#WWDC19

Architecting Your App for Multiple Windows

Janum Trivedi, UIKit

Changes to app lifecycle

Using the scene delegate

Architecture

Changes to app lifecycle

Using the scene delegate

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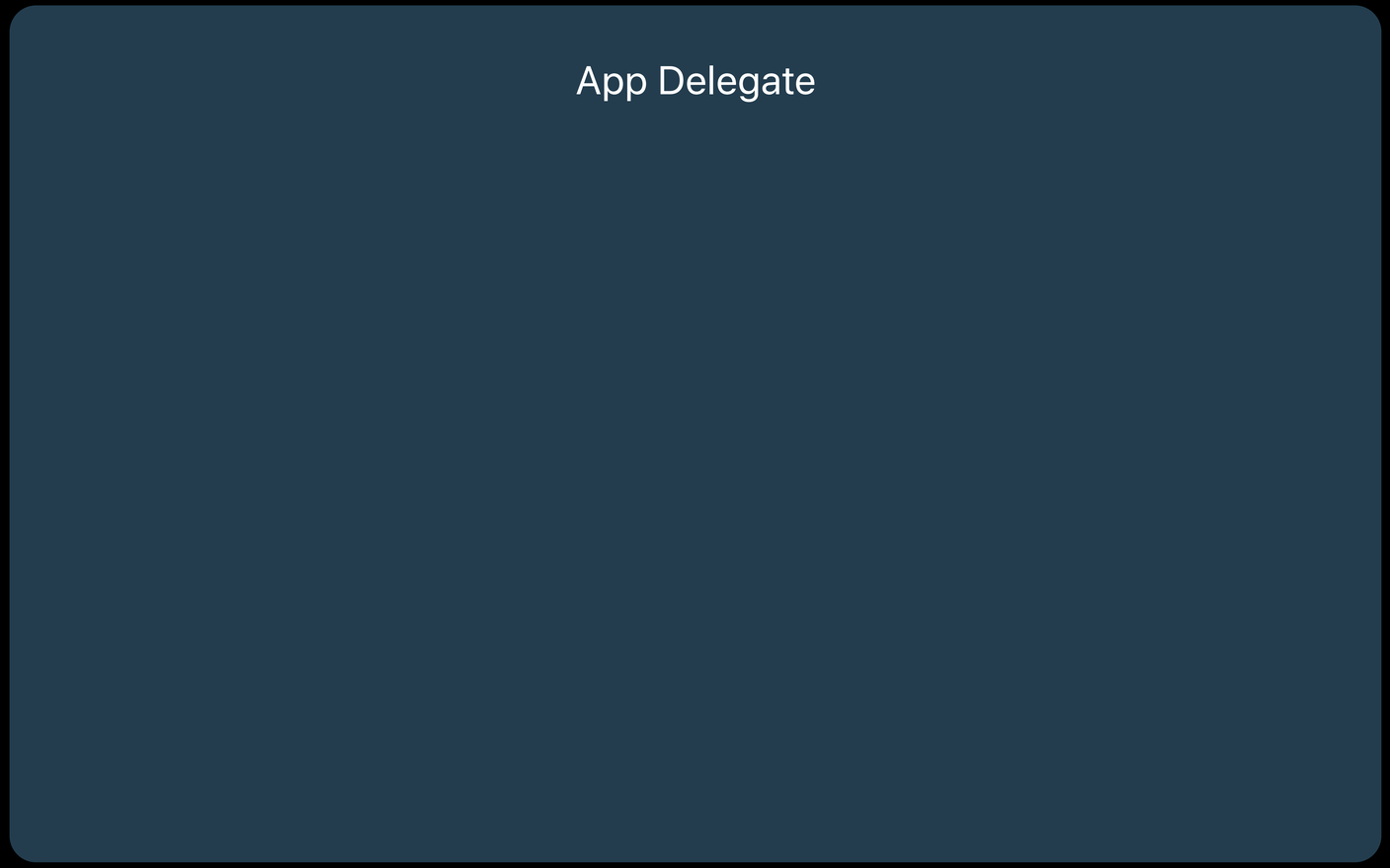
Using the scene delegate

Architecture

App Delegate Responsibilities

iOS 12 and earlier



App Delegate Responsibilities

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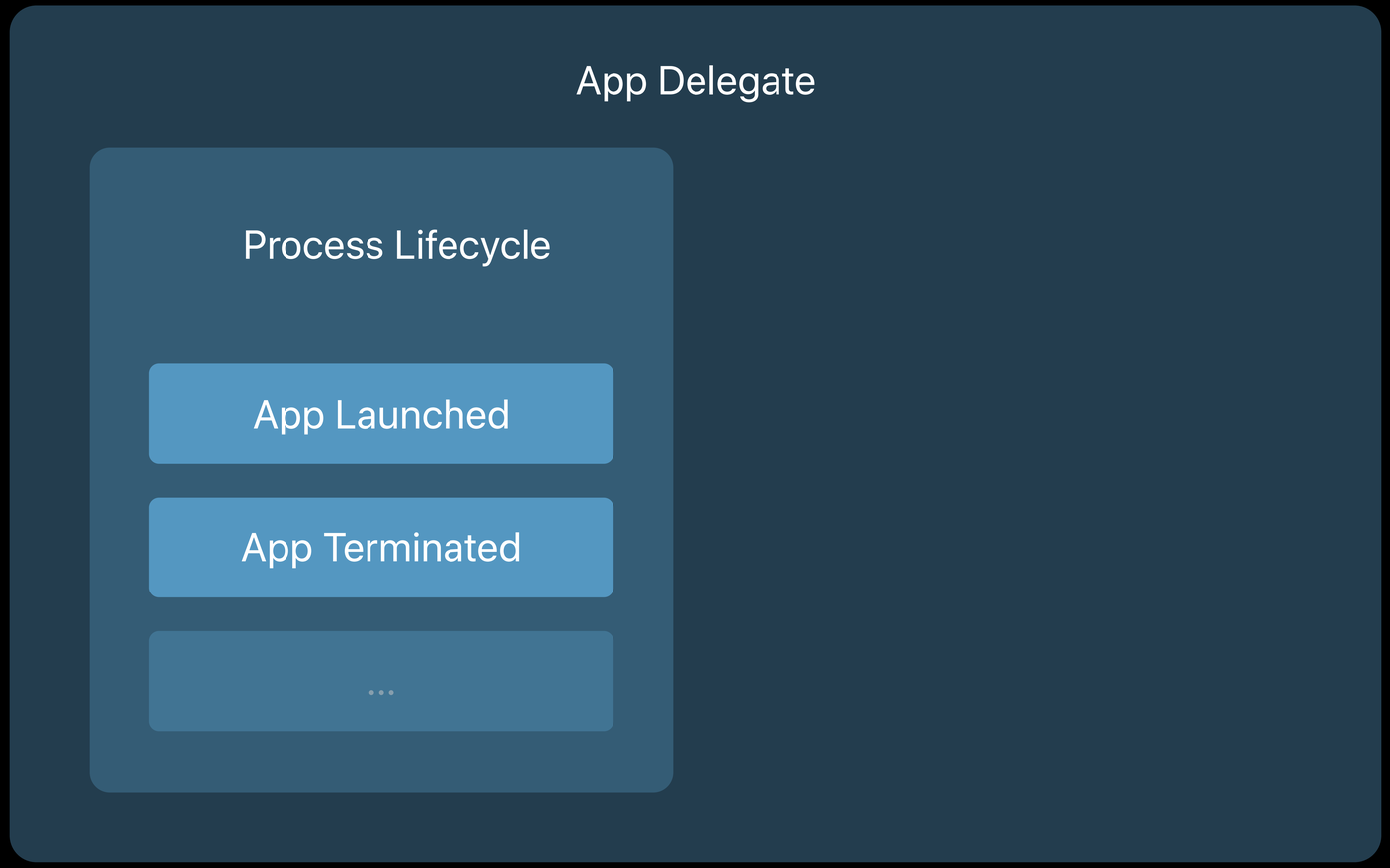

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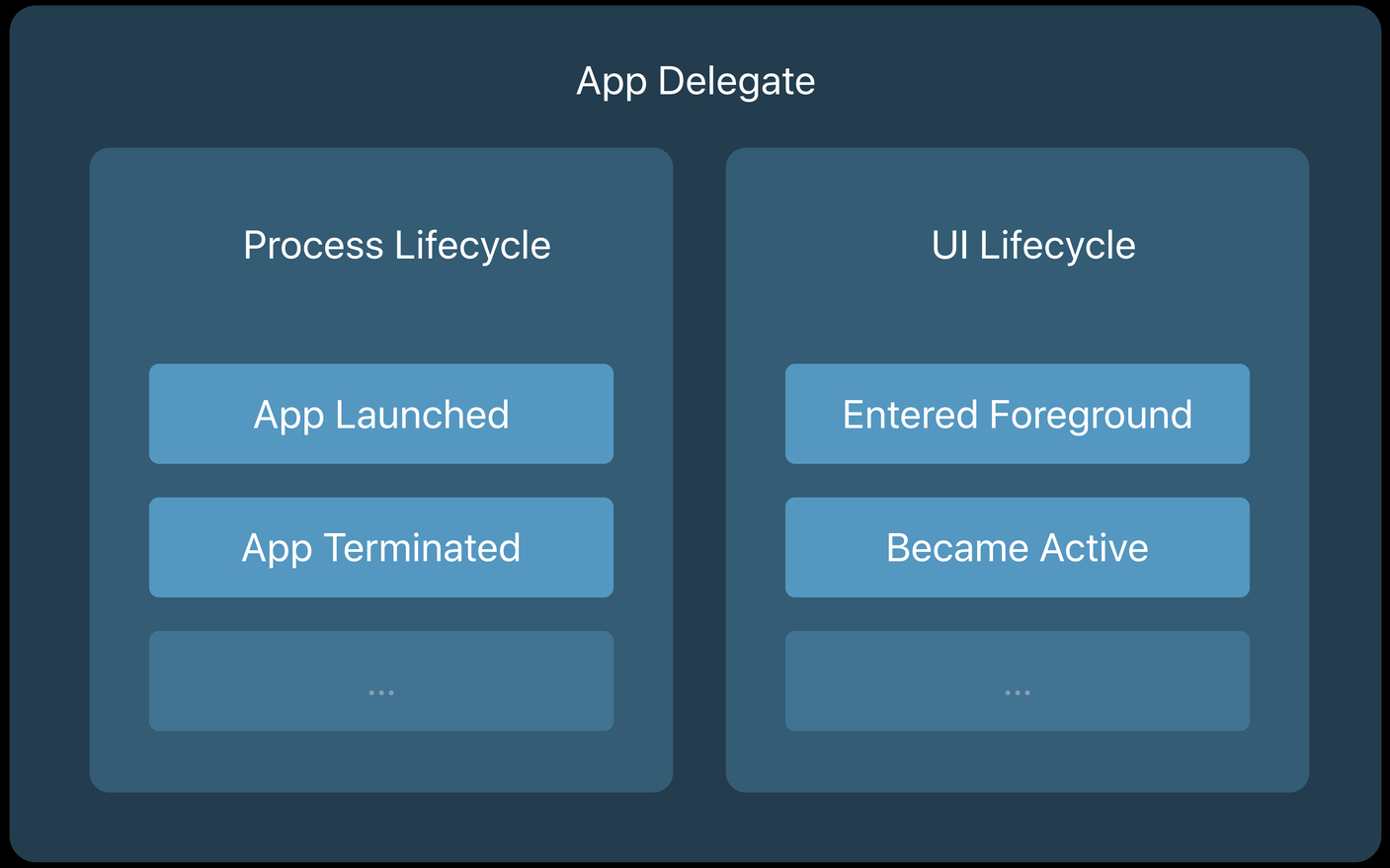


