

# Auto Layout by Example

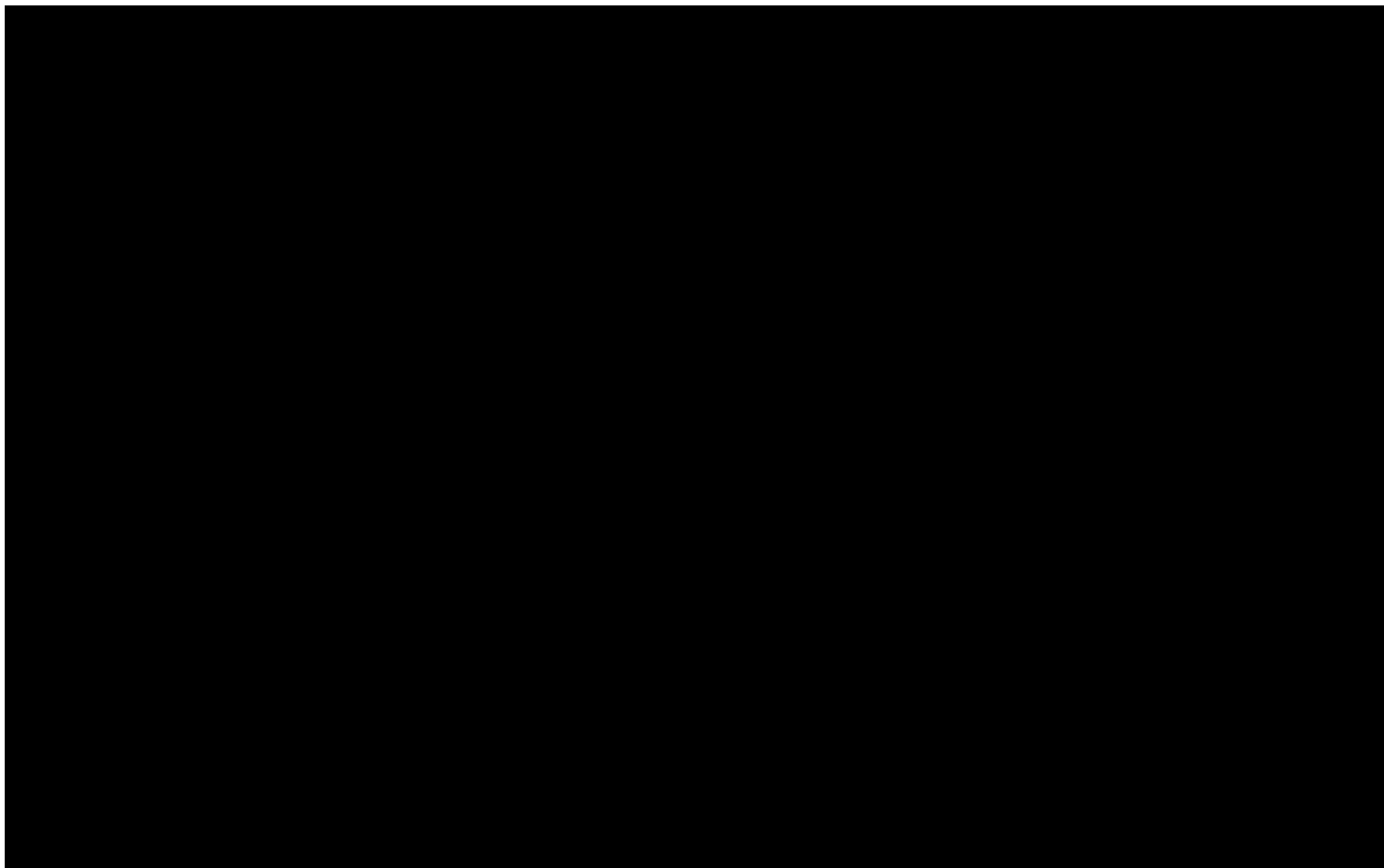
Putting it all together

Session 232

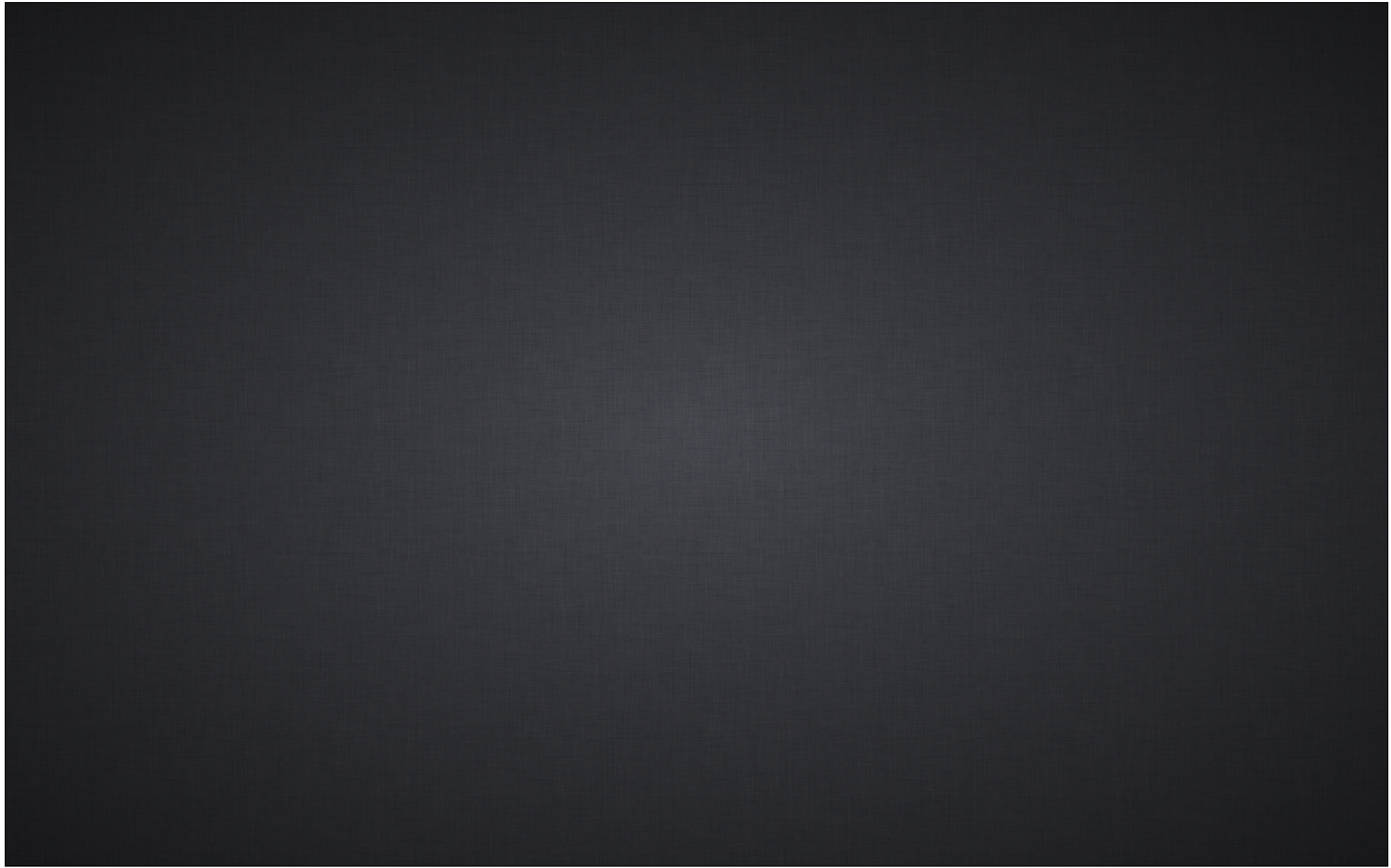
**Kevin Cathey**

Interface Builder Engineer

These are confidential sessions—please refrain from streaming, blogging, or taking pictures



**How do I do that?**



# Transitioning to Auto Layout

# Transitioning to Auto Layout

## Explicit Widths

Transitioning to Auto Layout

Explicit Widths

Localization

Transitioning to Auto Layout

Explicit Widths

Localization

New API



# Transitioning to Auto Layout

Explicit Widths

Localization

New API

Animation

# Transitioning to Auto Layout

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# Transitioning to Auto Layout

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# Transitioning to Auto Layout

- Plan your attack—partial or full conversion, or new content
- In Interface Builder
  - Enable Auto Layout
  - Inspect, modify, add, and delete constraints
- In code
  - Convert `-setFrame` calls
  - Sanitize `-addSubview` and `-removeFromSuperview` calls
- Test

# *Demo*

Transitioning part of an application to Auto Layout

# Transitioning to Auto Layout

## Recap

- Plan your attack—partial or full conversion, or new content
- In Interface Builder
  - Enable Auto Layout
  - Inspect, modify, add, and delete constraints
- In code
  - Convert `-setFrame` calls
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# Transitioning to Auto Layout

