# Go Live with ReplayKit

Session 601

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# ReplayKit

Record app visuals and audio

Record microphone input

Share recordings

Simple API

# ReplayKit

HD quality

- Low performance impact
- Minimal power usage

Privacy safeguards

- User consent prompt
- Recording excludes system UI

Available since iOS 9

# ReplayKit

NEW

# ReplayKit

NEW

Apple TV support

# ReplayKit

NEW

Apple TV support

Live broadcasting

# ReplayKit

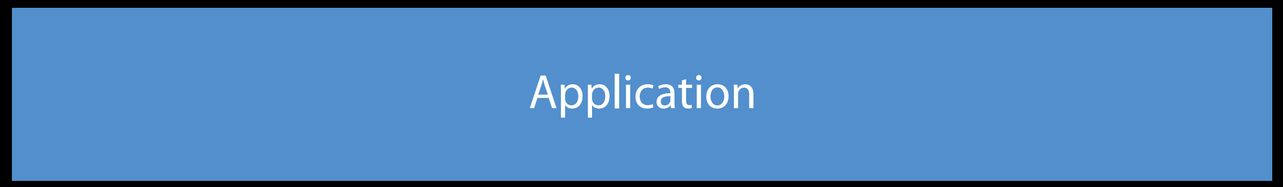
NEW

Apple TV support

Live broadcasting

Expanded commentary options

