Accessibility in OS X

Session 200

Gregory Hughes
Engineering Manager

Patti Hoa
Accessibility Software Engineer

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

LED Flash for Alerts

Mouse Keys

Contrast Enhancements

Speak Selection

Hearing-Aid Mode

Sticky Keys

Slow Keys

Mono Audio

Invert Colors

Zoom

Guided Access

Large Text

Zoom Window

Subtitles

Assistive Touch

Speak Auto-Text

VoiceOver

Closed Captioning

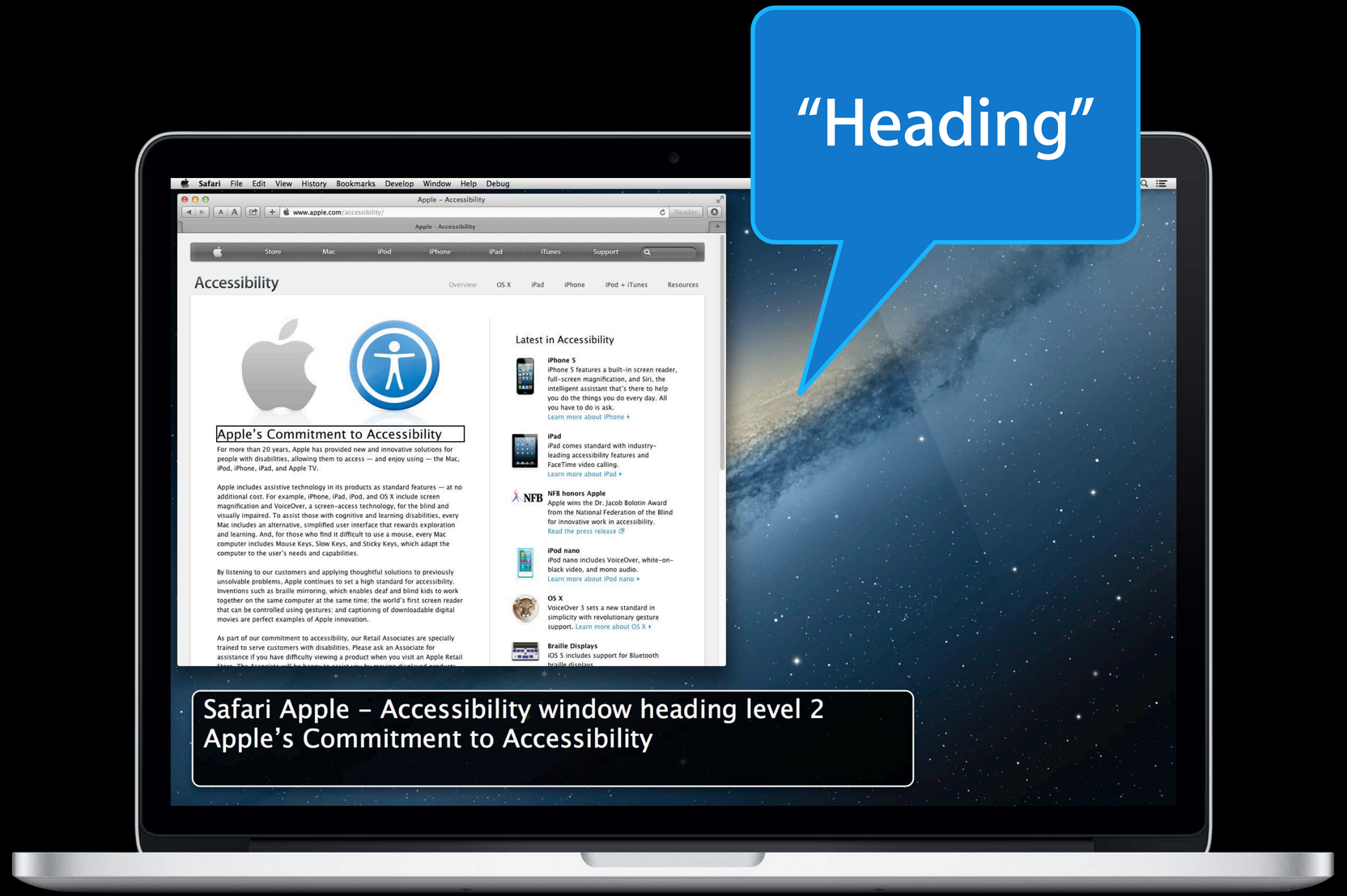
Cursor Scaling

VoiceOver

VoiceOver

Safari File Edit View History Bookmarks Develop Window Help Debug
3:58 PM
Apple – Accessibility
www.apple.com/accessibility/
Reader
Apple - Accessibility
Store Mac iPod iPhone iPad iTunes Support
Accessibility
Overview OS X iPad iPhone iPod + iTunes Resources
Apple's Commitment to Accessibility
For more than 20 years, Apple has provided new and innovative solutions for people with disabilities, allowing them to access — and enjoy using — the Mac, iPod, iPhone, iPad, and Apple TV.
Apple includes assistive technology in its products as standard features — at no additional cost. For example, iPhone, iPad, iPod, and OS X include screen magnification and VoiceOver, a screen-access technology, for the blind and visually impaired. To assist those with cognitive and learning disabilities, every Mac includes an alternative, simplified user interface that rewards exploration and learning. And, for those who find it difficult to use a mouse, every Mac computer includes Mouse Keys, Slow Keys, and Sticky Keys, which adapt the computer to the user's needs and capabilities.
By listening to our customers and applying thoughtful solutions to previously unsolvable problems, Apple continues to set a high standard for accessibility. Inventions such as braille mirroring, which enables deaf and blind kids to work together on the same computer at the same time; the world's first screen reader that can be controlled using gestures; and captioning of downloadable digital movies are perfect examples of Apple innovation.
As part of our commitment to accessibility, our Retail Associates are specially trained to serve customers with disabilities. Please ask an Associate for assistance if you have difficulty viewing a product when you visit an Apple Retail
Latest in Accessibility
iPhone 5
iPhone 5 features a built-in screen reader, full-screen magnification, and Siri, the intelligent assistant that's there to help you do the things you do every day. All you have to do is ask.
Learn more about iPhone
iPad
iPad comes standard with industry-leading accessibility features and FaceTime video calling.
Learn more about iPad
NFB honors Apple
Apple wins the Dr. Jacob Bolotin Award from the National Federation of the Blind for innovative work in accessibility.
Read the press release
iPod nano
iPod nano includes VoiceOver, white-on-black video, and mono audio.
Learn more about iPod nano
OS X
VoiceOver 3 sets a new standard in simplicity with revolutionary gesture support. Learn more about OS X
Braille Displays
iOS 5 includes support for Bluetooth
Safari Apple – Accessibility window heading level 2
Apple's Commitment to Accessibility

