-registered render listener callback function.

```
typealias AURenderCallback
```

Called by the system when an audio unit requires input samples, or before and after a render operation.

```
struct AudioUnitRenderActionFlags
```

Flags for configuring audio unit rendering.

Configuring Audio Unit Properties

```
func AudioUnitGetProperty(AudioUnit, AudioUnitPropertyID, AudioUnitScope, AudioUnitElement, UnsafeMutableRawPointer, UnsafeMutablePointer<UInt32>) -> OSStatus
```

Gets the value of an audio unit property.

```
func AudioUnitSetProperty(AudioUnit, AudioUnitPropertyID, AudioUnitScope, AudioUnitElement, UnsafeRawPointer?, UInt32) -> OSStatus
```

Sets the value of an audio unit property.

```
func AudioUnitGetPropertyInfo(AudioUnit, AudioUnitPropertyID, AudioUnitScope, AudioUnitElement, UnsafeMutablePointer<UInt32>?, UnsafeMutablePointer<DarwinBoolean>?) -> OSStatus
```

Gets information about an audio unit property.

```
func AudioUnitAddPropertyListener(AudioUnit, AudioUnitPropertyID, AudioUnitPropertyListenerProc, UnsafeMutableRawPointer?) -> OSStatus
```

Registers a callback to receive audio unit property change notifications.

```
func AudioUnitRemovePropertyListenerWithUserData(AudioUnit, AudioUnitPropertyID, AudioUnitPropertyListenerProc, UnsafeMutableRawPointer?) -> OSStatus
```

Unregisters a previously-registered property listener callback function.

Responding to Events

```
func AUEventListenerCreateWithDispatchQueue(UnsafeMutablePointer<AUEventListenerRef?>, Float32, Float32, dispatch_queue_t, AUEventListenerBlock) -> OSStatus
```

```
func AUEventListenerCreate(AUEventListenerProc, UnsafeMutableRawPointer?, CFRunLoop?, CFString?, Float32, Float32, UnsafeMutablePointer<AUEventListenerRef?>) -> OSStatus
```

```
func AUListenerDispose(AUParameterListenerRef) -> OSStatus
```

```
func AUEventListenerNotify(AUEventListenerRef?, UnsafeMutableRawPointer?, UnsafePointer<AudioUnitEvent>) -> OSStatus
```

```
func AUEventListenerAddEventType(AUEventListenerRef, UnsafeMutableRawPointer?, UnsafePointer<AudioUnitEvent>) -> OSStatus
```

```
func AUEventListenerRemoveEventType(AUEventListenerRef, UnsafeMutableRawPointer?, UnsafePointer<AudioUnitEvent>) -> OSStatus
```

```
func AUListenerAddParameter(AUParameterListenerRef, UnsafeMutableRawPointer?, UnsafePointer<AudioUnitParameter>) -> OSStatus
func AUListenerRemoveParameter(AUParameterListenerRef, UnsafeMutableRawPointer?, UnsafePointer<AudioUnitParameter>) -> OSStatus
```

```
typealias AUEventListenerBlock
```

Getting and Setting Parameters

```
func AudioUnitGetParameter(AudioUnit, AudioUnitParameterID, AudioUnitScope, AudioUnitElement, UnsafeMutablePointer<AudioUnitParameterValue>) -> OSStatus
```

Gets the value of an audio unit parameter.

```
func AudioUnitScheduleParameters(AudioUnit, UnsafePointer<AudioUnitParameterEvent>, UInt32) -> OSStatus
```

Schedules changes to the value of an audio unit parameter.

```
func AudioUnitSetParameter(AudioUnit, AudioUnitParameterID, AudioUnitScope, AudioUnitElement, AudioUnitParameterValue, UInt32) -> OSStatus
```

Sets the value of an audio unit parameter.

Monitoring Parameter Changes

```
func AUListenerCreateWithDispatchQueue(UnsafeMutablePointer<AUParameterListenerRef?>, Float32, dispatch_queue_t, AUParameterListenerBlock) -> OSStatus
```

```
func AUListenerCreate(AUParameterListenerProc, UnsafeMutableRawPointer, CFRunLoop?, CFString?, Float32, UnsafeMutablePointer<AUParameterListenerRef?>) -> OSStatus
```

```
func AUParameterListenerNotify(AUParameterListenerRef?, UnsafeMutableRawPointer?, UnsafePointer<AudioUnitParameter>) -> OSStatus
```

```
func AUParameterFormatValue(Float64, UnsafePointer<AudioUnitParameter>, UnsafeMutablePointer<CChar>, UInt32) -> UnsafeMutablePointer<CChar>
```

```
func AUParameterSet(AUParameterListenerRef?, UnsafeMutableRawPointer?, UnsafePointer<AudioUnitParameter>, AudioUnitParameterValue, UInt32) -> OSStatus
```

```
func AUParameterValueFromLinear(Float32, UnsafePointer<AudioUnitParameter>) -> AudioUnitParameterValue
```

```
func AUParameterValueToLinear(AudioUnitParameterValue, UnsafePointer<AudioUnitParameter>) -> Float32
```