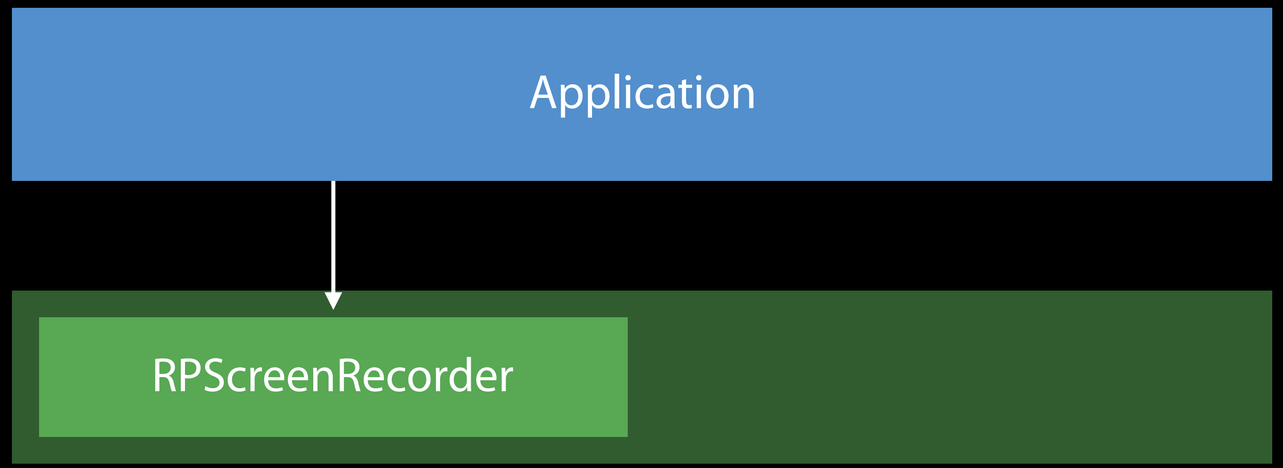
# ReplayKit Architecture



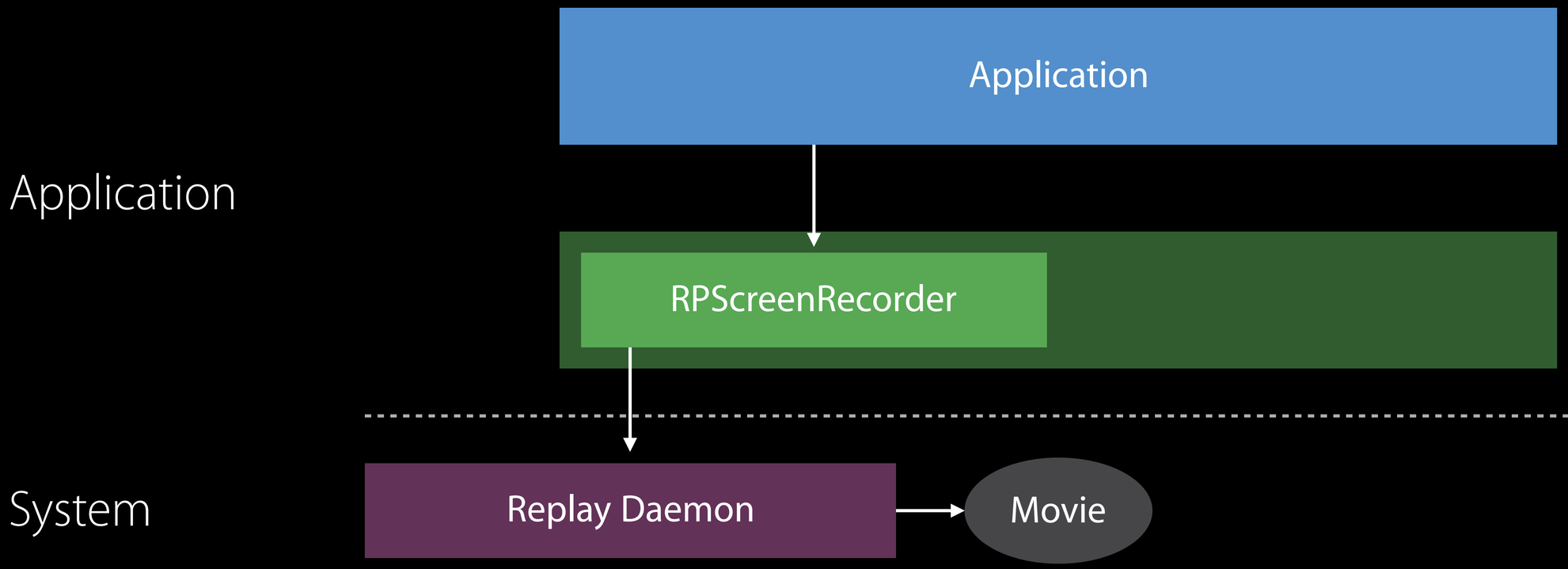

Application

# ReplayKit Architecture

Application

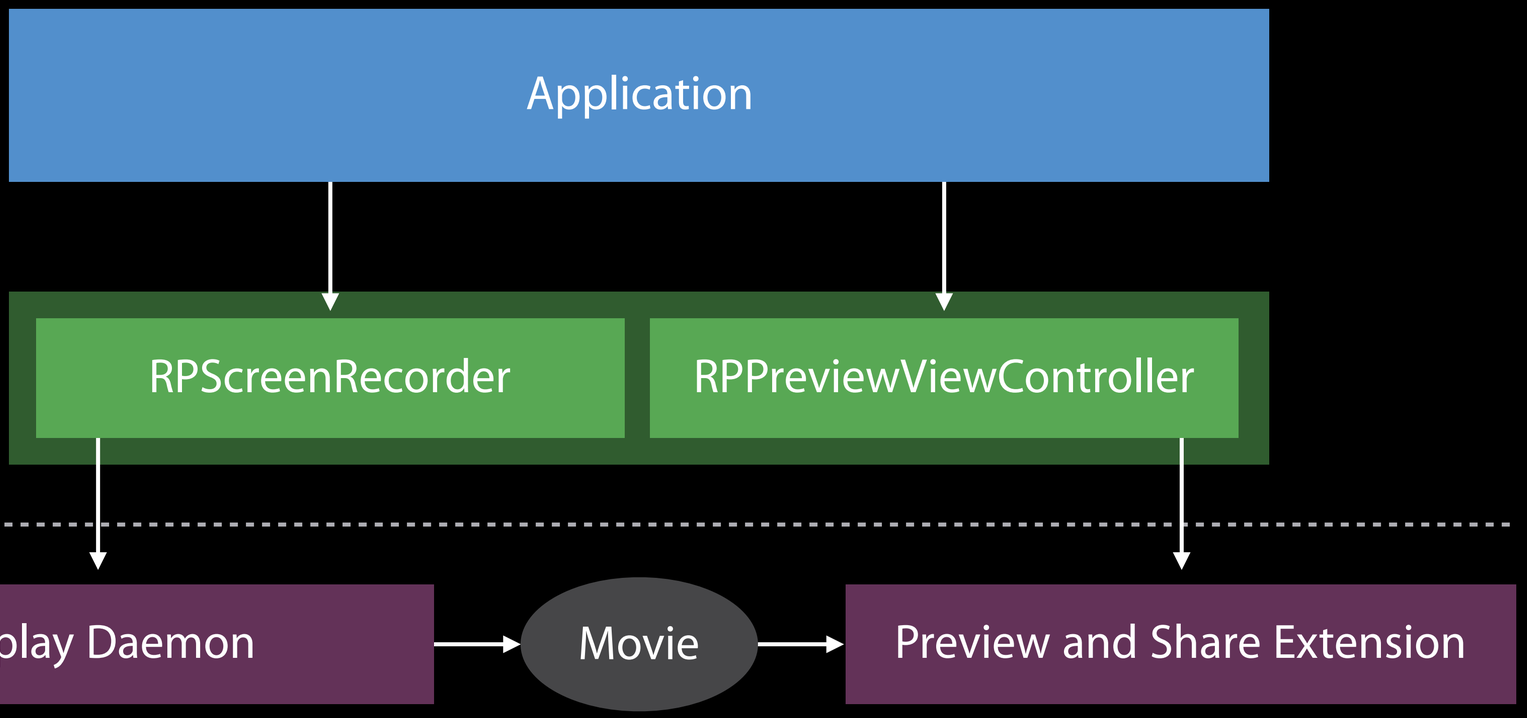


# ReplayKit Architecture



# ReplayKit Architecture

Application




System

# Classes and Protocols

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`RPScreenRecorder`

- Start, stop, discard recording
- Check availability to record

`RPScreenRecorderDelegate`

- Availability changes
- Recording stops

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`RPScreenRecorder`