VoiceOver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VoiceOver

“Heading”
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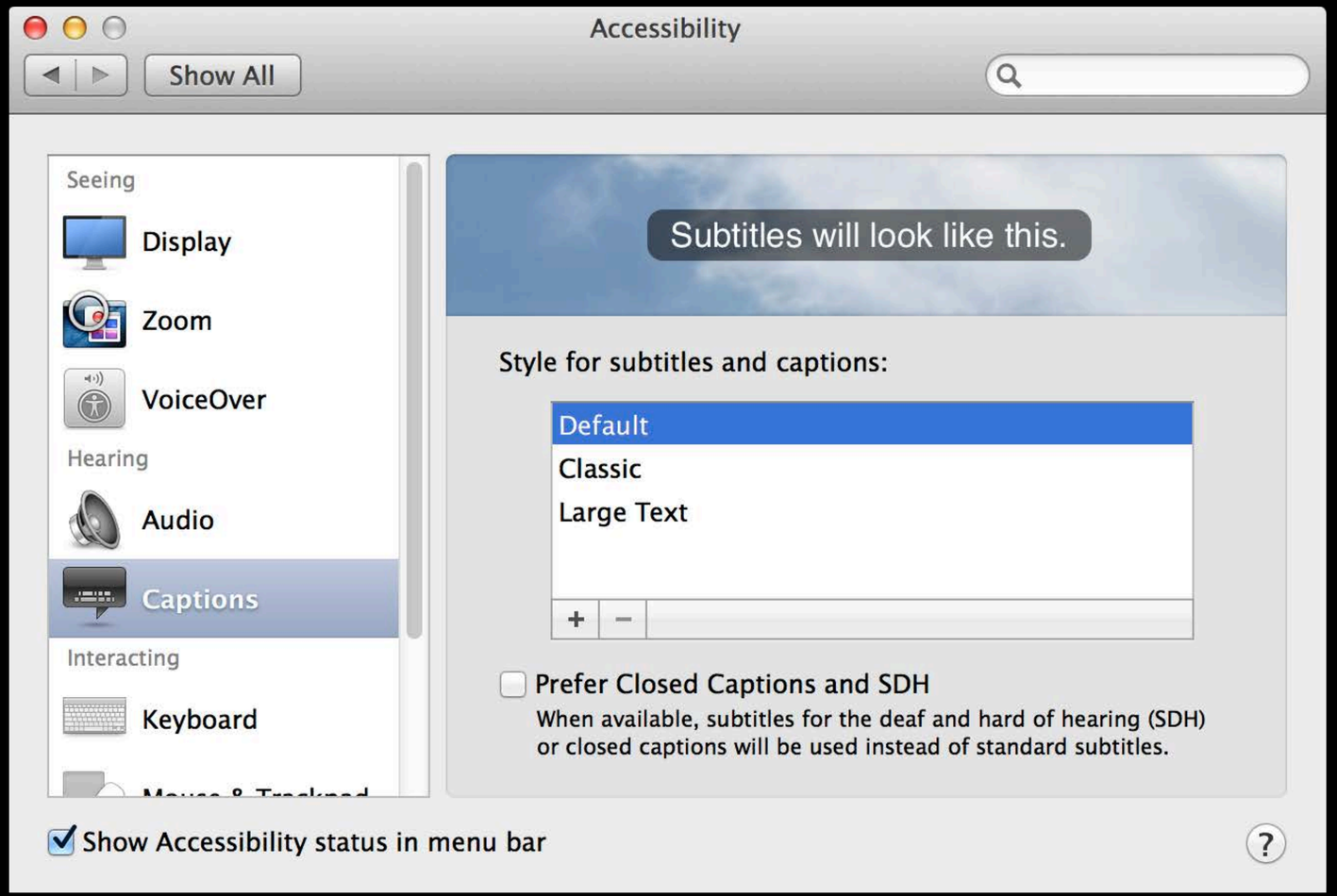
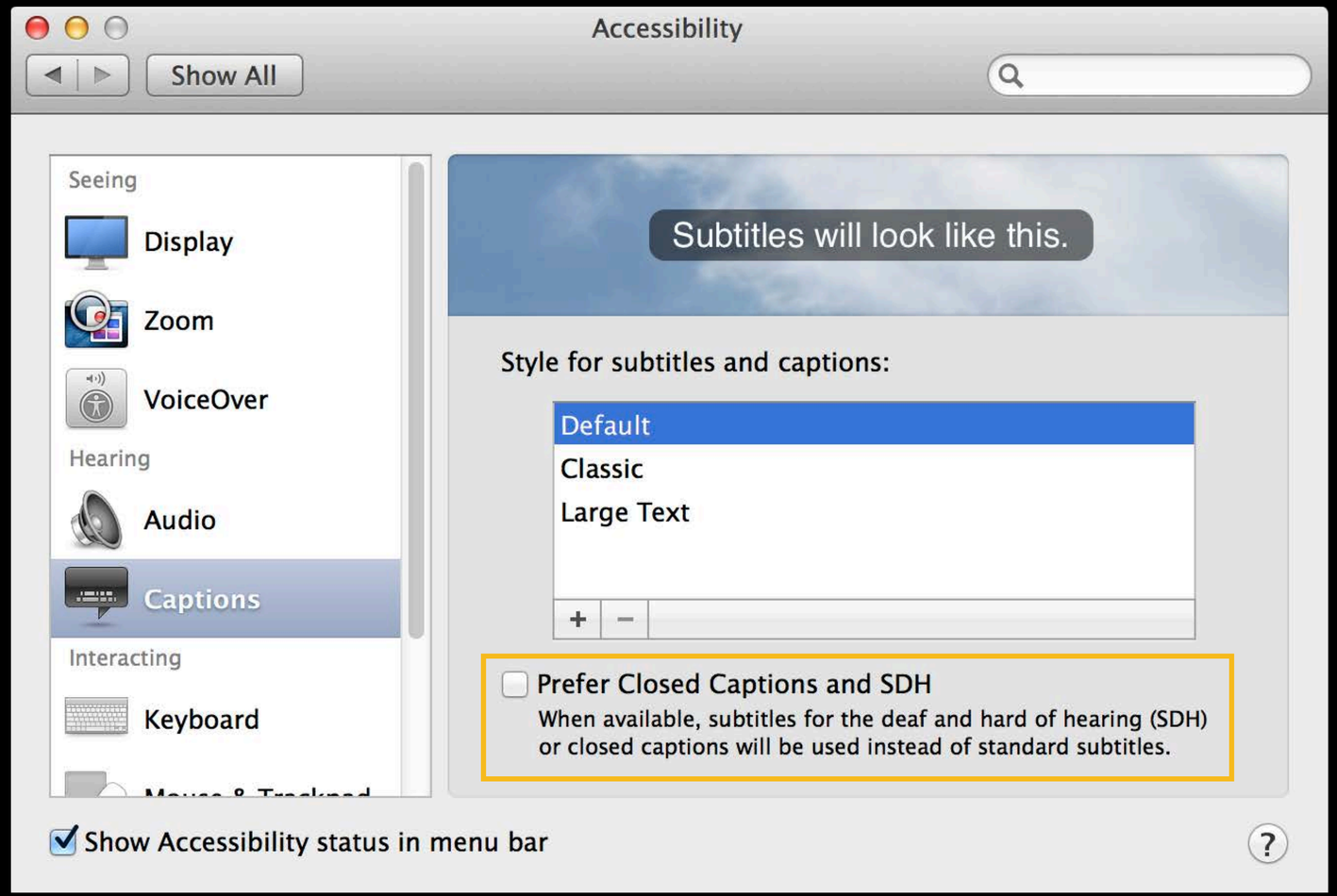
Apple’s Commitment to Accessibility

iTunes File Edit View Controls Store Window Help
Mon 9:41 AM
OneSixRight captioned
8:36
-46:32
T-Minus 13, 12, 11, 10, 9
MENU
T-Minus 13, 12, 11, 10, 9
T-Minus 13, 12, 11, 10, 9
T-Minus 13, 12, 11, 10, 9