App A
App B
App C
App D

```swift
@UIApplicationMain
class AppDelegate: UIResponder, UIApplicationDelegate {
    var window: UIWindow?

    func application(_ application: UIApplication, didFinishLaunchingWithOptions launchOptions:
[UIApplication.LaunchOptionsKey: Any]?) -> Bool {

        // Do some global setup
        Database.connect()

        // Set up the UI...
        window = UIWindow()
    }
}
```

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App A
App B
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App D


Session A
Session B
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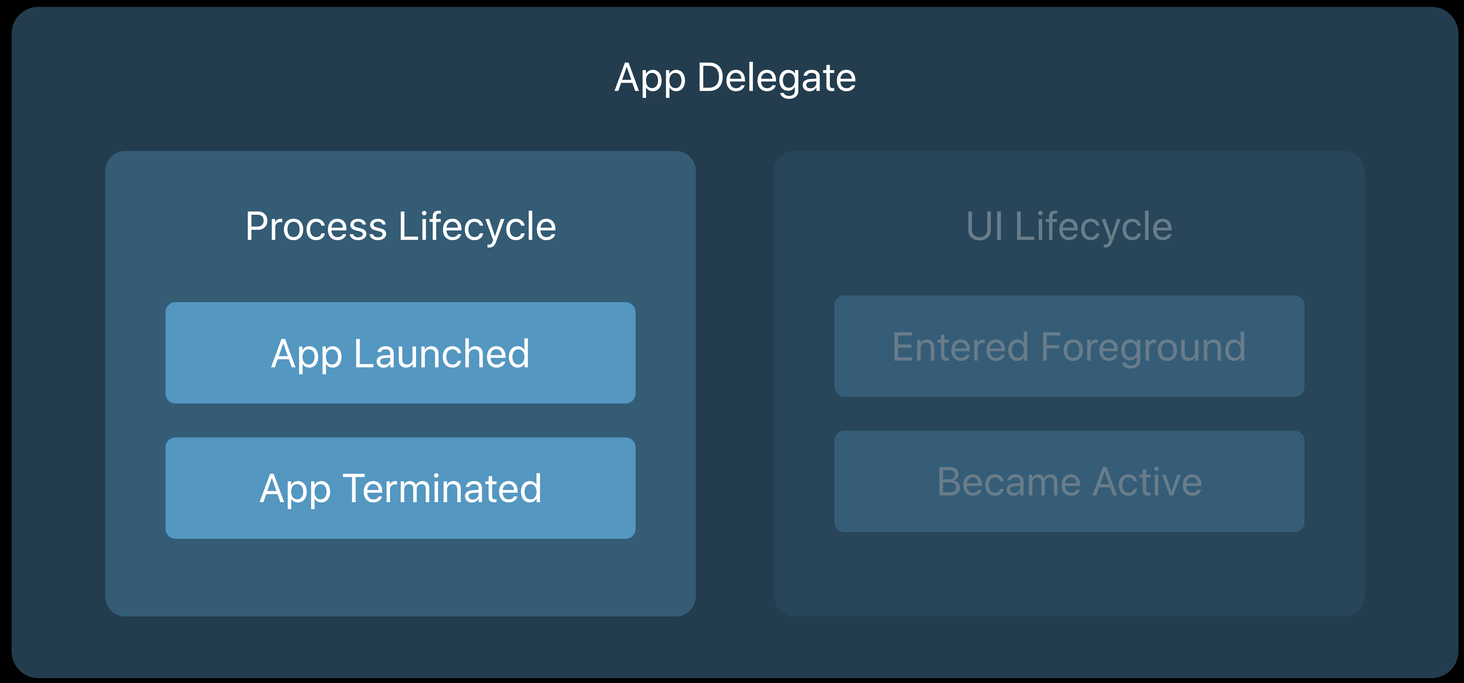
Session D