- Start, stop, discard recording
- Check availability to record

`RPScreenRecorderDelegate`

- Availability changes
- Recording stops

`RPPreviewViewController`

- Preview the recording
- Edit and trim (iOS)
- Share

`RPPreviewViewControllerDelegate`

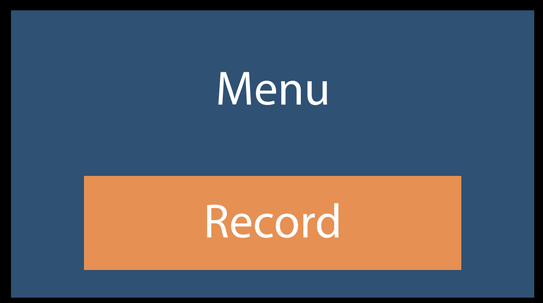
- Finished with preview user interface

# *Demo*

## ReplayKit on Apple TV

# ReplayKit on Apple TV

## From beginning to end



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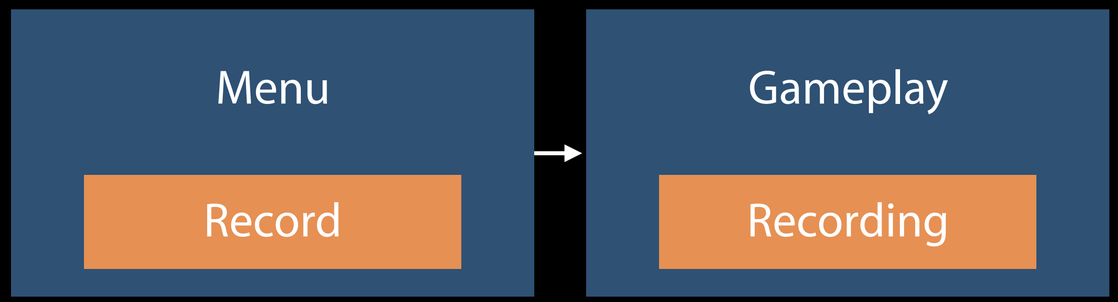

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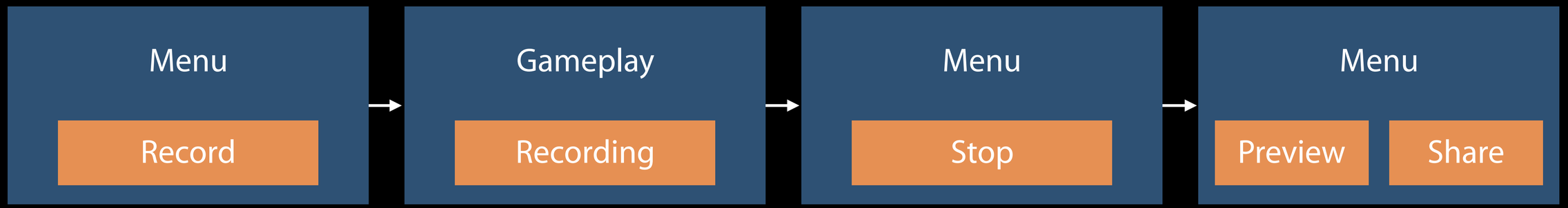

