Using Fonts with Text Kit

Session 223

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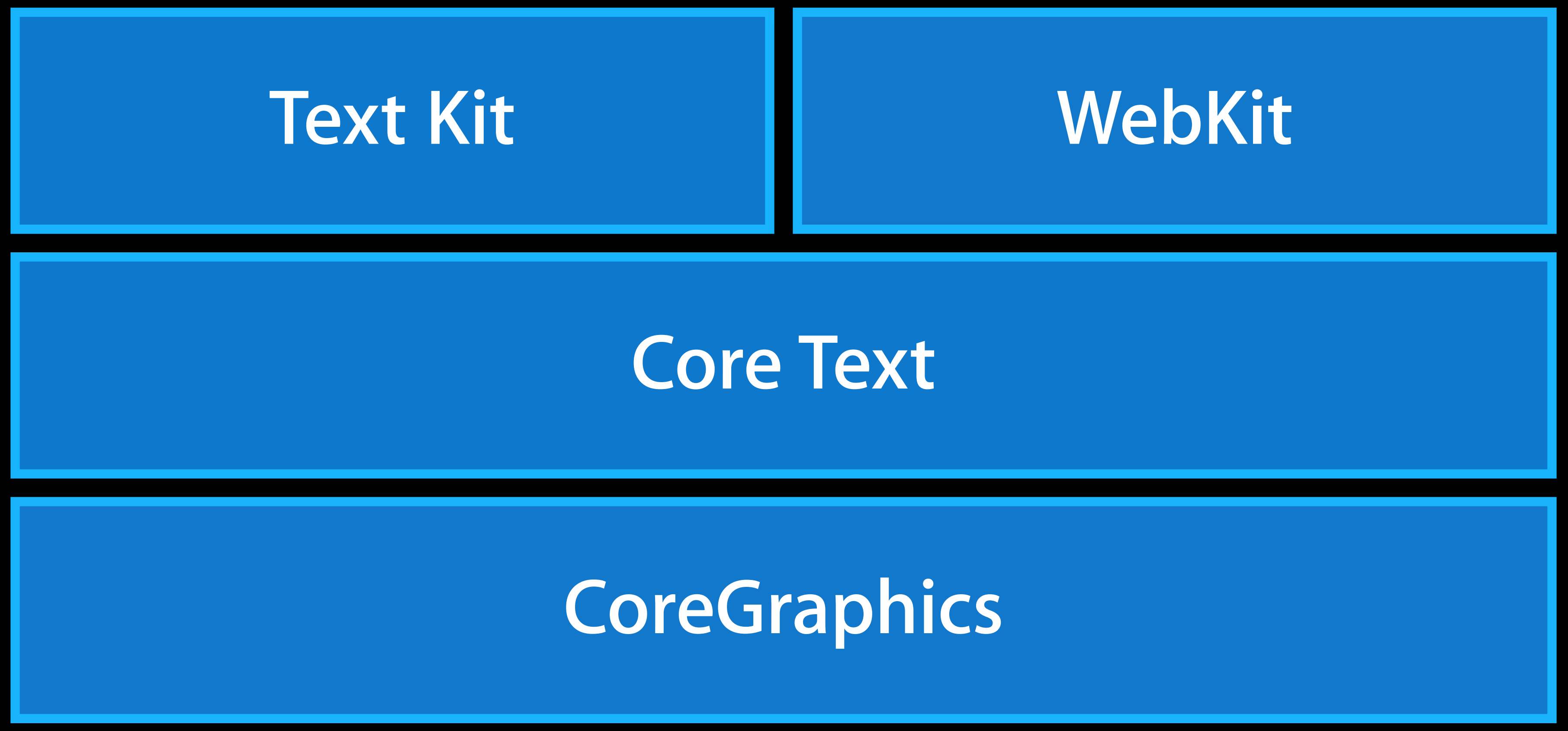
Typographic Engineer

What You’ll Learn

- Specifying fonts
    - Dynamic Type
    - Font descriptors
    - Adding fonts
- Language tagging
- Modifying fallbacks

What Is Text Kit?

Synopsis



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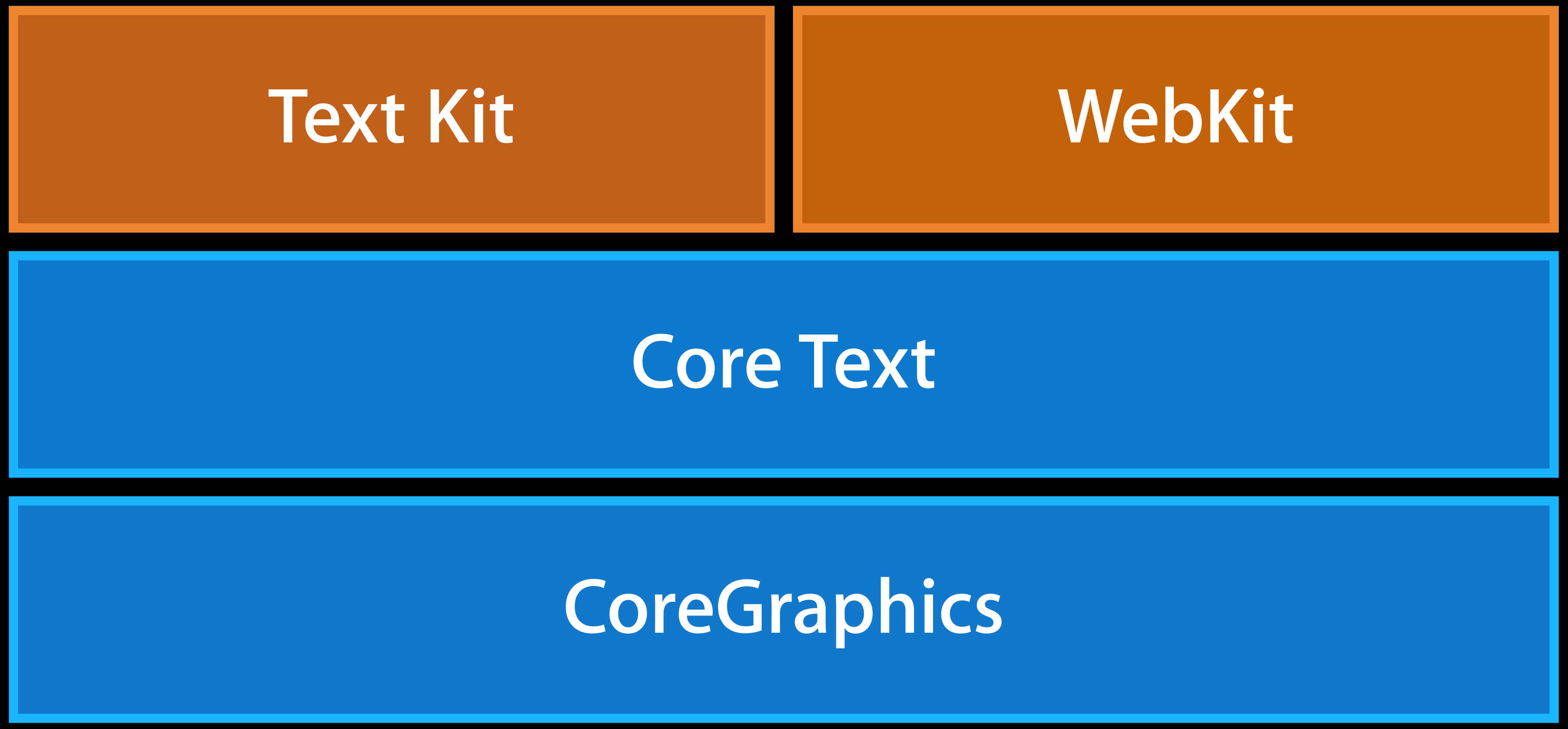
- Text Kit and Web Kit are built on Core Text