Accessibility
Show All
Seeing
Display
Zoom
VoiceOver
Hearing
Audio
Captions
Interacting
Keyboard
Subtitles will look like this.
Style for subtitles and captions:
Default
Classic
Large Text
Prefer Closed Captions and SDH
When available, subtitles for the deaf and hard of hearing (SDH) or closed captions will be used instead of standard subtitles.
Show Accessibility status in menu bar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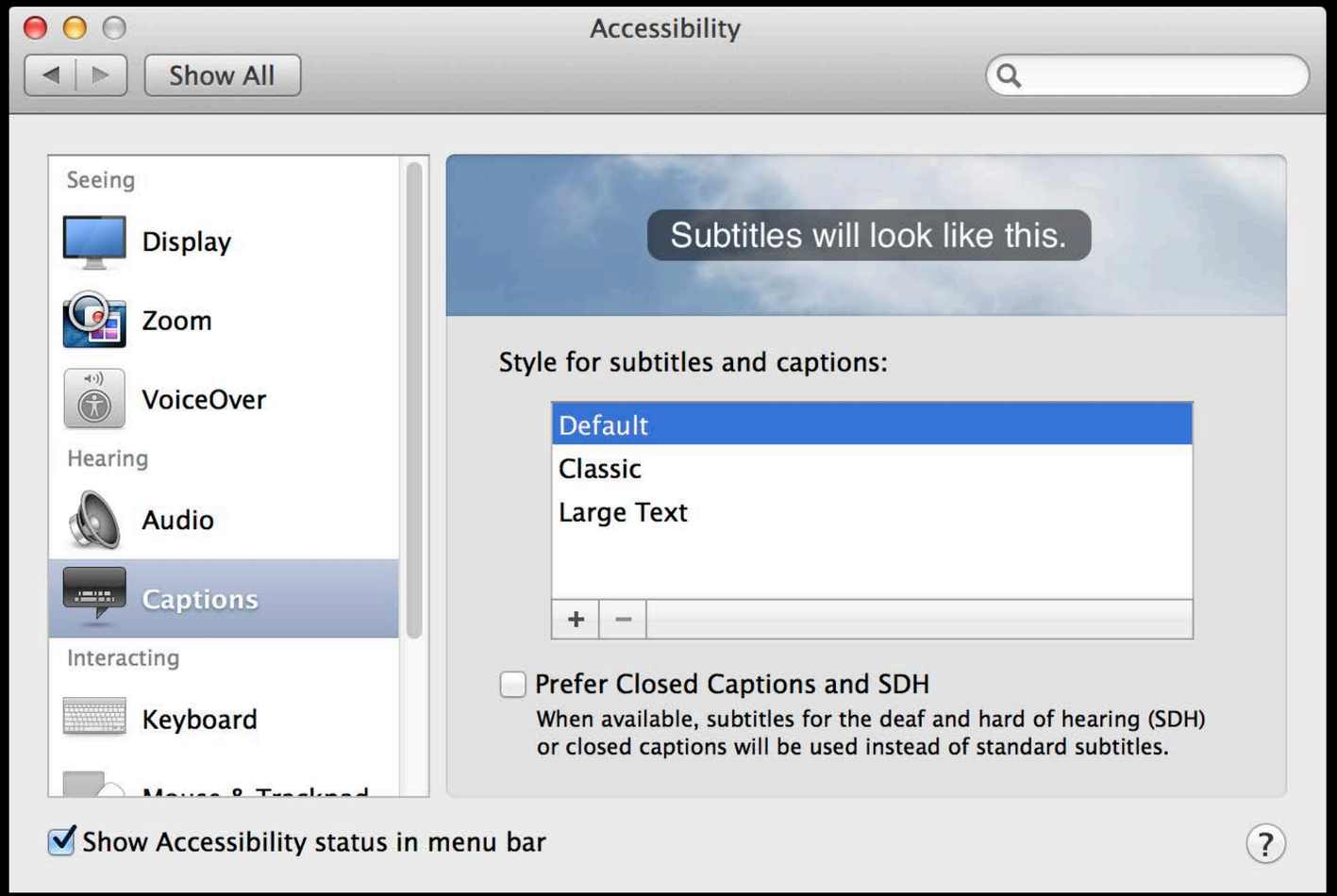
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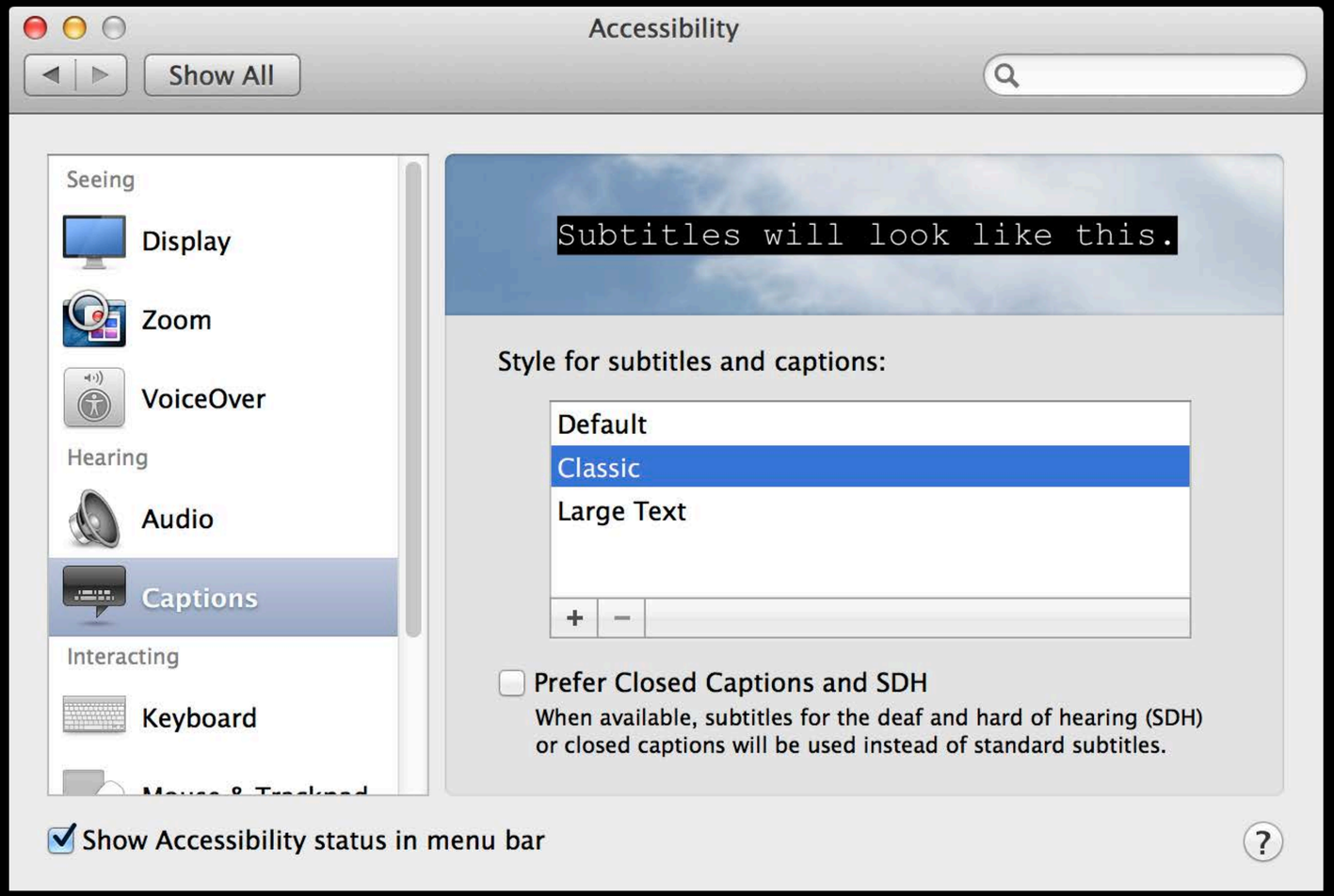
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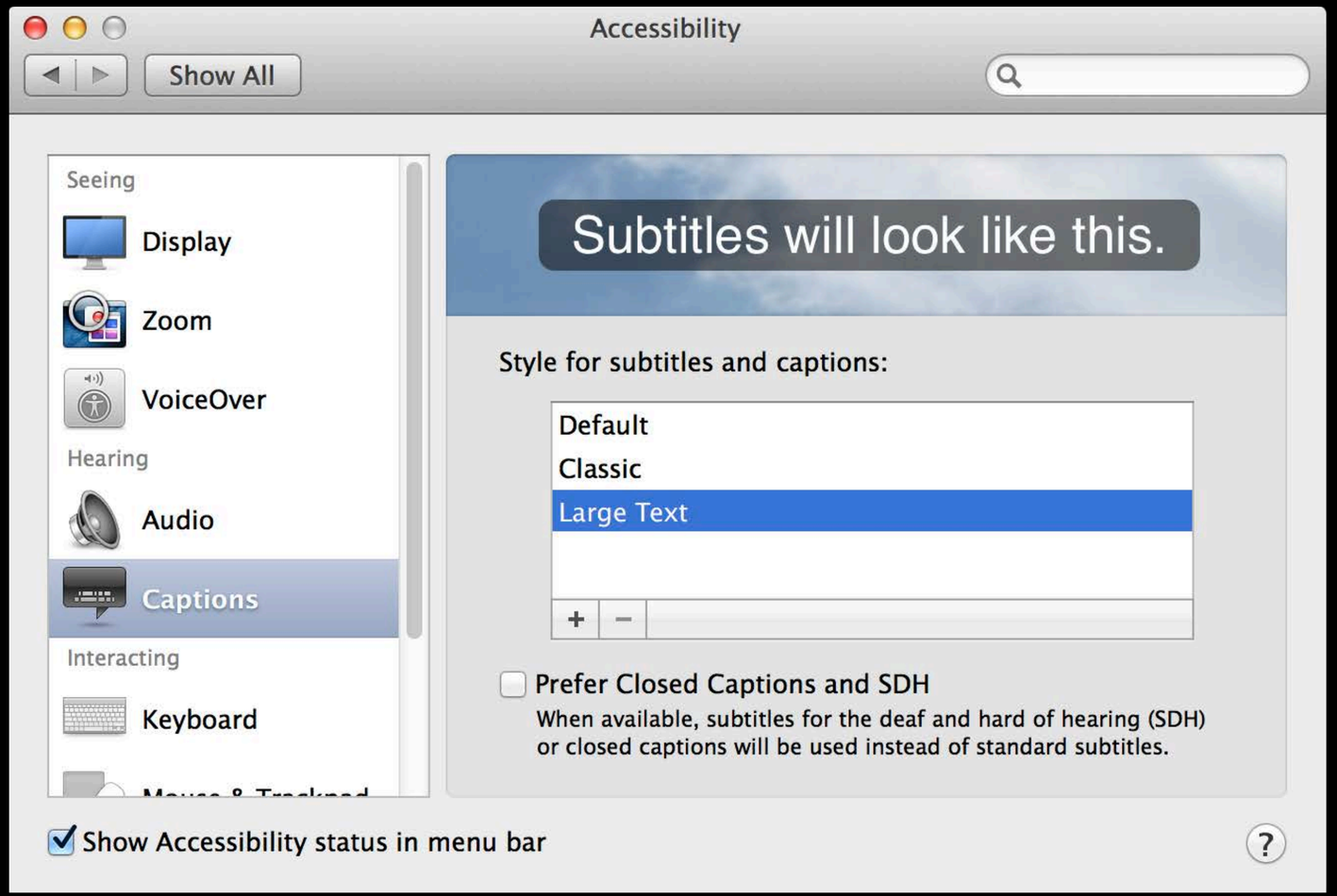
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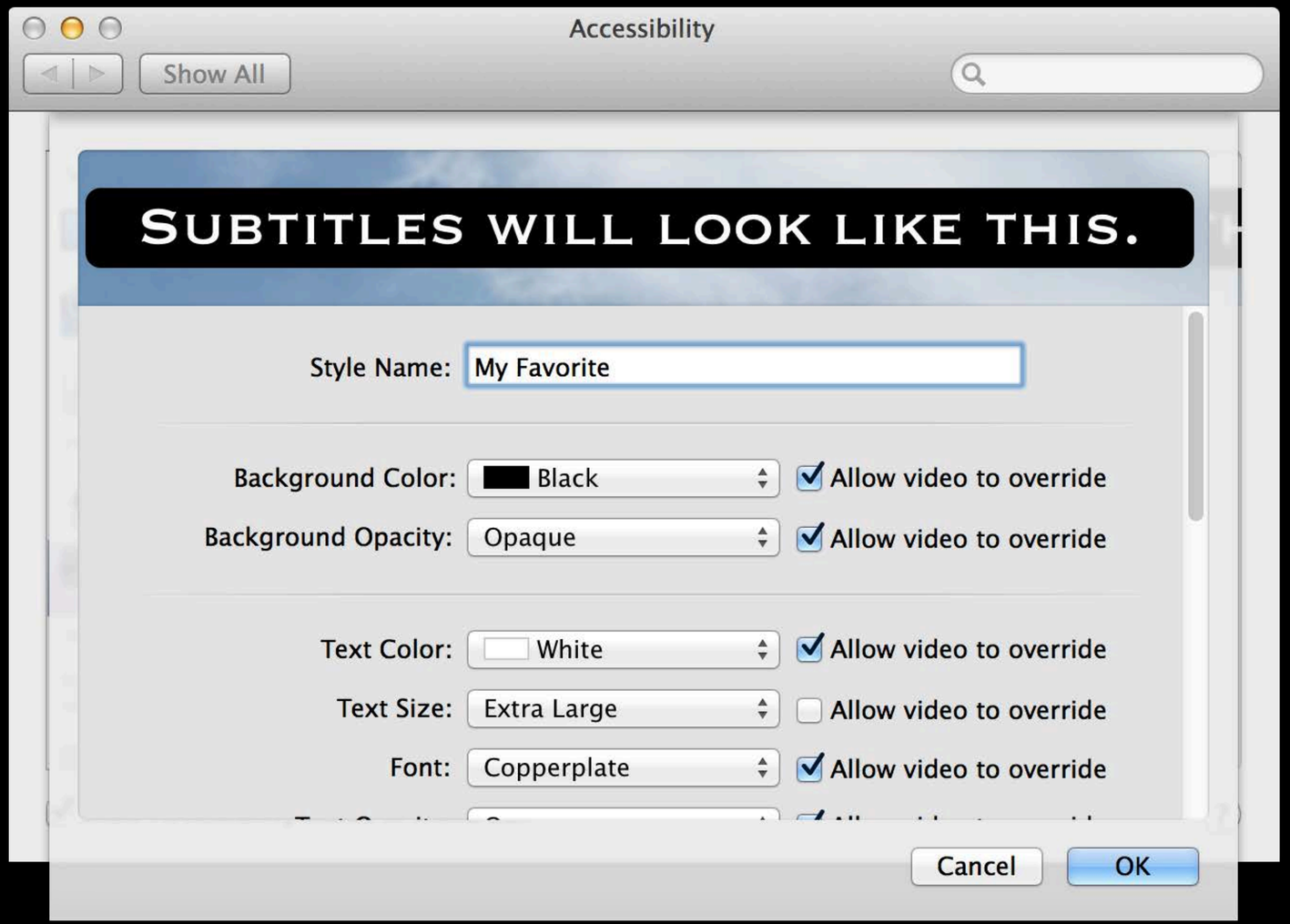
Accessibility
Show All
SUBTITLES WILL LOOK LIKE THIS.
Style Name:
My Favorite
Background Color:
Black
Allow video to override
Background Opacity:
Opaque
Allow video to override
Text Color:
White
Allow video to override
Text Size:
Extra Large
Allow video to override
Font:
Copperplate
Allow video to override
Cancel
OK

