Accessibility on iPhone OS

Make an app for everyone

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VoiceOver Engineering

Accessibility

- Closed captioning
- Zoom
- Screen readers
- *Many others…*

Settings › General › Accessibility

"I predict that the visually impaired community will agree that the iPhone was the single biggest game changing piece of technology for the assistive tech industry in modern times."
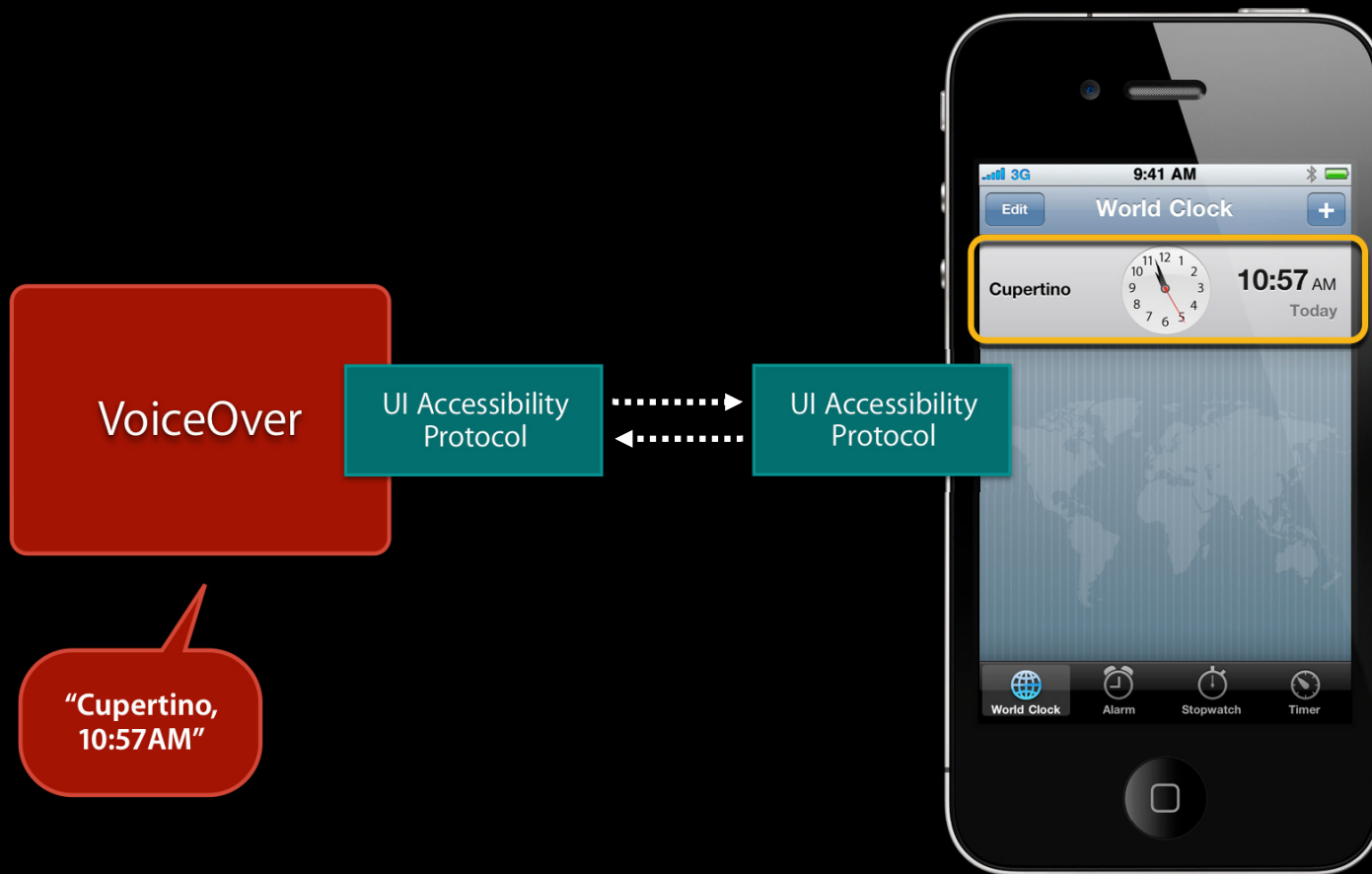
Josh de Lioncourt, maccessibility.net