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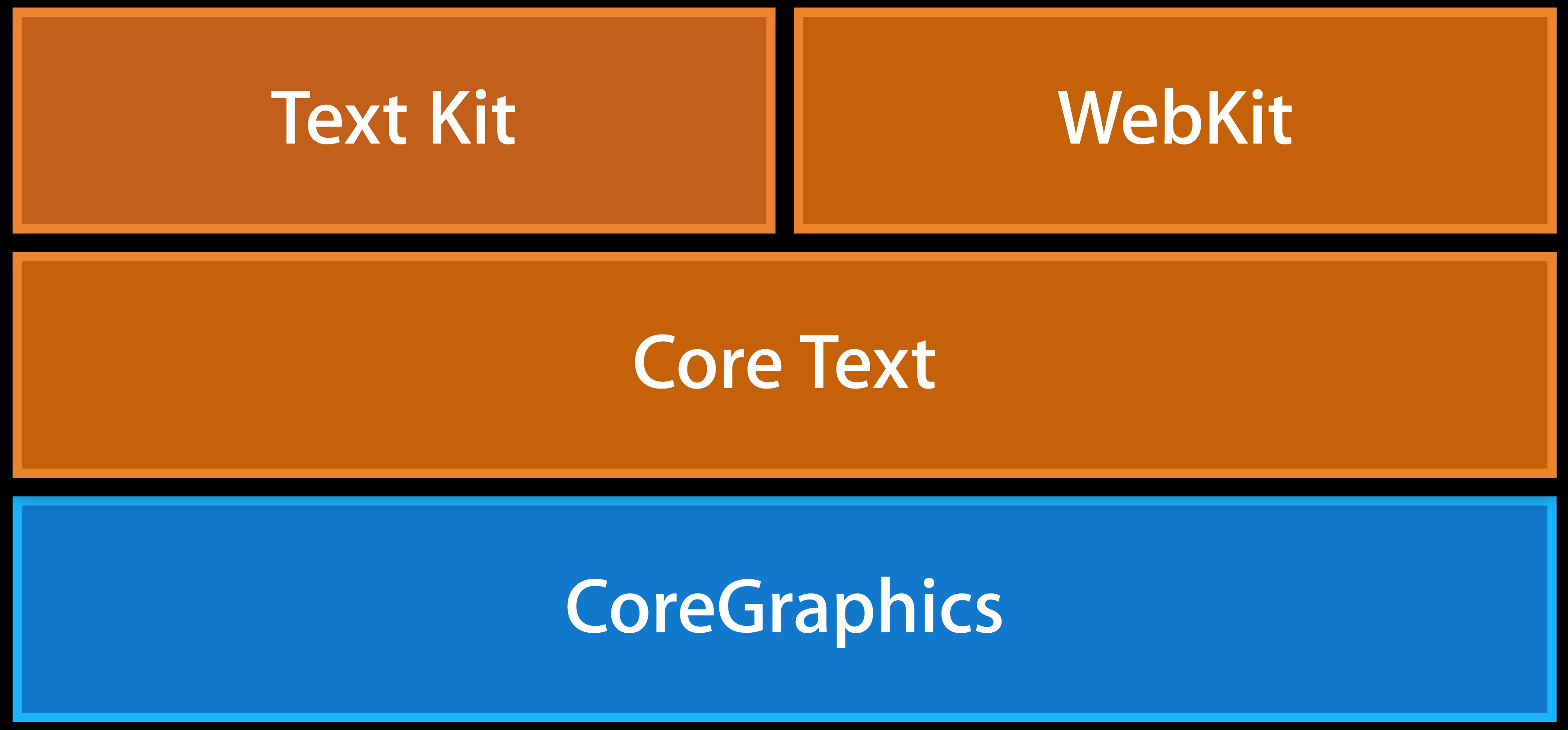
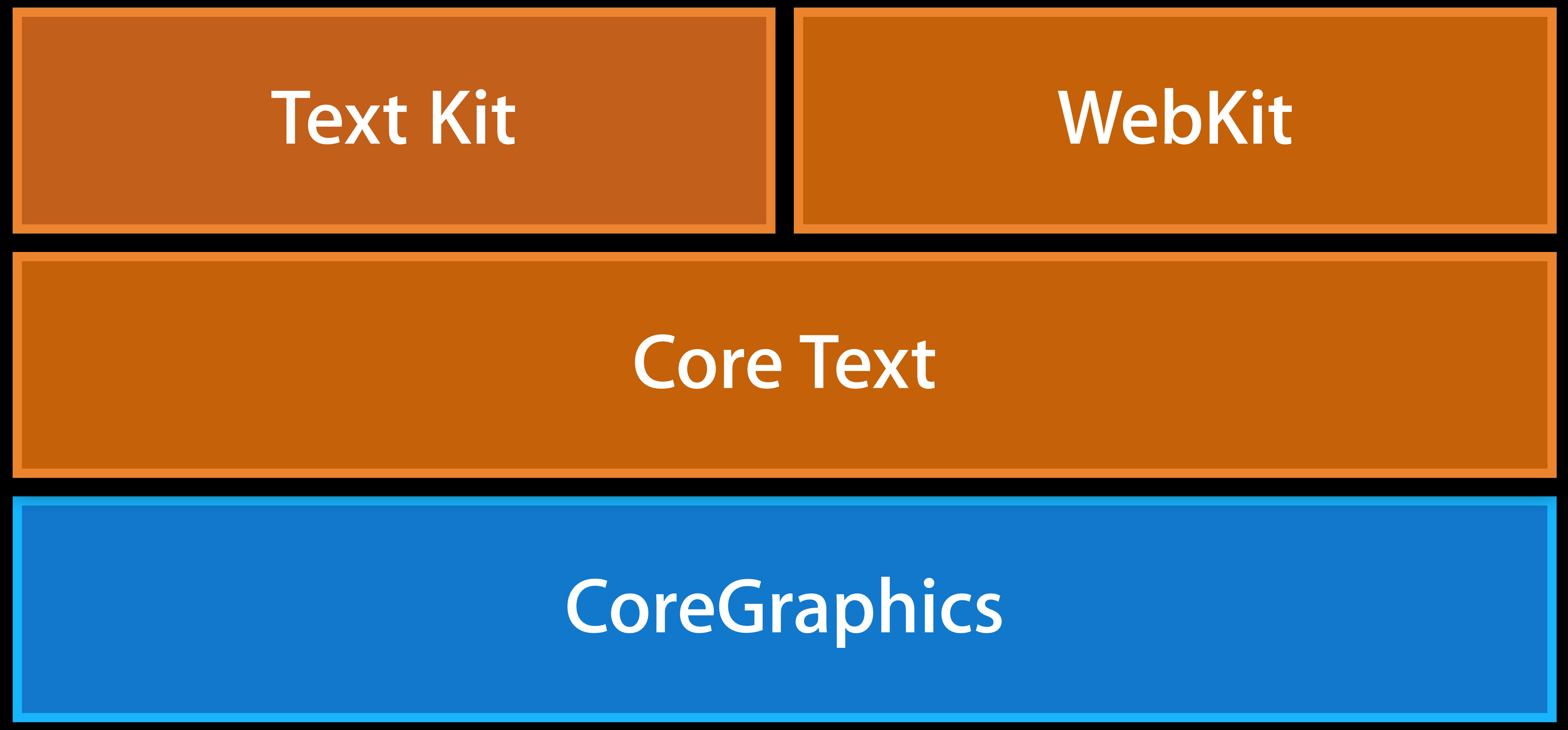
- Core Text is available for specialized tasks



What Is Text Kit?