Preparing and Presenting Media for Accessibility

Nob Hill
Wednesday 10:15AM

esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
~ `
! 1
@ 2
# 3
$ 4
% 5
^ 6
& 7
* 8
(9
) 0
– -
+ =
delete
tab
Q
W
E
R
T
Y
U
I
O
P
{ [
}]
| \
caps lock
A
S
D
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enter
return
shift
Z
X
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V
B
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< ,
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shift
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control
alt
option
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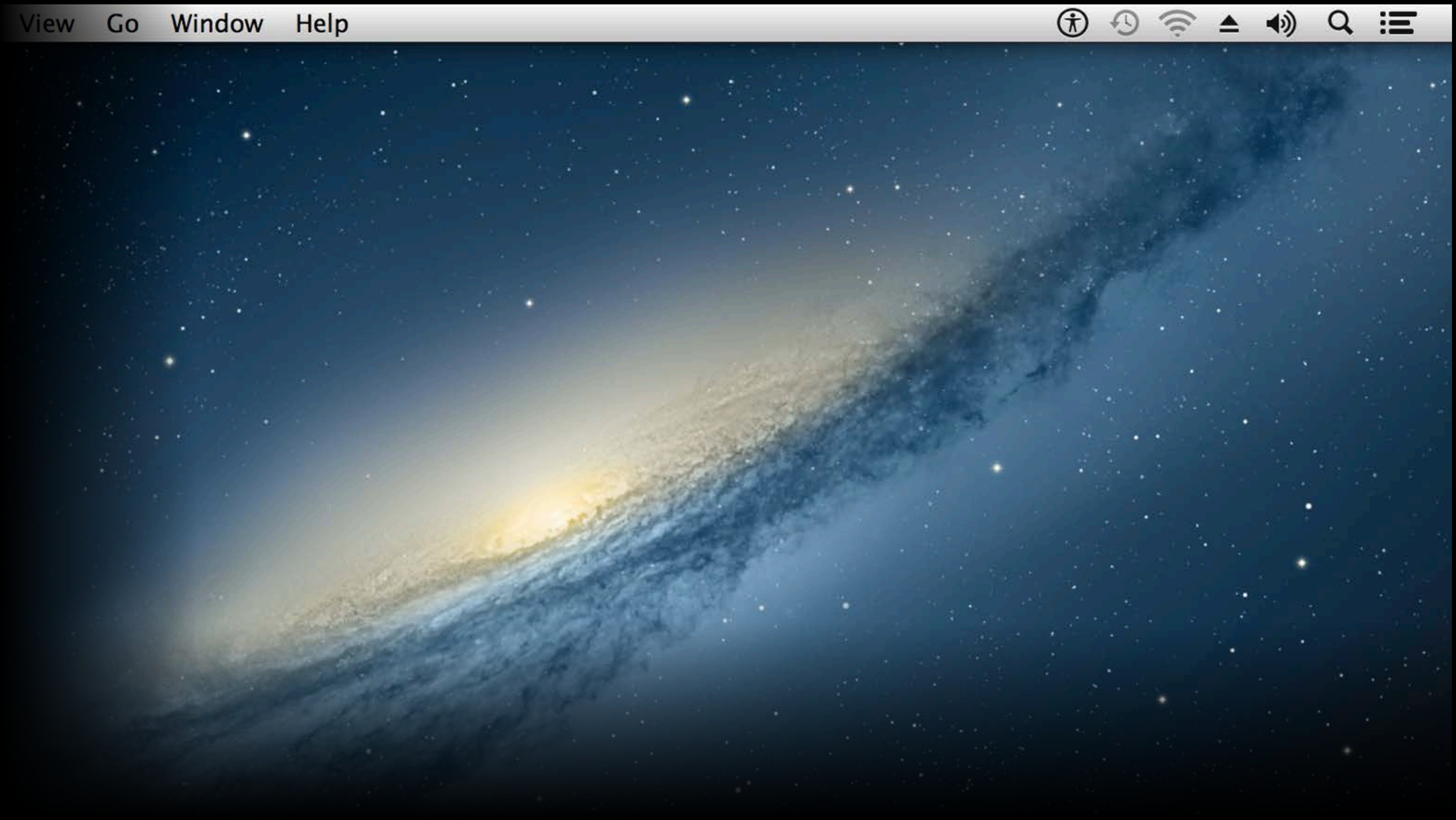
command
alt
option

Switch Control

Switch Control



Switch Control

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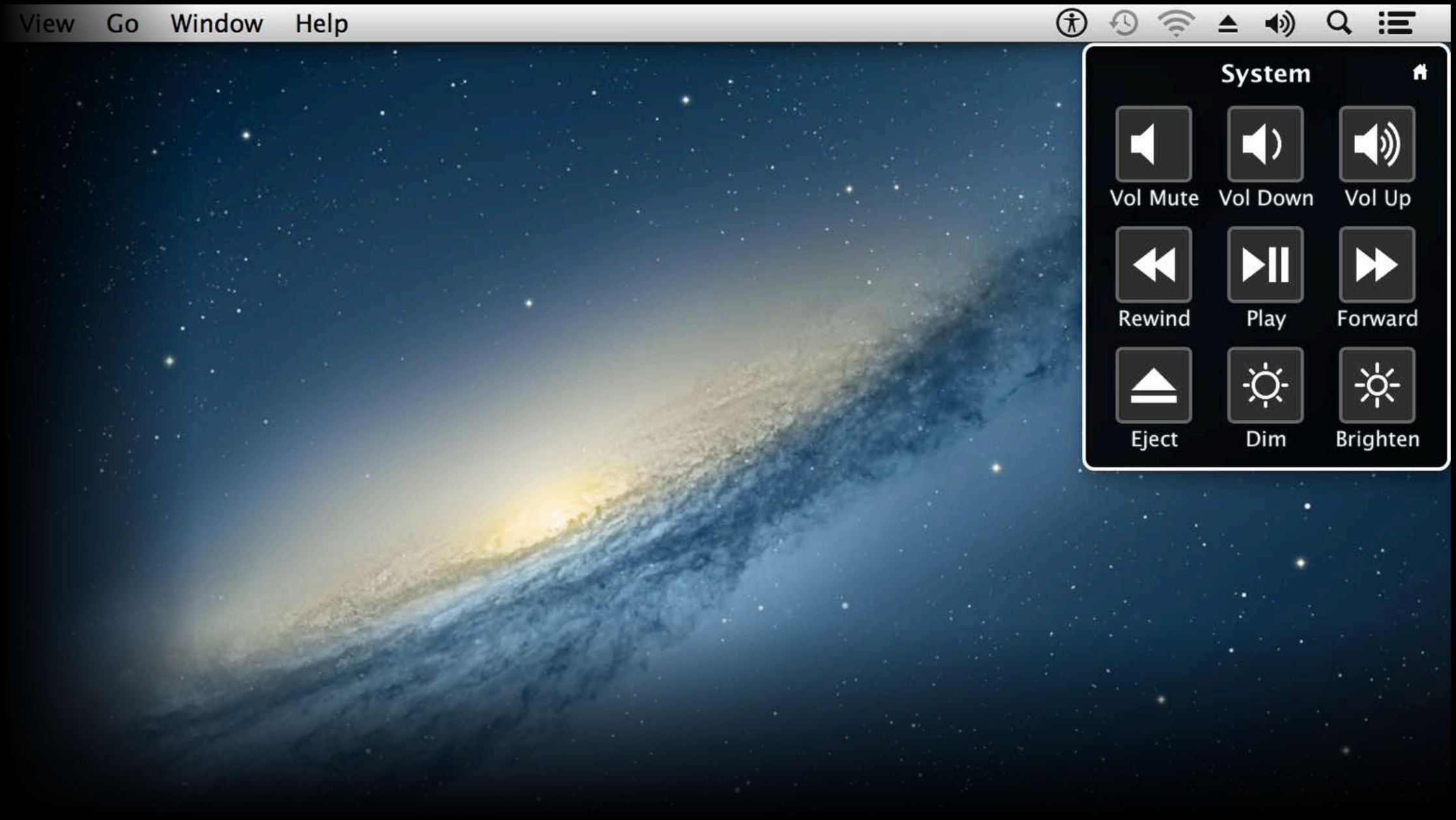

