CAMediaTiming Protocol Reference

Graphics & Animation: Animation

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CAMediaTiming Protocol Reference

Adopted by	CAAnimation CALayer
Framework	/System/Library/Frameworks/QuartzCore.framework
Availability	Available in Mac OS X v10.5 and later.
Declared in	CAMediaTiming.h
Companion guides	Core Animation Programming Guide Core Animation Cookbook

Overview

The `CAMediaTiming` protocol models a hierarchical timing system, with each object describing the mapping of time values from the object's parent to local time.

Absolute time is defined as mach time converted to seconds. The `CACurrentMediaTime` function is provided as a convenience for getting the current absolute time.

The conversion from parent time to local time has two stages:

1. Conversion to "active local time". This includes the point at which the object appears in the parent object's timeline and how fast it plays relative to the parent.
2. Conversion from "active local time" to "basic local time". The timing model allows for objects to repeat their basic duration multiple times and, optionally, to play backwards before repeating.

Tasks

Animation Start Time

`beginTime` (page 7) *required property*
Specifies the begin time of the receiver in relation to its parent object, if applicable. (required)

`timeOffset` (page 9) *required property*
Specifies an additional time offset in active local time. (required)

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Repeating Animations

`repeatCount` (page 8) *required property*
Determines the number of times the animation will repeat. (required)

`repeatDuration` (page 8) *required property*
Determines how many seconds the animation will repeat for. (required)

Duration and Speed

`duration` (page 7) *required property*
Specifies the basic duration of the animation, in seconds. (required)

`speed` (page 8) *required property*
Specifies how time is mapped to receiver's time space from the parent time space. (required)

Playback Modes

`autoreverses` (page 6) *required property*
Determines if the receiver plays in the reverse upon completion. (required)

`fillMode` (page 7) *required property*
Determines if the receiver's presentation is frozen or removed once its active duration has completed. (required)

Properties

For more about Objective-C properties, see "Properties" in *The Objective-C Programming Language*.

autoreverses

Determines if the receiver plays in the reverse upon completion. (required)

```
@property BOOL autoreverses
```

Discussion
When `YES`, the receiver plays backwards after playing forwards. Defaults to `NO`.

Availability
Available in Mac OS X v10.5 and later.

Related Sample Code
CoreAnimationKioskStyleMenu

Declared In
`CAMediaTiming.h`

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beginTime

Specifies the begin time of the receiver in relation to its parent object, if applicable. (required)

```
@property CFTimeInterval beginTime
```

Discussion
Defaults to 0.

Availability
Available in Mac OS X v10.5 and later.

Related Sample Code
Fireworks

Declared In
`CAMediaTiming.h`

duration

Specifies the basic duration of the animation, in seconds. (required)

```
@property CFTimeInterval duration
```

Discussion
Defaults to 0.

Availability
Available in Mac OS X v10.5 and later.

Related Sample Code
AnimatedTableView
CoreAnimationKioskStyleMenu
Fireworks

Declared In
`CAMediaTiming.h`

fillMode

Determines if the receiver's presentation is frozen or removed once its active duration has completed. (required)

```
@property(copy) NSString *fillMode
```

Discussion
The possible values are described in "`Fill Modes`" (page 9). The default is `kCAFillModeRemoved` (page 9).

Availability
Available in Mac OS X v10.5 and later.

Declared In
`CAMediaTiming.h`

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repeatCount

Determines the number of times the animation will repeat. (required)

```
@property float repeatCount
```

Discussion
May be fractional. If the `repeatCount` is 0, it is ignored. Defaults to 0. If both `repeatDuration` (page 8) and `repeatCount` (page 8) are specified the behavior is undefined.

Setting this property to `HUGE_VALF` will cause the animation to repeat forever.

Availability
Available in Mac OS X v10.5 and later.

Related Sample Code
CoreAnimationKioskStyleMenu

Declared In
`CAMediaTiming.h`

repeatDuration

Determines how many seconds the animation will repeat for. (required)

```
@property CFTimeInterval repeatDuration
```

Discussion
Defaults to 0. If the `repeatDuration` is 0, it is ignored. If both `repeatDuration` (page 8) and `repeatCount` (page 8) are specified the behavior is undefined.

Availability
Available in Mac OS X v10.5 and later.

Declared In
`CAMediaTiming.h`

speed

Specifies how time is mapped to receiver's time space from the parent time space. (required)

```
@property float speed
```

Discussion
For example, if `speed` is 2.0 local time progresses twice as fast as parent time. Defaults to 1.0.

Availability
Available in Mac OS X v10.5 and later.

Related Sample Code
Fireworks

Declared In
`CAMediaTiming.h`

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timeOffset

Specifies an additional time offset in active local time. (required)

```
@property CFTimeInterval timeOffset
```

Discussion
Defaults to 0. .

Availability
Available in Mac OS X v10.5 and later.

Declared In
`CAMediaTiming.h`

Constants

Fill Modes

These constants determine how the timed object behaves once its active duration has completed. They are used with the `fillMode` (page 7) property.

```
NSString * const kCAFillModeRemoved;
NSString * const kCAFillModeForwards;
NSString * const kCAFillModeBackwards;
NSString * const kCAFillModeBoth;
NSString * const kCAFillModeFrozen;
```

Constants

`kCAFillModeRemoved`
The receiver is removed from the presentation when the animation is completed.
Available in Mac OS X v10.5 and later.
Declared in `CAMediaTiming.h`.

`kCAFillModeForwards`
The receiver remains visible in its final state when the animation is completed.
Available in Mac OS X v10.5 and later.
Declared in `CAMediaTiming.h`.

`kCAFillModeBackwards`
The receiver clamps values before zero to zero when the animation is completed.
Available in Mac OS X v10.5 and later.
Declared in `CAMediaTiming.h`.

`kCAFillModeBoth`
The receiver clamps values at both ends of the object's time space
Available in Mac OS X v10.5 and later.
Declared in `CAMediaTiming.h`.

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`kCAFillModeFrozen`

The mode was deprecated before Mac OS X v10.5 shipped.

Deprecated in Mac OS X v10.5 and later.

Declared in `CAMediaTiming.h`.

Declared In

`CAMediaTiming.h`

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Document Revision History

This table describes the changes to *CAMediaTiming Protocol Reference*.

Date	Notes
2009-11-17	Deprecated kCAFillModeFrozen, which never shipped. Added infinite value to repeatCount property.
2009-03-04	Documented kCAFillModeFrozen as deprecated.
2007-07-24	New document that describes the protocol that defines the timespace of an object.

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Document Revision History

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