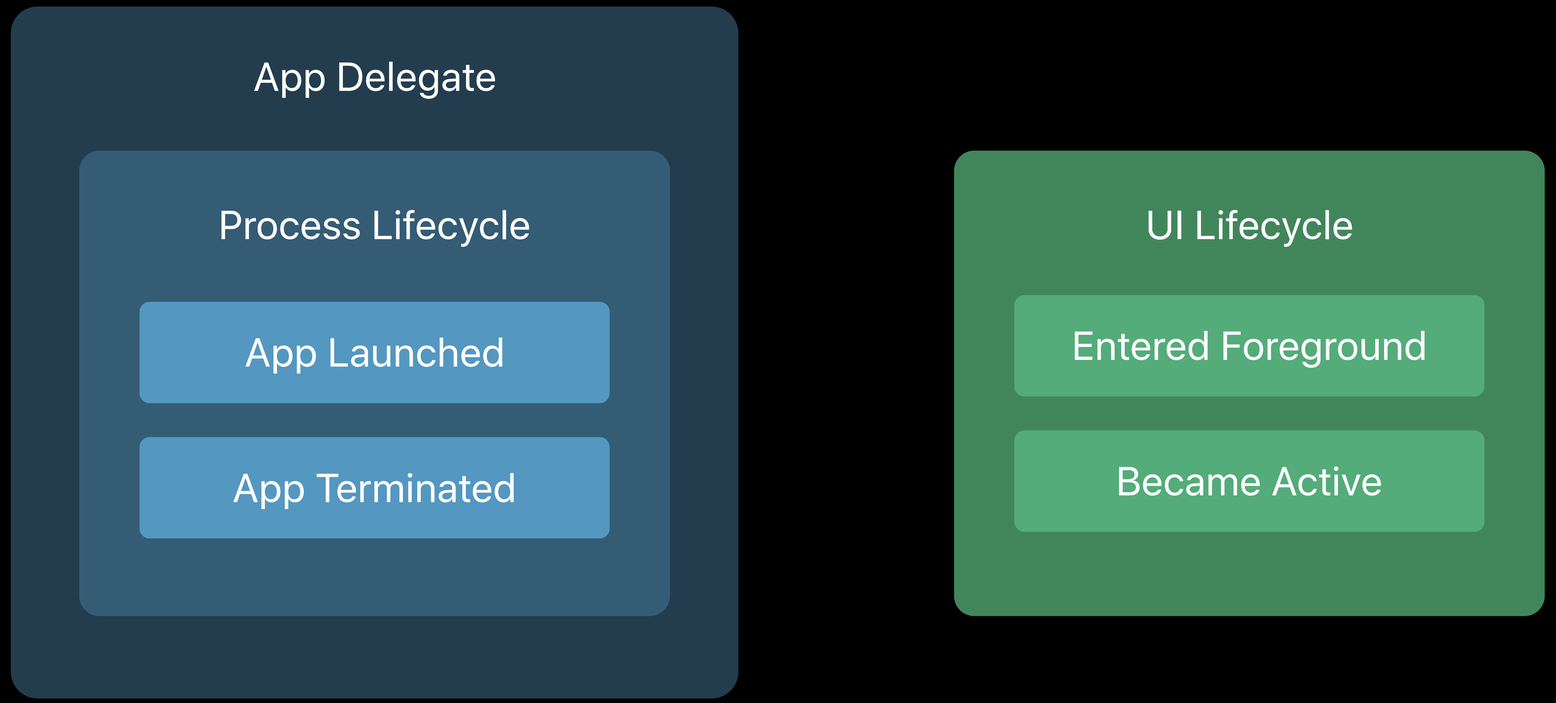
App Delegate Changes

iOS 13



App Delegate Changes

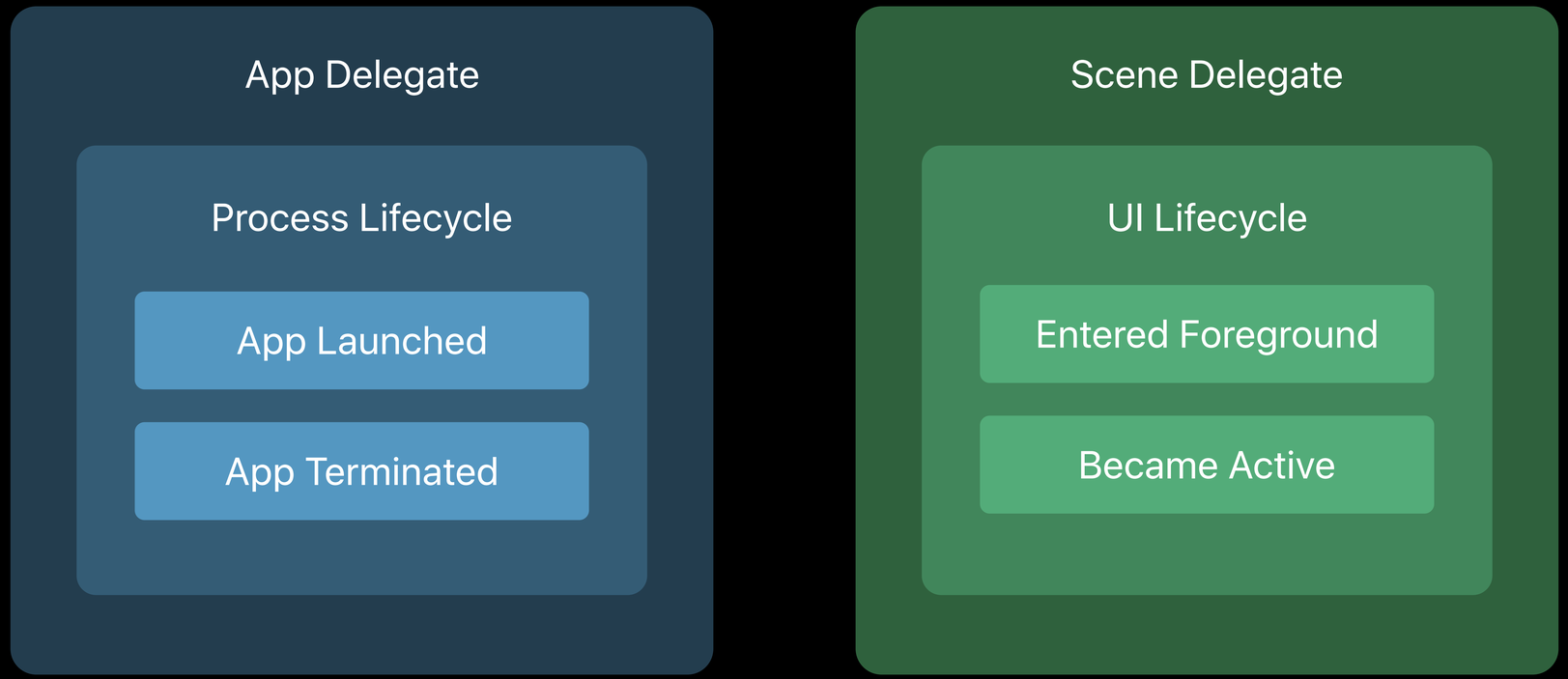
iOS 13



App Delegate Changes

iOS 13

NEW



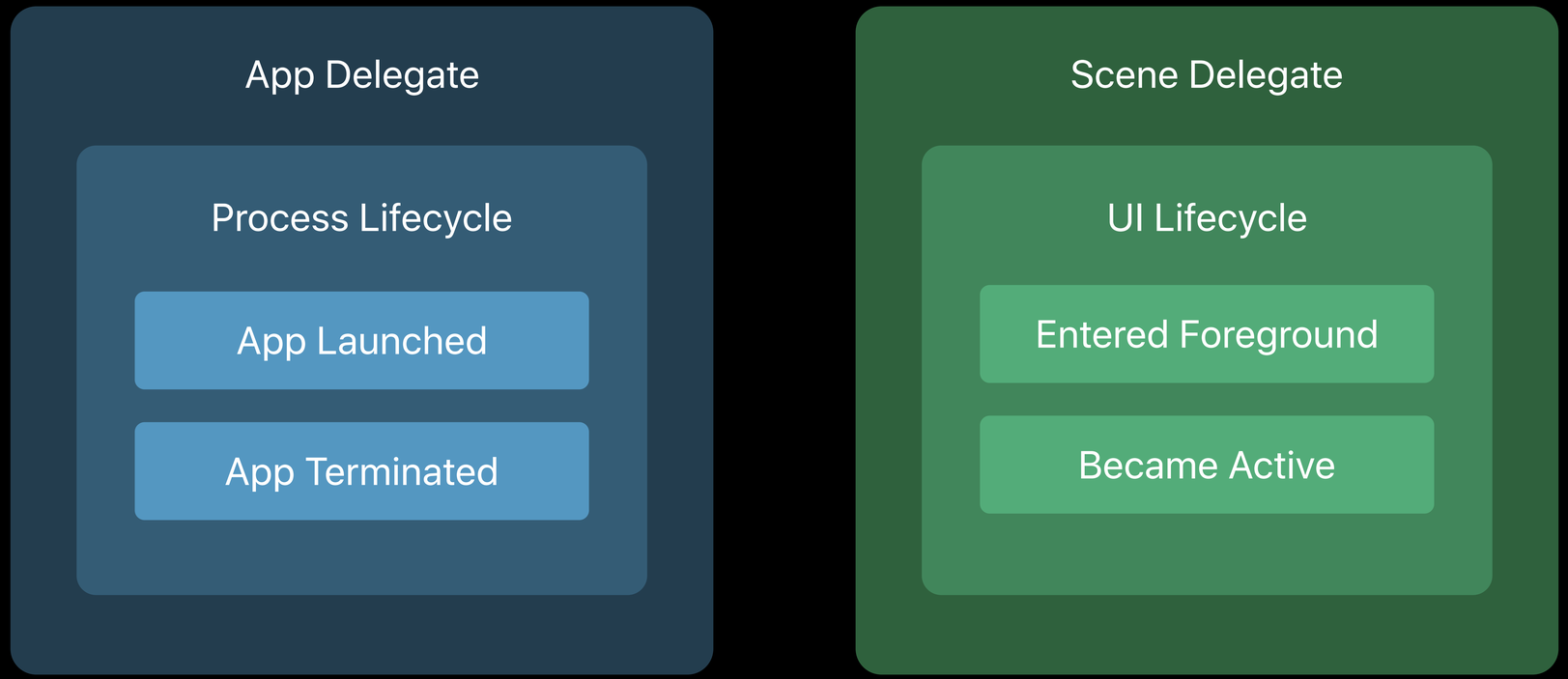
iOS 13

UIApplicationDelegate	UISceneDelegate
`application:willEnterForeground`	`scene:willEnterForeground`
`application:didEnterBackground`	`scene:didEnterBackground`
`application:willResignActive`	`scene:willResignActive`
`application:didBecomeActive`	`scene:didBecomeActive`

Session Lifecycle

iOS 13

NEW



Session Lifecycle

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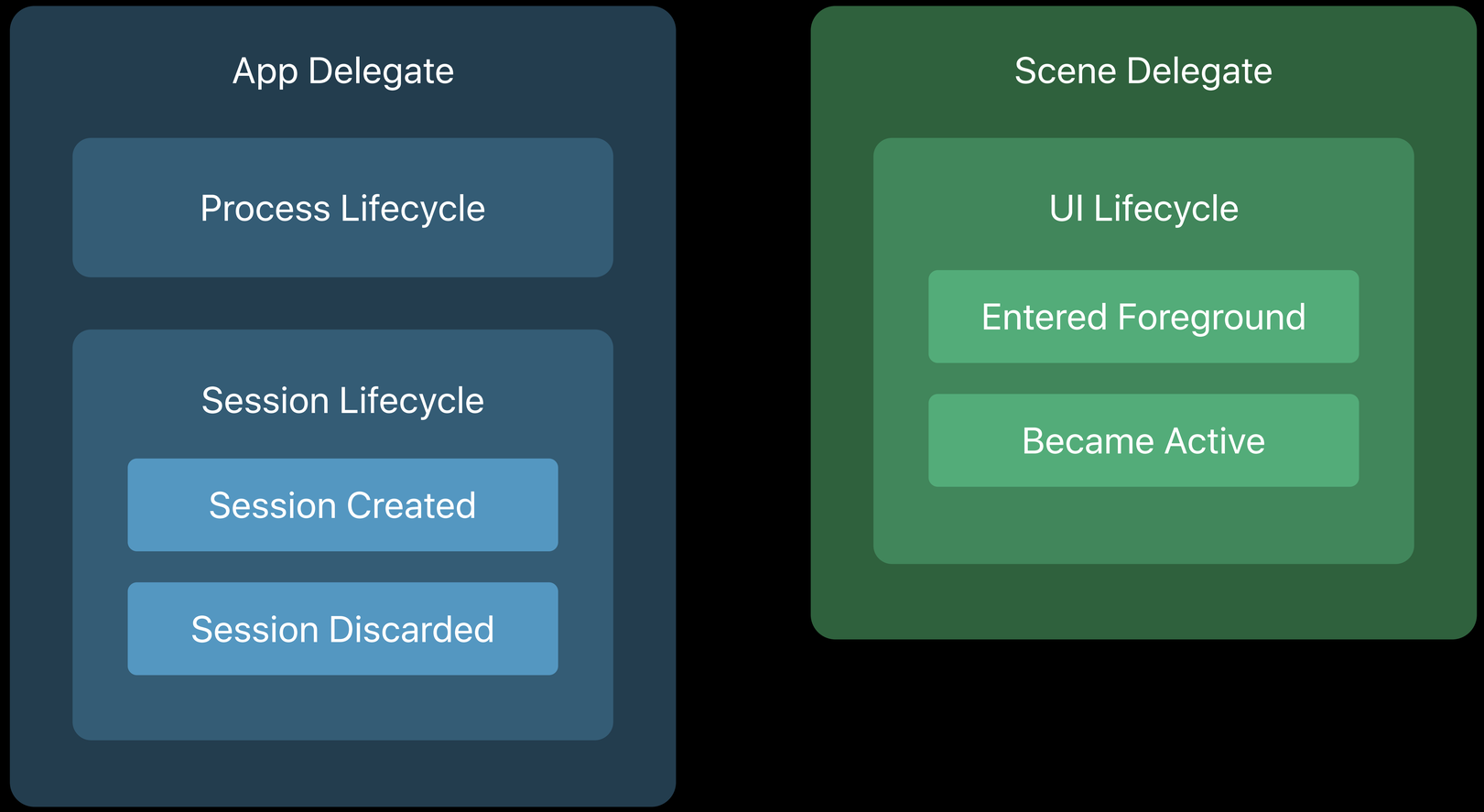