Demo
VoiceOver and Accessibility

Make Your App Accessible

- UIAccessibility API introduced in iPhone 3.0 SDK
- Allows your app to provide UI information to VoiceOver

Accessibility Architecture

Adding Accessibility to Your App

- Simple
- Most of the work done
- You will mainly add labels

What You'll Learn

- UIAccessibility Protocol
  - Accessibility Attributes
  - Accessibility Containers
  - Accessibility Actions
- Best Practices

UIAccessibility API: Attributes
Accessibility attributes return information about the element

- (BOOL)isAccessibilityElement

- (NSString *)accessibilityLabel

- (UIAccessibilityTraits)accessibilityTraits

- (CGRect)accessibilityFrame

- (NSString *)accessibilityHint
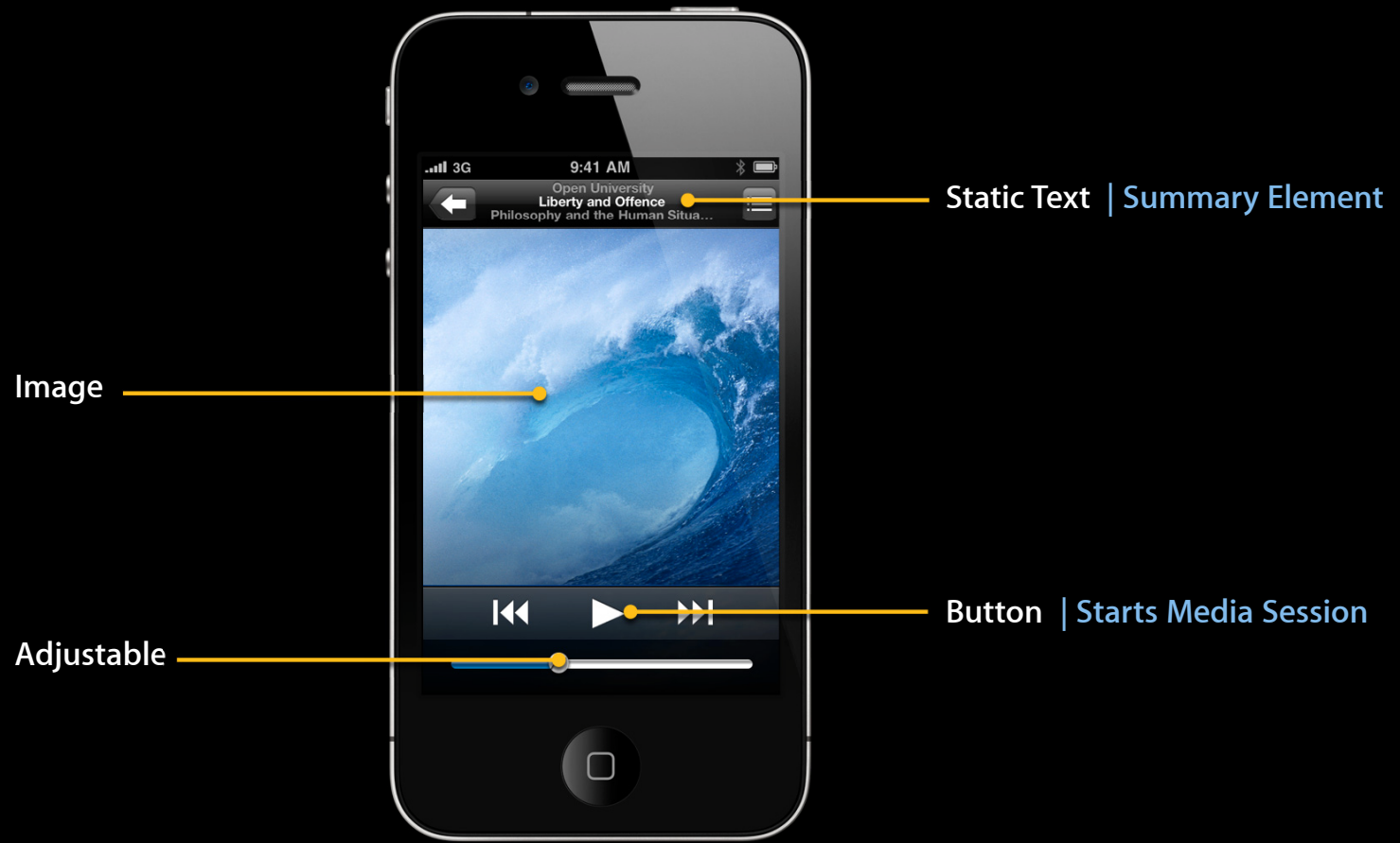
- (NSString *)accessibilityValue