Synopsis

- Text Kit and Web Kit are built on Core Text
- Core Text is available for specialized tasks
- Unicode text layout
  - String + Font = Glyphs

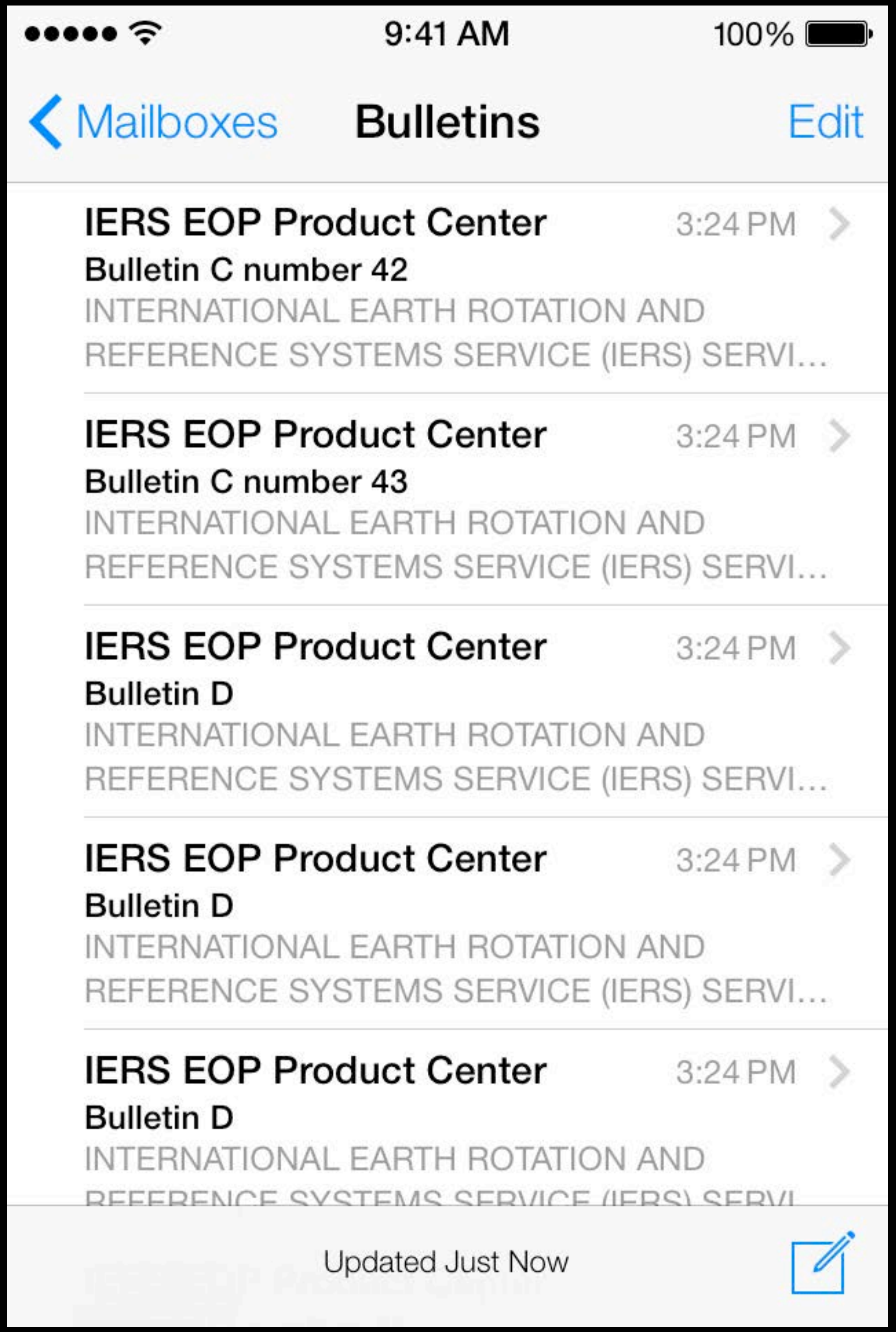


Specifying Fonts

Which Font?

- Dynamic Type
- System font
- UIFontDescriptor
- Adding fonts

Dynamic Type



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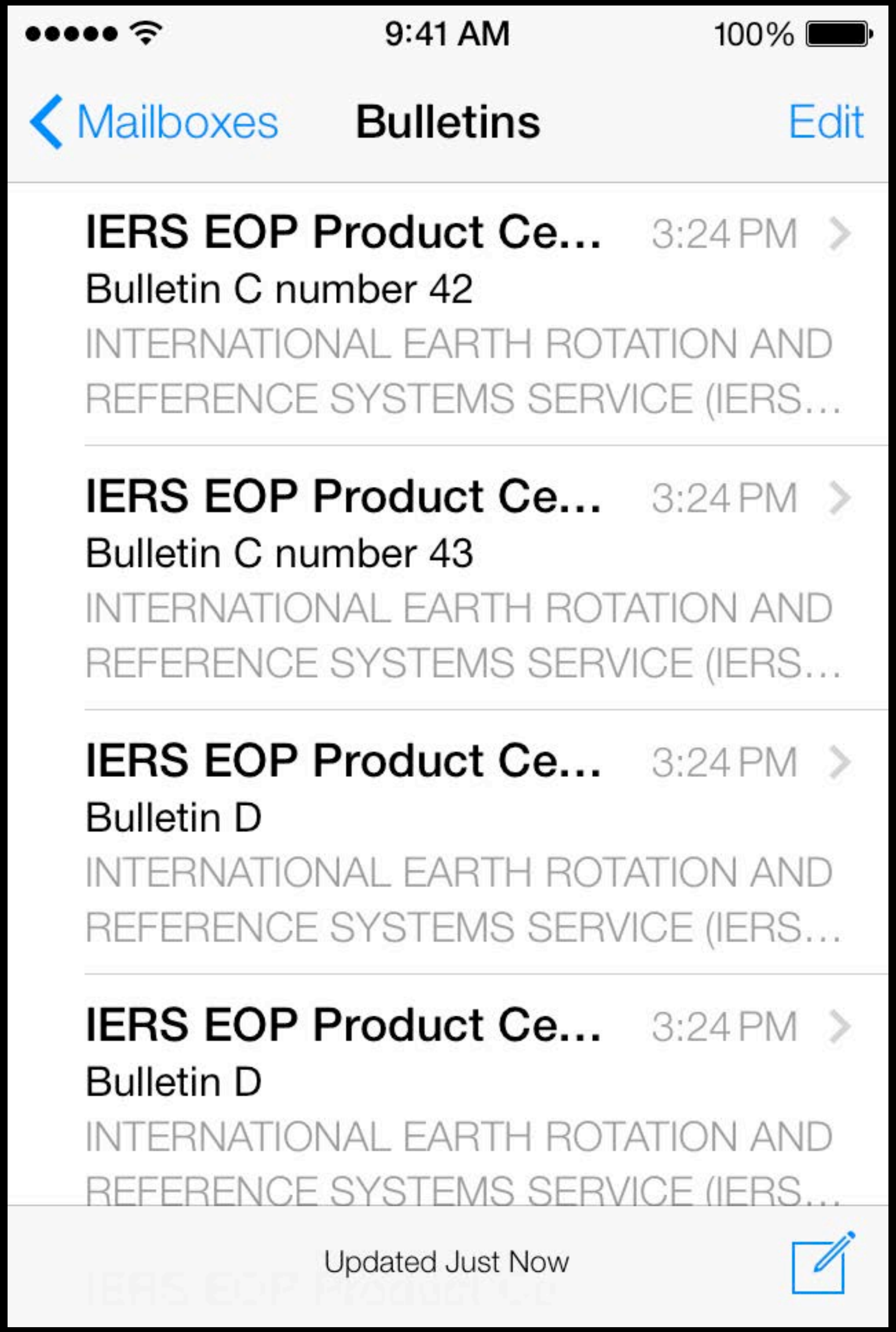