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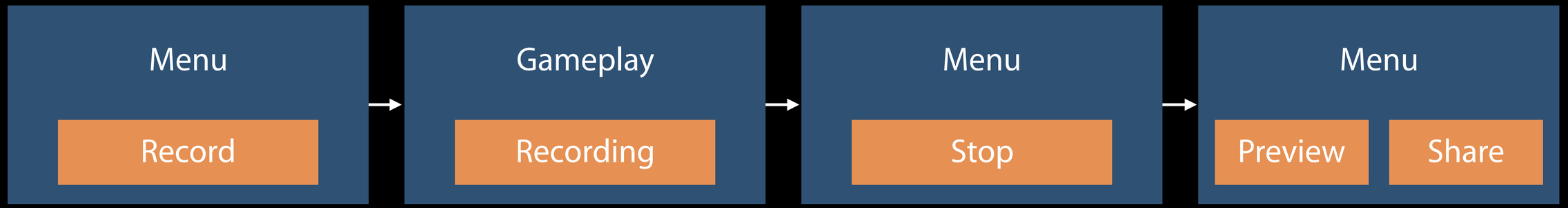

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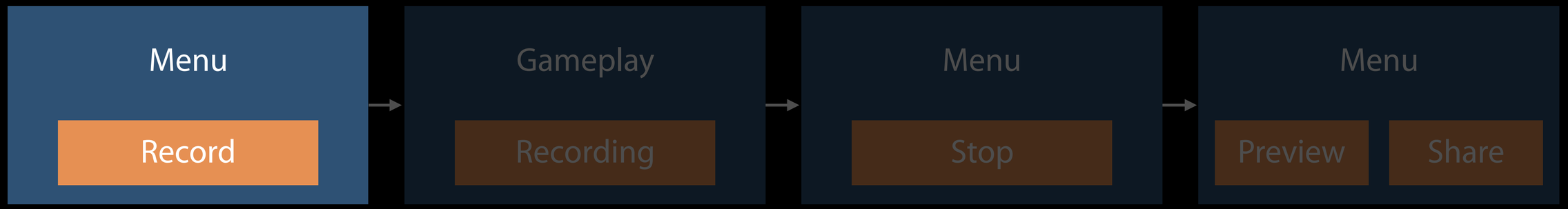
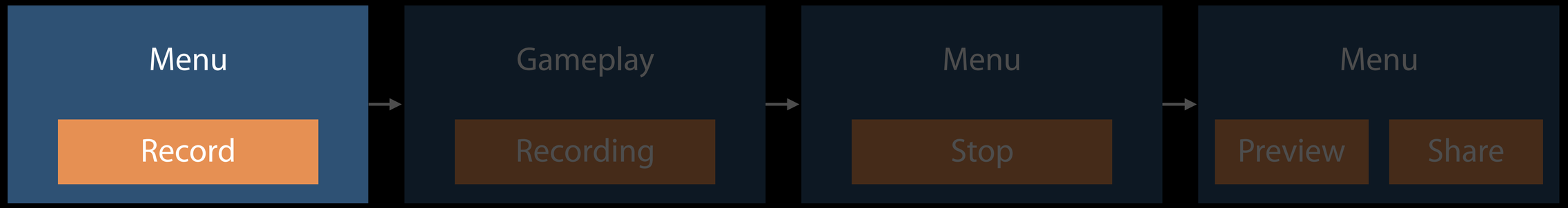



```
func didPressRecordButton() {
    let sharedRecorder = RPScreenRecorder.shared()

    sharedRecorder.startRecording { error in

        if error == nil {
            self.showIndicatorView(text: "Recording")
        }
    }
}
```

# Start Recording

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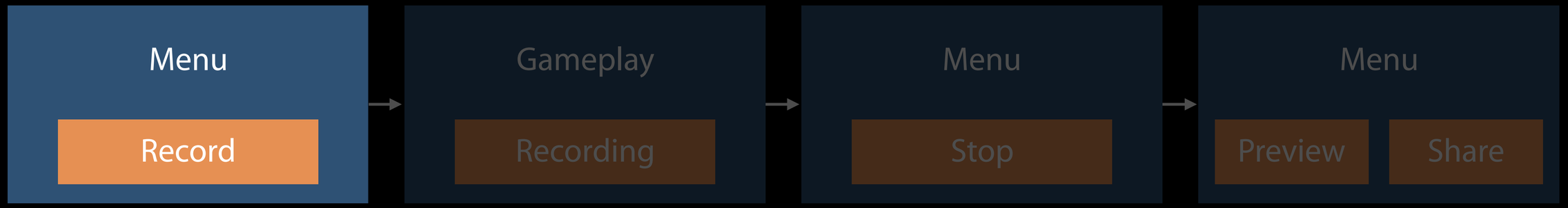