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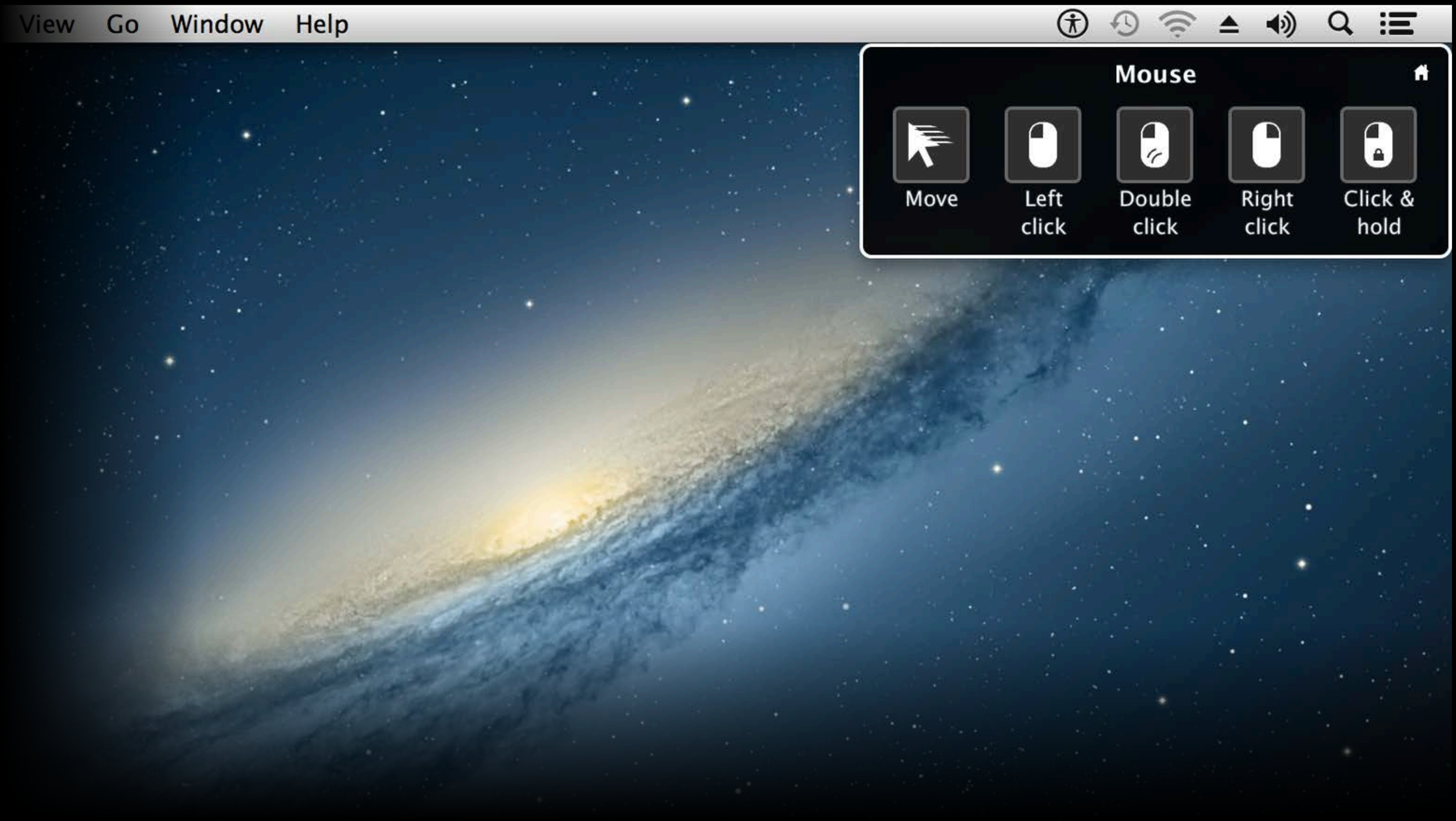

Finder File Edit View Go Window Help

Mouse

Move | Left click | Double click | Right click | Click & hold

Calculator File Edit View Convert Speech Window Help

Calculator

0

MC	M+	M−	MR
C	±	÷	×
7	8	9	−
4	5	6	+
1	2	3	
0		.	=

Calculator File Edit View Convert Speech Window Help

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Calculator File Edit View Convert Speech Window Help

Mouse

Move | Left click | Double click | Right click | Click & hold

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Switch Control

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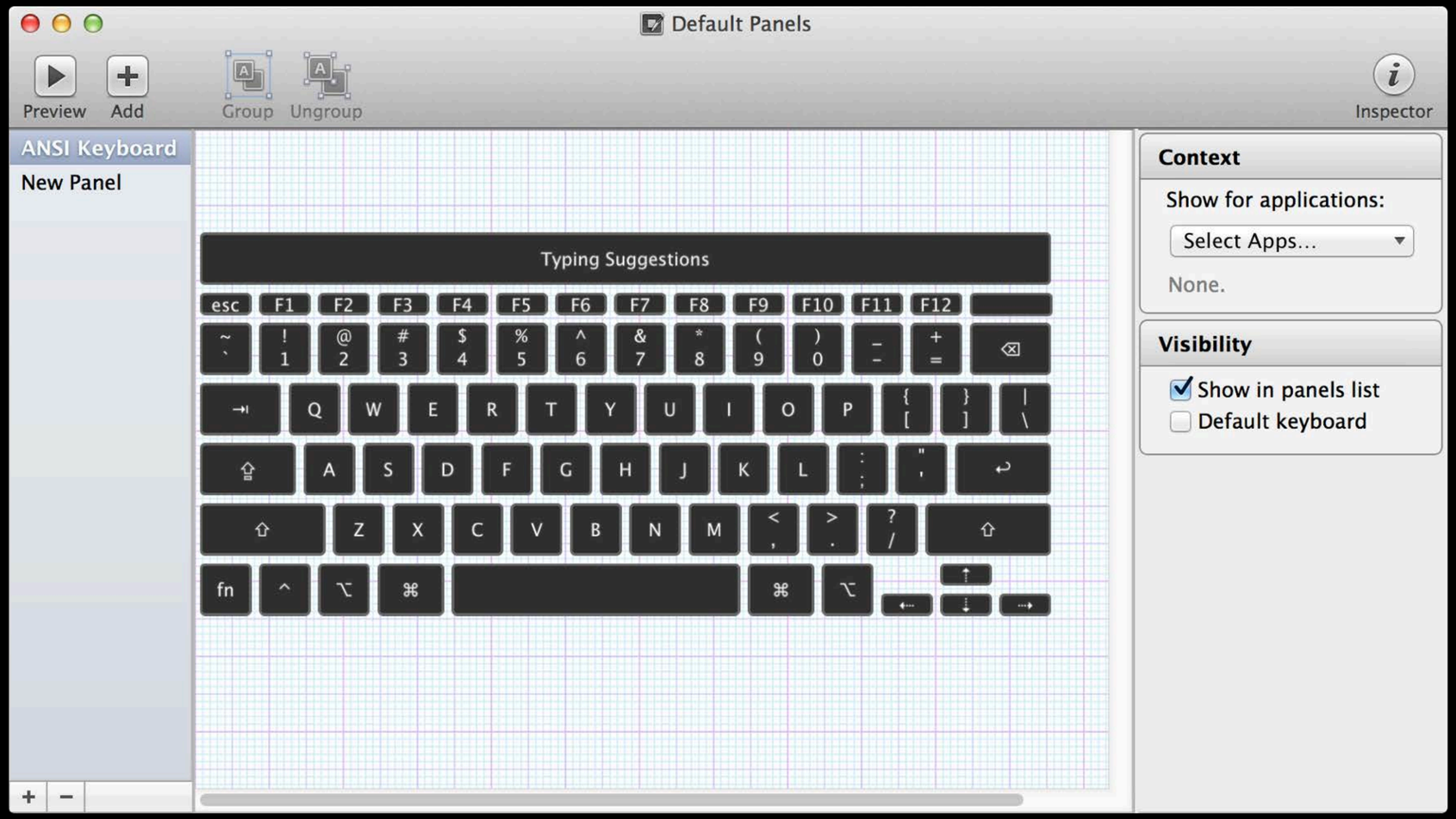


Accessibility in OS X 10.9

Patti Hoa
Accessibility Software Engineer

Overview

Overview

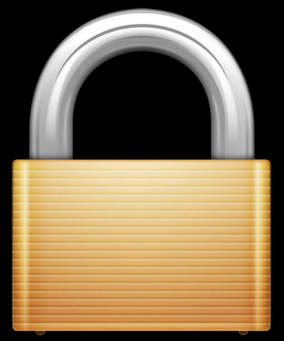
- Accessibility technology basics

Overview

- Accessibility technology basics
- New Accessibility APIs

Overview

- Accessibility technology basics
- New Accessibility APIs
- Security improvements



Flow of Accessibility Information

Application

Flow of Accessibility Information

Assistive Software

Application

Flow of Accessibility Information

Assistive Software

Application

Request accessibility information

Flow of Accessibility Information

Vends accessibility information

Assistive Software

Application

Request accessibility information

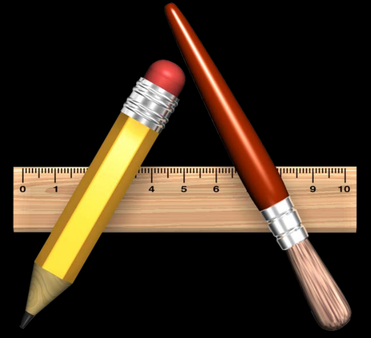
Flow of Accessibility Information

Assistive Software

Application

Flow of Accessibility Information

VoiceOver



Application

Flow of Accessibility Information

Flow of Accessibility Information

Flow of Accessibility Information

Attribute Name	Attribute Value
AXRoleDescription	“button”
AXDescription	“play”

Flow of Accessibility Information

Attribute Name	Attribute Value
AXRoleDescription	“button”
AXDescription	“play”

NSAccessibility Protocol

Overview

- Is ignored

NSAccessibility Protocol

Overview

- Is ignored
- Attributes

NSAccessibility Protocol

Overview

- Is ignored
- Attributes
- Actions

NSAccessibility Protocol

Overview

- Is ignored
- Attributes
- Actions
- Hit testing and focus testing

NSAccessibility Protocol

Overview

- Is ignored
- Attributes
- Actions
- Hit testing and focus testing
- Notifications

Demo

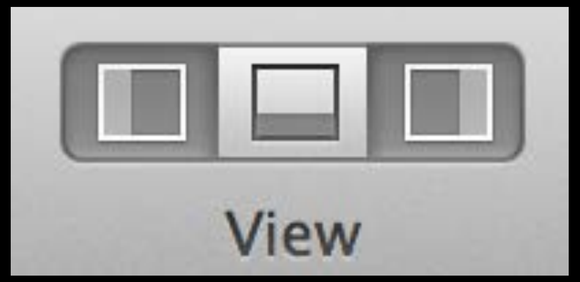
Accessibility Inspector
AccessibilityUIExamples

New Accessibility APIs

New APIs to Solve UI Issues

- Toggle and switch button subroles
- Support for transient UI
- Support for accessibility announcement

