

Resource Management

This document describes some common CarPlay use cases with flow diagrams and recommended mode changes. For more details, see the *Accessory Interface Specification* section on *Resource Management*.

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How to use this document

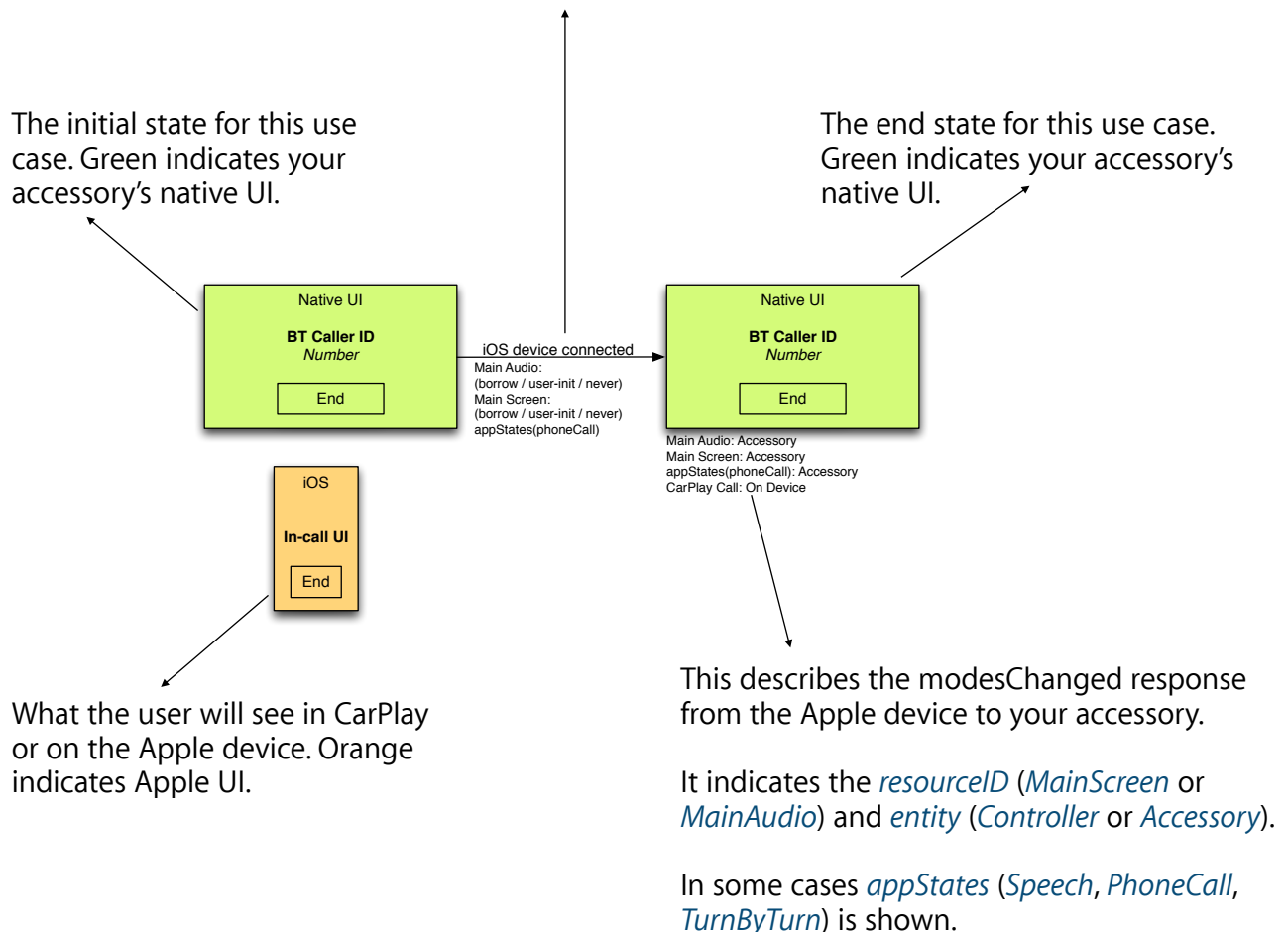
The following sections describe resource management for a variety of use cases. Each use case is presented as a diagram with an initial state, one or more additional states and detailed information on the *changeModes/modesChanged* commands that are exchanged between your CarPlay accessory and the Apple device.

This describes the *changeModes* request sent from your accessory to the Apple device.

It indicates the *resourceID* (*MainScreen* or *MainAudio*), *transferType* (*Take*, *Untake*, *Borrow*, or *Unborrow*), and *transferPriority* (*Nice-to-have* or *User Initiated*).

If *transferType* is *Take* then *takeConstraint* and *borrowConstraint* will also be shown. If *transferType* is *Borrow* then *unborrowConstraint* will be shown.