Common Accessibility Attributes

- `(BOOL)isAccessibilityElement`
  - Return YES to make VoiceOver see this element

- `(NSString *)accessibilityLabel`
  - A textual representation of the element

Accessibility Traits

– `(UIAccessibilityTraits)accessibilityTraits`

- Defines behavior
- Bitmask of integers

Accessibility Traits

Static Text | Summary Element

Image

Button | Starts Media Session

Adjustable

Other Accessibility Attributes

- `(CGRect)accessibilityFrame`
  - The onscreen rectangle for the UI element

- `(NSString *)accessibilityValue`
  - A dynamically changing value that describes the UI element

- `(NSString *)accessibilityHint`
  - A string that provides additional help

Adding Accessibility with IB
Change simple accessibility values
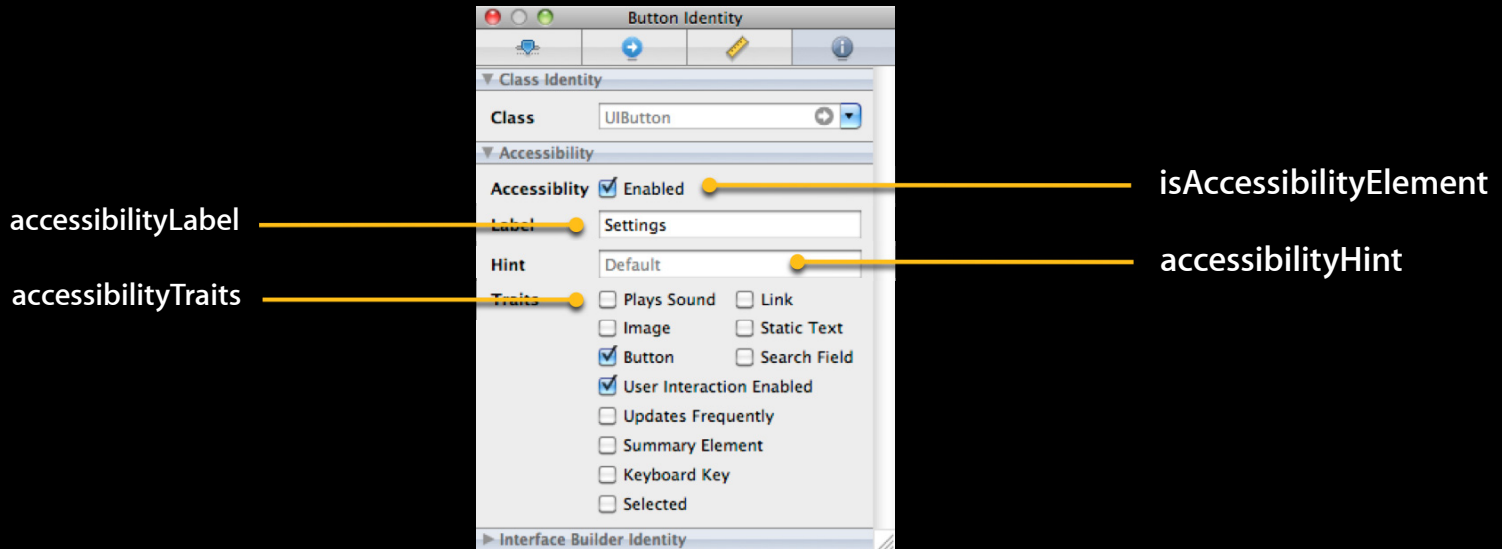
Demo
Introduction to iPhone Accessibility