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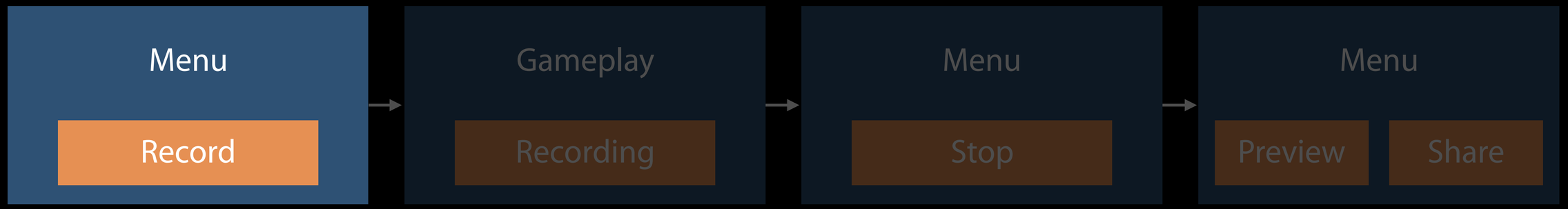


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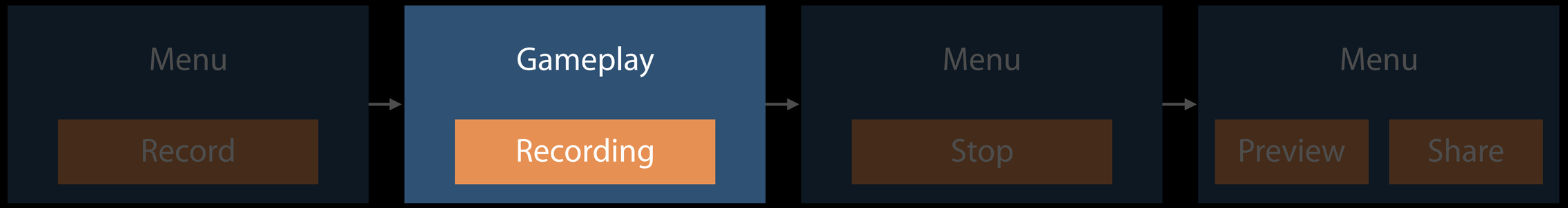
# Excluding UI



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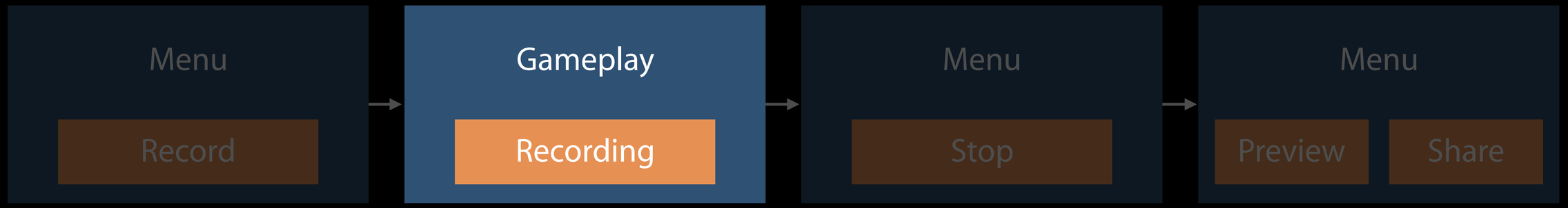


```
func showIndicatorView(text: String) {

    recordingIndicatorWindow = UIWindow(frame: UIScreen.main().bounds)
    recordingIndicatorWindow?.isHidden = false
    recordingIndicatorWindow?.backgroundColor = UIColor.clear()
    recordingIndicatorWindow?.isUserInteractionEnabled = false

    let indicatorView = IndicatorView(text: text)
    recordingIndicatorWindow?.addSubview(indicatorView)
}
```

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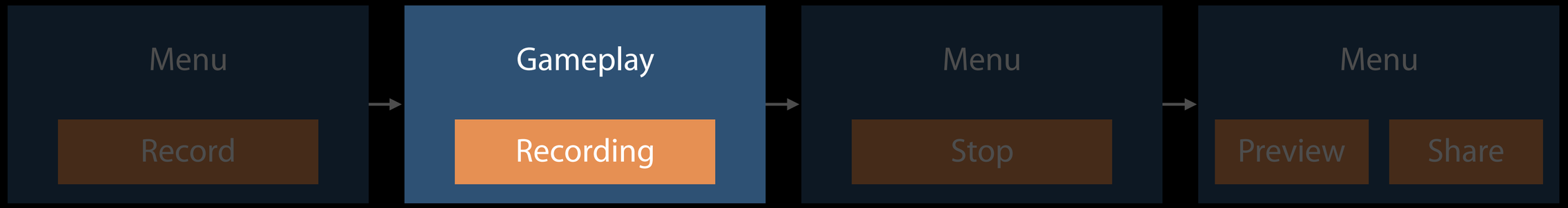