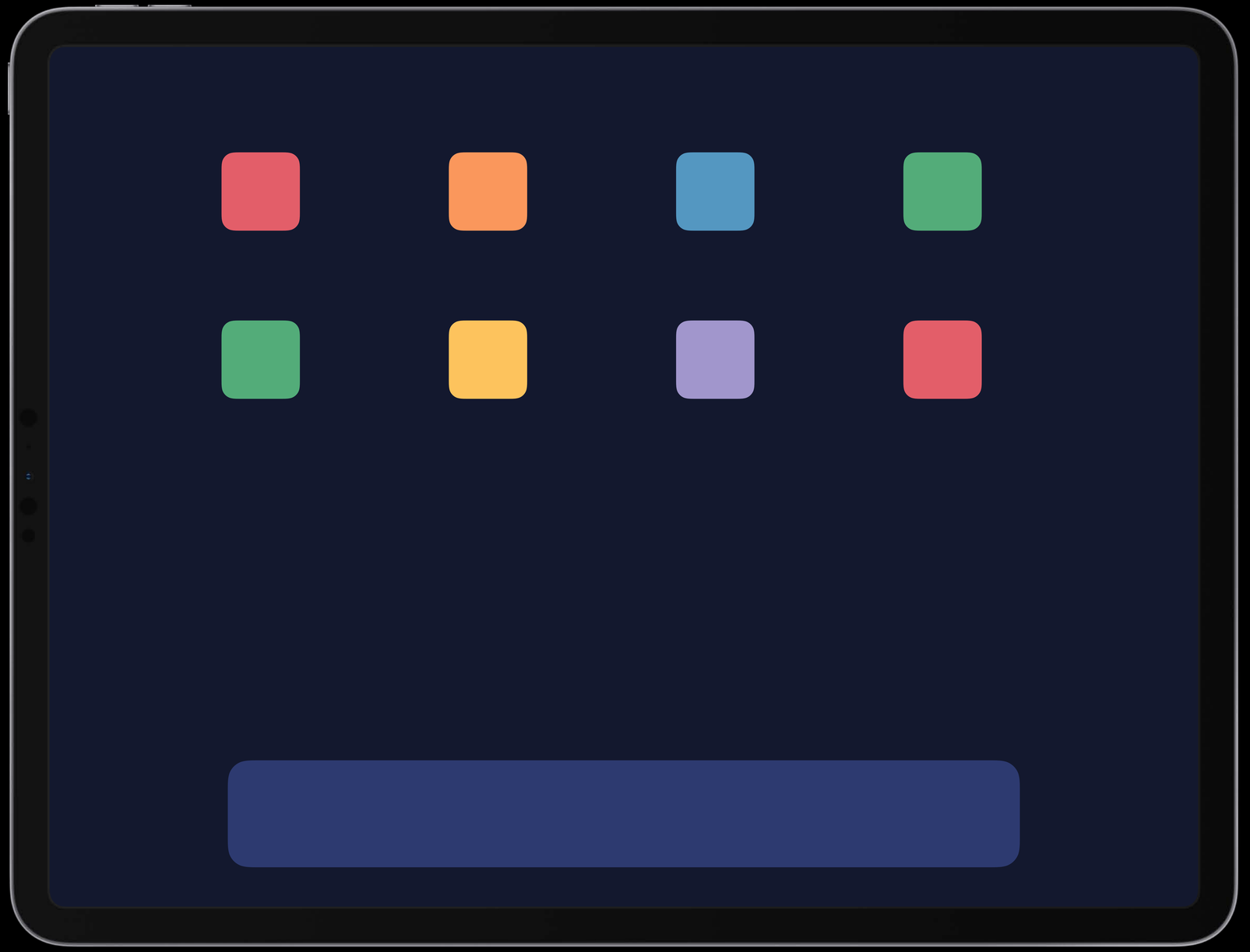

App Delegate

didFinishLaunching

App Delegate

didFinishLaunching

configurationForSession

Configuring New Sessions

```
func application(_ application: UIApplication,
                 configurationForConnecting connectingSceneSession: UISceneSession,
                 options: UIScene.ConnectionOptions) -> UISceneConfiguration
```

Select a scene *configuration*

Provides user activities, URLs

Static and dynamic definition

Configuring New Sessions

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func application(_ application: UIApplication,
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Select a scene *configuration*

Provides user activities, URLs

Static and dynamic definition

```swift
// Configuring incoming scenes

class AppDelegate: UIResponder, UIApplicationDelegate {

    func application(_ application: UIApplication,
                     configurationForConnecting connectingSceneSession: UISceneSession,
                     options: UIScene.ConnectionOptions) -> UISceneConfiguration {

        // First check the options...
        return UISceneConfiguration(name: "Default", sessionRole: connectingSceneSession.role)
    }

}
```

```
// Configuring incoming scenes

class AppDelegate: UIResponder, UIApplicationDelegate {

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    }

}
```

App Delegate

didFinishLaunching

configurationForSession

Scene Delegate

willConnectToSession

```
class SceneDelegate: UIResponder, UIWindowSceneDelegate {

    var window: UIWindow?

    func scene(_ scene: UIScene, willConnectTo session: UISceneSession,
options: .ConnectionOptions)

        window = UIWindow(windowScene: scene as! UIWindowScene)

        if let activity = options.userActivities.first ?? session.stateRestorationActivity {
            configure(window: window, with: activity)
        }

    }

}
```

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App Delegate

didFinishLaunching

configurationForSession

Scene Delegate

willConnectToSession

Scene Delegate

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Scene Delegate

willConnectToSession

willResignActive

didEnterBackground

Scene Delegate

willConnectToSession

willResignActive

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didDisconnect

Scene Disconnection

```
func sceneDidDisconnect(_ scene: UIScene)
```

System is releasing the scene

May be called any time

Release associated resources

The scene may return!

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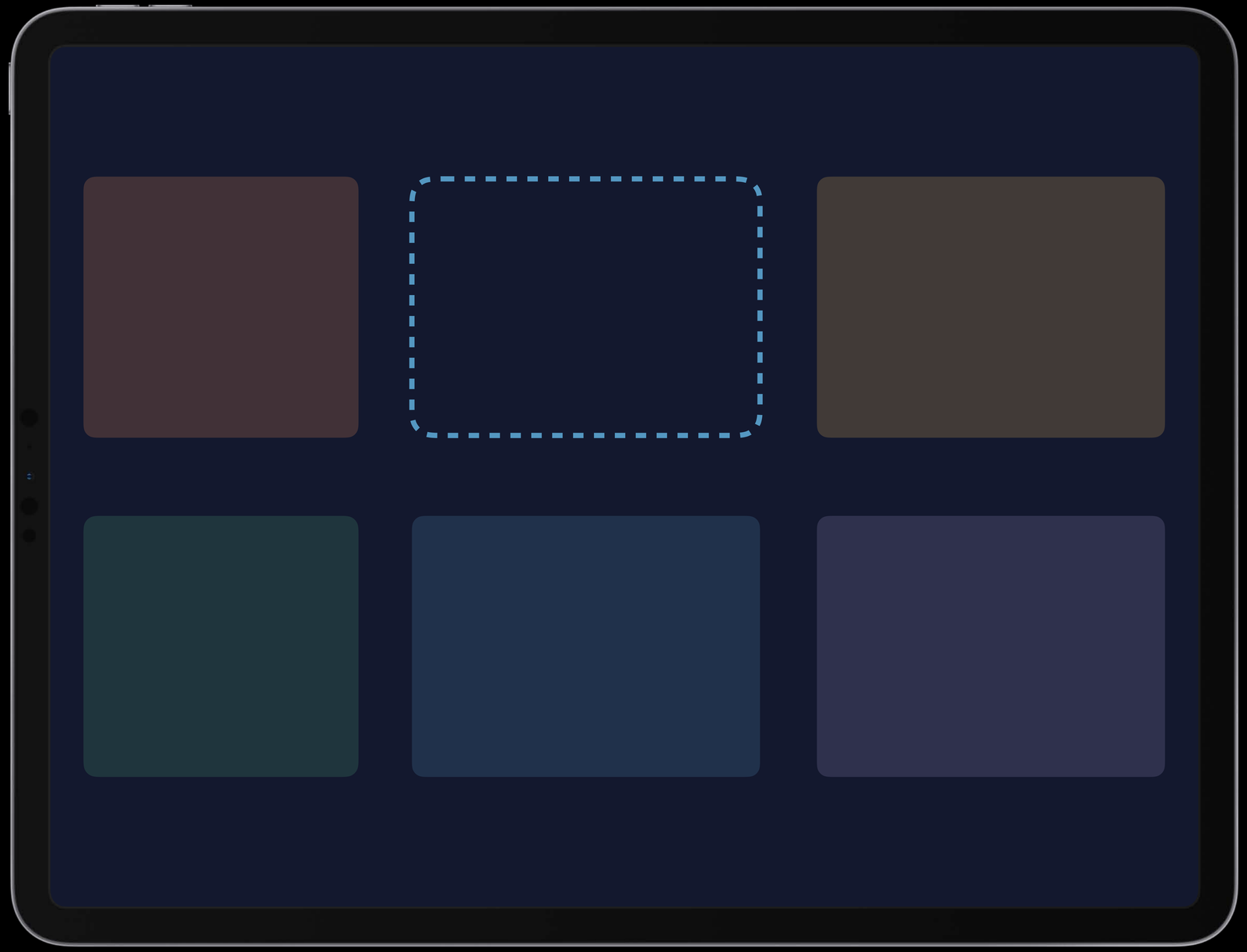

didEnterBackground

didDisconnect

App Delegate

didDiscardSceneSession

Cleaning up Discarded Sessions

```
func application(_ application: UIApplication,
                 didDiscardSceneSessions sceneSessions: Set<UISceneSession>)
```