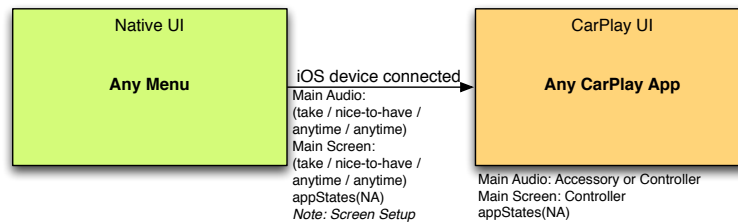
In some cases *appStates* (*Speech*, *PhoneCall*, *TurnByTurn*) is shown.



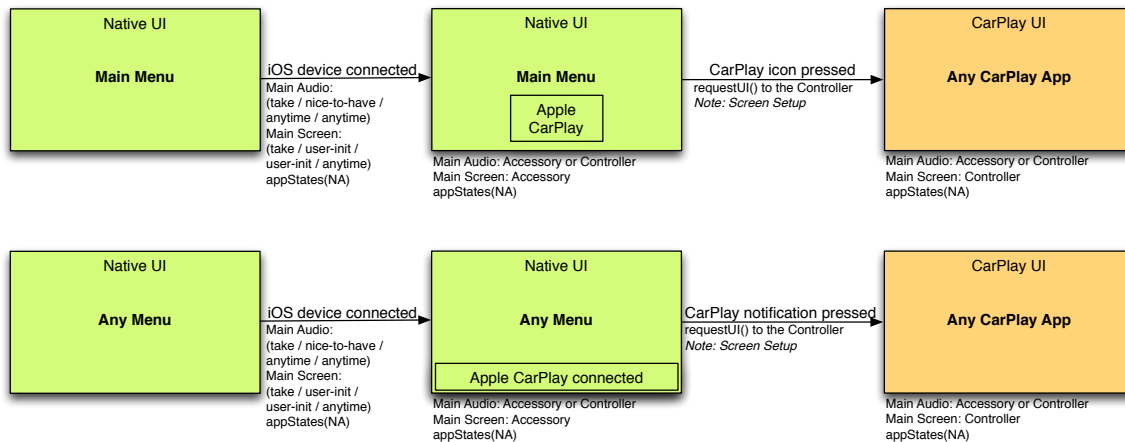
Connection

The following use cases describe resource management when the user connects an Apple device to your CarPlay accessory.

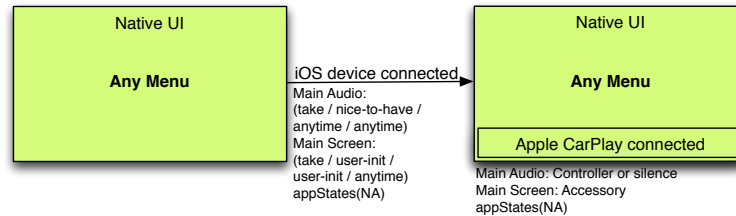
1. Connecting to an Apple device for the first time, and immediately showing CarPlay
Your accessory is playing FM radio and the user connects a new Apple device for the very first time. You have chosen *to automatically display* the CarPlay UI when the Apple device is connected for the first time.



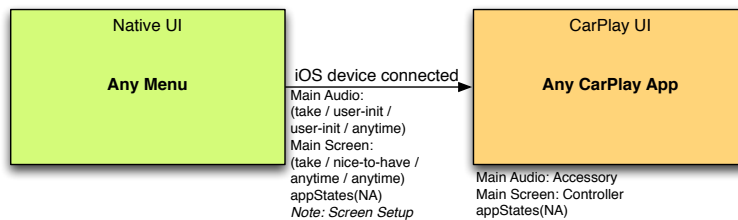
2. Connecting to an Apple device for the first time, and staying in the native UI
Your accessory is playing FM radio and the user connects a new Apple device for the very first time. You have chosen *not to automatically display* the CarPlay UI when the Apple device is connected for the first time.



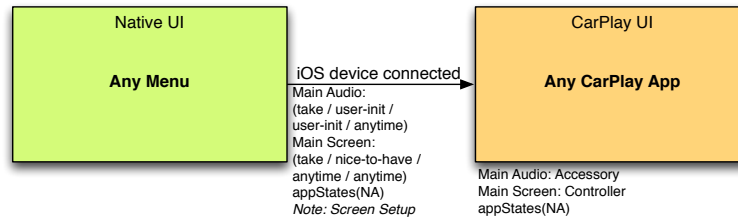
3. Connecting to a known Apple device, and the last user mode for the screen was native UI
 The last user mode for the screen is native UI if (1) the native UI was on the screen when the Apple device was disconnected, or (2) the native UI was used at any time between the Apple device being disconnected and reconnected. When the last user mode for the screen is native UI, the display shows the native UI when the Apple device is reconnected. In this example, the last user mode for audio is CarPlay (see use cases 5–6 for details on audio).