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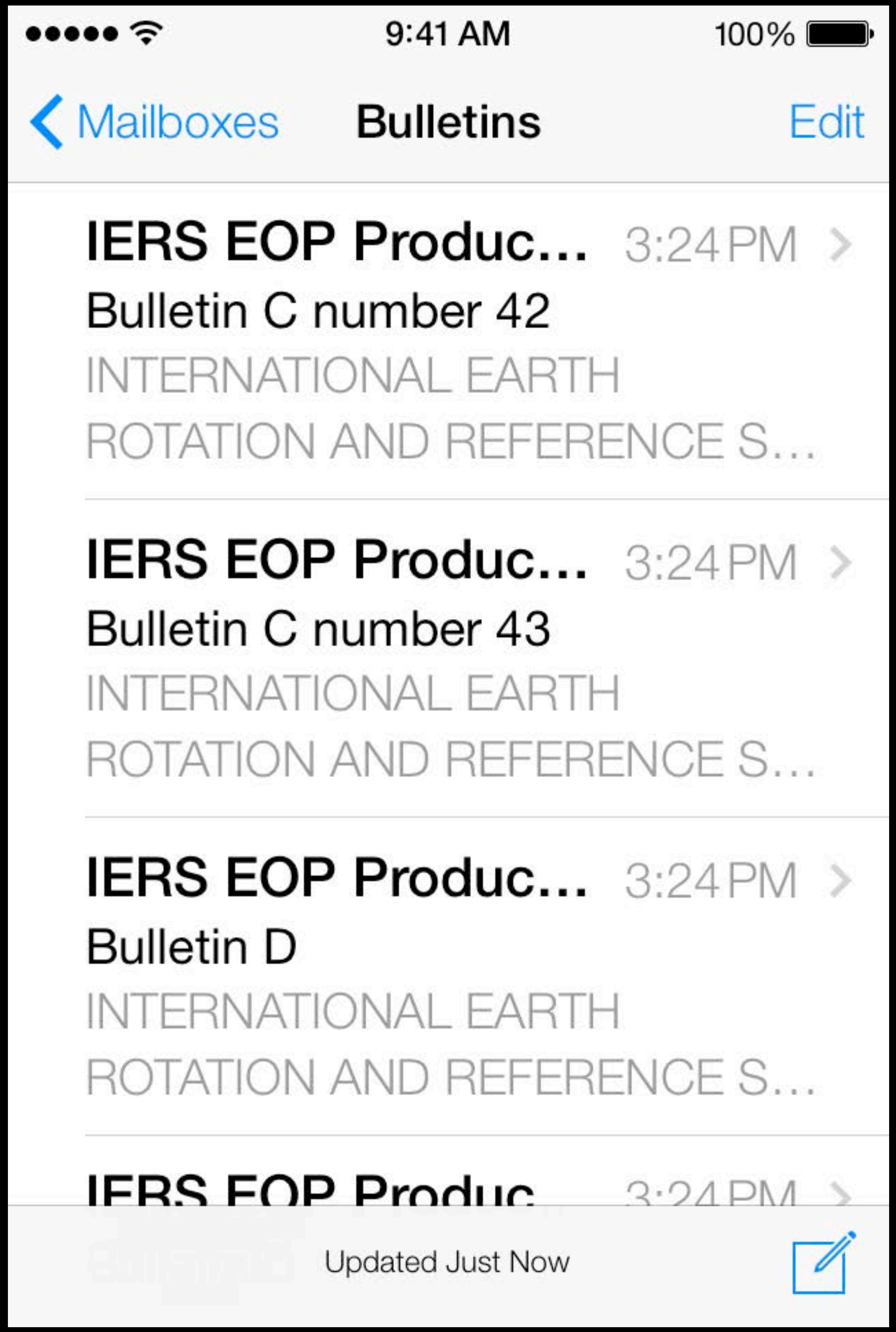