## Recap

- Best practices for constraints
  - Avoid explicit widths for controls (more on this soon)
  - Add spacing constraints to avoid overlap
  - Let window minimum size be driven by constraints
  - Other expressive constraints where applicable (e.g. equal sizes)



# Transitioning to Auto Layout

Explicit Widths

Localization

New API

Animation

# Transitioning to Auto Layout

## Explicit Widths

Localization

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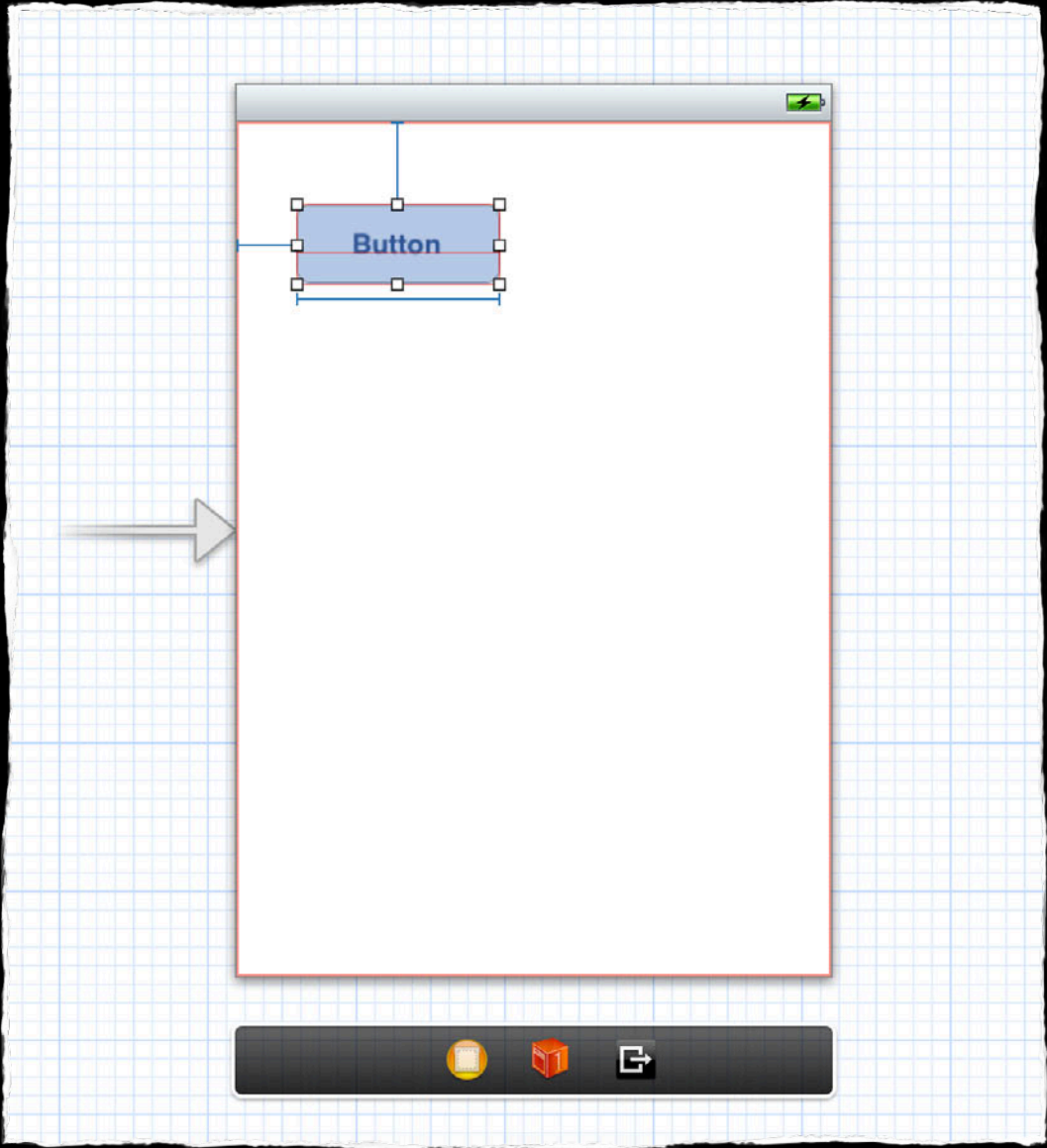
# Transitioning to Auto Layout