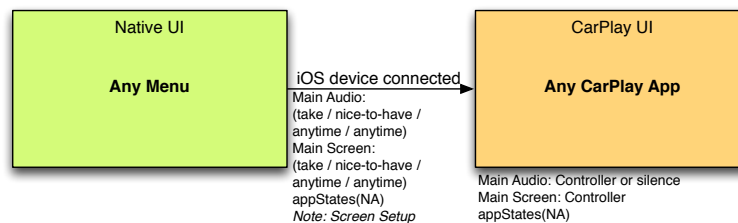
4. Connecting to a known Apple device, and the last user mode for the screen was CarPlay
 The last user mode for the screen is CarPlay, if CarPlay was on the screen when the Apple device was disconnected. When the last user mode for the screen is CarPlay, the display shows CarPlay when the Apple device is reconnected. In this example, the last user mode for audio is FM radio (see use cases 5–6 for details on audio).



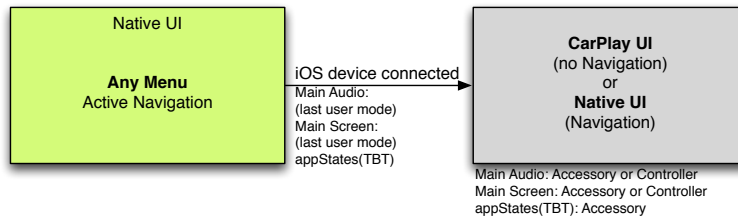
5. Connecting to a known Apple device, and the last user mode for audio was FM radio
 The last user mode for audio is FM radio if (1) FM radio was playing when the Apple device was disconnected, or (2) the user actively switched to FM radio at any time between the Apple device being disconnected and reconnected. When the last user mode for the audio is FM radio, FM radio plays through the car's speakers when the Apple device is reconnected. In this example, the last user mode for screen is CarPlay (see use cases 3–4 for details on screen).



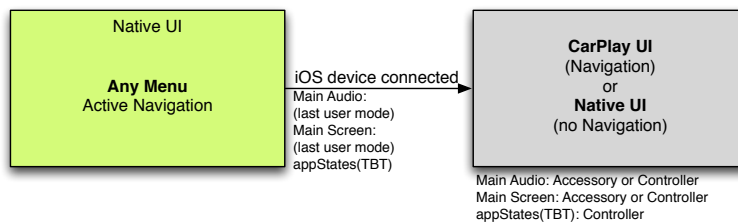
6. Connecting to a known Apple device, and the last user mode for audio was CarPlay
 The last user mode for audio is CarPlay, if CarPlay was playing media when the Apple device was disconnected. When the last user mode for audio is CarPlay, playback is determined by the Apple device (media or silence). In this example, the last user mode for screen is CarPlay (see use cases 3–4 for details on screen).



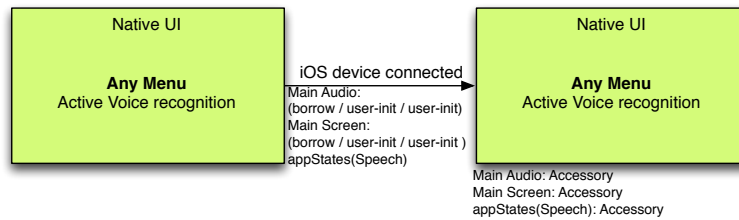
7. Your accessory is providing turn-by-turn guidance and the user connects an Apple device. The connected Apple device *is not providing* turn-by-turn guidance so your accessory continues to provide turn-by-turn guidance. Last user mode for audio and screen is valid.



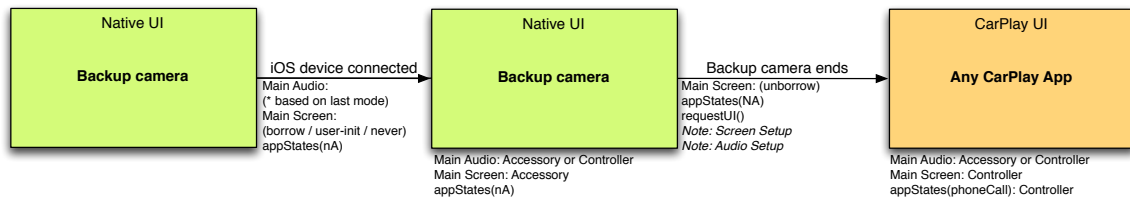
8. Your accessory is providing turn-by-turn guidance and the user connects an Apple device. The connected Apple device *is providing* turn-by-turn guidance so your accessory ends turn-by-turn guidance. Last user mode for audio and screen is valid.



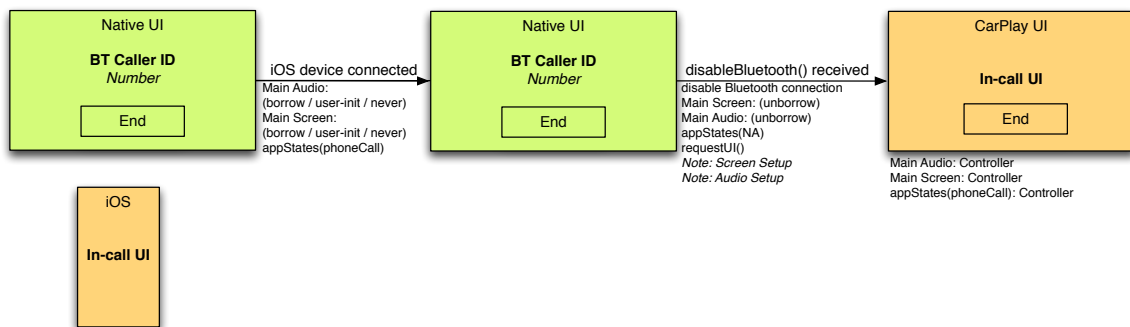
9. Your accessory is in a voice recognition session and the user connects an Apple device. *Siri is not active* on the connected Apple device so your accessory continues the voice recognition session.