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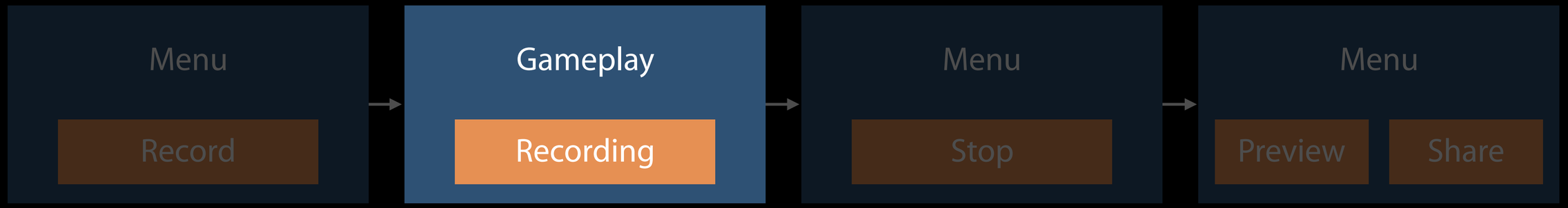


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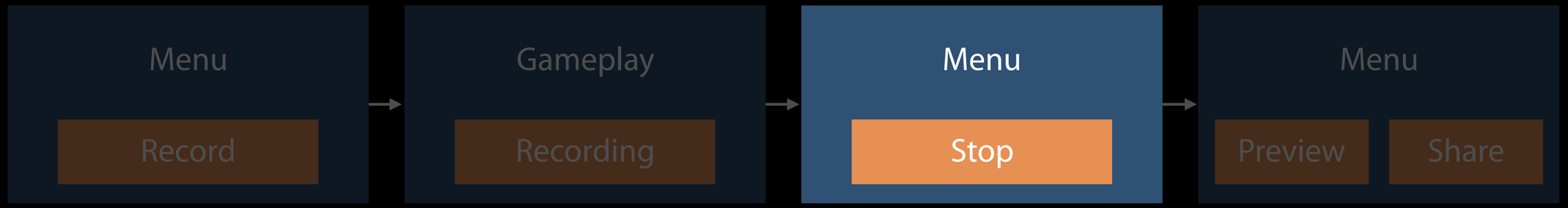

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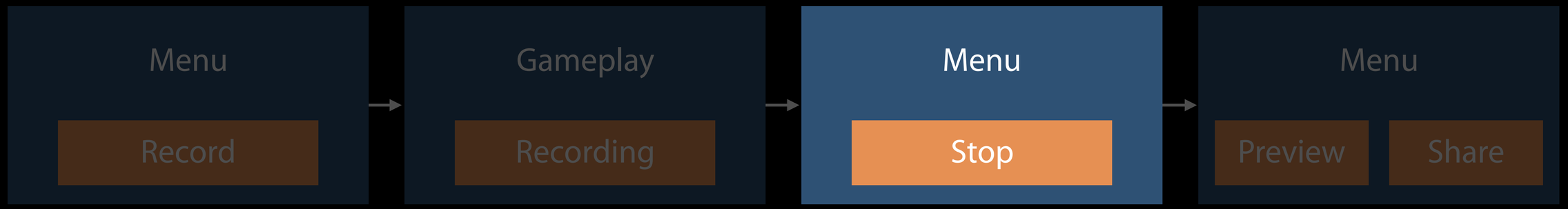