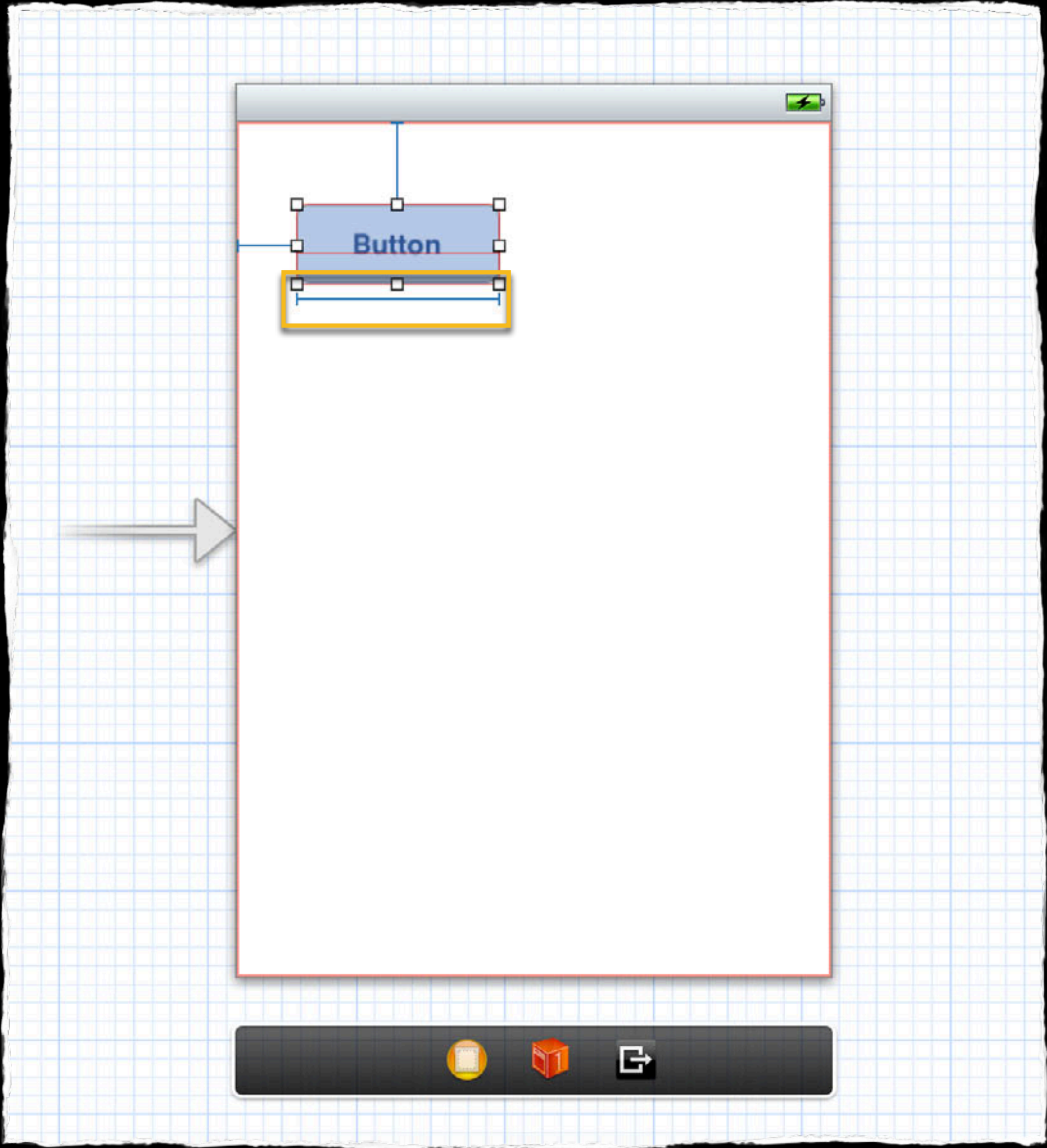
## Explicit Widths

Localization

New API

Animation





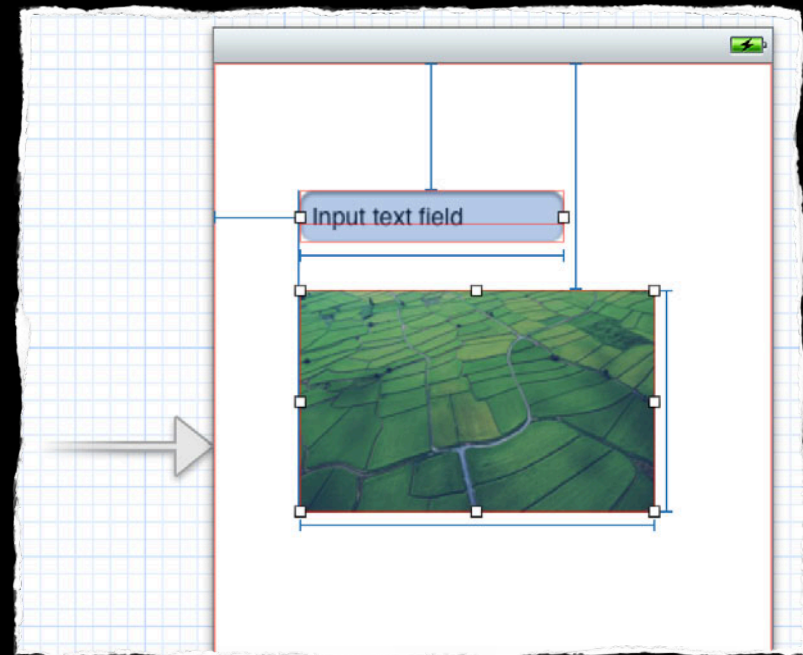
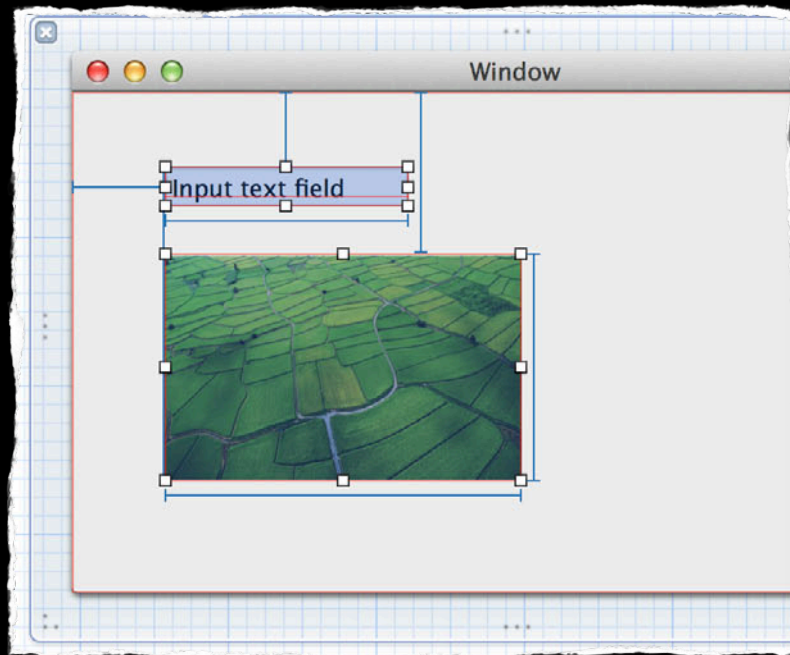
# Explicit Widths

## Generally speaking

- Generally, avoid explicit widths on controls
- Prevents controls from reacting to changes in content
- Want intrinsic content size to drive size of controls
- Can cause clipping during localization or with dynamic content

# Explicit Widths

Few examples of exceptions



Bordered (input) text fields and image views

# Explicit Widths in Interface Builder

How do I get rid of them?

- How Interface Builder generates constraints for you
  - Picks minimum and best set of constraints
  - Avoids unsatisfiable constraints
  - Avoids ambiguity



*Demo*

Explicit widths in Interface Builder

# Explicit Widths in Interface Builder

## Recap

- Add the constraint you want
- If visual layout can be changed
  - Keep controls at their intrinsic content size (size to fit size)
- If visual layout cannot be changed
  - Change relation of explicit widths to  $\geq$
- Adjust content hugging and compression resistance priorities

# Transitioning to Auto Layout

## Explicit Widths

Localization

New API

Animation

Transitioning to Auto Layout

Explicit Widths

**Localization**

New API

Animation

Transitioning to Auto Layout

Explicit Widths

**Localization**

New API

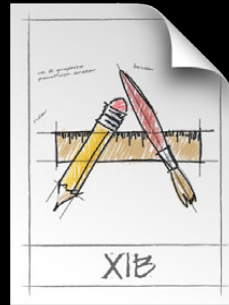
Animation

# Localization Before Auto Layout



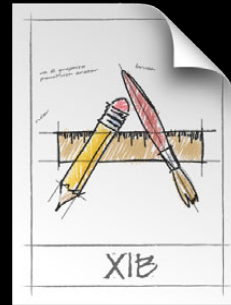
Development Region  
(English)

# Localization Before Auto Layout



Development Region  
(English)

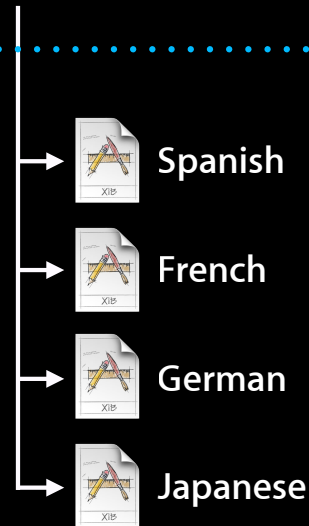
# Localization Before Auto Layout



Development Region  
(English)

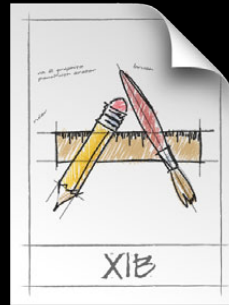
Engineering

Localized Nibs





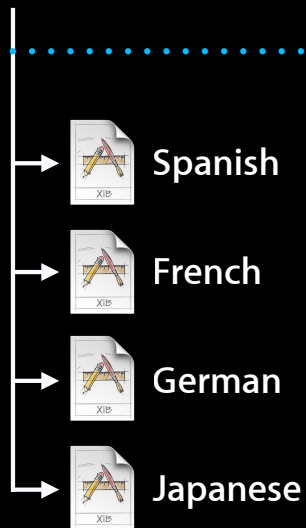
# Localization Before Auto Layout



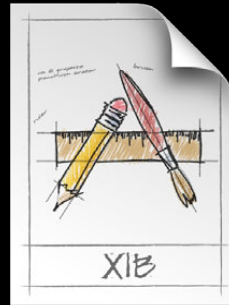
Development Region  
(English)

Engineering

Localized Nibs



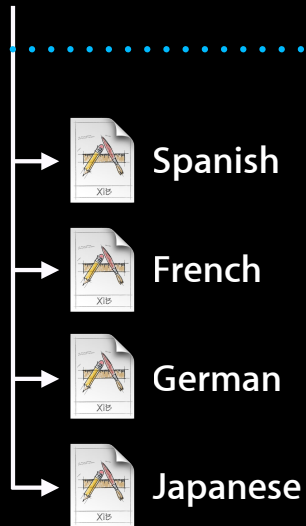
# Localization Before Auto Layout



Development Region  
(English)

Engineering

Localized Nibs



# Localization Before Auto Layout

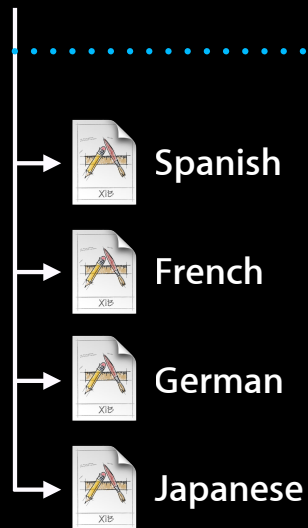


Development Region  
(English)

Modified Development Region  
(English)

Engineering

Localized Nibs



# Localization Before Auto Layout

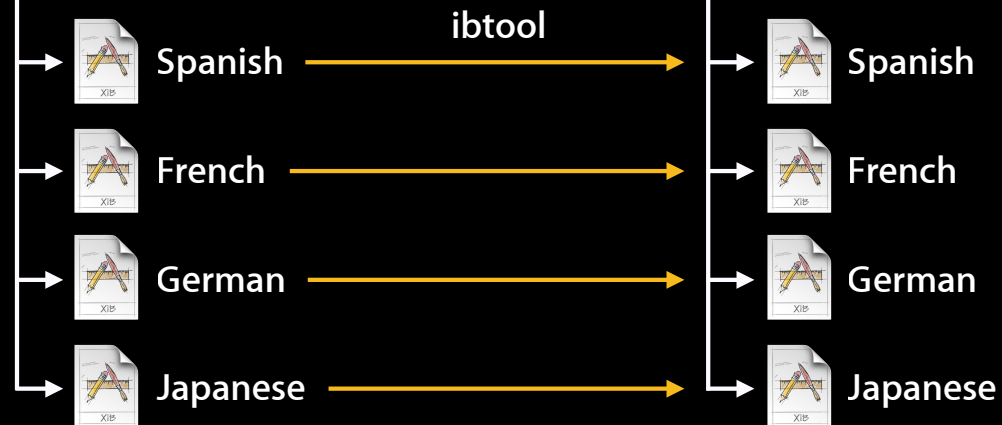


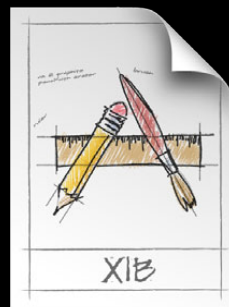
Development Region  
(English)

