
CAConstraint Class Reference

[Graphics & Imaging](#) > Quartz



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Contents

CAConstraint Class Reference 5

Overview 5

Tasks 6

 Create a New Constraint 6

Class Methods 6

 constraintWithAttribute:relativeTo:attribute: 6

 constraintWithAttribute:relativeTo:attribute:offset: 7

 constraintWithAttribute:relativeTo:attribute:scale:offset: 7

Instance Methods 8

 initWithAttribute:relativeTo:attribute:scale:offset: 8

Constants 9

 CAConstraintAttribute 9

 Constraint Attribute Type 10

Document Revision History 11

Index 13

CAConstraint Class Reference

| | |
|-------------------------|---|
| Inherits from | NSObject |
| Conforms to | NSCoding NSObject (NSObject) |
| Framework | /System/Library/Frameworks/QuartzCore.framework |
| Availability | Available in Mac OS X v10.5 and later. |
| Declared in | CAConstraintLayoutManager.h |
| Companion guides | Core Animation Programming Guide Core Animation Cookbook |

Overview

`CAConstraint` represents a single layout constraint between two layers. Each `CAConstraint` instance encapsulates one geometry relationship between two layers on the same axis.

Sibling layers are referenced by name, using the `name` property of each layer. The special name `superlayer` is used to refer to the layer's superlayer.

For example, to specify that a layer should be horizontally centered in its superview you would use the following:

```
theConstraint=[CAConstraint constraintWithAttribute:kCAConstraintMidX
                                             relativeTo:@"superlayer"
                                             attribute:kCAConstraintMidX];
```

A maximum of two relationships must be specified per axis. If you specify constraints for the left and right edges of a layer, the width will vary. If you specify constraints for the left edge and the width, the right edge of the layer will move relative to the superlayer's frame. Often you'll specify only a single edge constraint, the layer's size in the same axis will be used as the second relationship.

Important: It is possible to create constraints that result in circular references to the same attributes. In cases where the layout is unable to be computed the behavior is undefined.

Tasks

Create a New Constraint

- + [constraintWithAttribute:relativeTo:attribute:scale:offset:](#) (page 7)
Creates and returns an `CAConstraint` object with the specified parameters.
- + [constraintWithAttribute:relativeTo:attribute:offset:](#) (page 7)
Creates and returns an `CAConstraint` object with the specified parameters.
- + [constraintWithAttribute:relativeTo:attribute:](#) (page 6)
Creates and returns an `CAConstraint` object with the specified parameters.
- [initWithAttribute:relativeTo:attribute:scale:offset:](#) (page 8)
Returns an `CAConstraint` object with the specified parameters. Designated initializer.

Class Methods

constraintWithAttribute:relativeTo:attribute:

Creates and returns an `CAConstraint` object with the specified parameters.

```
+ (id)constraintWithAttribute:(CAConstraintAttribute)attr
   relativeTo:(NSString *)srcLayer
   attribute:(CAConstraintAttribute)srcAttr
```

Parameters

attr

The attribute of the layer for which to create a new constraint.

srcLayer

The name of the layer that this constraint is calculated relative to.

srcAttr

The attribute of *srcLayer* the constraint is calculated relative to.

Return Value

A new `CAConstraint` object with the specified parameters. The scale of the constraint is set to 1.0. The offset of the constraint is set to 0.0.

Discussion

The value for the constraint is calculated is *srcAttr*.

Availability

Available in Mac OS X v10.5 and later.

Declared In

CAConstraintLayoutManager.h

constraintWithAttribute:relativeTo:attribute:offset:Creates and returns an `CAConstraint` object with the specified parameters.

```
+ (id)constraintWithAttribute:(CAConstraintAttribute)attr
    relativeTo:(NSString *)srcLayer
    attribute:(CAConstraintAttribute)srcAttr
    offset:(CGFloat)offset
```

Parameters*attr*

The attribute of the layer for which to create a new constraint.

srcLayer

The name of the layer that this constraint is calculated relative to.

*srcAttr*The attribute of *srcLayer* the constraint is calculated relative to.*offset*The offset added to the value of *srcAttr*.**Return Value**A new `CAConstraint` object with the specified parameters. The scale of the constraint is set to 1.0.**Discussion**The value for the constraint is calculated as $(srcAttr + offset)$.**Availability**

Available in Mac OS X v10.5 and later.

Declared In

CAConstraintLayoutManager.h

constraintWithAttribute:relativeTo:attribute:scale:offset:Creates and returns an `CAConstraint` object with the specified parameters.

```
+ (id)constraintWithAttribute:(CAConstraintAttribute)attr
    relativeTo:(NSString *)srcLayer
    attribute:(CAConstraintAttribute)srcAttr
    scale:(CGFloat)scale
    offset:(CGFloat)offset
```

Parameters*attr*

The attribute of the layer for which to create a new constraint.

srcLayer

The name of the layer that this constraint is calculated relative to.