New UI Behavior and Style



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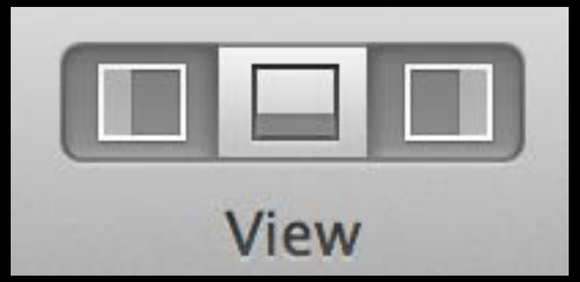
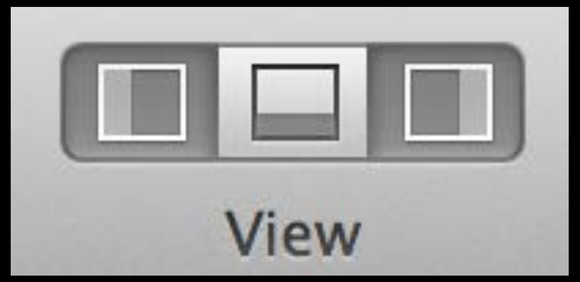
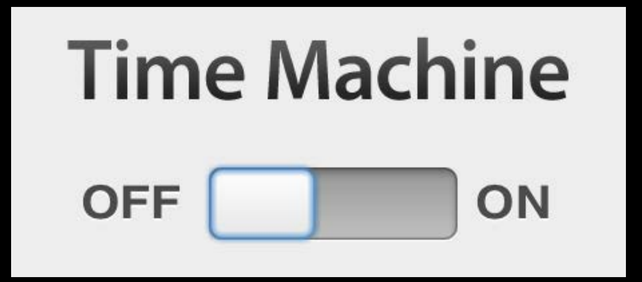


NSAccessibilityToggleSubrole

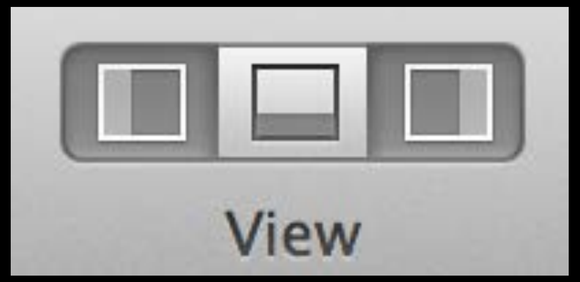
New UI Behavior and Style



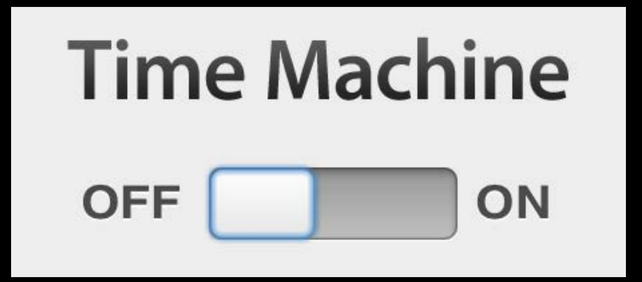


NSAccessibilityToggleSubrole

New UI Behavior and Style



NSAccessibilityToggleSubrole



NSAccessibilitySwitchSubrole

Transient UI

Mouse Hover Triggered UI

Transient UI

Mouse Hover Triggered UI

Transient UI

Mouse Hover Triggered UI

- New actions

```
NSAccessibilityShowAlternateUIAction
NSAccessibilityShowDefaultUIAction
```

- New notification

```
NSAccessibilityLayoutChangedNotification
```

- User info key

```
NSAccessibilityUIElementsKey
Value: NSArray of changed elements
```

Transient UI

Mouse Hover Triggered UI

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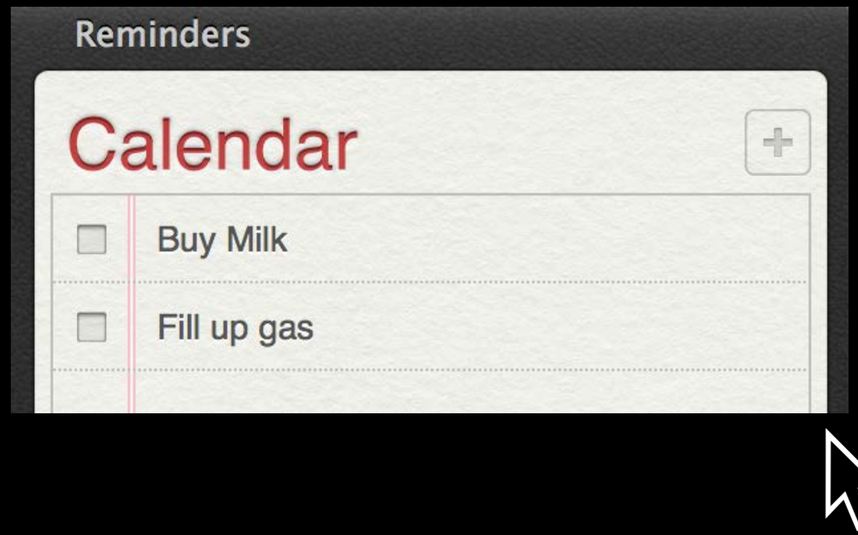

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NSAccessibilityUIElementsKey
Value: NSArray of changed elements
```

Transient UI

Mouse Hover Triggered UI

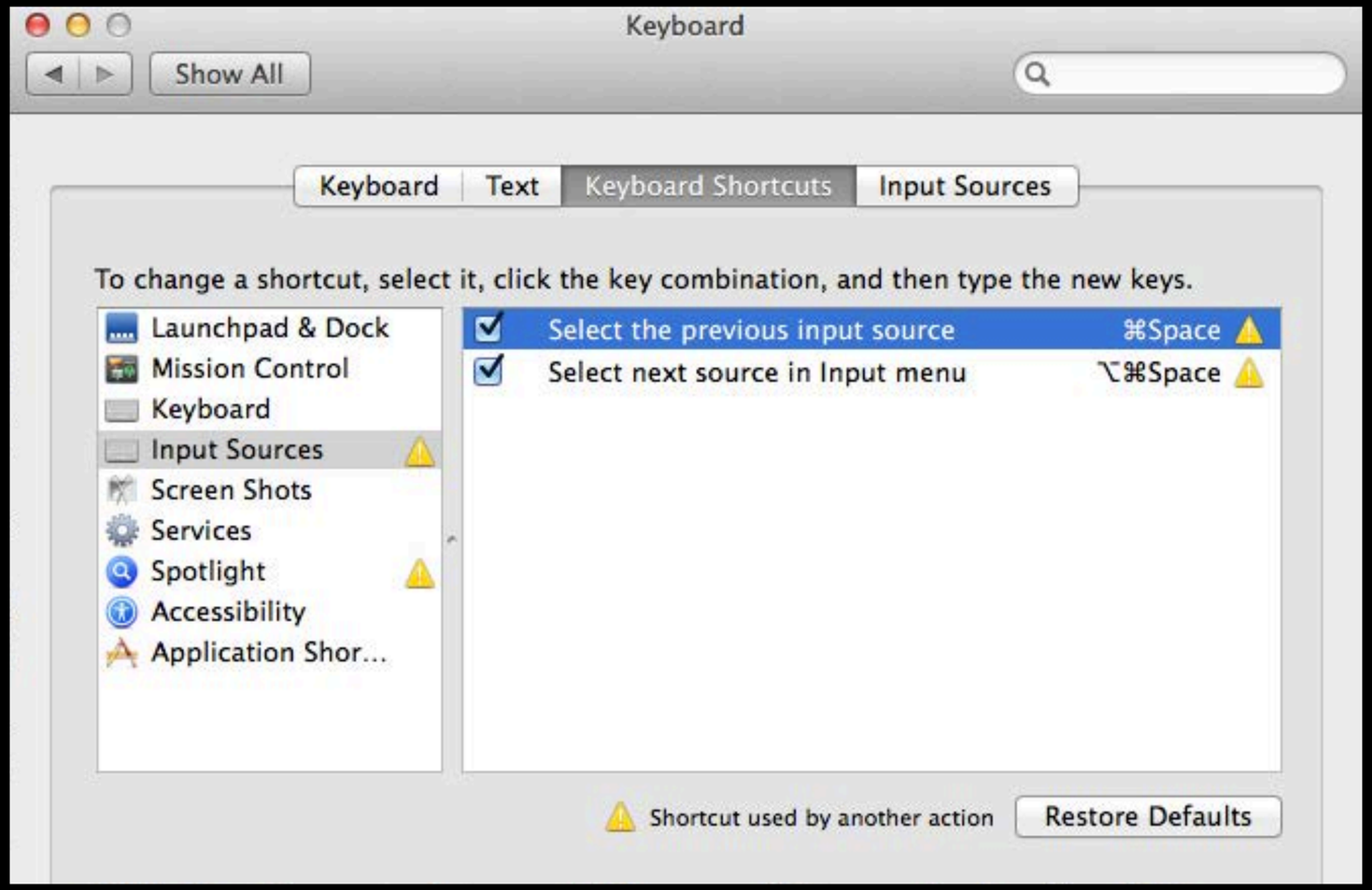
- New API