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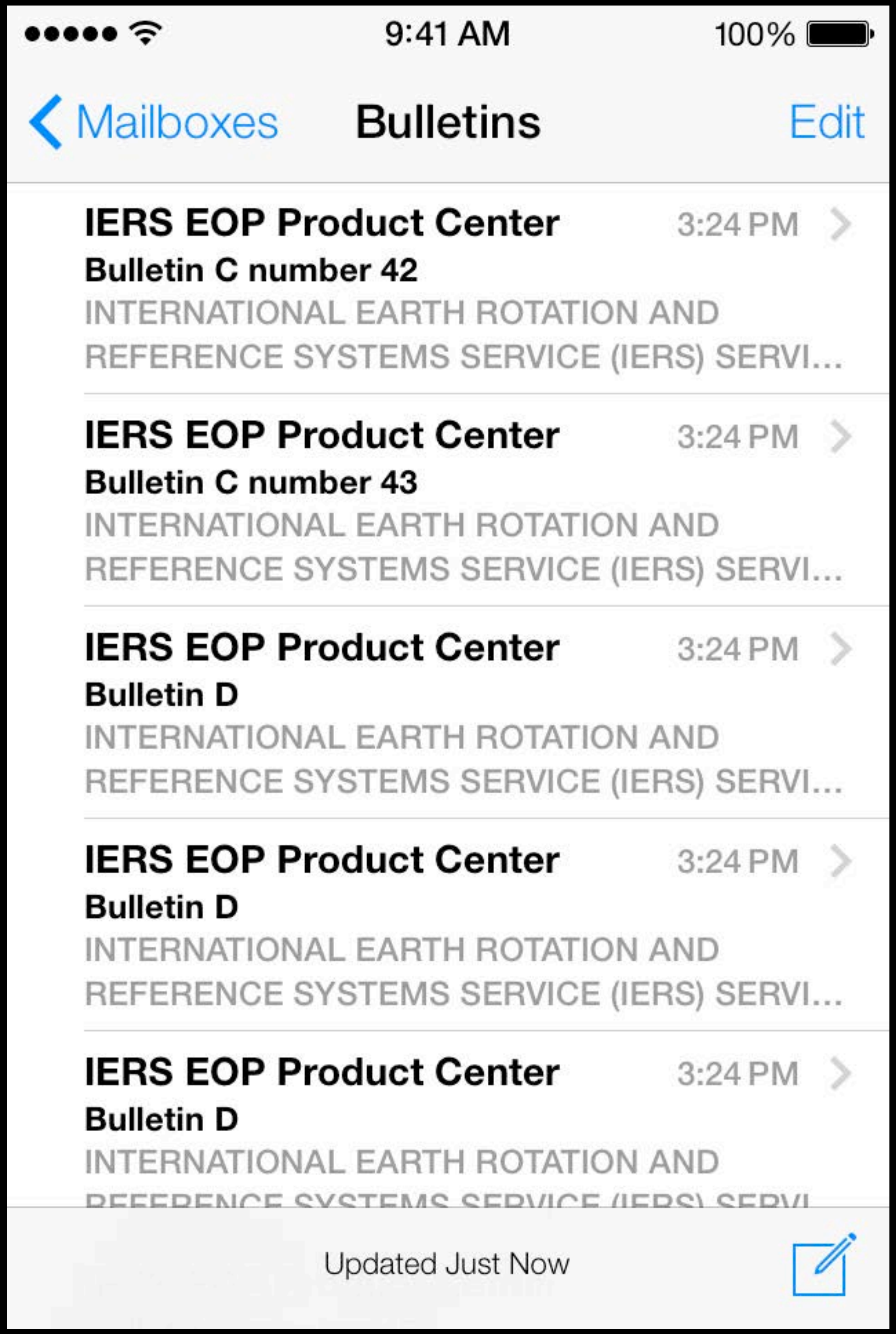
Dynamic Type



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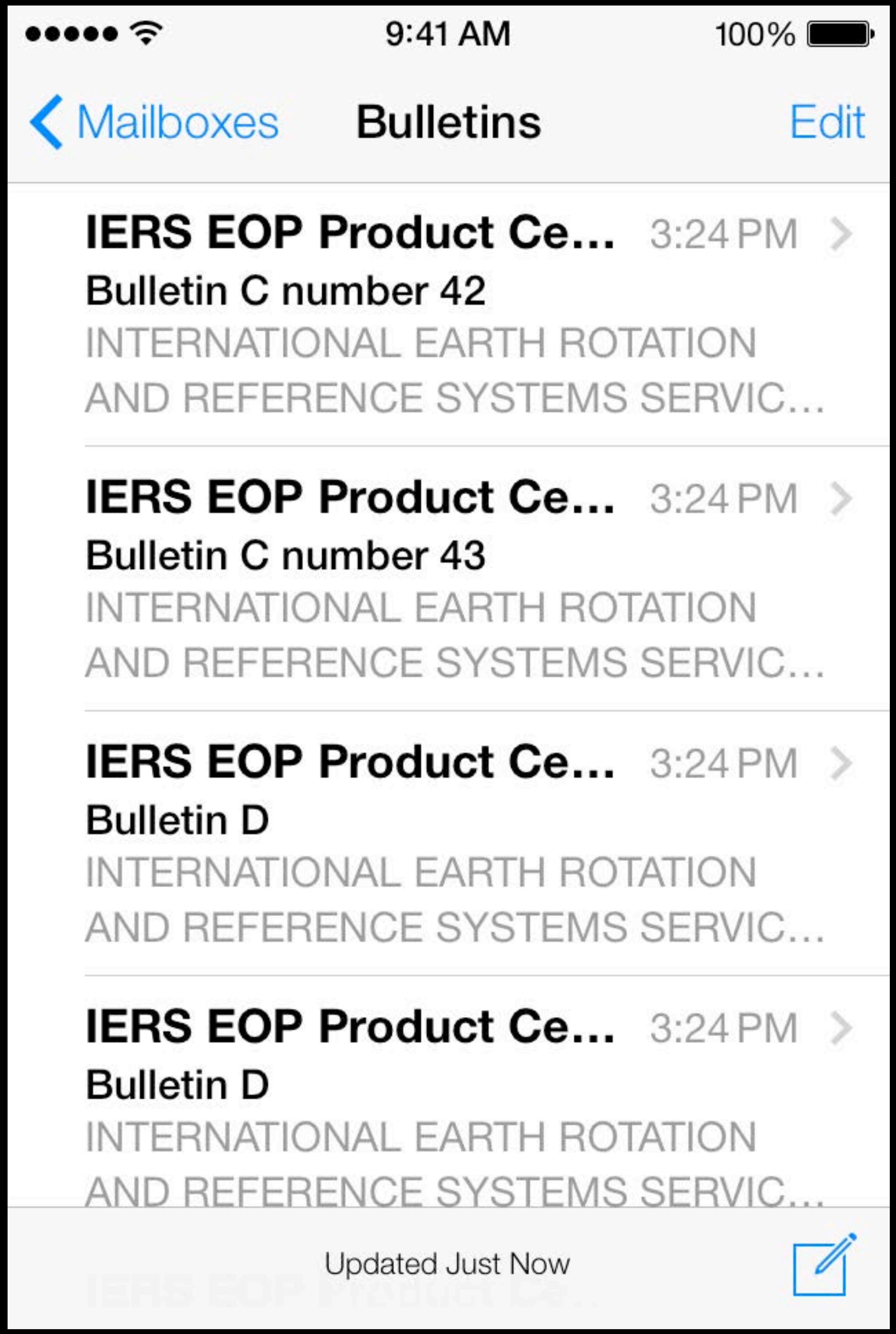