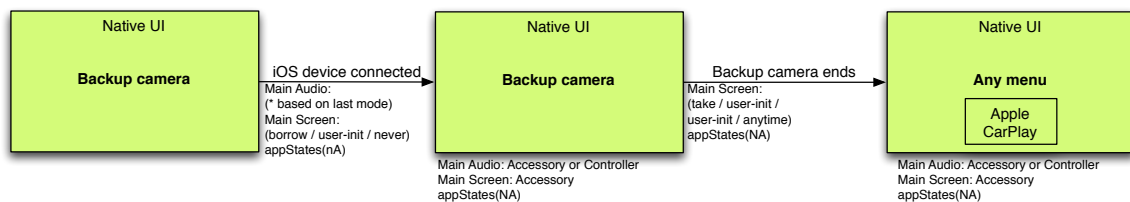
10. Your accessory is showing backup camera and the user connects an Apple device. Last user mode for screen is CarPlay. Backup camera stays visible on the screen until the user disengages the reverse gear. Then the accessory restores the valid last user mode.



11. The Apple device is on an active phone call with your accessory using Bluetooth Hands-Free Profile. The user connects the Apple device to your accessory.



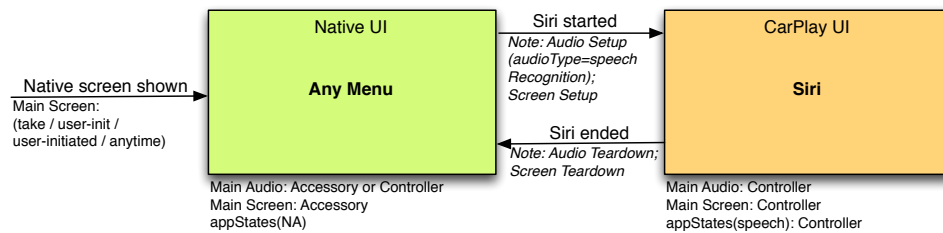
12. Your accessory is showing backup camera and the user connects an Apple device. Last user mode for screen is native UI. Backup camera stays visible on the screen until the user disengages the reverse gear. Then the accessory restores the valid last user mode.



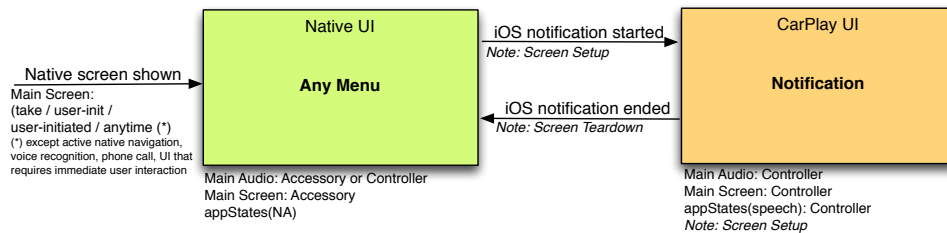
User interactions with your accessory

The following use cases describe resource management during user interactions with your accessory.

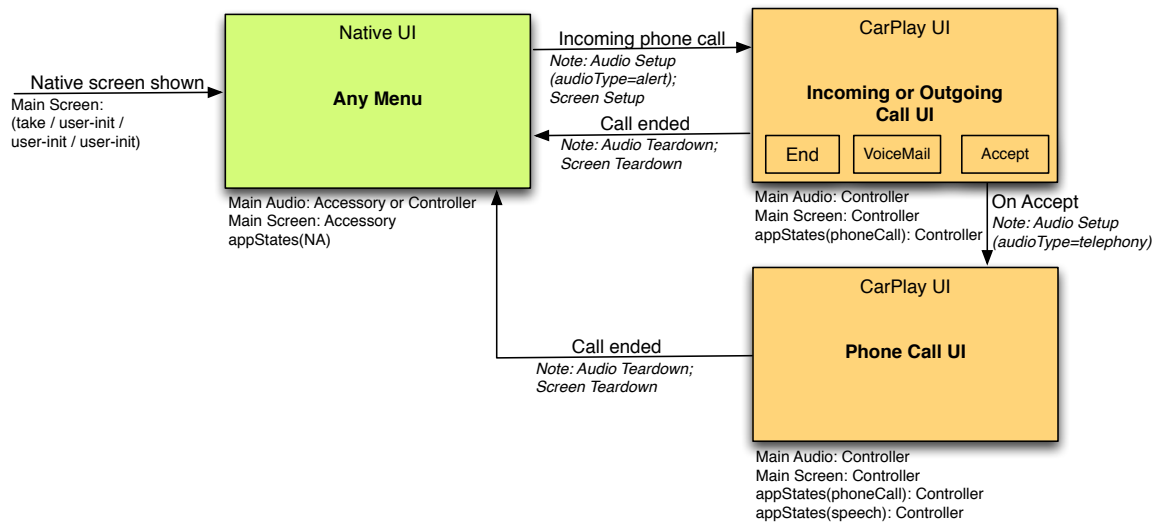
1. Your accessory's UI is shown on the Main Screen. The user starts Siri using your steering wheel button or the Home button on the Apple device. The CarPlay UI is shown. After the Siri session ends, the Main Screen returns to your accessory, except when Siri is used to trigger an application which requires UI (e.g. Maps).