```
NSAccessibilityPostNotificationWithUserInfo(
    id element,
    NSString *notification,
    NSDictionary *userInfo)
```

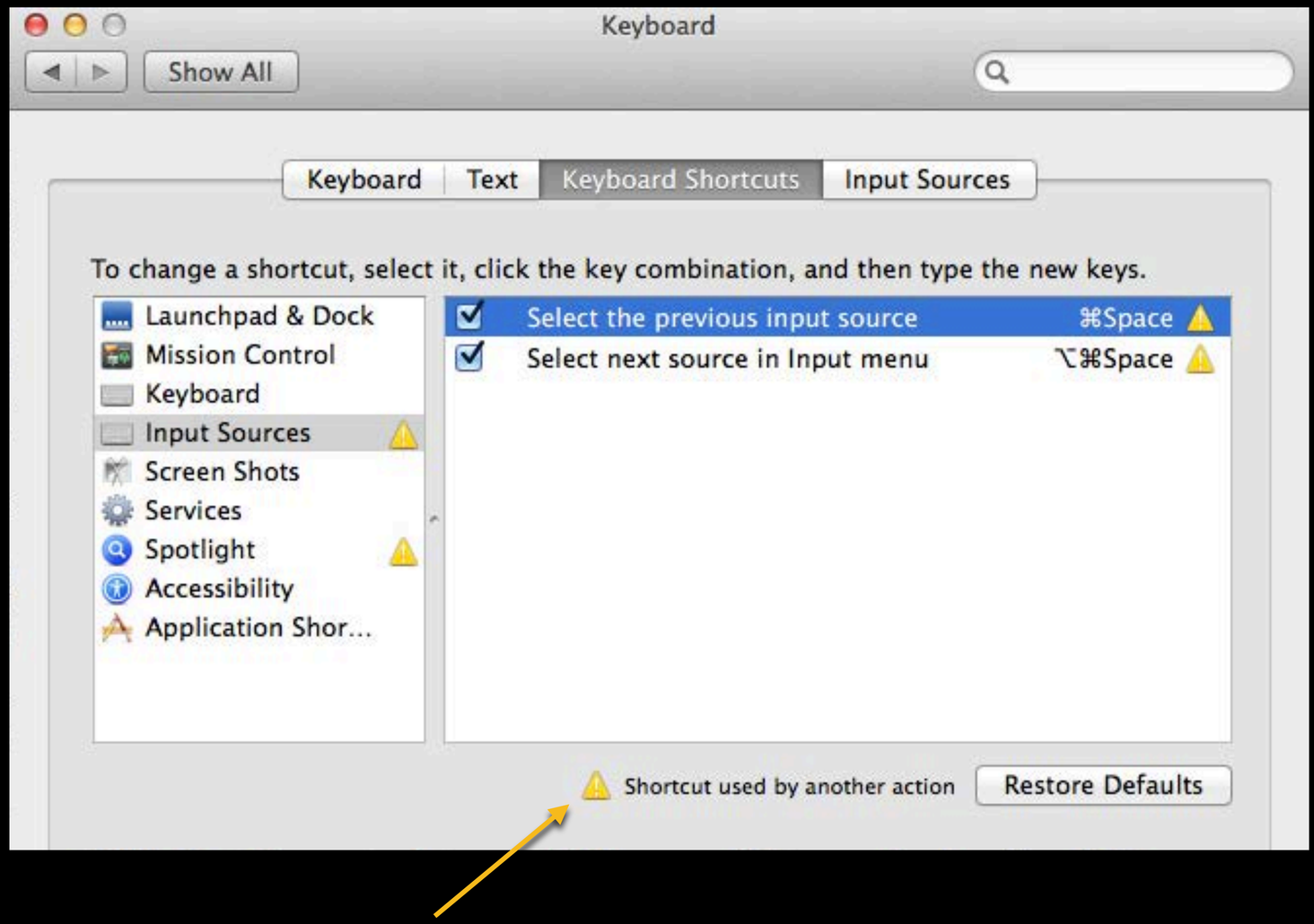
Demo

Transient UI
AccessibilityUIExamples

Accessibility Announcement



Accessibility Announcement



Accessibility Announcement

- New notification

```
NSAccessibilityAnnouncementRequestedNotification
```

- User info key

```
NSAccessibilityAnnouncementKey  (required)
NSAccessibilityPriorityKey  (optional)
```

- Priorities

```
NSAccessibilityPriorityLow
NSAccessibilityPriorityMedium
NSAccessibilityPriorityHigh
```

Security Improvements

Security Improvements

Security Improvements

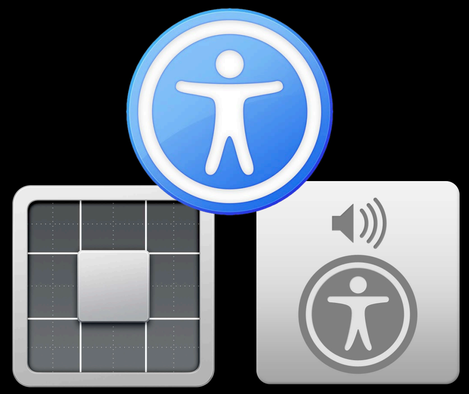
- Text Content Protection

Application

Security Improvements

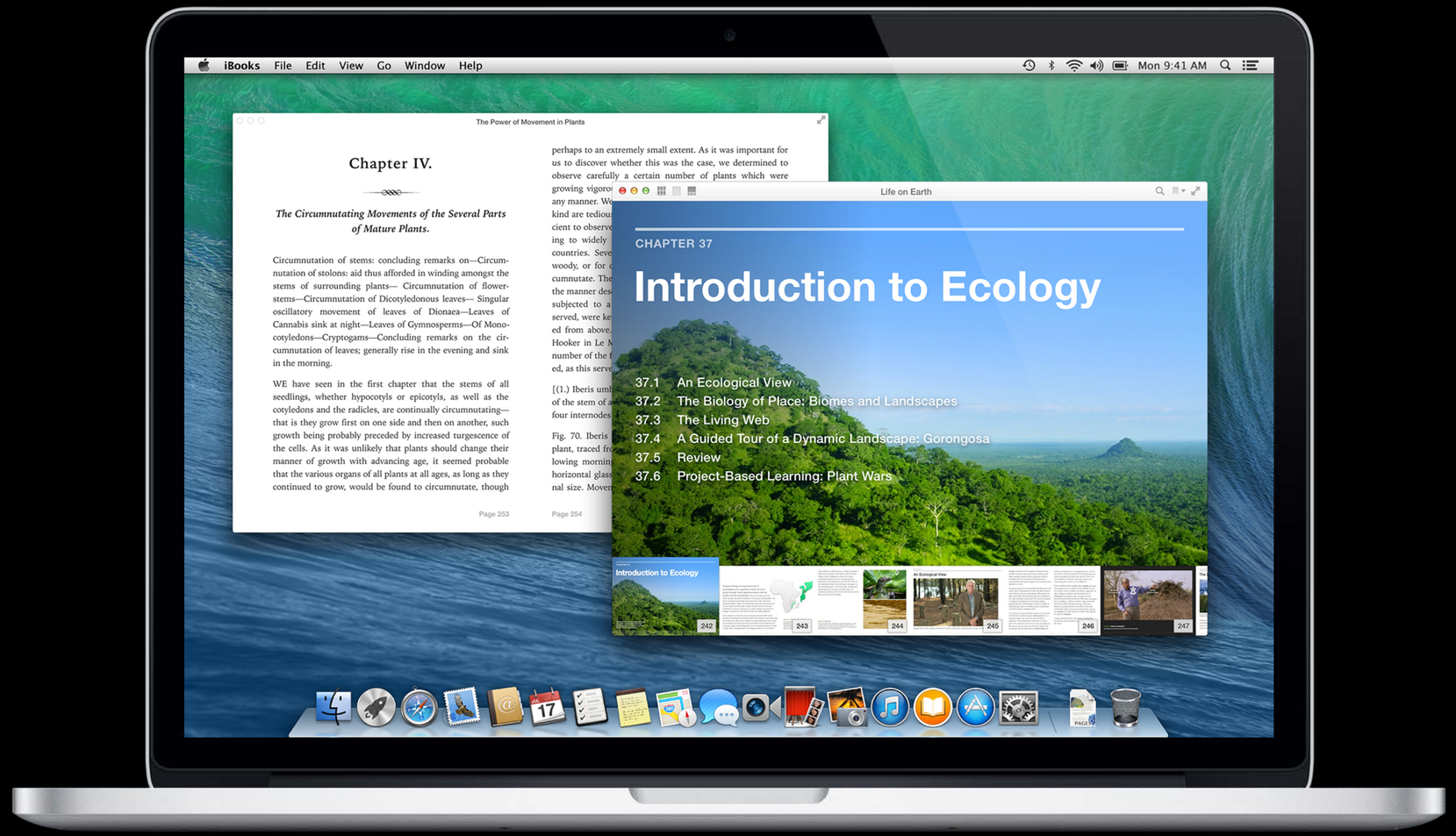
- Text Content Protection
- More Secured Usage of Accessibility API

Application



Assistive Software

Protecting Text Content



Protecting Text Content

For content publishers only

- New attribute

```
NSAccessibilityContainsProtectedContentAttribute
```

- New method (required)