For permanently discarded sessions

Delete associated data

May be called after next launch

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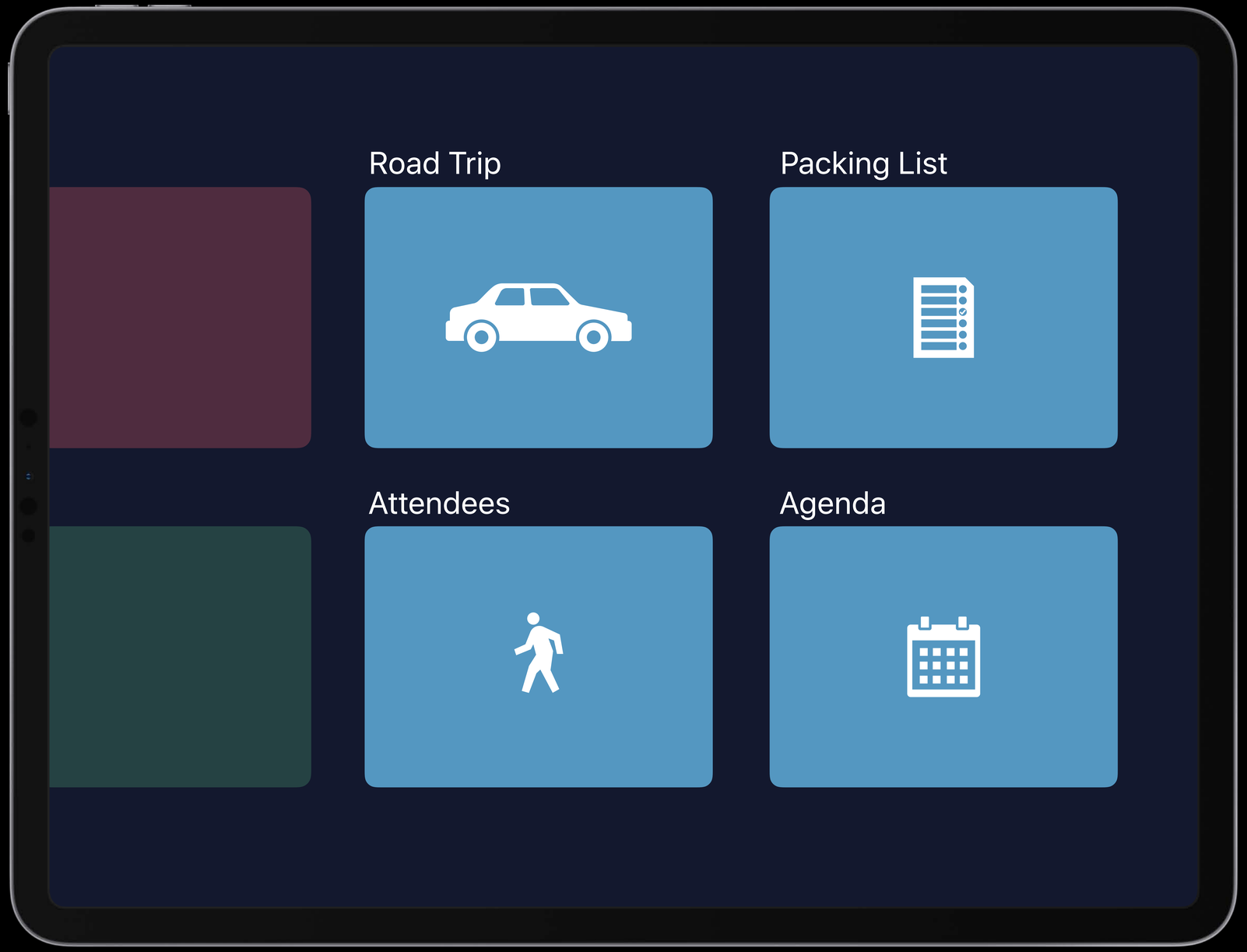
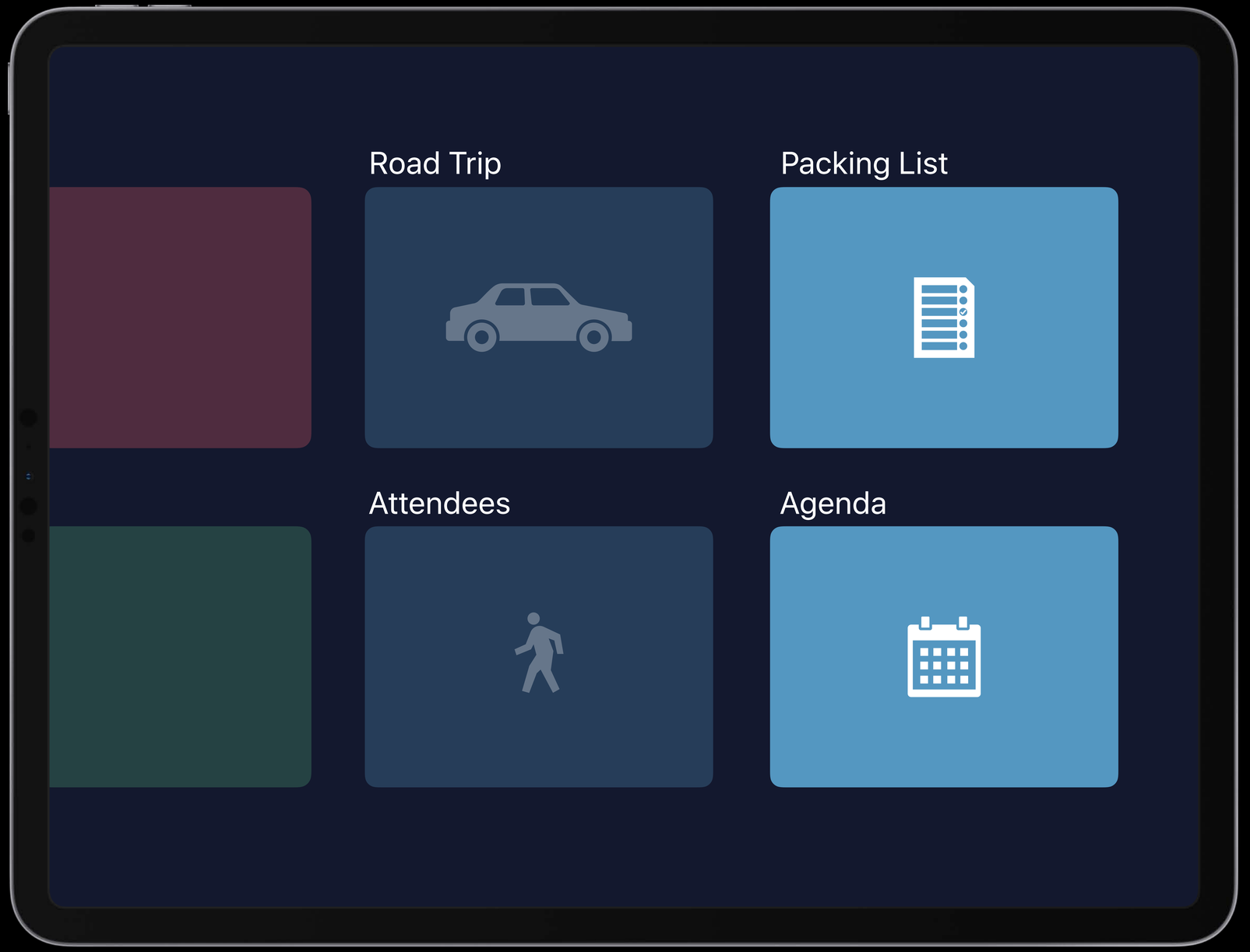
Changes to app lifecycle

Using the scene delegate

Architecture

State Restoration


Road Trip
Packing List
Attendees
Agenda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Per-Scene State Restoration

NEW

```
func stateRestorationActivity(for scene: UIScene) -> NSUserActivity?
```

Called on scene background

Encode state via NSUserActivity

Data protection

Per-Scene State Restoration

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func stateRestorationActivity(for scene: UIScene) -> NSUserActivity?
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Called on scene background

Encode state via NSUserActivity

Data protection

```
class SceneDelegate: UIResponder, UIWindowSceneDelegate {

   func stateRestorationActivity(for scene: UIScene) -> NSUserActivity? {
      let currentActivity = fetchCurrentUserActivity(for: self.window)
      return currentActivity
   }

   func scene(_ scene: UIScene, willConnectTo session: UISceneSession,
options: .ConnectionOptions)
      if let restorationActivity = session.stateRestorationActivity {
         self.configure(window: window, with: restorationActivity)
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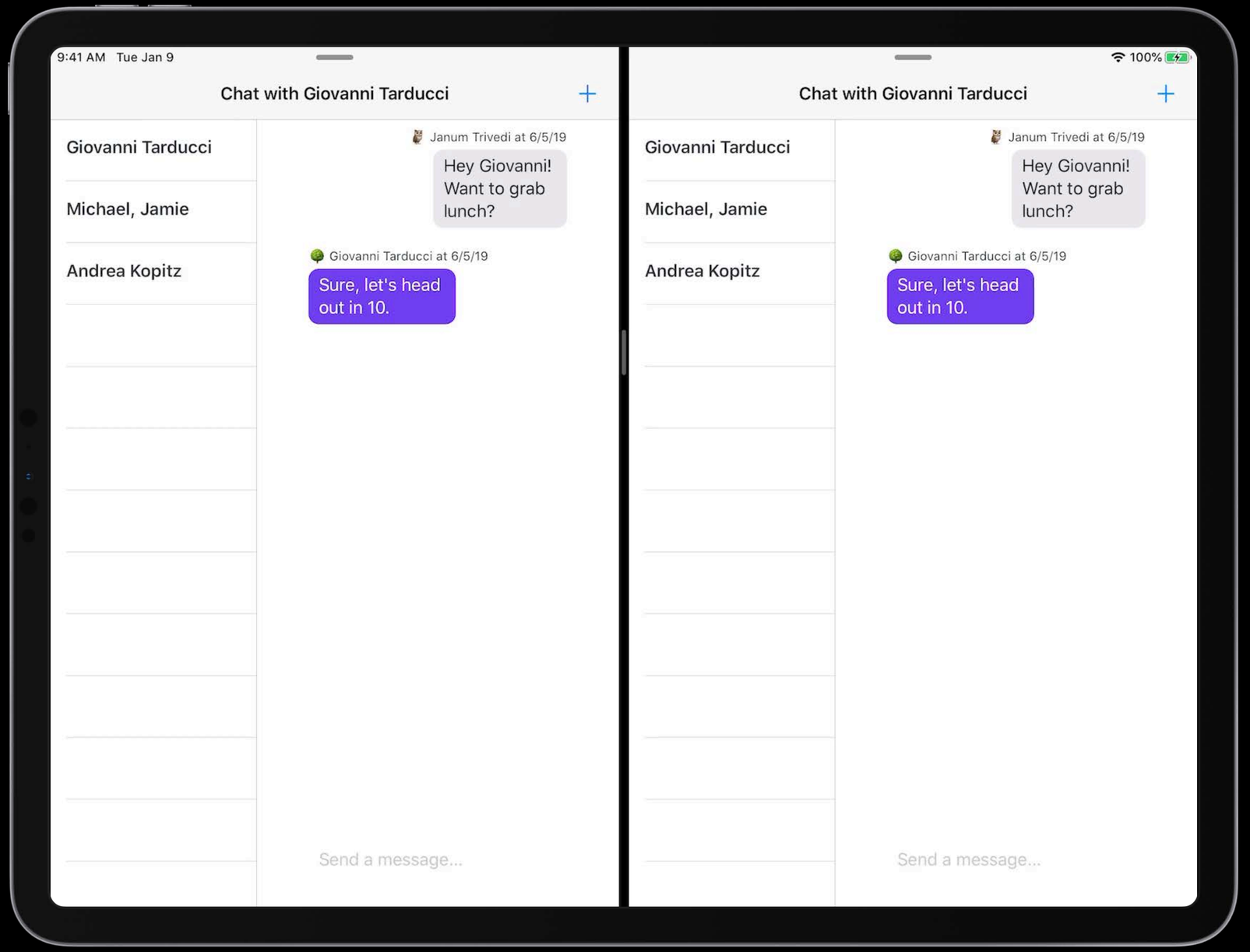
```