What You'll Learn

- UIAccessibility Protocol
  - Accessibility Attributes
    - Adding Accessibility in Code
  - Accessibility Containers
  - Accessibility Actions
- Best Practices

Adding Accessibility in Code
If accessibility values don't change

```
- (void)awakeFromNib {
    ...

    UIControl *control = [[UIControl alloc] initWithFrame:frame];

    control.isAccessibilityElement = YES;
    control.accessibilityLabel = @"Play";

    [window addSubview:control];

    ...
}
```

Adding Accessibility in Code
If accessibility values change

```objc
@implementation MyTemperatureView

- (BOOL)isAccessibilityElement {
    return YES;
}

- (NSString *)accessibilityLabel {
    return @"Current Temperature";
}

- (NSString *)accessibilityValue {
    return [cityWeather currentTemperatureAsString];
}

@end
```
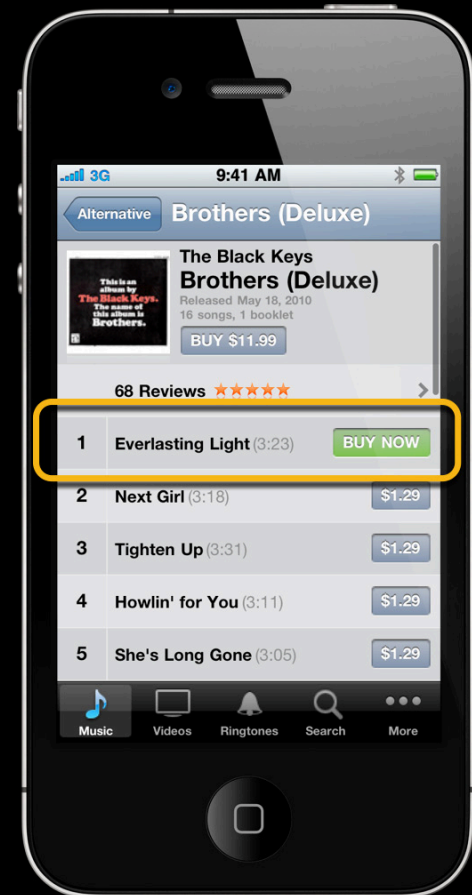
Notifications

Tell VoiceOver something happened

```
UIAccessibilityPostNotification(

    UIAccessibilityScreenChangedNotification,

    nil);
```

```
UIAccessibilityPostNotification(

    UIAccessibilityLayoutChangedNotification,

    nil);
```

Demo
Setting Accessibility Attributes

What You'll Learn

- UIAccessibility Protocol
  - Accessibility Attributes
  - Accessibility Containers
  - Accessibility Actions
- Best Practices

Accessibility Containers

- For custom views with multiple parts
- Returns accessibility "sub-elements"

MonthView : UIView

Accessibility Containers

- For custom views with multiple parts
- Returns accessibility "sub-elements"