`typealias AUParameterListenerBlock`

`typealias AUParameterListenerProc`

`typealias AUParameterListenerRef`

`typealias AUImplementorDisplayNameWithLengthCallback`

A block called to obtain a parameter node’s display name, possibly truncated to a desired length.

`typealias AUImplementorStringFromValueCallback`

A block called to convert a parameter value to a string representation.

`typealias AUImplementorValueFromStringCallback`

A block called to convert a string to a parameter value.

Getting Information from the Host

`typealias HostCallback_GetBeatAndTempo`

When called by the system, provides beat and tempo information to an audio unit from a host application.

`typealias HostCallback_GetMusicalTimeLocation`

When called by the system, provides musical timing information to an audio unit from a host application.

`typealias HostCallback_GetTransportState`

When called by the system, provides audio transport state and timeline information to an audio unit from a host application.

`typealias HostCallback_GetTransportState2`

`typealias AUInputSamplesInOutputCallback`

Called by the system when an audio unit has provided a buffer of output samples.

`typealias AUMIDIOutputCallback`

When called by a host application, gets MIDI data from an audio unit.

Getting the Configuration Information

`var kAudioUnitConfigurationInfo_BusCountWritable: String`

`var kAudioUnitConfigurationInfo_ChannelConfigurations: String`

```
var kAudioUnitConfigurationInfo_HasCustomView: String
```

```
var kAudioUnitConfigurationInfo_IconURL: String
```

```
var kAudioUnitConfigurationInfo_InitialInputs: String
```

```
var kAudioUnitConfigurationInfo_InitialOutputs: String
```

```
var kAudioUnitConfigurationInfo_SupportedChannelLayoutTags: String
```

Configuring the Audio Unit UI

```
struct AudioUnitCocoaViewInfo
```

The name and number of custom Cocoa views for an audio unit.

```
func GetAudioUnitParameterDisplayType(AudioUnitParameterOptions) -> AudioUnitParameterOptions
```

```
func SetAudioUnitParameterDisplayType(AudioUnitParameterOptions, AudioUnitParameterOptions) -> AudioUnitParameterOptions
```

Audio Unit Types

```
struct ScheduledAudioFileRegion
```

```
struct ScheduledAudioSlice
```

```
typealias ScheduledAudioFileRegionCompletionProc
```

```
typealias ScheduledAudioSliceCompletionProc
```

```
typealias MIDIChannelNumber
```

MIDI Channel, 0~15 (channels 1 through 16, respectively).

```
typealias AUAudioObjectID
```

```
typealias AUMIDICIProfileChangedBlock
```

```
typealias AUAudioChannelCount
```

A number of audio channels.

```
typealias AUAudioFrameCount
```

A number of audio sample frames.

```
typealias AUAudioUnitStatus
```

A result code returned from an audio unit’s render function.

`typealias AUEventListenerProc`

`typealias AUEventListenerRef`

`typealias AUEventSampleTime`

Expresses time as a sample count.

`typealias AUImplementorValueObserver`

A block called to notify the audio unit implementation of changes to a parameter value.

`typealias AUImplementorValueProvider`

A block called to fetch a parameter’s current value from the audio unit implementation.

`typealias AUInputHandler`

A block to notify the host of an I/O unit that an input is available.

`typealias AUNodeConnection`

`typealias AUParameterAddress`

A numeric identifier for an audio unit parameter.

`typealias AUParameterAutomationObserver`

`typealias AUParameterObserver`

A block called after the value of a parameter changes.

`typealias AUParameterObserverToken`

A token representing an installed parameter observer block.

`typealias AUParameterRecordingObserver`

A block called to record parameter changes as automation events.

`typealias AURenderBlock`

A block to render the audio unit.

`typealias AURenderObserver`

A block called when an audio unit renders audio.

`typealias AURenderPullInputBlock`

A block to supply audio input to a render block.

`typealias AUScheduleParameterBlock`

A block to schedule parameter changes.

`typealias AUValue`

A value of an audio unit parameter.