Keeping Scenes in Sync


9:41 AM Tue Jan 9
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Michael, Jamie
Andrea Kopitz
Janum Trivedi at 6/5/19
Hey Giovanni! Want to grab lunch?
Giovanni Tarducci at 6/5/19
Sure, let's head out in 10.
Send a message...
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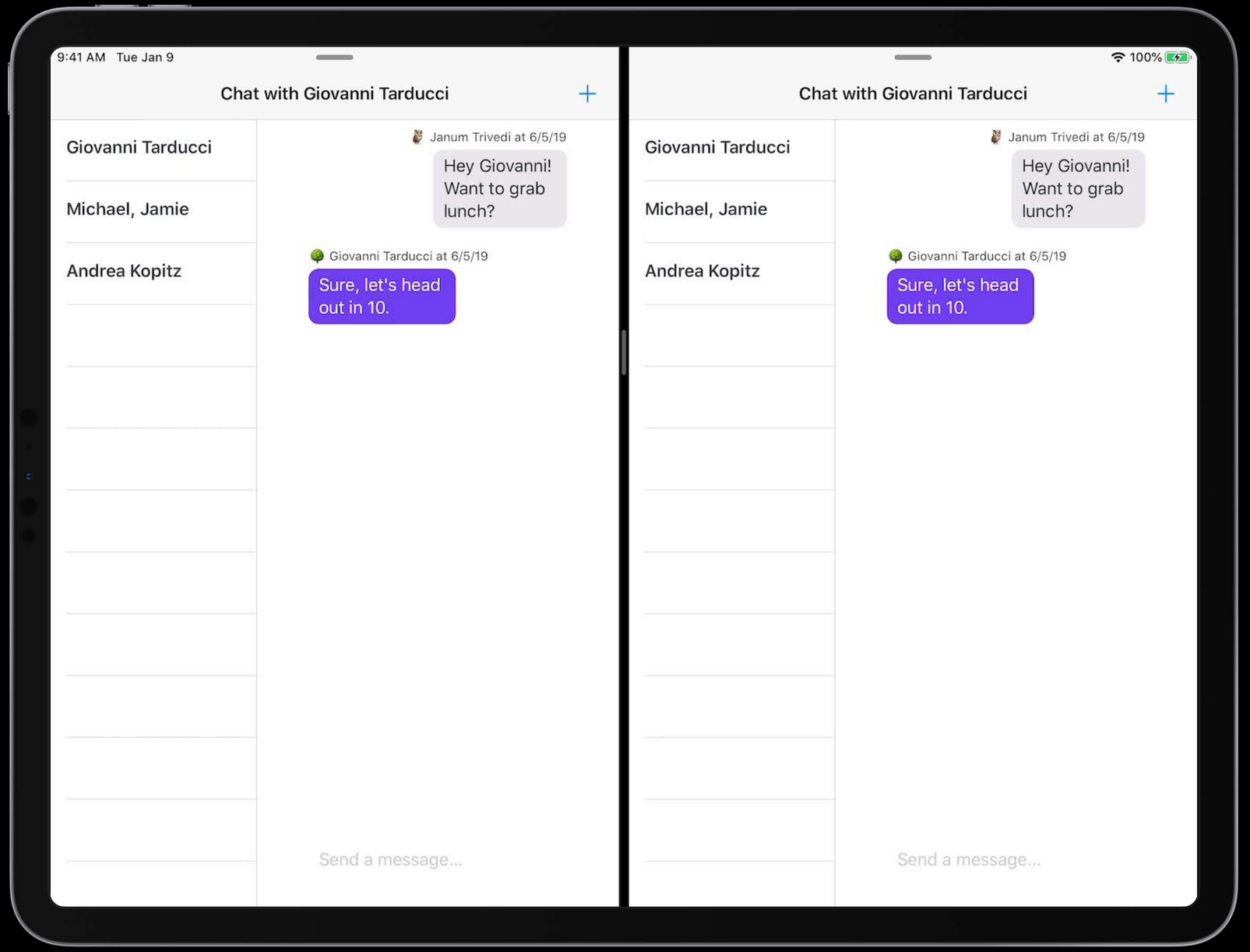
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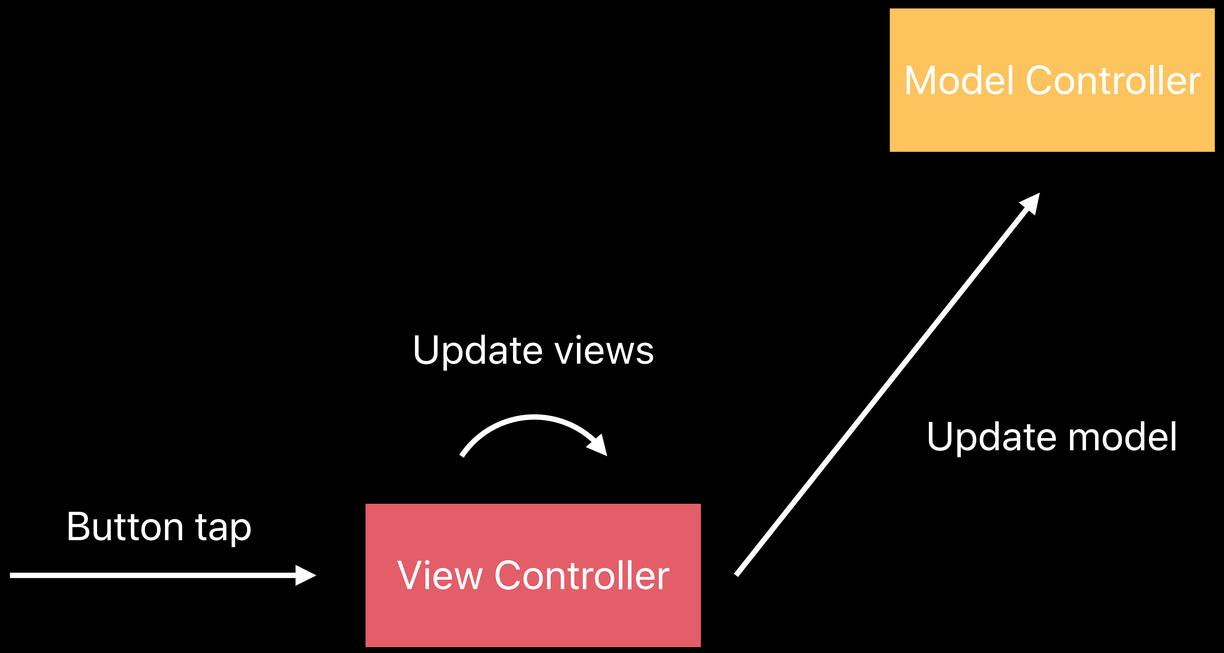
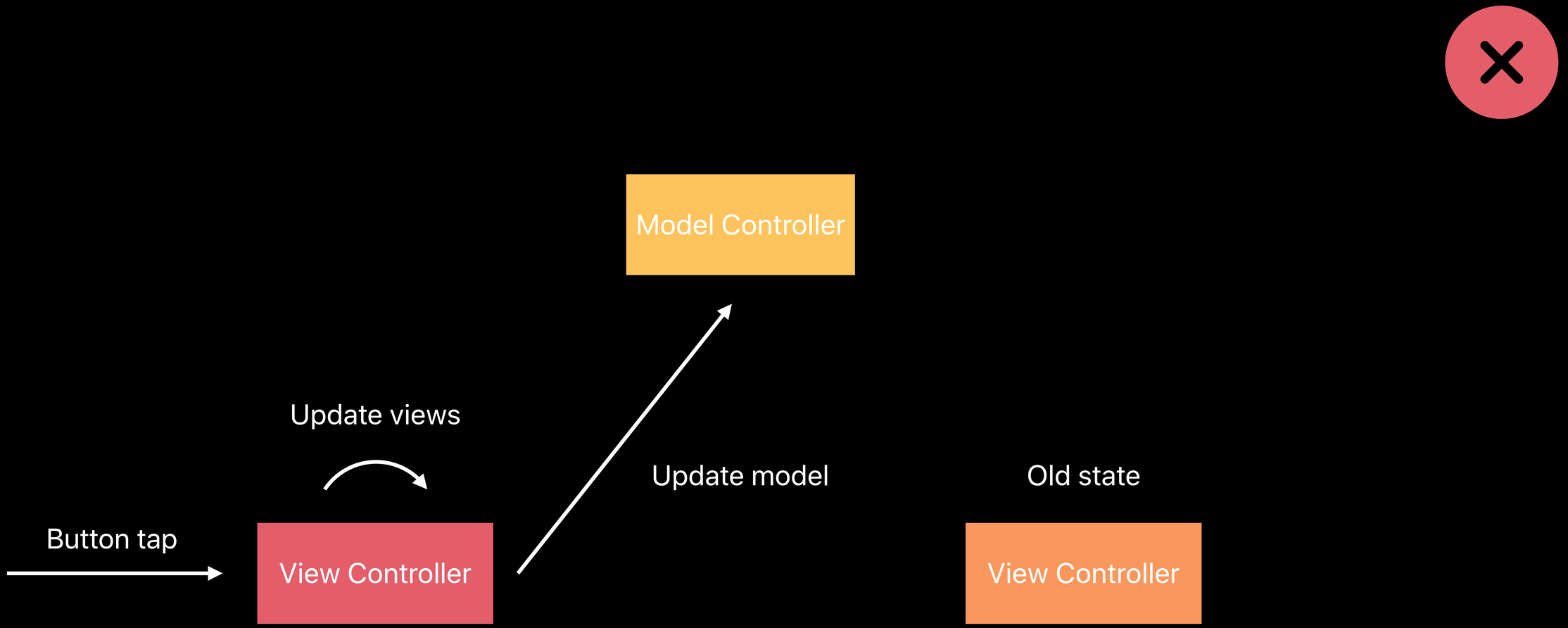
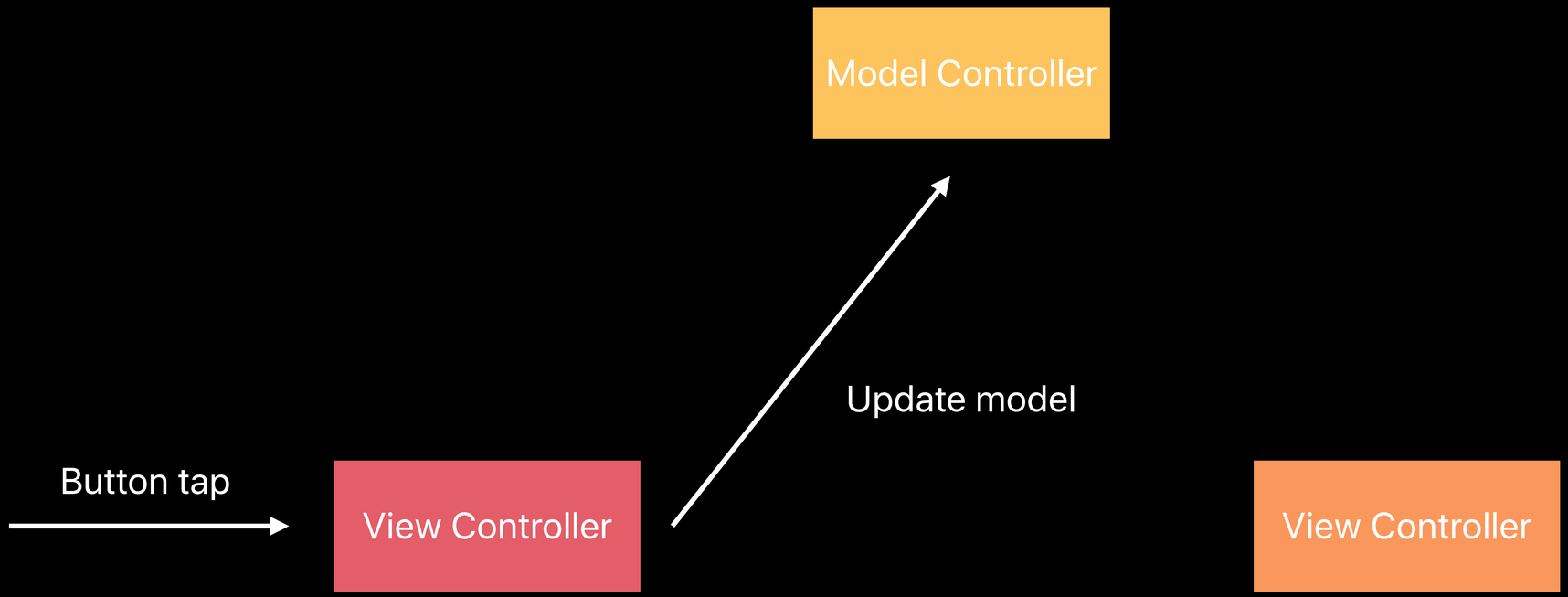

