Cocoa Animation

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Mac & iOS

- Mac laid the groundwork
- iPhone came from the Mac
- iPhone is mostly still ahead of the Mac

Old Mac (Pre-2007)

- ✦ Primitive window animations for free

  - ✦ `- (void)setFrame:(NSRect)windowFrame display:(BOOL)displayViews animate:(BOOL)performAnimation`

- ✦ More complex?

  - ✦ Manual compositing, threading & timers

  - ✦ NSAnimation: notifies delegate of progress

    - ✦ You do the drawing yourself

New Mac (2007-?)

✦ Core Animation in 10.5+

 ✦ *"Core Animation enables you to provide a* ***cinematic experience*** *to users of your application. Best of all, it takes advantage of the latest motion graphics techniques and hardware and requires a* ***minimum of code.****"*

 ✦ *"With Core Animation, you simply manipulate the* ***properties*** *of the animation that you want to execute and Core Animation takes care of the rest in the* ***background.****"*

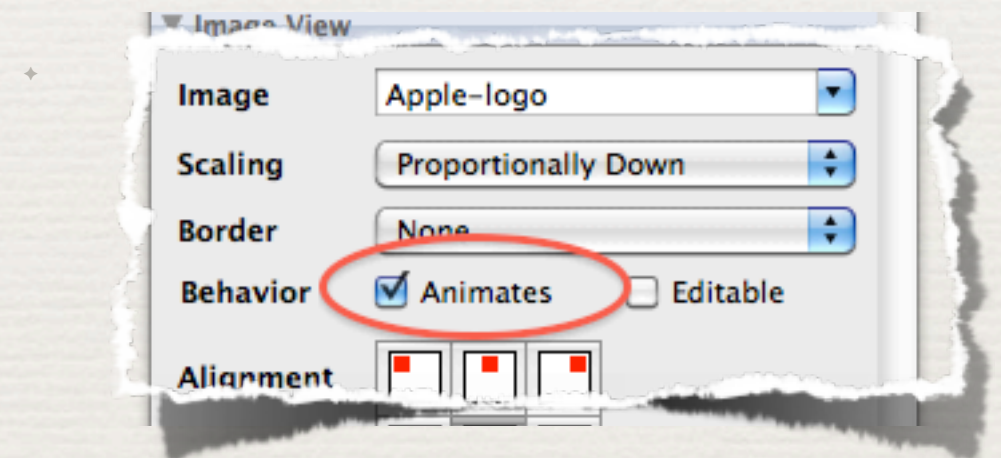# Layer-Backed Views

- Introduces a proxy, the **animator**

- Animations can be retargeted

- Animations can be grouped

  - Automatic backgrounding

  - Multi-animation syncing

  - Easy end-to-end chaining

- Turn it on per-view

  - `[someView setWantsLayer:YES];`

The Animator Proxy

✦ Non-animated

   ✦   `[aView setFrameOrigin:someRect];`

✦ Animated

   ✦   `[[aView animator] setFrameOrigin:someRect];`

Animation Grouping

```
[NSAnimationContext beginGrouping];

[[NSAnimationContext currentContext] setDuration:1.2];

[[aView animator] setFrame:newFrame];

[[aView animator] setAlphaValue:0.5];

[NSAnimationContext endGrouping];
```

Mac Demo

Advent of the iPhone

iOS Animation

✦ All views are automatically layer-backed

✦ Animation "blocks" (in the *group* sense)

  ✦ Animation blocks have delegates

  ✦ Notifies of start & stop (easy chaining)