Modified Development Region  
(English)

Engineering

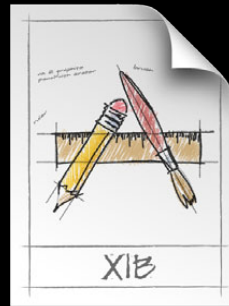
Localized Nibs





Development Region  
(English)

# Localization with Auto Layout



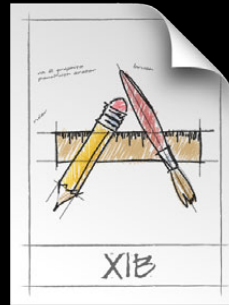
Development Region  
(English)

# Localization with Auto Layout



Development Region  
(English)

# Localization with Auto Layout



Development Region  
(English)

Engineering

Localized Strings



Spanish



French



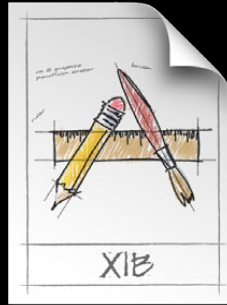
German



Japanese



# Localization with Auto Layout



Development Region  
(English)

Engineering

Localized Strings



Spanish



French



German



Japanese

# Localization with Auto Layout







Development Region  
(English)

Modified Development Region  
(English)

Engineering

Localized Strings

-  Spanish
-  French
-  German
-  Japanese

# Localization with Auto Layout






Development Region  
(English)

Modified Development Region  
(English)

Engineering

Localized Strings

-  Spanish
-  French
-  German
-  Japanese

New strings might  
not be needed

# Localization with Auto Layout

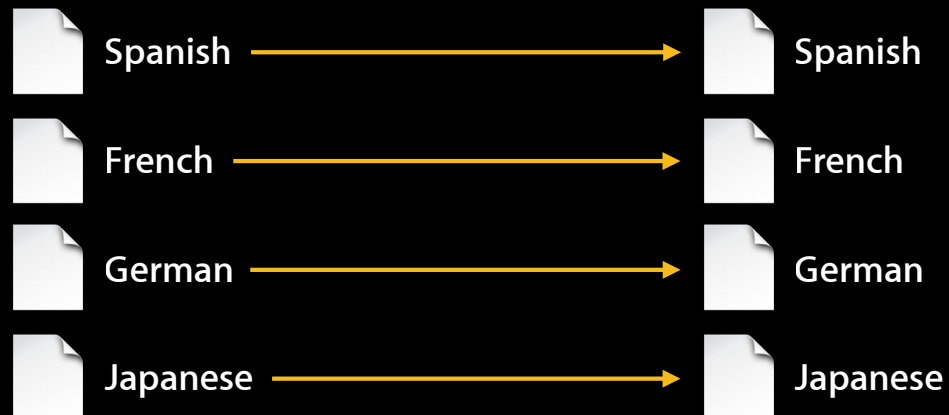


Development Region  
(English)

Modified Development Region  
(English)