```
BOOL NSAccessibilitySetMayContainProtectedContent(BOOL flag)
```

Demo

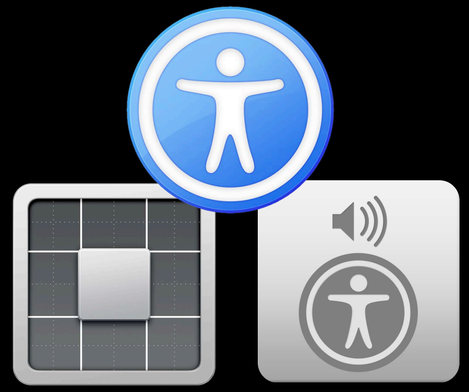
Text Content Protection
AccessibilityUIExamples

Flow of Accessibility Information

Assistive Software

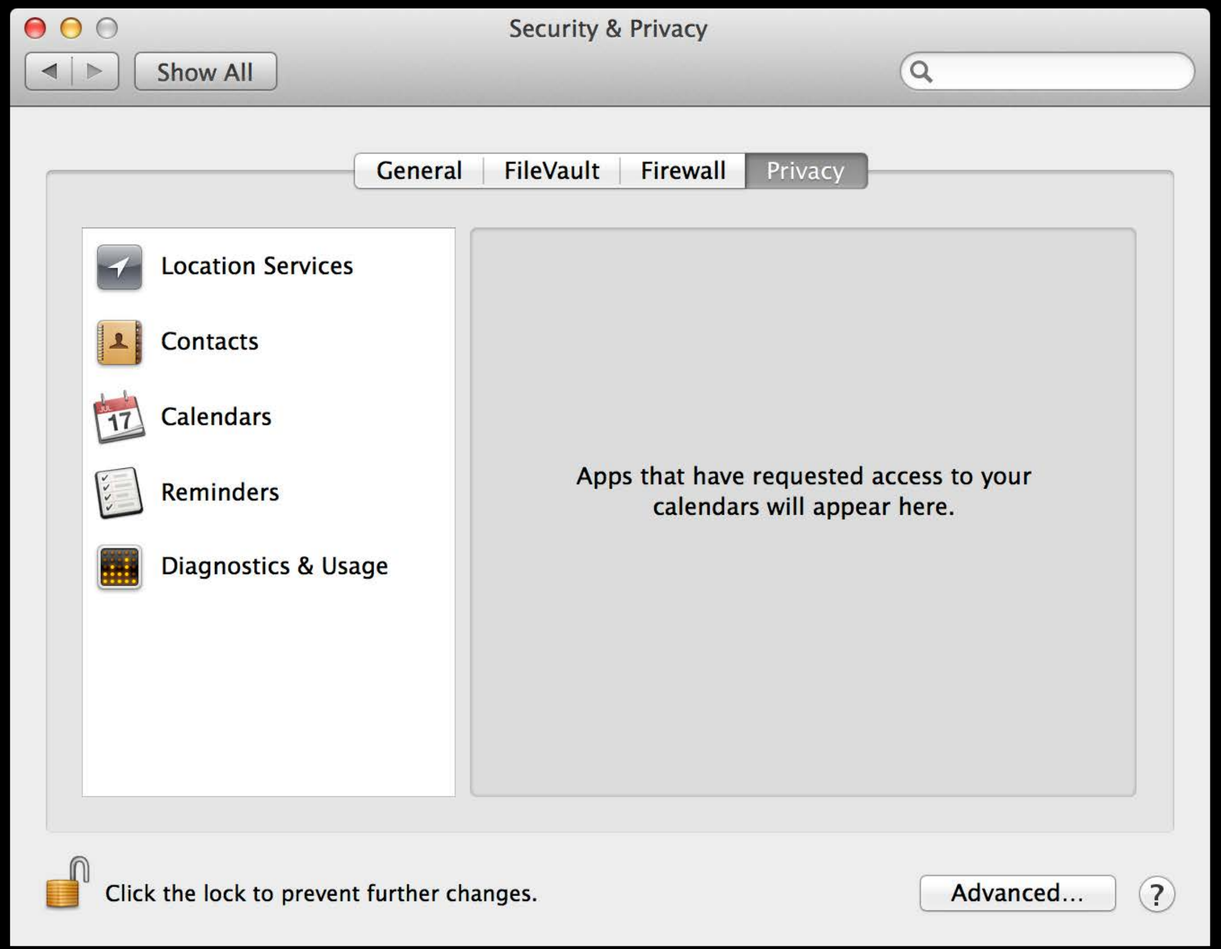
Application

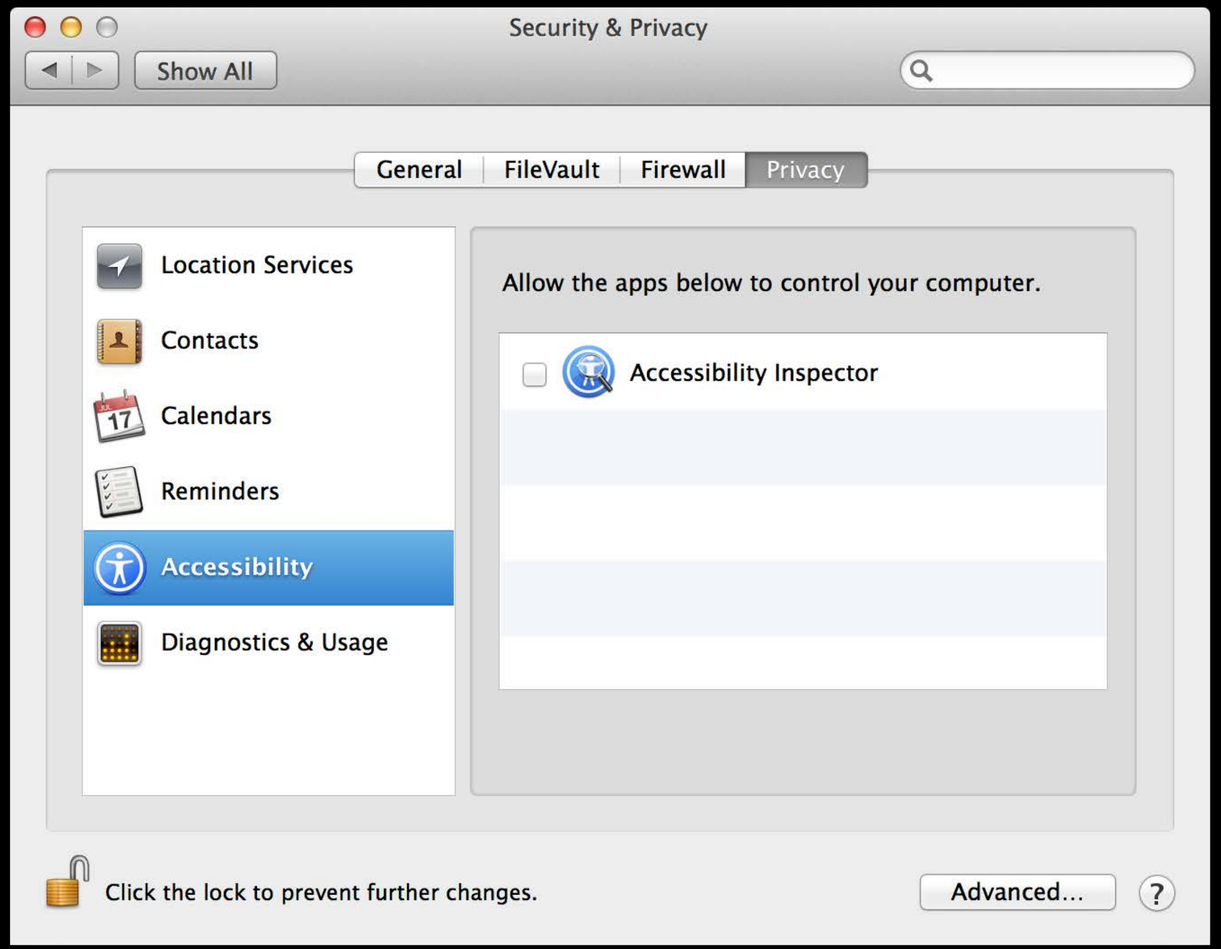
Flow of Accessibility Information



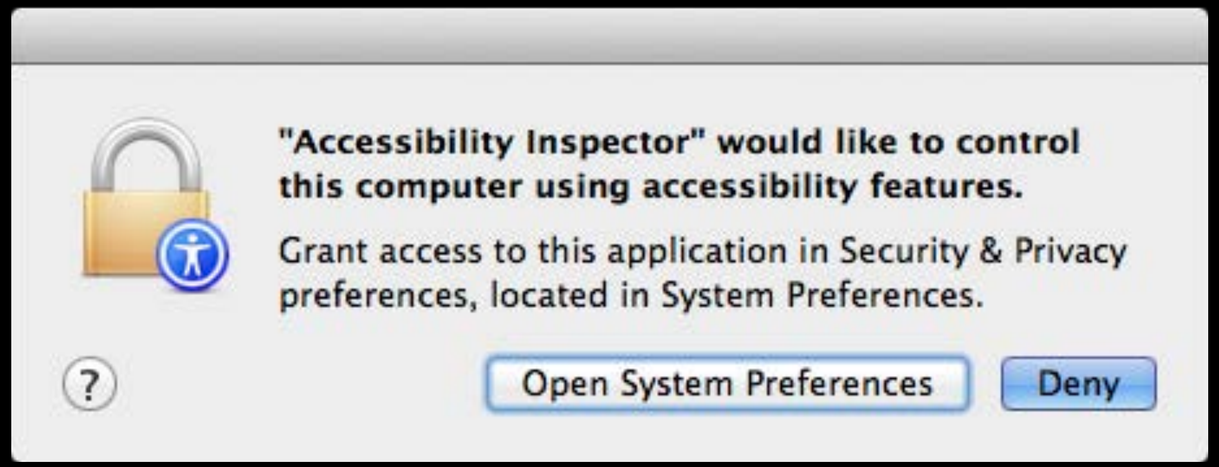
Assistive Software

Application


Security & Privacy
Show All
General
FileVault
Firewall
Privacy
Location Services
Contacts
Calendars
Reminders
Diagnostics & Usage
Apps that have requested access to your calendars will appear here.
Click the lock to prevent further changes.
Advanced...
?


Security & Privacy
Show All
General
FileVault
Firewall
Privacy
Location Services
Contacts
Calendars
Reminders
Accessibility
Diagnostics & Usage
Allow the apps below to control your computer.
Accessibility Inspector
Click the lock to prevent further changes.
Advanced...
?

Security


"Accessibility Inspector" would like to control this computer using accessibility features.
Grant access to this application in Security & Privacy preferences, located in System Preferences.
Open System Preferences
Deny

Secure Usage of Accessibility API

For assistive software

- New method

```
Boolean AXIsProcessTrustedWithOptions(CFDictionaryRef options);

Available option Key: kAXTrustedCheckOptionPrompt
```

Prompt End User for Permission

- During Application launch time

```
- (void)applicationDidFinishLaunching:(NSNotification *)aNotification
{
    CFMutableDictionaryRef options = CFDictionaryCreateMutable(NULL, 0,
    &kCFTypeDictionaryKeyCallBacks, &kCFTypeDictionaryValueCallBacks);

    CFDictionarySetValue(options, kAXTrustedCheckOptionPrompt, kCFBooleanTrue);

    AXIsProcessTrustedWithOptions(options);

    CFRelease(options);
}
```

More Information

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General Accessibility Feedback
accessibility@apple.com

Accessibility Developer Forum
accessibility-dev@lists.apple.com

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

Related Sessions

Accessibility in iOS	Pacific Heights Tuesday 9:00AM
Preparing and Presenting Media for Accessibility	Nob Hill Wednesday 10:15AM

Labs

Accessibility and Speech Lab	Services Lab A Tuesday 12:45PM

Summary

- Apple’s commitment to accessibility

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- Basics of accessibility technology

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WWDC2013