  ✦ Other niceties: delays, repeats, curves & view transitions

✦ Brings animated properties to the foreground

alpha

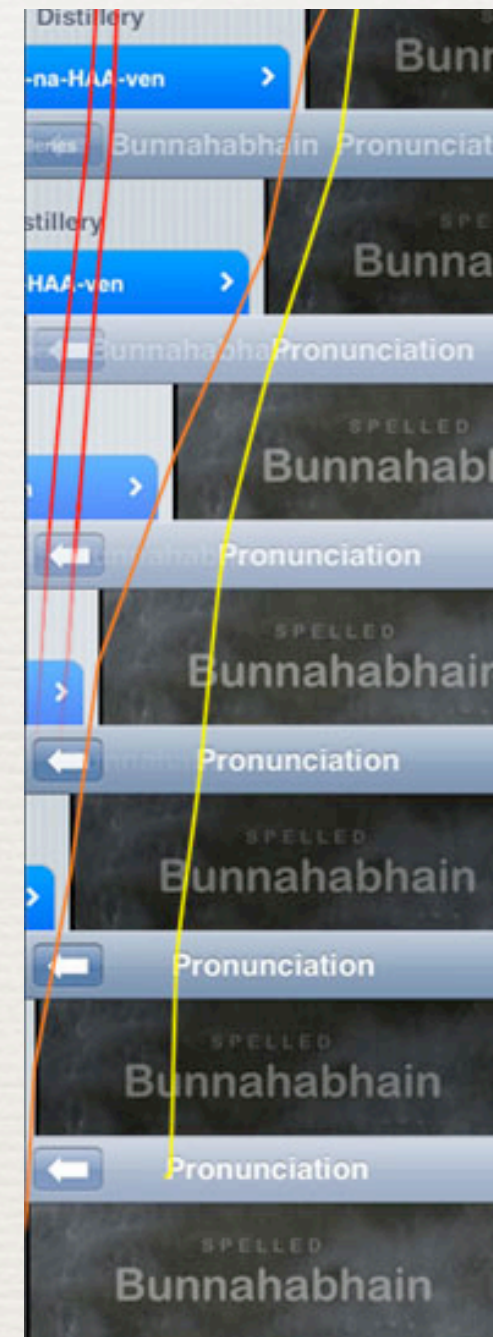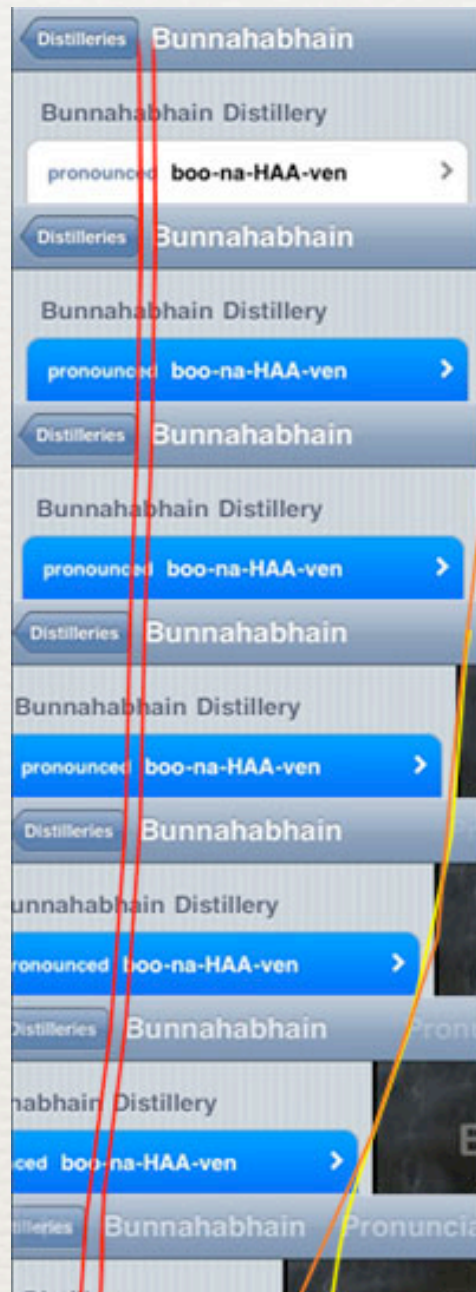The receiver's alpha value.

`@property(nonatomic) CGFloat alpha`

Discussion
Changes to this property can be animated. Use the `beginAnimations:context:` class method to begin and the `commitAnimations` class method to end an animation block.

Availability
Available in iOS 2.0 and later.