2. Your accessory's UI is shown on the Main Screen. The Apple device triggers a notification which is shown on the Main Screen. The Main Screen returns to your accessory.



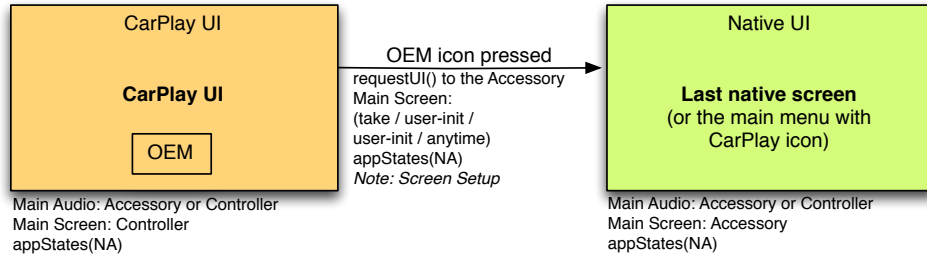
3. Your accessory's UI is shown on the Main Screen. The user makes a phone call using CarPlay. The CarPlay UI is shown on the Main Screen. At the end of the phone call, the Main Screen returns to your accessory.



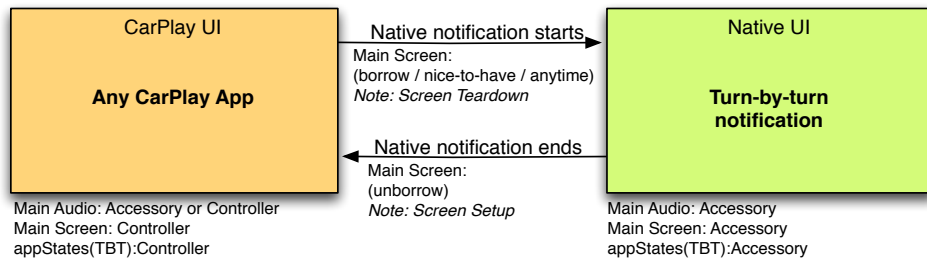
User interactions with CarPlay

The following use cases describe resource management during user interactions with CarPlay.

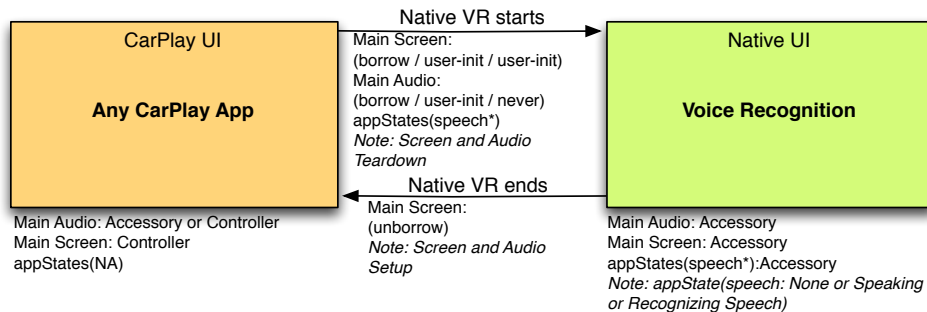
1. The CarPlay UI is shown on the Main Screen. The user transitions to your accessory's UI.



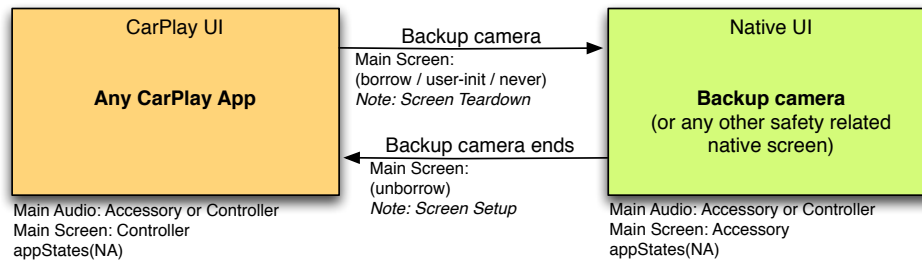
2. The CarPlay UI is shown on the Main Screen. Your accessory displays a turn-by-turn notification. The Main Screen returns to CarPlay after the notification ends.