Model Controller
Update views
Update model
Button tap
View Controller


Model Controller
Update views
Update model
Old state
Button tap
View Controller
View Controller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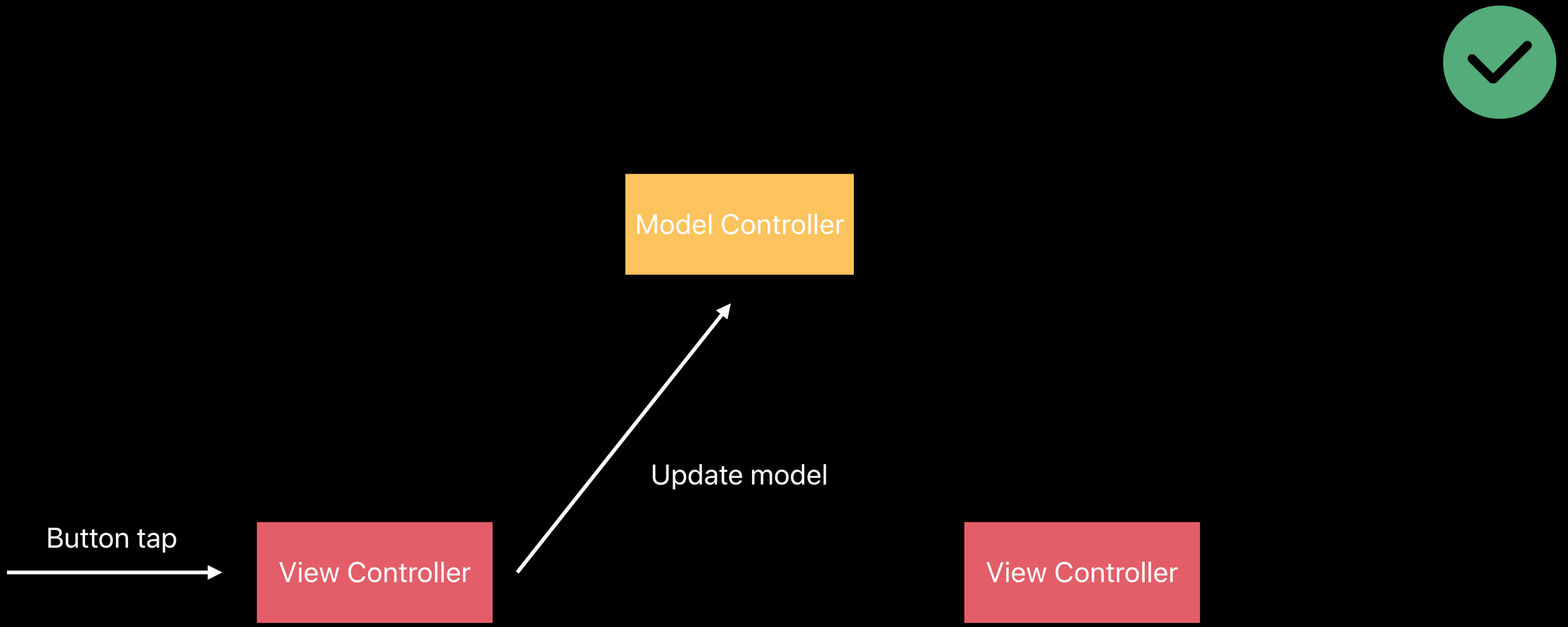
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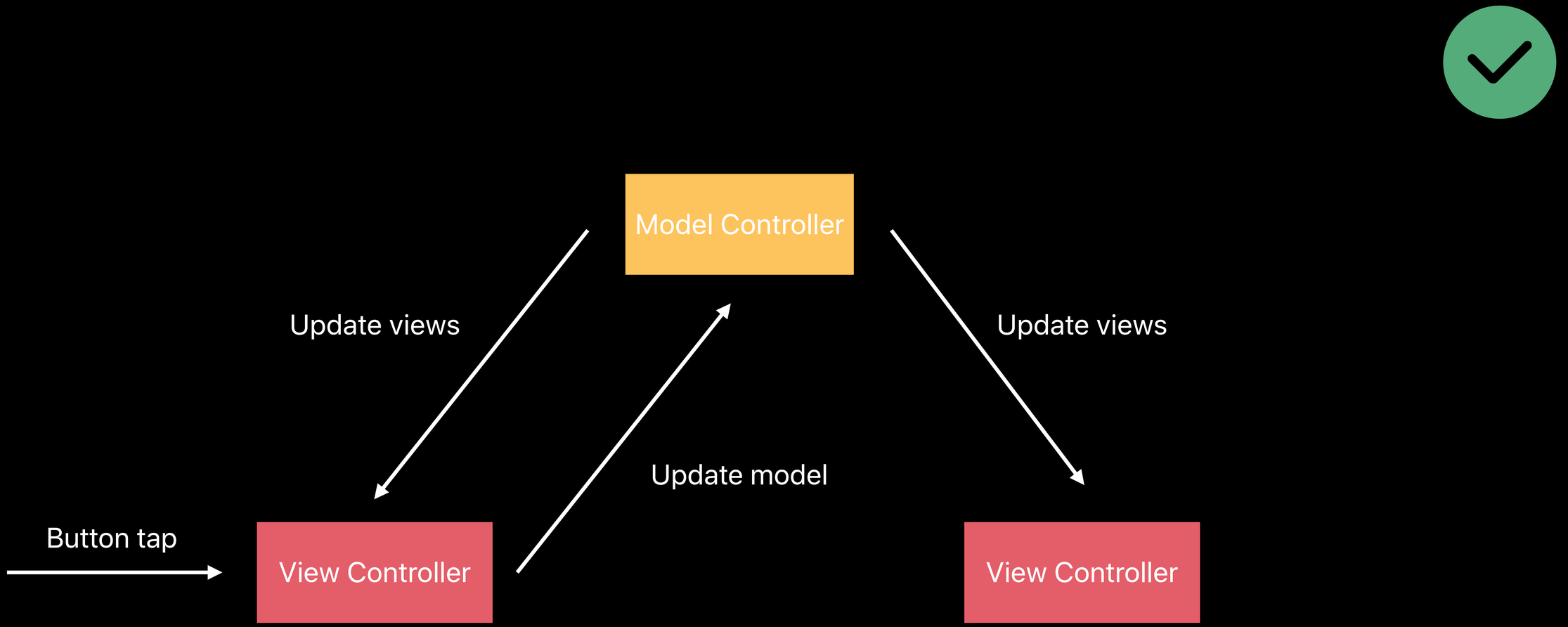
Model Controller
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```
class ChatViewController: UIViewController {