Engineering

Localized Strings



# How Does That Work?

Localization and Auto Layout at runtime

# How Does That Work?

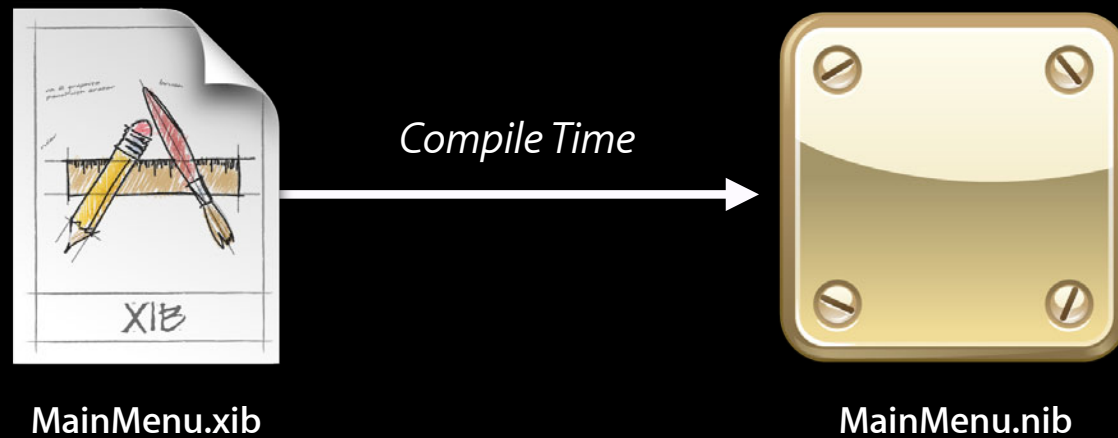
Localization and Auto Layout at runtime



MainMenu.xib

# How Does That Work?

Localization and Auto Layout at runtime



# How Does That Work?

Localization and Auto Layout at runtime

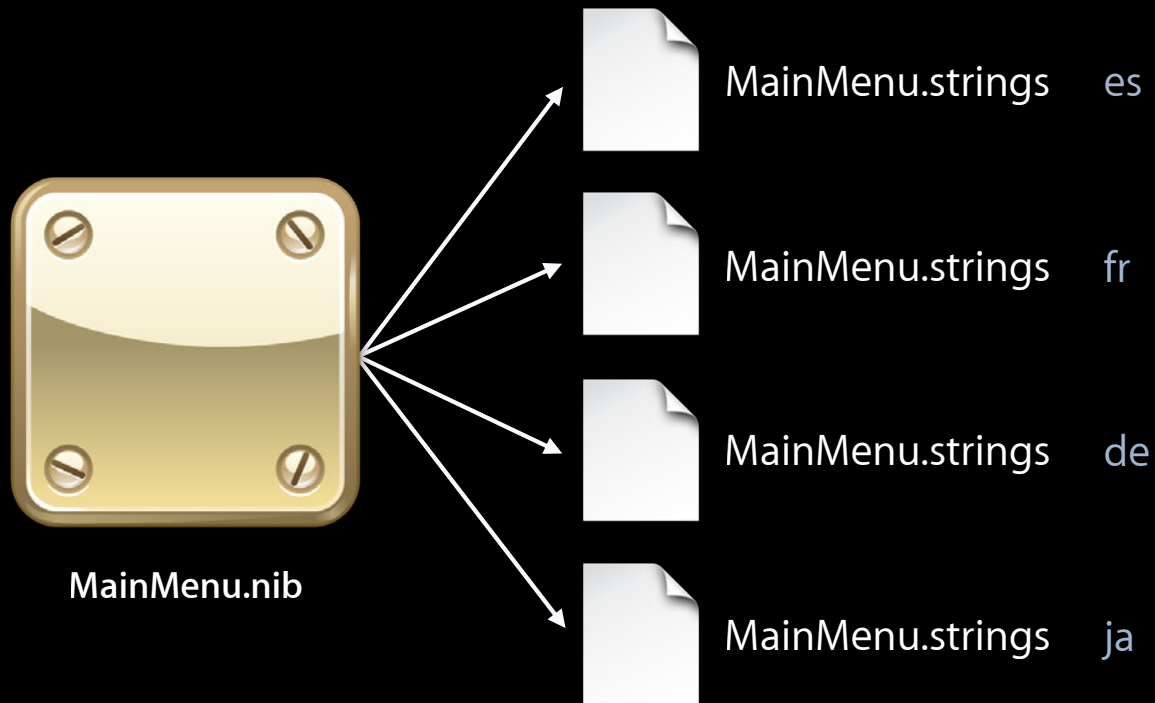


MainMenu.nib



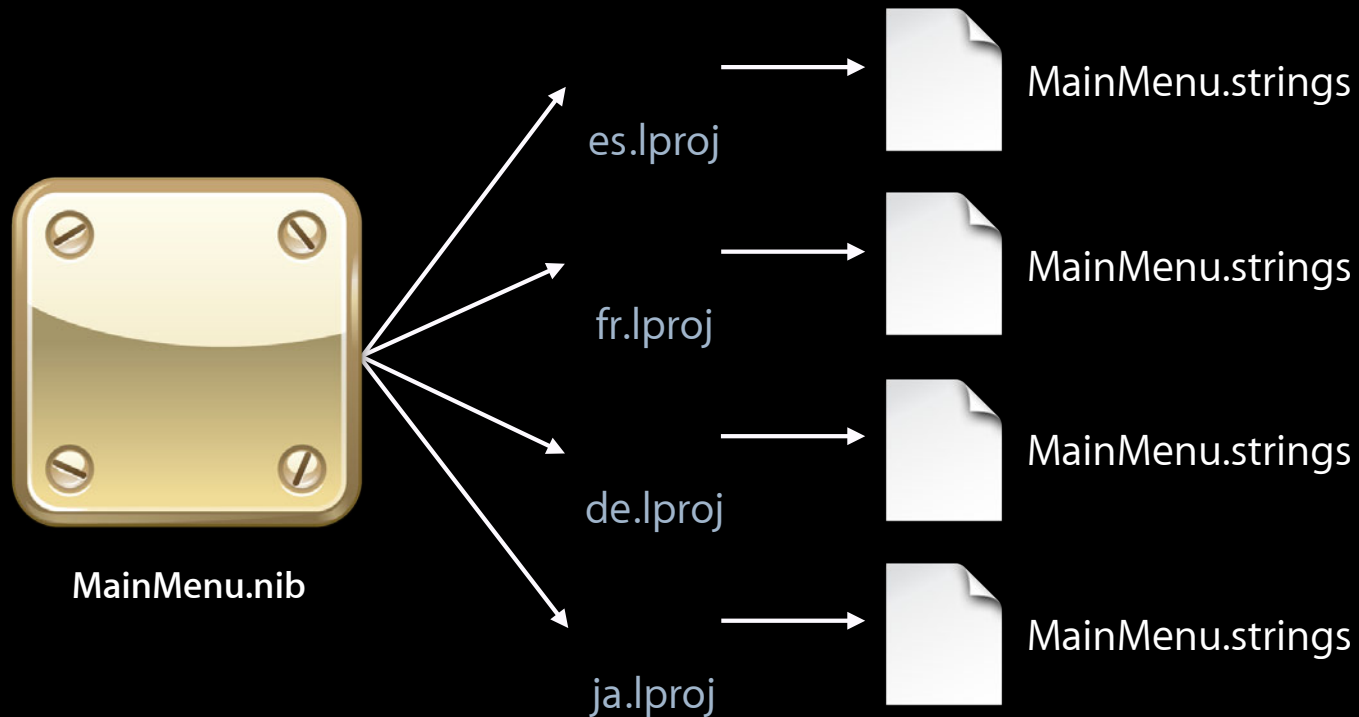
# How Does That Work?

Localization and Auto Layout at runtime



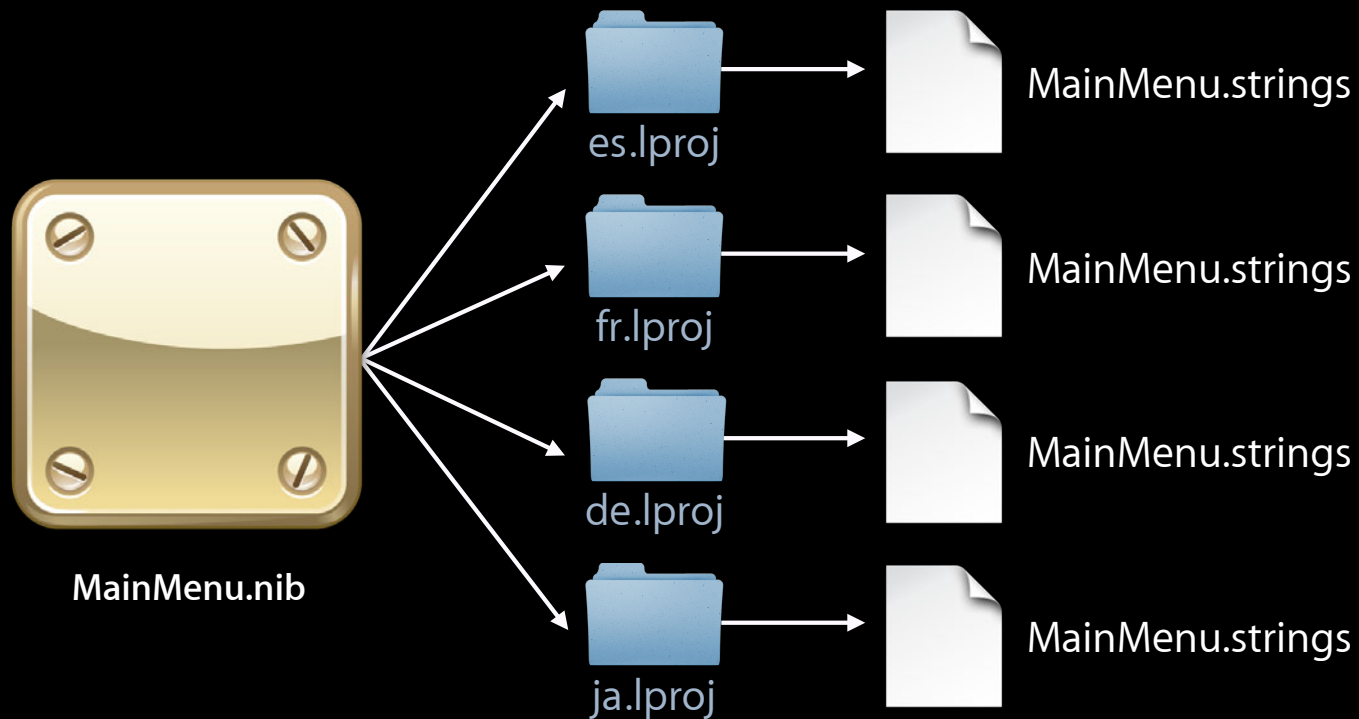
# How Does That Work?