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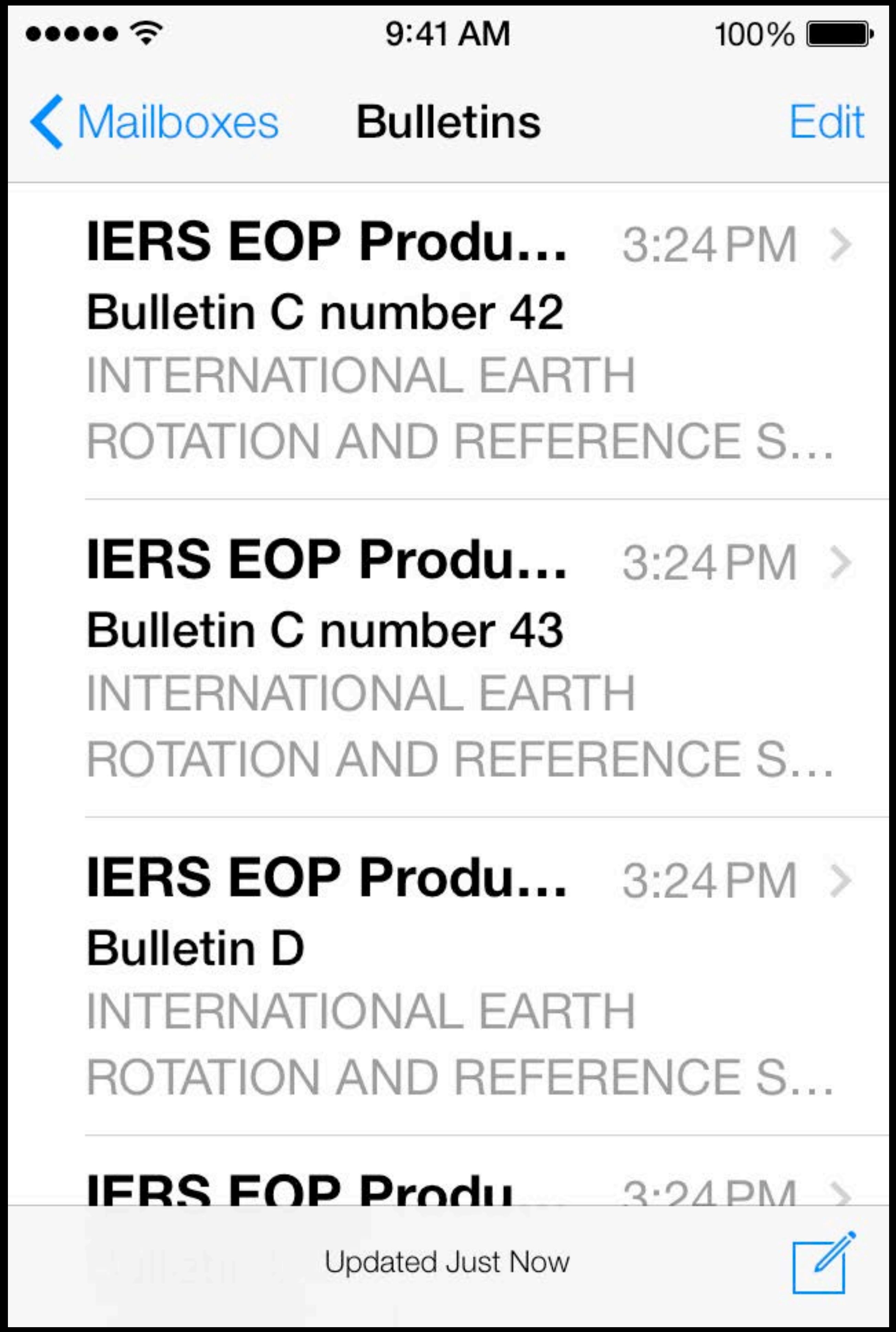

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Updated Just Now

Dynamic Type

- Organized by usage
- Optimized for legibility
- User picks size
    - Auto Layout

Text Styles

Subhead comparison

Quo usque tandem abutere,
Catilina, patientia nostra?

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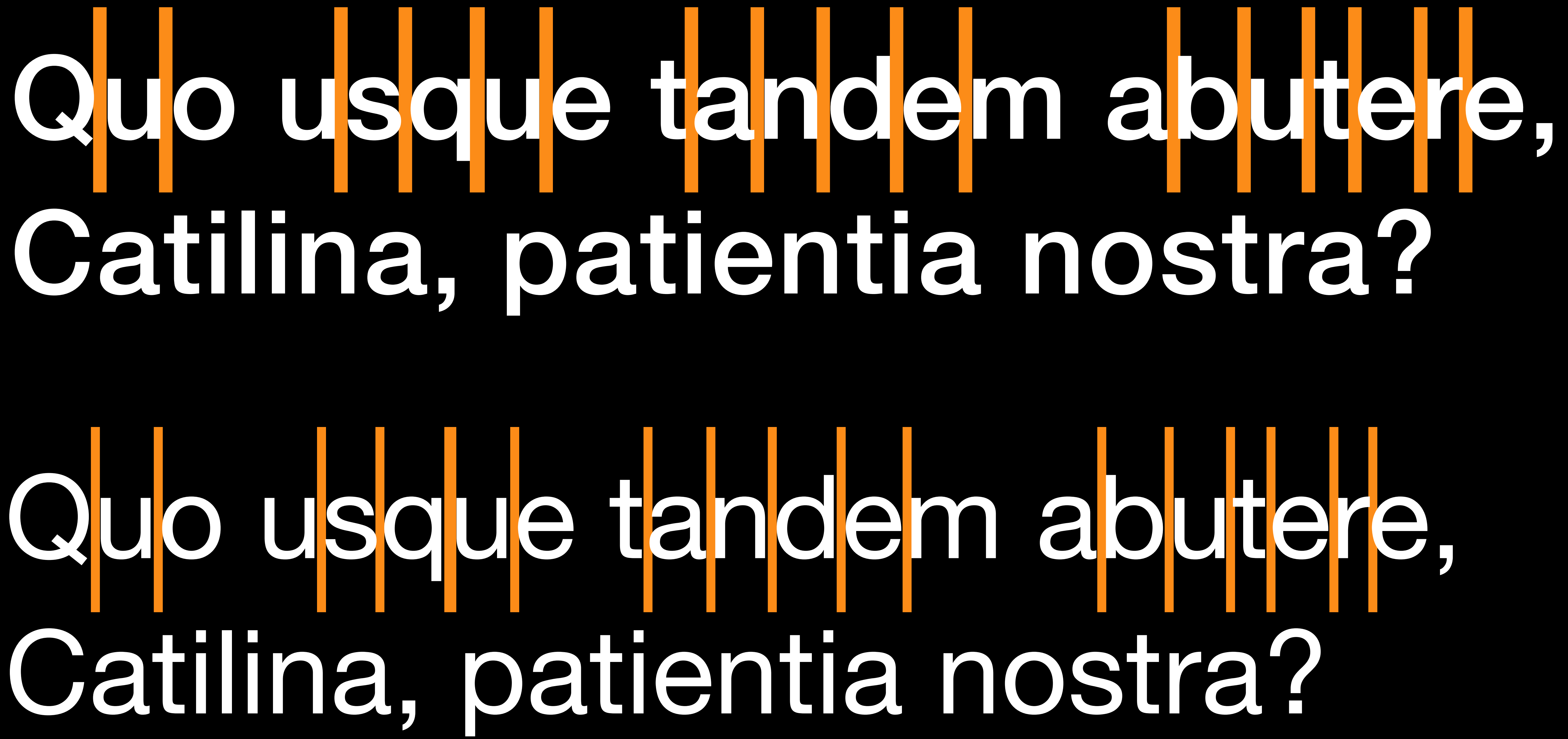

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Using Text Styles

`+[UIFont preferredFontForTextStyle:]`

  - Styles in UIFontDescriptor documentation

- Can be modified with symbolic traits
- CSS properties
  - Prefixed with `-apple-system-`

System Fonts

- “Meta” fonts
  - May change across releases (e.g., Lucida Grande)
  - Hidden names start with ‘.’ (period)
- `+[UIFont systemFontOfSize:]` and friends
  - Not for user content
  - Only recompiled code will get new font on iOS 7

UIFontDescriptor

- Describes a font
- Access and modify font properties
- List available fonts
- Specify your own fonts

Descriptor Basics

- Font attributes
    - Names, size, traits, features, etc.
- Described font may not exist
- Describe an actual font by matching on attributes

Descriptor Matching

- Explicit matching

```
–[UIFontDescriptor matchingFontDescriptorsWithMandatoryKeys:]
```

- Implicit matching

```
–[UIFontDescriptor fontDescriptorWithSymbolicTraits:]
–[UIFont fontWithDescriptor:size:]
```

Descriptor Matching

Family name matching

```
UIFontDescriptor *helveticaNeueFamily =
  [UIFontDescriptor fontDescriptorWithFontAttributes: @{
    UIFontDescriptorFamilyAttribute: @"Helvetica Neue"
  }];

NSArray *matches =
  [helveticaNeueFamily matchingFontDescriptorsWithMandatoryKeys: nil];
```

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HelveticaNeue
HelveticaNeue-Medium
HelveticaNeue-Light
HelveticaNeue-Thin
...