`typealias AudioUnitAddPropertyListenerProc`

`typealias AudioUnitAddRenderNotifyProc`

`typealias AudioUnitComplexRenderProc`

`typealias AudioUnitElement`

The data type for an audio unit element identifier.

`typealias AudioUnitGetParameterProc`

`typealias AudioUnitGetPropertyInfoProc`

`typealias AudioUnitGetPropertyProc`

`typealias AudioUnitInitializeProc`

`typealias AudioUnitParameterID`

The data type for an audio unit parameter identifier.

`struct AudioUnitParameterNameInfo`

A short version of the name for an audio unit parameter.

`typealias AudioUnitParameterIDName`

A type definition for a data type that defines the short version of the name for an audio unit parameter.

`typealias AudioUnitParameterValue`

The data type for an audio unit parameter value.

`typealias AudioUnitProcessMultipleProc`

`typealias AudioUnitProcessProc`

`typealias AudioUnitPropertyID`

The data type for audio unit property keys.

`typealias AudioUnitPropertyListenerProc`

Called by the system when the value of a specified audio unit property has changed.

`typealias AudioUnitRemoteControlEventListener`

`typealias AudioUnitRemovePropertyListenerProc` `typealias AudioUnitRemovePropertyListenerWithUserDataProc`

`typealias AudioUnitRemoveRenderNotifyProc`

`typealias AudioUnitRenderProc`

`typealias AudioUnitResetProc`

`typealias AudioUnitScheduleParametersProc`

`typealias AudioUnitScope`

The data type for audio unit scope identifiers.

`typealias AudioUnitSetParameterProc`

`typealias AudioUnitSetPropertyProc`

`typealias AudioUnitUninitializeProc`

Enumerations

Audio Unit Types

The defined types of audio processing plug-ins known as audio units.

Inter-App Audio Unit Types

Audio Unit Manufacturer Identifier

The Apple audio unit manufacturer code.

Audio Unit Output Subtypes

I/O Audio Unit Subtypes

Converter Audio Unit Subtypes

Audio data format converter audio unit subtypes for audio units provided by Apple.

Reserved Audio Unit Clump Identifier

Reserved for system use.

Offline Audio Unit Properties

Properties for audio units that perform offline processing—that is, processing in a nonplayback, nonrealtime mode.

MIDI Audio Unit Parameters

Parameters for instrument units.

General Audio Unit Function Selectors

General audio unit component selectors that correspond to functions in the audio unit API.

Generator Audio Unit Subtypes

Audio units that serve as sound sources.

Input/Output Audio Unit Subtypes

Input/output audio unit subtypes for audio units provided by Apple.

Audio Unit Panner Subtypes

Audio Unit Player Subtypes

Audio Unit Pitch Subtypes

`enum AudioUnitEventType`

`struct AudioUnitParameterOptions`

Value options for audio unit parameters.

`enum AudioUnitParameterUnit`

The unit-of-measure for an audio unit parameter.

`enum AudioUnitRemoteControlEvent`

Audio Unit Sample Rate Converter Complexity

Quality levels for the audio sample-rate conversion algorithm.

Audio Unit Scopes

Programmatic roles and contexts for audio unit properties.

Audio Unit SRC Algorithms

Audio Unit Full Name Parameter

Audio Unit Parameter Flags

Audio Unit Filter Parameters

Audio Unit Generic Properties

Audio Unit Parameter Flags

Audio Unit Scheduled Sound Player Properties

Audio Unit Offline Preflight Flags

Audio Unit Migration Properties

Audio Unit File Player Properties

Audio Unit Parameter Listener

Audio Unit Errors

`enum AUAudioUnitBusType`

AUEventSampleTime

Expresses time as a sample count.

`struct AUHostTransportStateFlags`

`enum AUParameterAutomationEventType`

`enum AUParameterEventType`

Audio unit parameter event types.

`enum AURenderEventType`

`struct AUScheduledAudioSliceFlags`

`struct AUParameterMIDIMappingFlags`

See Also

Audio Units

{} Generating spatial audio from a multichannel audio stream

Convert 8-channel audio to 2-channel spatial audio by using a spatial mixer audio unit.

Audio Unit v3 Plug-Ins

Deliver custom audio effects, instruments, and other audio behaviors using an Audio Unit v3 app extension.

Audio Components

Find, load, and configure audio components, such as Audio Units and audio codecs.

Audio Unit Properties

Obtain information about the built-in mixers, equalizers, filters, effects, and other Audio Unit app extensions.

Audio Unit Voice I/O

Configure system voice processing and respond to speech events.