Attention To Detail

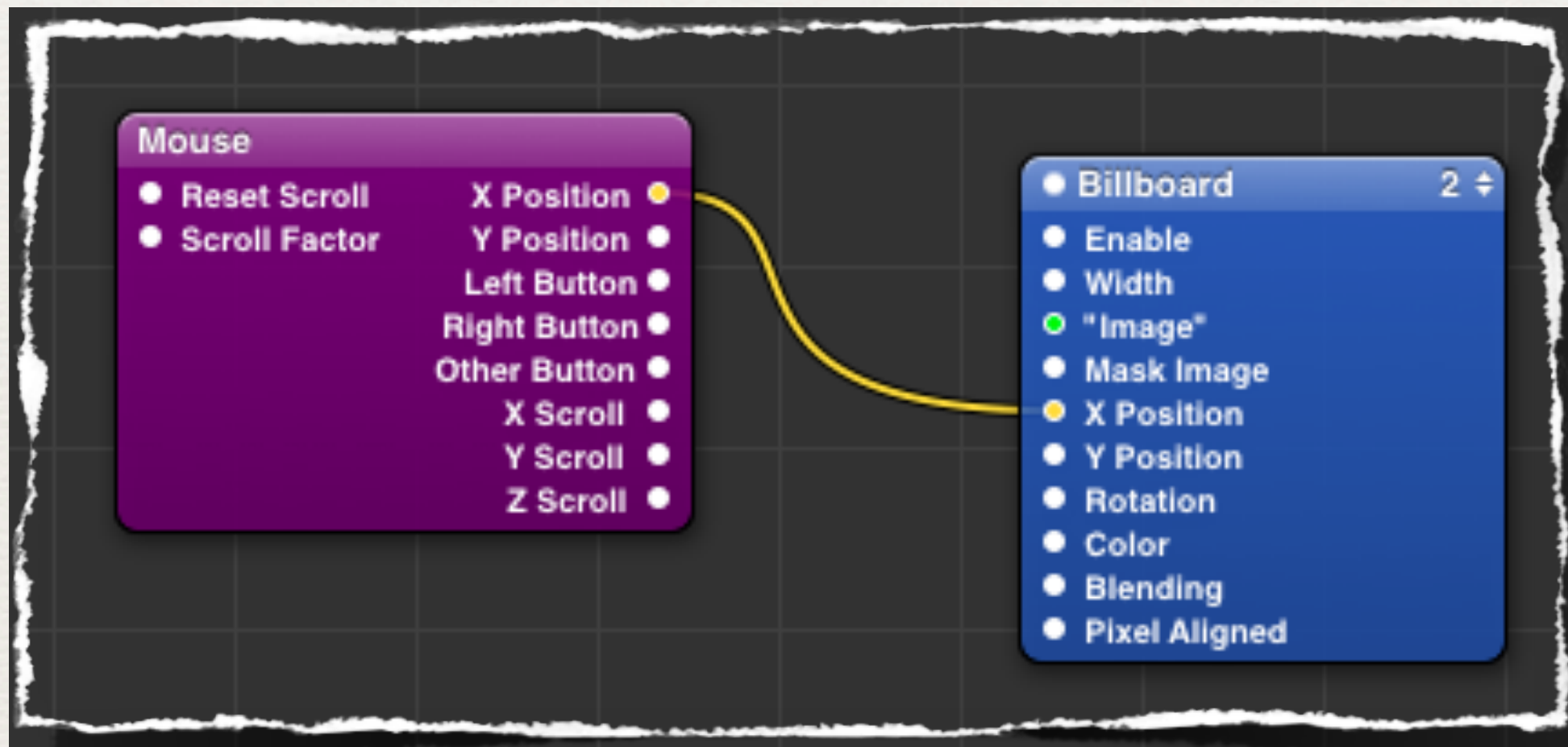http://watchingapple.com/2009/11/a-closer-look-at-iphone-transition-animations/

iPhone Demo

Quartz Composer

- Ships with developer tools on 10.4+

- Has been getting some love each release

- Patch-based graphical effects

    - Desktop only

    - Good for prototyping

    - Can integrate with desktop Cocoa

    - Can make screensavers

Patches

QC Demos

AR Credits

✦ Brad Larson of Sunset Lake Software

  ✦ http://www.sunsetlakesoftware.com/2010/10/22/gpu-accelerated-video-processing-mac-and-ios

Download

* Will post slides & code tonight

    * http://tinyurl.com/pdxanimation