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```

Descriptor Matching

Text style emboldening

```
UIFontDescriptor *fontDescriptor =
  [UIFontDescriptor preferredFontDescriptorWithTextStyle:
                                                        UIFontTextStyleBody];

UIFontDescriptor *boldFontDescriptor =
  [fontDescriptor fontDescriptorWithSymbolicTraits:
                                                  UIFontDescriptorTraitBold];

UIFont *boldFont = [UIFont fontWithDescriptor: boldFontDescriptor size: 0.0];
```

Descriptor Matching

Text style emboldening

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UIFontDescriptor *fontDescriptor =
  [UIFontDescriptor preferredFontDescriptorWithTextStyle:
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UIFontDescriptor *boldFontDescriptor =
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Descriptor Serialization

- `NSCoding` protocol
- Manual serialization
  - `–[UIFontDescriptor fontAttributes]`

Modifying a Font Instance

- Activate typographic features

```
UIFontDescriptorFeatureSettingsAttribute
```

- Remove unwanted characters

```
UIFontDescriptorCharacterSetAttribute
```

Modifying a Font Instance

Time appearance

11:15

vs.

11:15

Modifying a Font Instance

Time appearance

```
NSArray *timeFeatureSettings = @[
  @{
    UIFontFeatureTypeIdentifierKey: @(kNumberSpacingType),
    UIFontFeatureSelectorIdentifierKey: @(kProportionalNumbersSelector)
  },
  @{
    UIFontFeatureTypeIdentifierKey: @(kCharacterAlternativesType),
    UIFontFeatureSelectorIdentifierKey: @(1)
  }];

UIFont *font = …;
UIFontDescriptor *originalDescriptor = [font fontDescriptor];
UIFontDescriptor *timeDescriptor = [originalDescriptor
  fontDescriptorByAddingAttributes: @{
    UIFontDescriptorFeatureSettingsAttribute: timeFeatureSettings }];
UIFont *timeFont = [UIFont fontWithDescriptor: timeDescriptor size: 0.0];
```

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UIFont *timeFont = [UIFont fontWithDescriptor: timeDescriptor size: 0.0];
```

Modifying a Font Instance

Overly happy snowman

```
This ☃ isn’t my favorite
```

vs.

```
This ⛄ is more sedate
```

Modifying a Font Instance

Overly happy snowman

```
UIFont *font = …;
UIFontDescriptor *originalDescriptor = [font fontDescriptor];
NSMutableCharacterSet *cset = [[originalDescriptor
  objectForKey: UIFontDescriptorCharacterSetAttribute] mutableCopy];
[cset removeCharactersInRange: NSMakeRange(0x2603, 1)];

UIFontDescriptor *snowmanRemoved = [originalDescriptor
  fontDescriptorByAddingAttributes: @{
    UIFontDescriptorCharacterSetAttribute: cset }];
font = [UIFont fontWithDescriptor: snowmanRemoved size: 0.0];
```

Modifying a Font Instance

Overly happy snowman

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```

Adding Fonts

BYOF

- Containers
  - TTF, TTC
  - OTF, OTC
- Formats
  - Apple Advanced Typography (AAT)
    - iOS: ‘morx’ only (no ‘mort’)
  - OpenType
    - Complex scripts (pre-Vista Indic)

Adding Fonts

- Include in app bundle
  - Automatically added using `UIAppFonts` Info.plist key
- Manually add
  - Registered or unregistered

Adding Fonts

Registered

- Referenced by name—same as with installed fonts

```
CTFontManagerRegisterFontsForURL()
CTFontManagerRegisterFontsForURLs()
CTFontManagerRegisterGraphicsFont()
```

Adding Fonts

Unregistered

- Referenced by descriptor—use it or lose it
  - Cannot be matched by name

```
CTFontManagerCreateFontDescriptorsFromURL()
CTFontManagerCreateFontDescriptorFromData()
```

Extra Credit

- Downloadable fonts
    - All OS X fonts
    - Additional international fonts

```
CTFontDescriptorCreateMatchingFontDescriptorsWithProgressHandler()
  + kCTFontDownloadableAttribute
```

- Profiles

```
kCTFontManagerRegisteredFontsChangedNotification
```

Language Tagging

kCTLanguageAttributeName

- Override system language for localized behaviors
  - Glyph substitution
  - Line breaking
  - Font fallbacks

kCTLanguageAttributeName

Glyph substitution

```
[[NSAttributedString alloc] initWithString: @"\u015F\u0163" attributes: @{
  NSFontAttributeName: @"Verdana",
  (id)kCTLanguageAttributeName:
```

@"en"

şţ

@"ro"

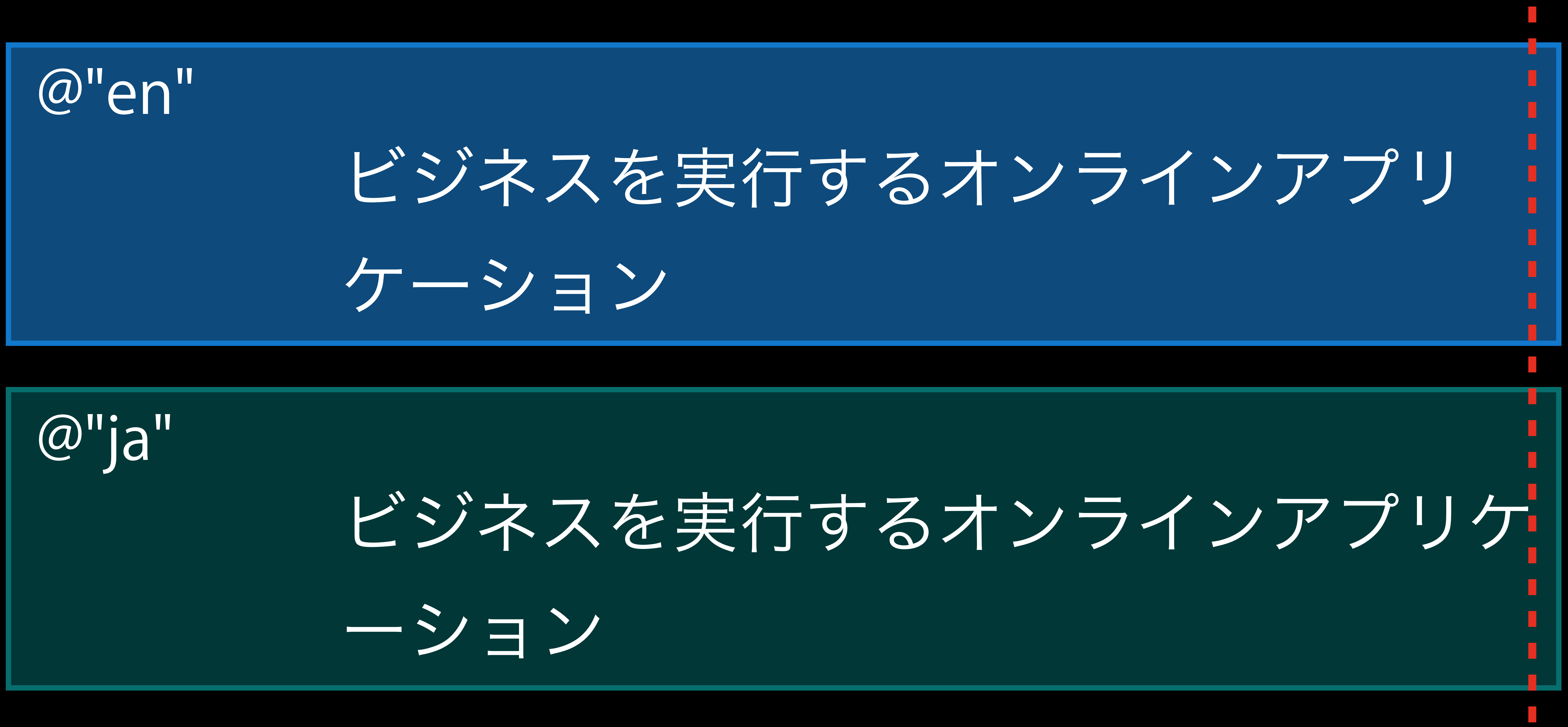
șț