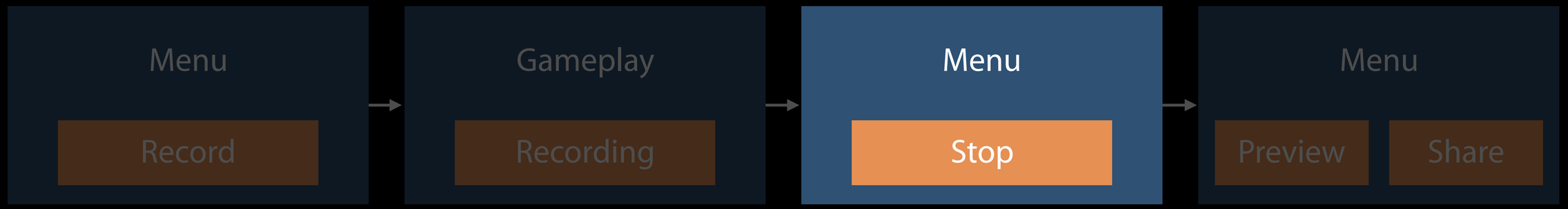

```
func didPressStopButton() {

    sharedRecorder.stopRecording { previewViewController, error in

        self.hideIndicatorView()

        if error == nil {
            self.previewViewController = previewViewController
            self.previewViewController?.previewControllerDelegate = self
        }
    }
}
```

# Stop Recording

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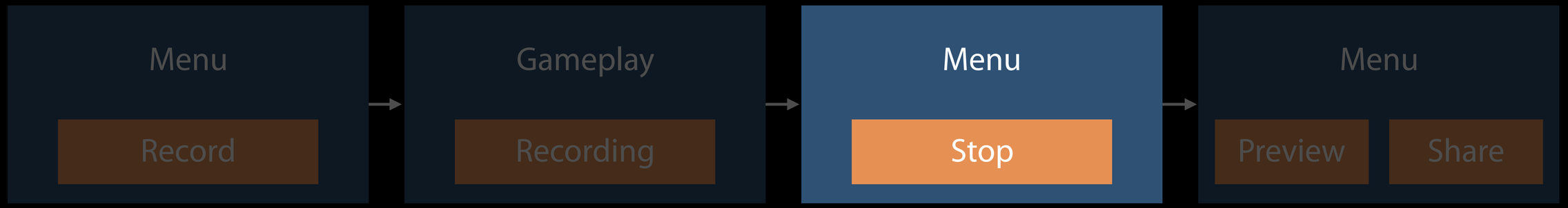


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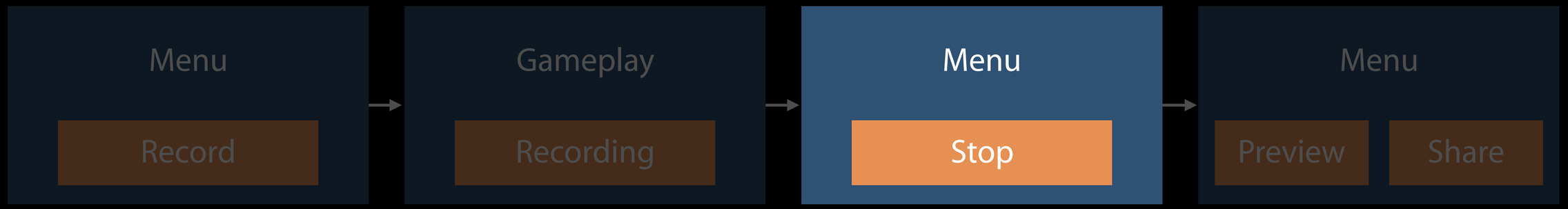


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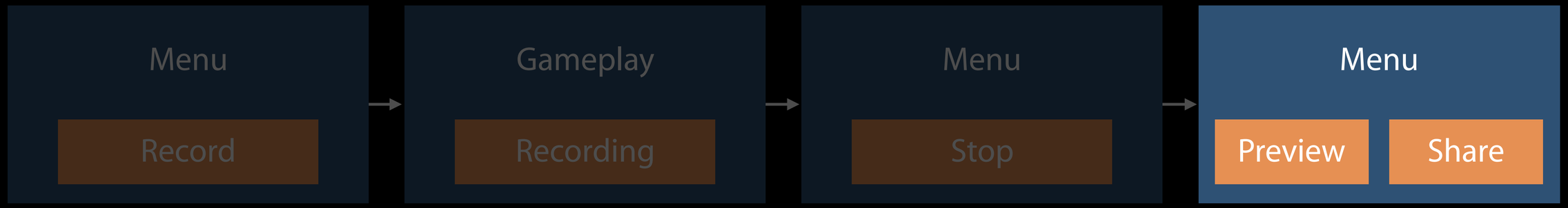