    @objc func didEnterMessage(sender: UITextField) {

        let message = Message(text: sender.text)

        // Update views
        self.animateNewRow(for: message)
        self.updateBadgeCount()

        // Update the model
        ChatModelController.shared.add(message: message)
    }

}
```

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    @objc func didEnterMessage(sender: UITextField) {

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        // Update the model
        ChatModelController.shared.add(message: message)
    }

}
```

```
class ChatModelController {

    static let shared = ChatModelController()

    func add(message: Message) {
        saveToDisk(message)
    }

}
```

How will we send the update down?

```
enum UpdateEvent {

}
```

```
enum UpdateEvent {
   case NewMessage(message: Message)
}
```

```
enum UpdateEvent {
   case NewMessage(message: Message)

   static let NewMessageNotificationName = Notification.Name(rawValue: "NewMessage")

   func post() {
      // Notify subscribers
   }

}
```

```swift
enum UpdateEvent {
    case NewMessage(message: Message)

    static let NewMessageNotificationName = Notification.Name(rawValue: "NewMessage")

    func post() {
        // Notify subscribers
        switch self {
        case .NewMessage(message: _): NotificationCenter.default.post(
                name: UpdateEvent.NewMessageNotificationName,
                object: self
            )
        }
    }

}
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class ChatModelController {

    static let shared = ChatModelController()

    func add(message: Message) {
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        let event = UpdateEvent.NewMessage(message: message)
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```

```
class ChatViewController: UIViewController {

   override func viewDidLoad() {
      NotificationCenter.default.addObserver(selector: ..., name: .NewMessageNotificationName)
   }

}
```

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```
class ChatViewController: UIViewController {

    override func viewDidLoad() {
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    }

    @objc func handle(notification: Notification) {
        let event = notification.object as! UpdateEvent

        switch event {
        case .NewMessage(message: newMessage):
            // Update the UI
            self.animateNewRow(for: newMessage)
            self.updateBadgeCount()
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    }

`
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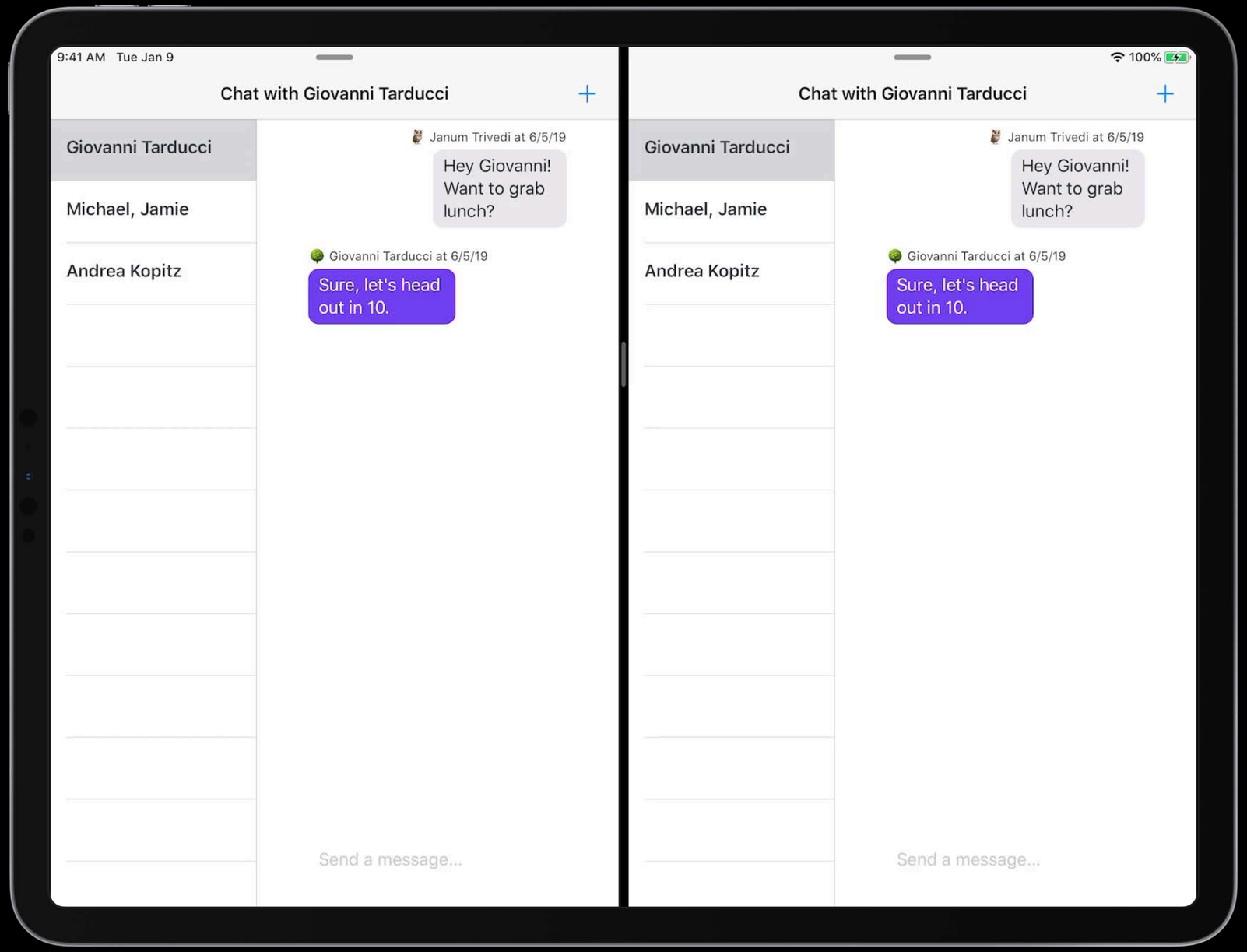
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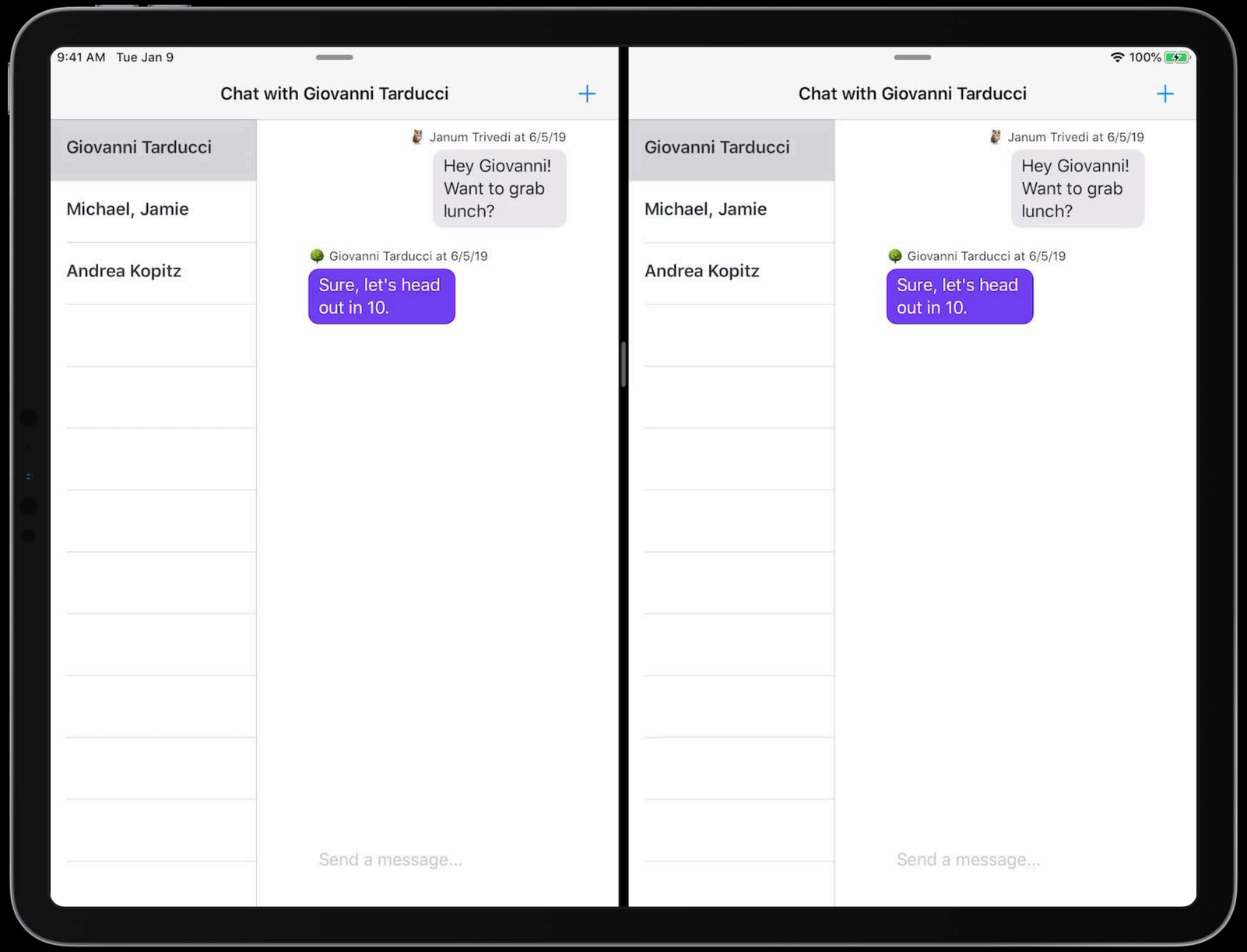
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Review

App vs. scene delegate

State restoration

Keeping scenes in sync

More Information

developer.apple.com/wwdc19/258


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