```
}];
```

kCTLanguageAttributeName

Line breaking

```
[[NSAttributedString alloc] initWithString: @"…" attributes: @{
  (id)kCTLanguageAttributeName:
```



@"en"

ビジネスを実行するオンラインアプリ
ケーション

@"ja"

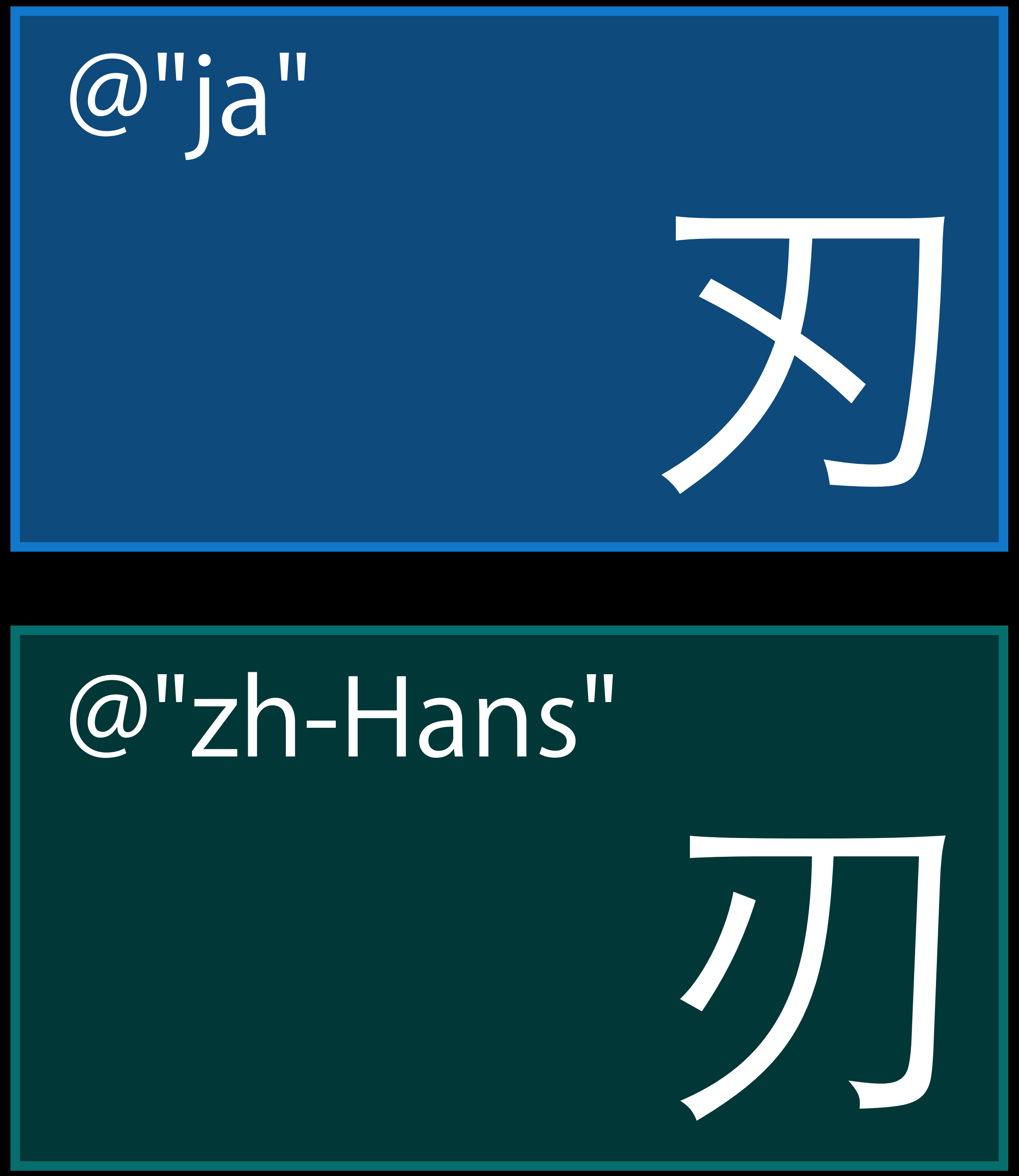
ビジネスを実行するオンラインアプリケ
ーション

```
}];
```

kCTLanguageAttributeName

Font fallbacks

```
[[NSAttributedString alloc] initWithString: @"\u5203" attributes: @{
  (id)kCTLanguageAttributeName:
```



```
}];
```

Modifying Fallbacks

Custom Cascade List

- `UIFontDescriptorCascadeListAttribute`
- Inserted before standard fallbacks

Custom Cascade List

Specifying an Arabic fallback font

apple: التّفّاحة

vs.

apple: التّفّاحة

Custom Cascade List

Specifying an Arabic fallback font

```
UIFontDescriptor *arabic = …;
NSArray *cascadeList = @[ arabic ];

UIFont *font = …;
UIFontDescriptor *originalDescriptor = [font fontDescriptor];
UIFontDescriptor *cascadeListAdded = [originalDescriptor
  fontDescriptorByAddingAttributes: @{
    UIFontDescriptorCascadeListAttribute: cascadeList }];
font = [UIFont fontWithDescriptor: cascadeListAdded size: 0.0];
```

Custom Cascade List

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```

More Information

Jake Behrens
App Frameworks Evangelist
behrens@apple.com

Documentation
http://developer.apple.com

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

Related Sessions

Introduction to Text Kit	Presidio Wednesday 2:00PM
Advanced Text Layouts and Effects with Text Kit	Mission Thursday 2:00PM

Summary

- Text styles on iOS 7
  - Use Auto Layout or otherwise adapt to font and size changes
- Language tagging
  - Override system language for known content
- Modifying fallbacks
  - Insert descriptors prior to default fallbacks

WWDC2013