*srcAttr*The attribute of *srcLayer* the constraint is calculated relative to.

scale

The amount to scale the value of *srcAttr*.

offset

The offset from the *srcAttr*.

Return Value

A new `CAConstraint` object with the specified parameters.

Discussion

The value for the constraint is calculated as $(srcAttr * scale) + offset$.

Availability

Available in Mac OS X v10.5 and later.

Declared In

`CAConstraintLayoutManager.h`

Instance Methods

initWithAttribute:relativeTo:attribute:scale:offset:

Returns an `CAConstraint` object with the specified parameters. Designated initializer.

```
- (id)initWithAttribute:(CAConstraintAttribute)attr
    relativeTo:(NSString *)srcLayer
    attribute:(CAConstraintAttribute)srcAttr
    scale:(CGFloat)scale
    offset:(CGFloat)offset
```

Parameters

attr

The attribute of the layer for which to create a new constraint.

srcLayer

The name of the layer that this constraint is calculated relative to.

srcAttr

The attribute of *srcLayer* the constraint is calculated relative to.

scale

The amount to scale the value of *srcAttr*.

offset

The offset added to the value of *srcAttr*.

Return Value

An initialized constraint object using the specified parameters.

Discussion

The value for the constraint is calculated as $(srcAttr * scale) + offset$.

Availability

Available in Mac OS X v10.5 and later.

Declared In

CAConstraintLayoutManager.h

Constants

CAConstraintAttribute

These constants represent the geometric edge or axis of a constraint.

```
enum _CAConstraintAttribute
{
    kCAConstraintMinX,
    kCAConstraintMidX,
    kCAConstraintMaxX,
    kCAConstraintWidth,
    kCAConstraintMinY,
    kCAConstraintMidY,
    kCAConstraintMaxY,
    kCAConstraintHeight,
};
```

Constants`kCAConstraintMinX`

The left edge of a layer's frame.

Available in Mac OS X v10.5 and later.

Declared in CAConstraintLayoutManager.h.

`kCAConstraintMidX`

The horizontal location of the center of a layer's frame.

Available in Mac OS X v10.5 and later.

Declared in CAConstraintLayoutManager.h.

`kCAConstraintMaxX`

The right edge of a layer's frame.

Available in Mac OS X v10.5 and later.

Declared in CAConstraintLayoutManager.h.

`kCAConstraintWidth`

The width of a layer.

Available in Mac OS X v10.5 and later.

Declared in CAConstraintLayoutManager.h.

`kCAConstraintMinY`

The bottom edge of a layer's frame.

Available in Mac OS X v10.5 and later.

Declared in CAConstraintLayoutManager.h.

`kCAConstraintMidY`

The vertical location of the center of a layer's frame.

Available in Mac OS X v10.5 and later.

Declared in CAConstraintLayoutManager.h.

`kCAConstraintMaxY`

The top edge of a layer's frame.

Available in Mac OS X v10.5 and later.

Declared in `CAConstraintLayoutManager.h`.

`kCAConstraintHeight`

The height of a layer.

Available in Mac OS X v10.5 and later.

Declared in `CAConstraintLayoutManager.h`.

Declared In

`CAConstraint.h`

Constraint Attribute Type

The constraint attribute type.

```
typedef int CAConstraintAttribute;
```

Availability

Available in Mac OS X v10.5 and later.

Declared In

`CAConstraintLayoutManager.h`

Document Revision History

This table describes the changes to *CAConstraint Class Reference*.

| Date | Notes |
|------------|--|
| 2007-07-24 | New document that describes the class that defines a single geometric constraint between two layers. |

REVISION HISTORY

Document Revision History

Index

C

CAConstraintAttribute 9

Constraint Attribute Type **data type** 10

`constraintWithAttribute:relativeTo:attribute:`
class method 6

`constraintWithAttribute:relativeTo:attribute:`
`offset:` **class method** 7

`constraintWithAttribute:relativeTo:attribute:`
`scale:offset:` **class method** 7

I

`initWithAttribute:relativeTo:attribute:scale:`
`offset:` **instance method** 8

K

`kCAConstraintHeight` **constant** 10

`kCAConstraintMaxX` **constant** 9

`kCAConstraintMaxY` **constant** 10

`kCAConstraintMidX` **constant** 9

`kCAConstraintMidY` **constant** 9

`kCAConstraintMinX` **constant** 9

`kCAConstraintMinY` **constant** 9

`kCAConstraintWidth` **constant** 9