"October 14th"
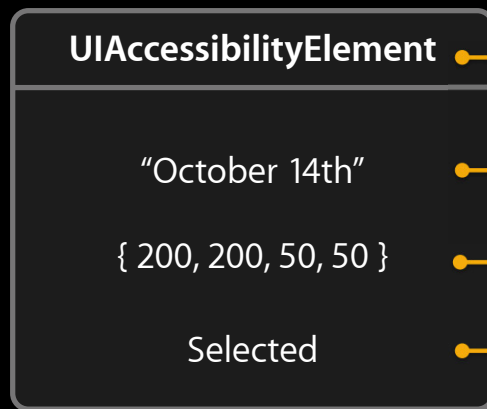
Accessibility Containers

- For custom views with multiple parts
- Returns accessibility "sub-elements"

"October 11th"

Creating a Sub Element
Make a UIAccessibilityElement

UIAccessibilityElement

"October 14th"

{ 200, 200, 50, 50 }

Selected

```
UIAccessibilityElement *dayPart = [[UIAccessibilityElement alloc]
        initWithAccessibilityContainer:monthView];

dayPart.accessibilityLabel = @"October 14th";

dayPart.accessibilityFrame = CGRectMake(200, 200, 50, 50);

dayPart.accessibilityTraits = UIAccessibilityTraitSelected;

[accessibilityElements addObject:dayPart];
```

Accessibility Container
Mirrors NSArray

```objc
@implementation MonthView
- (NSInteger)accessibilityElementCount {
    return [accessibilityElements count];
}
- (id)accessibilityElementAtIndex:(NSInteger)index {
    return [accessibilityElements objectAtIndex:index]
}
- (NSInteger)indexOfAccessibilityElement:(id)element {
    return [accessibilityElements indexOfObject:element]
}
@end
```

Demo
Accessibility Container Protocol

What You'll Learn

- UIAccessibility Protocol
  - Accessibility Attributes
  - Accessibility Containers
 - Accessibility Actions
- Best Practices

Accessibility Actions
For custom, adjustable elements

```
@implementation PageControl

- (UIAccessibilityTraits)accessibilityTraits {
    return [super accessibilityTraits] |
        UIAccessibilityTraitAdjustable;
}

- (void)accessibilityIncrement {
    [self moveToNextPage];
}

- (void)accessibilityDecrement {
    [self moveToPreviousPage];
}

@end
```

Adler. All emotions, and that one
particularly, were abhorrent to his
cold, precise, but admirably

· · · · · · · · · · · · · · · · ·
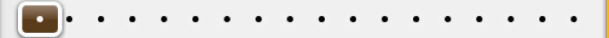
12 of 1175   98 pages left

Best Practices

- Use short, concise labels

✓ Good: "Add city"

✗ Bad: "Adds a city to the list of cities"

Best Practices

- Don't include the type information in the label
  - ✓ Good: "Remove city"
  - ✗ Bad: "Remove city button"

Best Practices

- Use localized strings for labels and hints
  - ✓ VoiceOver works in over 20 languages

Best Practices

- With custom table view cells
  - ✔ Only need to add accessibilityLabel

Demo

Accessible Bowling

Bonus API

```
BOOL UIAccessibilityIsVoiceOverRunning()
```
▪ Is VoiceOver on?


```
- (BOOL)accessibilityElementIsFocused
```
▪ Is VoiceOver focused on this element?

Summary

- Add accessibility
  - It's easy and fun
  - Increases user base
  - Heaps of praise
  - Karmic improvement

Labs

iPhone Accessibility Lab	Application Frameworks Lab B Thursday 9:00AM

More Information

Bill Dudney
User Experience Evangelist
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Documentation
Accessibility Programming Guideline for iPhone OS
Search on http://developer.apple.com/ for Accessibility

UIAccessibility Protocol Reference
Search on http://developer.apple.com/ for UIAccessibility

VoiceOver User Manual
http://support.apple.com/manuals/iphone

Apple Developer Forums
http://devforums.apple.com