Localization and auto layout at runtime



# How Does That Work?

Localization and auto layout at runtime



# What About MainMenu.nib?

The base localization



Base.lproj



MainMenu.nib

# What About MainMenu.nib?

The base localization



Base.lproj



MainMenu.nib

# What About MainMenu.nib?

The base localization



Base.lproj

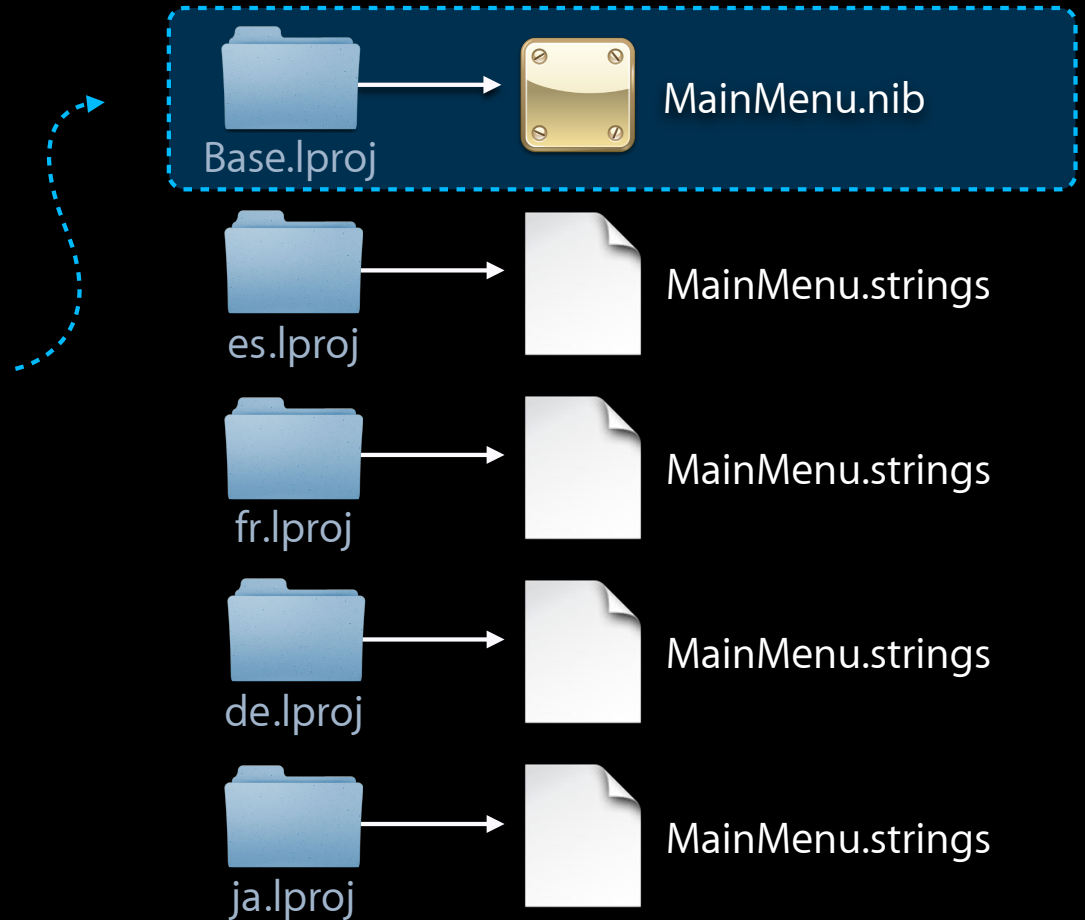


MainMenu.nib

# At Runtime

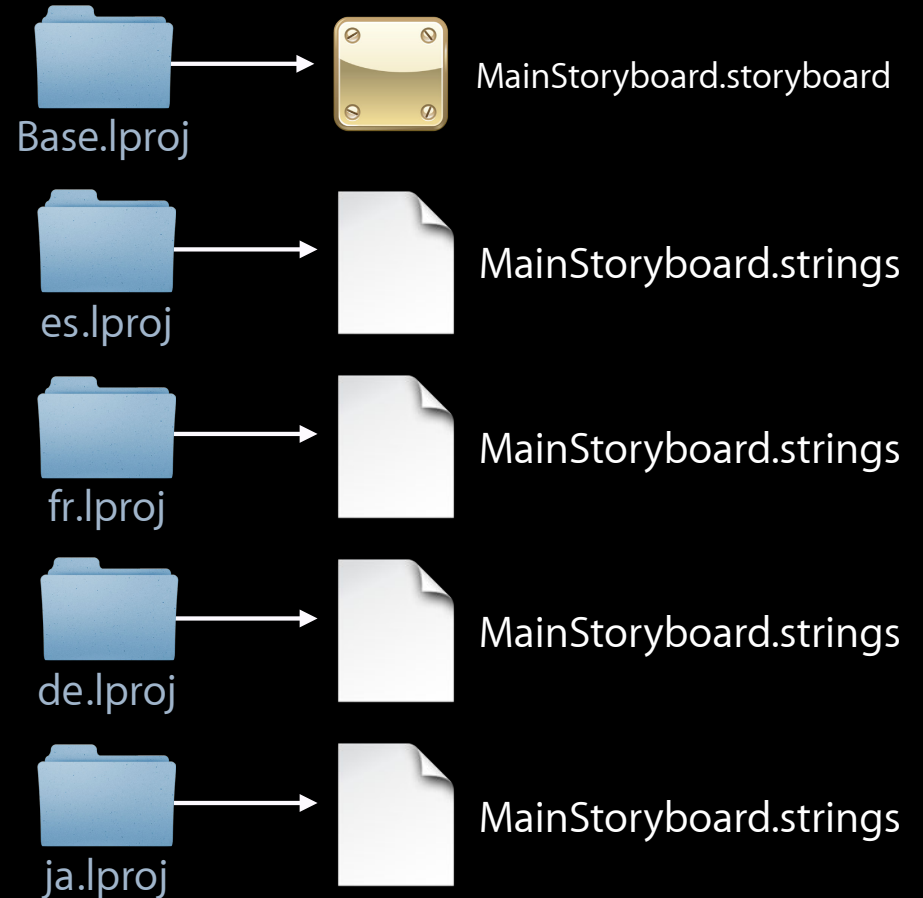


# At Runtime

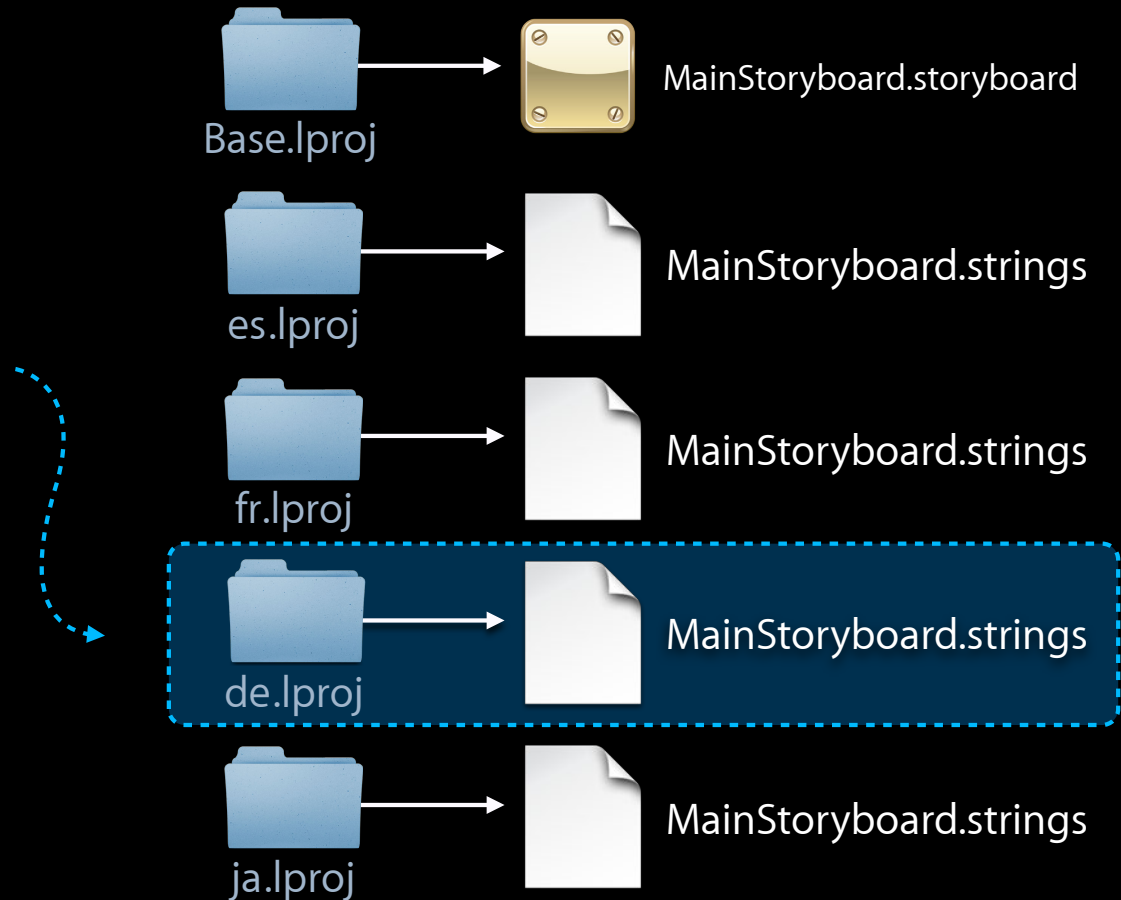




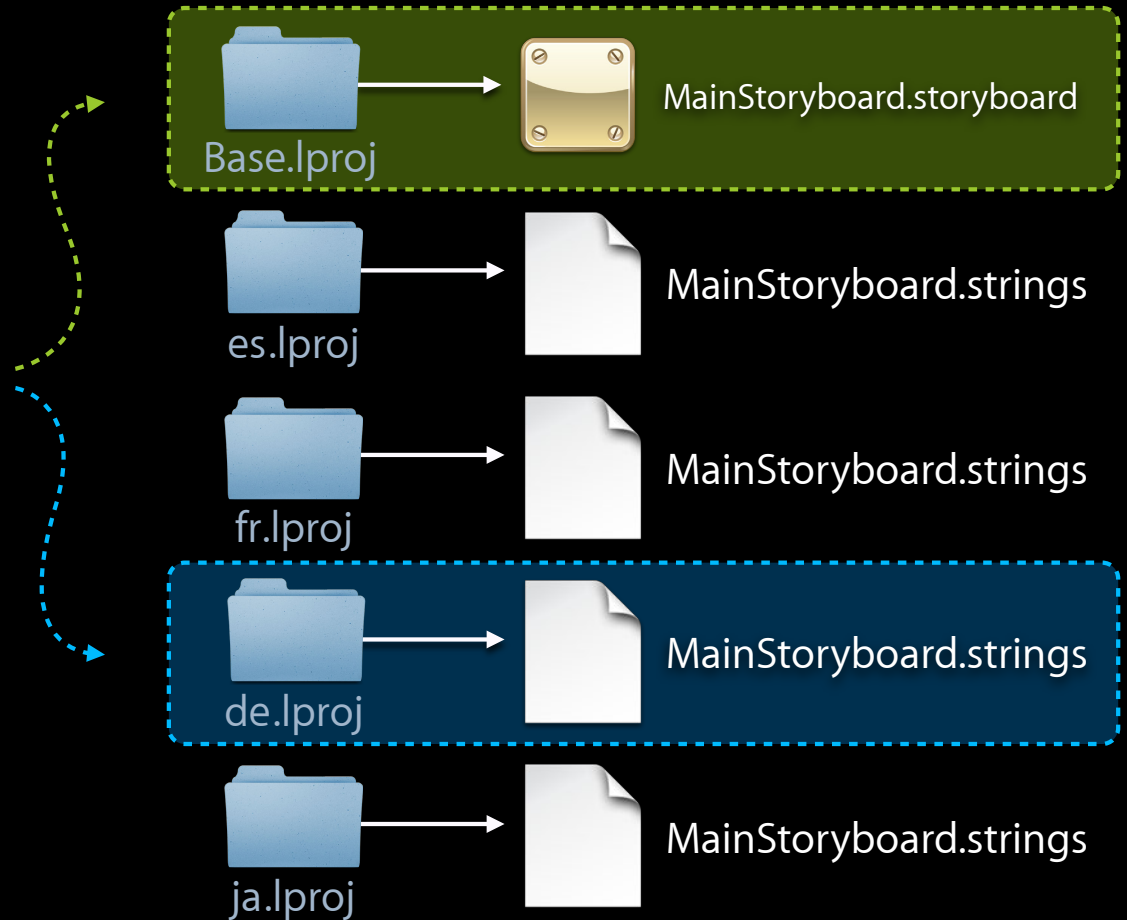
# At Runtime



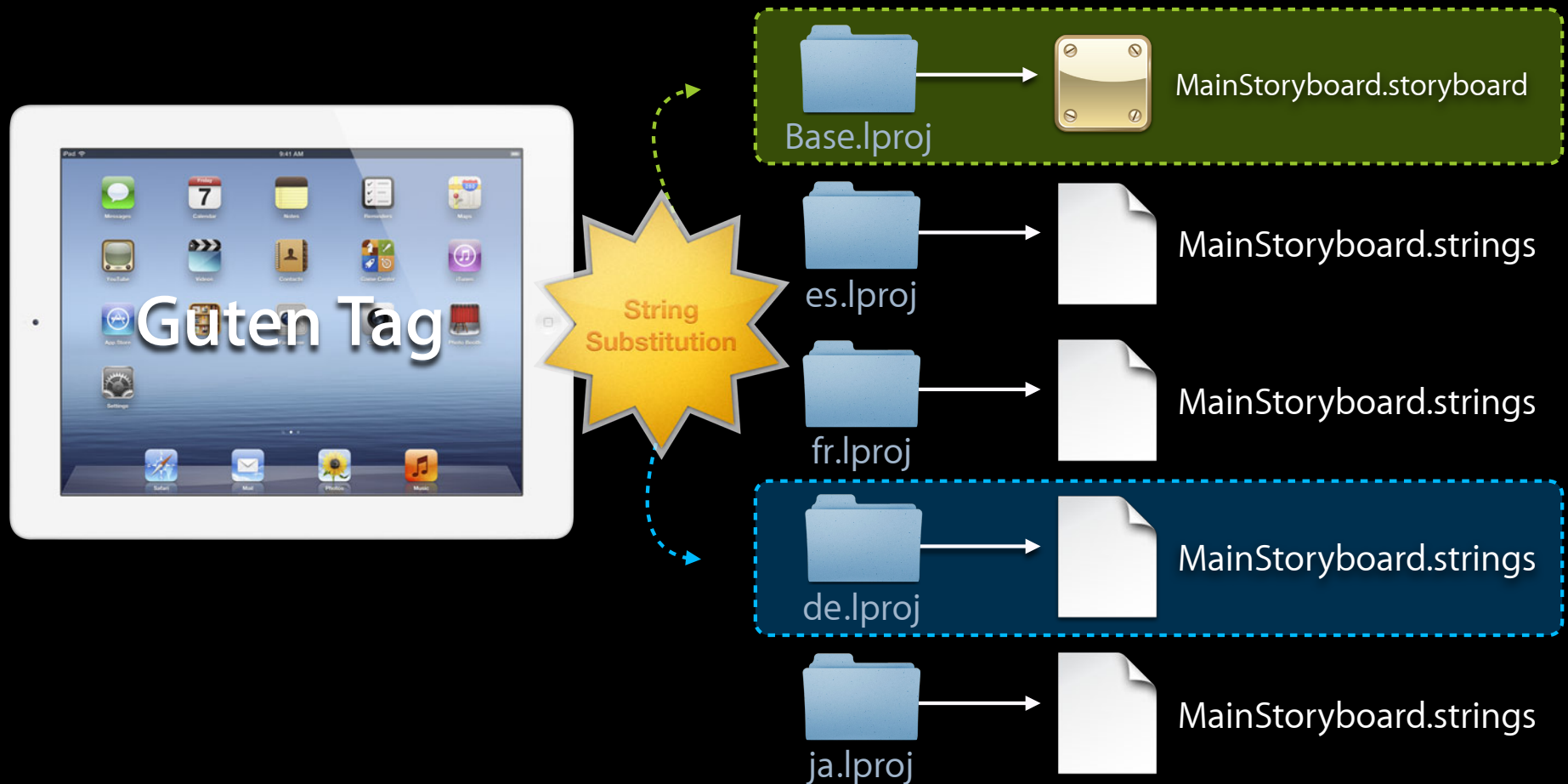
# At Runtime



# At Runtime



# At Runtime



*Demo*

Localization and Auto Layout

# Base Localization

## Recap



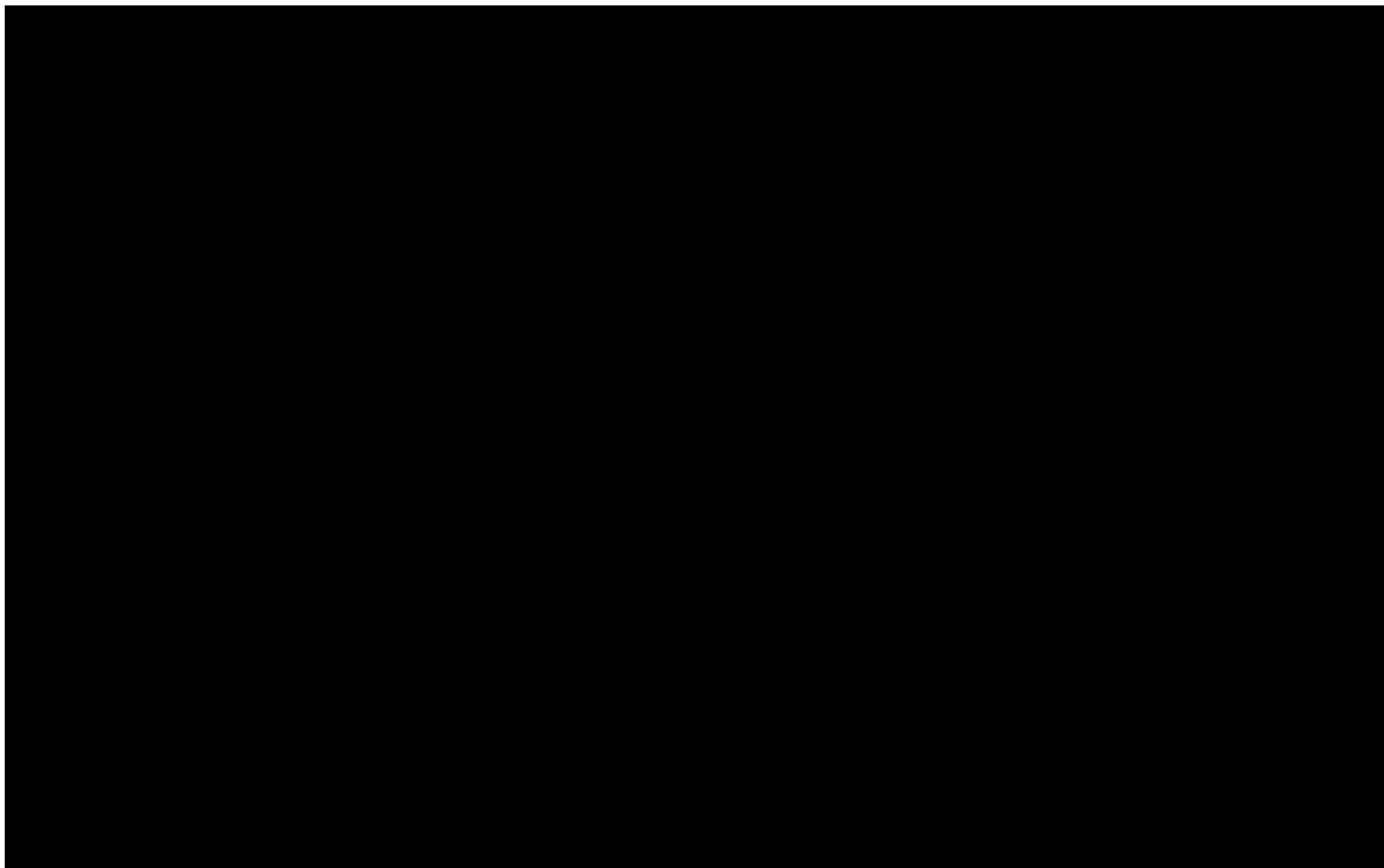
- Base is development localization
  - Not necessarily English
  - Can have English strings file
- Base contains nibs and storyboards with Auto Layout
- For other localizations, one strings file per nib or storyboard

# Base Localization

## Recap



- At runtime, strings from Base are substituted with strings from active language
- Can have nib or storyboard for specific localization if layout customization is required
- Availability
  - Mountain Lion and iOS 6





**Takeaway:**  
**Think ahead!**

# Thinking Ahead

Dynamic content

# Thinking Ahead

## Dynamic content

the bridge's unique design touches, including the crossovers connecting the sides of the towers and the arch element at Fort Point. The Bethlehem Steel Company provided the material and the construction management for the bridge. There are over 27,000 strands of wire, equal to about 100 million used throughout the bridge. The Golden Gate Bridge cost \$35 million (in 1937 dollars of course!).