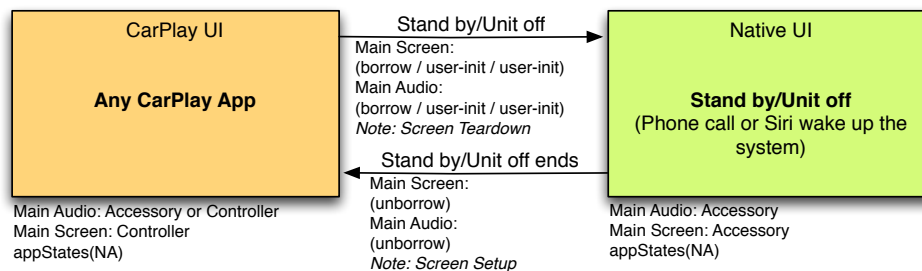
3. The CarPlay UI is shown on the Main Screen. Your accessory displays the native voice recognition. The Main Screen returns to CarPlay after the voice recognition ends.



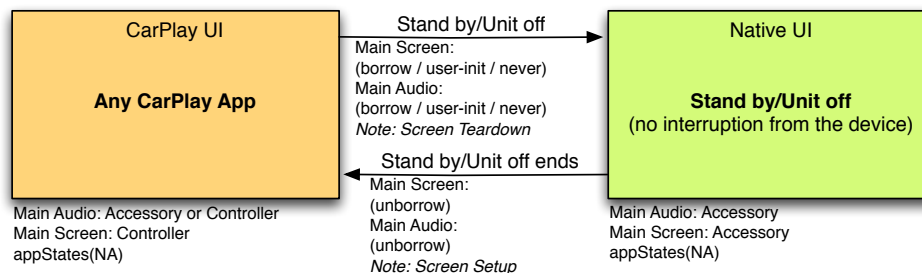
4. The CarPlay UI is shown on the Main Screen. Your accessory displays images from the backup camera. The Main Screen returns to CarPlay after the backup camera ends.



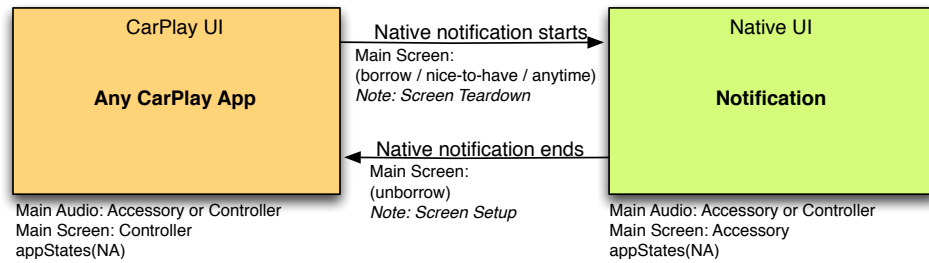
5. The CarPlay UI is shown on the Main Screen. Your accessory is in a standby mode (display or audio off) or turned off. Phone calls and Siri interaction can wake up the system and be shown to the user. The Main Screen returns to CarPlay after the user exits the stand by mode.



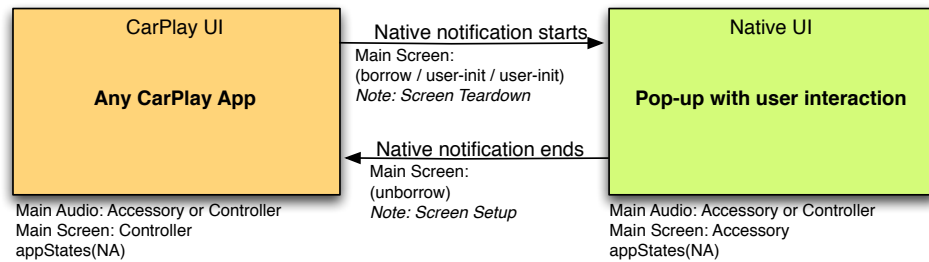
6. The CarPlay UI is shown on the Main Screen. Your accessory is in a standby mode (display or audio off) or turned off. Phone calls and Siri interaction can not wake up the system and be shown to the user. The Main Screen returns to CarPlay only after the user exits the stand by mode.



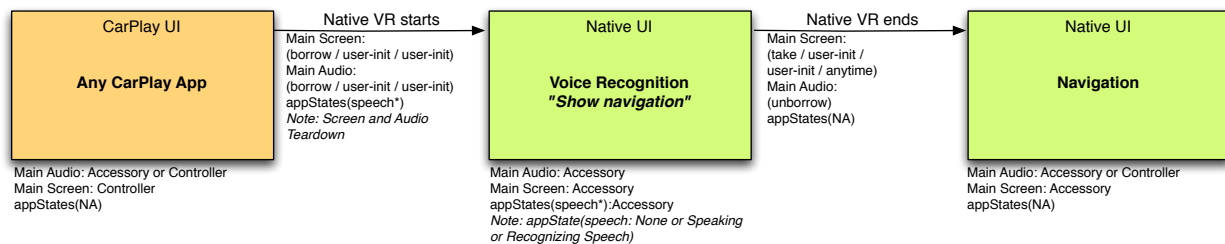
7. The CarPlay UI is shown on the Main Screen. Your accessory displays a temporary notification. The Main Screen returns to CarPlay after the notification ends.