**LENGTH** 8,981 ft (2,737.4 m), about

**WIDTH** 90 ft (27.4 m)

**HEIGHT** 746 ft (227.4 m)

**LONGEST SPAN** 4,200 ft (1,280.2 m)

**HEIGHT** 210 ft (64 m)

**AREA** 1.7 acres (0.69 ha)

**BUILT** 1933

**ARCHITECT** Brown, Arthur Jr

**ARCHITECTURAL STYLE** Art Deco

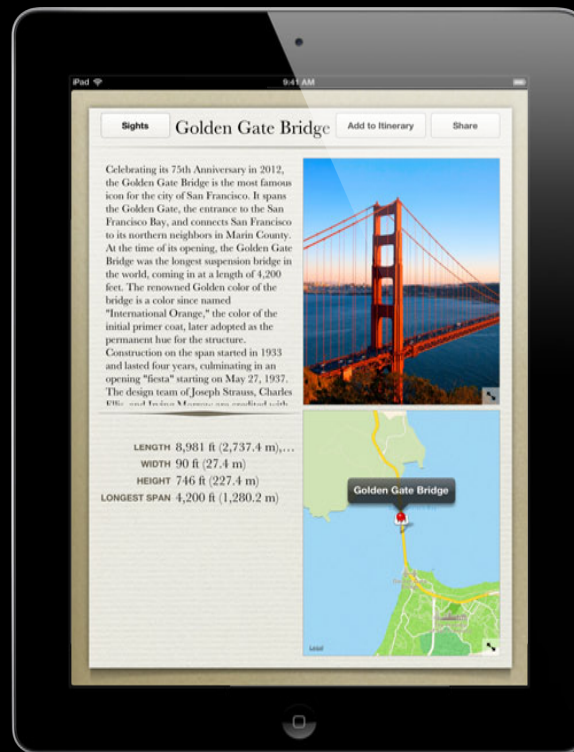
# Think Ahead

## Device rotation



# Think Ahead

## Device rotation



# Think Ahead

## Localization

# Think Ahead

## Localization

Golden Gate Bridge

California Academy...

Coit Tower

San Francisco-Oakla...

Twin Peaks

The Presidio

Fisherman's Wharf

Moscone Center

Castro Theater

Ferry Building

Old Barbary Coast

Chinatown

Dolores Park

AT&T Park

Cable Cars

Legion of Honor

DeYoung Museum

SFMOMA

Conservatory of Flowers


Haight-Ashbury

Fort Point

Ocean Beach & The...

### Golden Gate Bridge

Celebrating its 75th Anniversary in 2012, the Golden Gate Bridge is the most famous icon for the city of San Francisco. It spans the Golden Gate, the entrance to the San Francisco Bay, and connects San Francisco to its northern neighbors in Marin County. At the time of its opening, the Golden Gate Bridge was the longest suspension bridge in the world, coming in at a length of 4,200 feet. The renowned Golden color of the bridge is a color since named "International Orange," the color of the initial primer coat, later adopted as the permanent hue for the structure. Construction on the span started in 1933 and lasted four years, culminating in an opening "fiesta" starting on May 27, 1937. The design team of Joseph Strauss, Charles Ellis, and Irving Morrow are credited with many of the bridge's unique design touches, including the chevrons connecting the sides of the towers and the arch element that frames Fort Point. The Bethlehem Steel Company provided most of the material and the construction management for the entire project. There are over 27,000 strands of wire, equal to about 80,000 miles, used throughout the bridge. The Golden Gate Bridge cost \$35 million (as of 1937 dollars).



LENGTH 8,981 ft (2,737.4 m), about 1.7 mi

WIDTH 90 ft (27.4 m)

HEIGHT 746 ft (227.4 m)

LONGEST SPAN 4,200 ft (1,280.2 m)

Click

جسر غولدن غيت

أكاديمية كاليفورنيا للعلوم

برج كويت

سان فرانسيسكو اوكلاند جسر خليج

التوأم قمم

ويريزيدو

الصيداء وارف

مركز موسكون

كاسترو مسرح

العبرة البناء

قديم البريري الساحل

الحي الصيني

دولويرس بارك

بارك AT & T

كابل سيارات

وسام جوقة الشرف

ديونغ متحف

SFMOMA

المعهد الموسيقي من الزهور

هايت-اشبوري


حصن نقطة

شاطئ المحيط وعلى الطريق السريع العد...

### جسر غولدن غيت

إضافة إلى خط سير الرحلة

حصنة



تحتفل بالذكرى السنوية 75 في عام 2012، وجسر غولدن غيت هو الرمز الأكثر شهرة لمدينة سان فرانسيسكو. إنه يمتد جولدن جيت، على مدخل خليج سان فرانسيسكو، ويربط بين سان فرانسيسكو لجيرانها في شمال مقاطعة مارين. في وقت افتتاحها، وكان جولدن جيت بريدج أطول جسر معلق في العالم، إذ تأتي في بطول 4200 متر. اللون الذهبي الشهير للجسر هو اللون منذ اسمه "أورانج الدولية." هذا اللون من معطف التمهيد الأولي، التي اعتمدت في وقت لاحق كما هو دائم للهيكل البناء. في فترة بدأت في عام 1933 واستمرت أربع سنوات، وبلغت ذروتها في فتح "عيد" اعتباراً من يوم 27 مايو 1937. وتقيد فريق التصميم من تشاروس يوسف، اليس تشارلز، ومورو إيرفينغ مع العديد من اللمسات الجسر تصميم فريد من نوعه، بما في ذلك علامتي الاقتباس الذي يربط بين الجانبين من الأبراج والعنصر فوس تلك النقطة فورت الإطارات. قدمت شركة الحديد والصلب بيت لحم معظم المواد، وإدارة الإنشاءات للمشروع بأكمله. هناك أكثر من 27000 جداول من الأسلاك، أي ما يعادل حوالي 80.000 كيلومتر، وتستخدم في جميع أنحاء الجسر. يكلف جسر البوابة الذهبية 35 مليون دولار (في عام 1937 دولار)، طمعا!

طول 2,737.4 متر (حوالي 2.73 كيلومتر)

عرض 27.4 متر

ارتفاع 227.4 متر

أطول فترة 1,280.2 متر

Click to play movie

# Think Ahead

## Helpful debugging defaults

- Double all localized strings  
`NSDoubleLocalizedString YES`
- Simulate right to left  
`AppleTextDirection YES`  
`NSForceRightToLeftWritingDirection YES`
- Draw view alignment rects  
`NSViewShowAlignmentRects YES`  
`UIViewShowAlignmentRects YES`



Transitioning to Auto Layout

Explicit Widths

**Localization**

New API

Animation

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# Priorities

- Priorities are for expressing required or optional behaviors
  - Content hugging and compression resistance priorities
  - User constraints (e.g. centered title... if possible)
  - Split view holding priority

# Priorities

- By default, constraints are required (priority value 1000)
- If less than 1000, indicates optional constraint
- System will try to get as close as possible to fulfilling all constraints
- System has some predefined, special priorities

*Demo*

New API

# New API

## Recap

- NSSplitView
  - [NSSplitView setHoldingPriority:forSubviewAtIndex:]
- Text Wrapping
  - [UILabel setPreferredMaxLayoutWidth:]
  - [NSTextField setPreferredMaxLayoutWidth:]
- Use first layout width for preferred max layout width in IB

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Transitioning to Auto Layout

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New API

**Animation**

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New API

**Animation**

*Demo*  
Animation

# Animation

## Recap

- Animating the constant (OS X Lion and OS X Mountain Lion)
- Animation using CoreAnimation (OS X Mountain Lion and iOS 6)

```
[[myConstraint animator] setConstant:10.0];
```

```
[NSAnimationContext runAnimationGroup:^(NSAnimationContext *ctx) {  
    [ctx setAllowsImplicitAnimation:YES];
```

```
    ...
```

```
    [view layoutSubtreeIfNeeded];
```

```
} completionHandler:NULL];
```

```
[UIView animateWithDuration:2.0 animations:^(
```

```
    ...
```

```
    [view layoutIfNeeded];
```

```
});
```

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**Animation**

Transitioning to Auto Layout

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**Animation**

# Transitioning to Auto Layout

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# Takeaway

## Think ahead

- Dynamic content at runtime
- Device rotation or window resize
- Localization
- Use debugging defaults



# More Information

## Jake Behrens

UI Frameworks Evangelist  
[behrens@apple.com](mailto:behrens@apple.com)

## Michael Jurewitz

Developer Tools and Performance Evangelist  
[jury@apple.com](mailto:jury@apple.com)

## Documentation

Mac OS X Human Interface Guidelines  
<http://developer.apple.com/ue>

## Apple Developer Forums

<http://devforums.apple.com>

# Related Sessions

Introduction to Auto Layout for iOS and OS X

Mission  
Tuesday 10:15PM

Best Practices for Mastering Auto Layout

Mission  
Thursday 9:00AM

# Labs

Auto Layout Lab

App Services Lab B  
Thursday 2:00PM

 **WWDC2012**