8. The CarPlay UI is shown on the Main Screen. Your accessory displays a temporary popup which requires user input. The Main Screen returns to CarPlay after the popup ends.



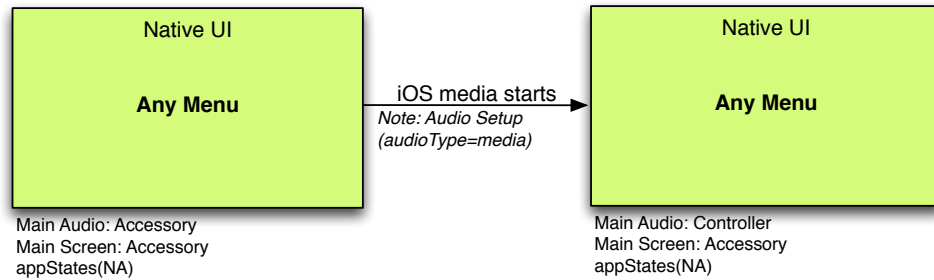
9. The CarPlay UI is shown on the Main Screen. Your accessory displays the native voice recognition. The user asks to show the native navigation or any other native UI. The Main Screen transfers from a borrow to take to show the native route guidance. The transfer will succeed only if the take priority level is higher or equal than the take constraint specified by iOS.



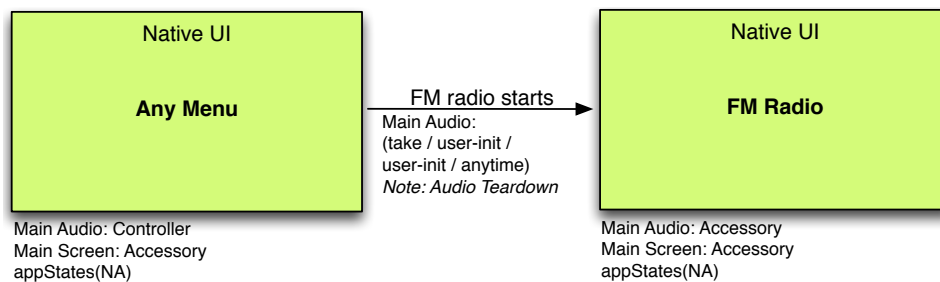
Audio selection

The following use cases describe resource management during audio interactions with CarPlay.

1. Your accessory is playing FM radio and the user starts music playback on the Apple device.



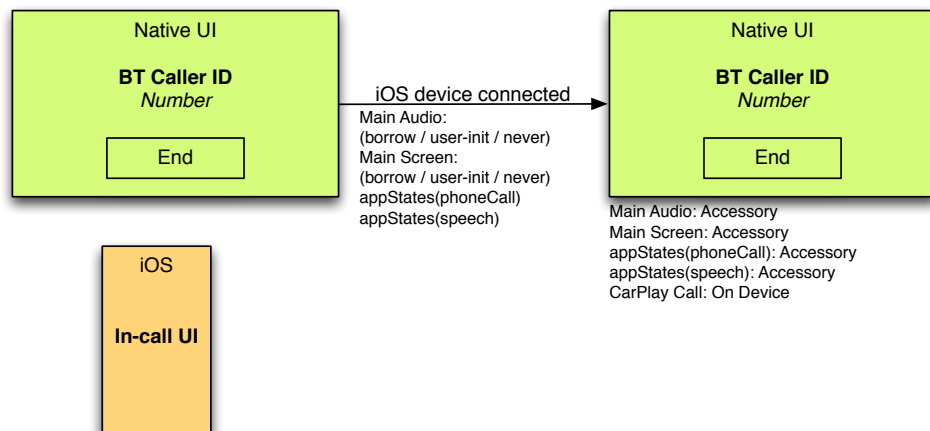
2. Music is playing on the Apple device and the user starts FM radio on your accessory.



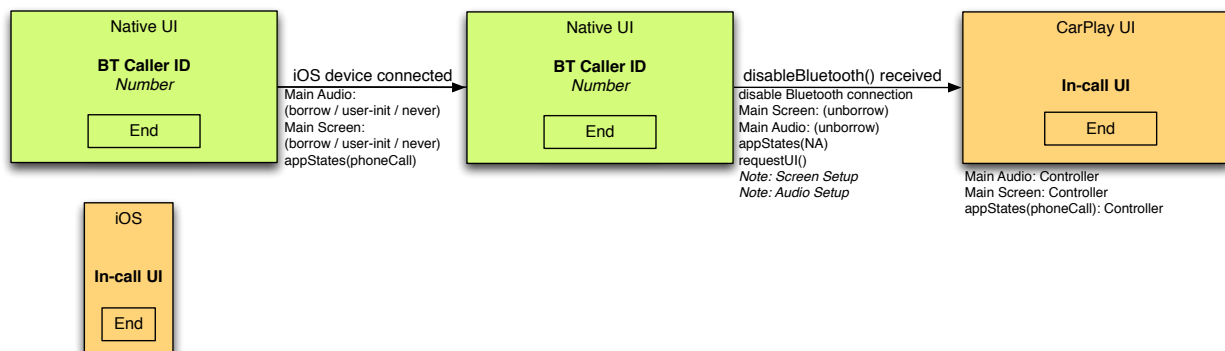
Second phones connected using Bluetooth

The following use cases describe resource management when a second phone is connected to your accessory using Bluetooth or the accessory executes a call using any additional phone service, e.g. concierge calls, etc.

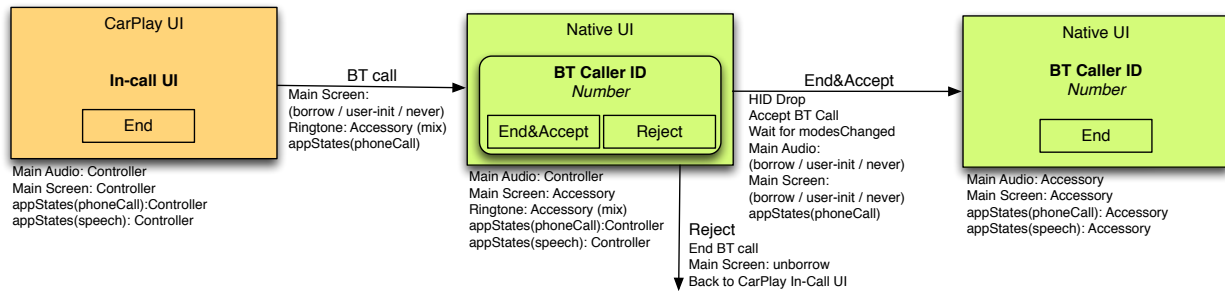
1. Your accessory is on a phone call using a second phone connected using Bluetooth and the user connects an Apple device which is also on an active phone call.



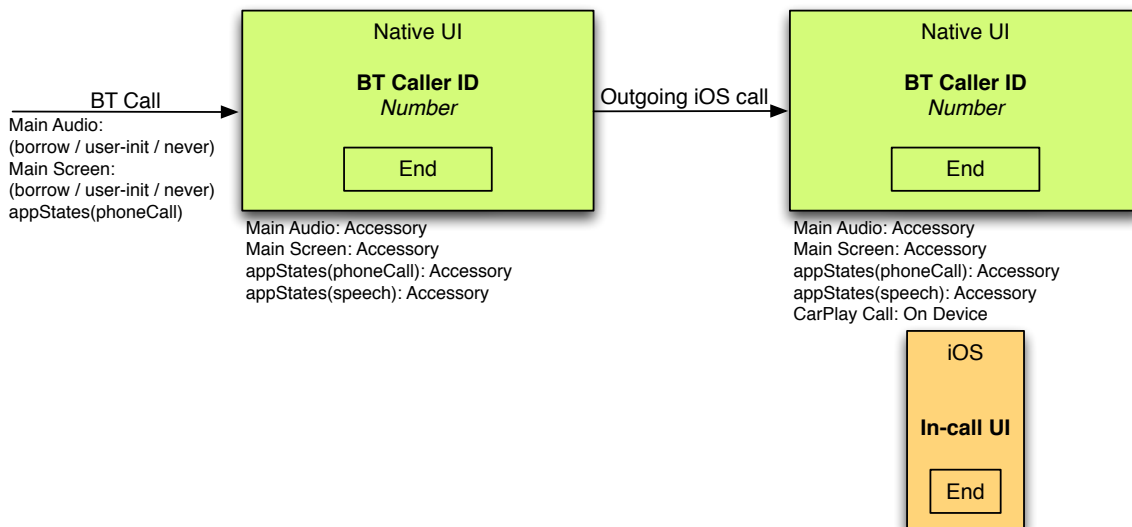
2. Your accessory is on a phone call using a second phone connected using Bluetooth. The connected Apple device receives an incoming CarPlay phone call.



- CarPlay is on a phone call. Your accessory receives an incoming phone call on a second phone connected using Bluetooth.



- Your accessory is on a phone call using a second phone connected using Bluetooth. The user places a phone call using CarPlay



Revision History

This table describes the changes to *Resource Management*.

Release	Notes
2016-07-27 Release R4	Added <i>Connection</i> use case 12.
	Added <i>User interactions with CarPlay</i> use case 9.
	Updated <i>User interactions with CarPlay</i> use case 3.
	Updated <i>Second phones connected using Bluetooth</i> use case 1.
	Updated <i>Second phones connected using Bluetooth</i> use case 2.