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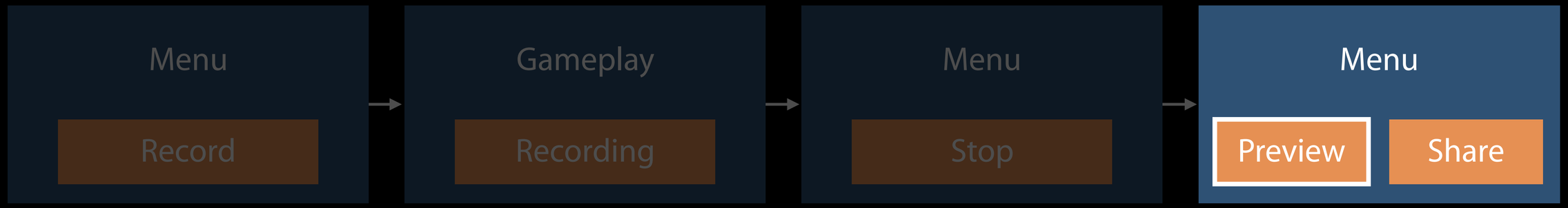

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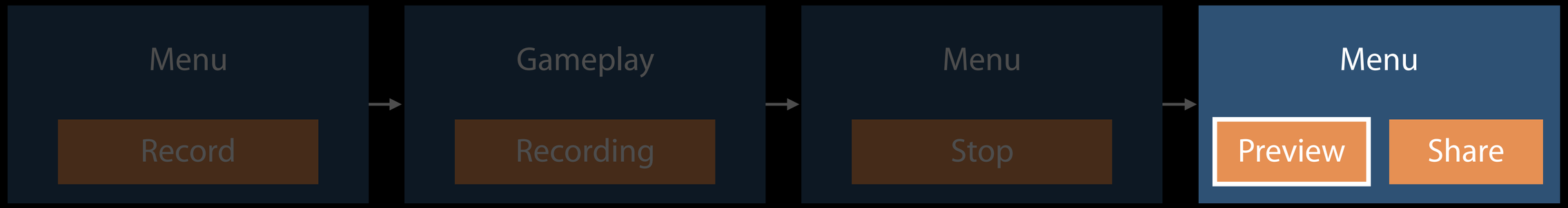
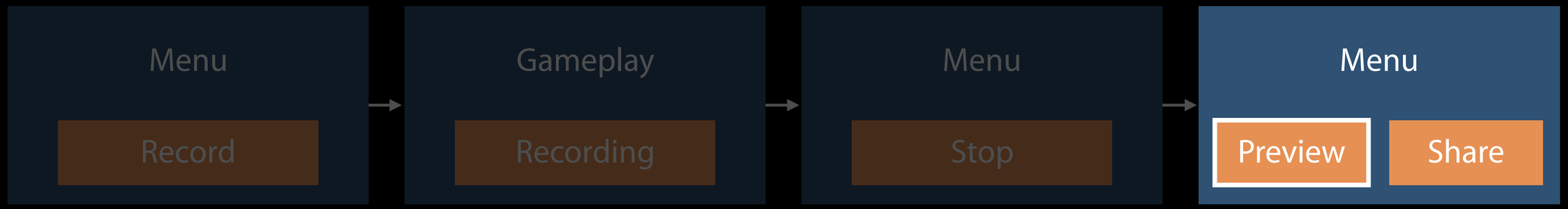



```
// RPPreviewViewController
public var mode: RPPreviewViewControllerMode
```

# Preview Recording

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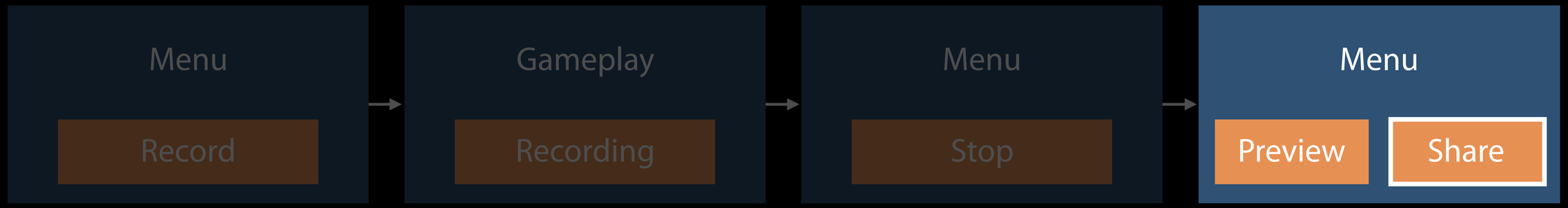
// RPPreviewViewController
public var mode: RPPreviewViewControllerMode
```

```
func didPressPreviewButton() {
    if let preview = previewViewController {
        preview.mode = .preview
        self.present(preview, animated: true)
    }
}
```

# Share Recording



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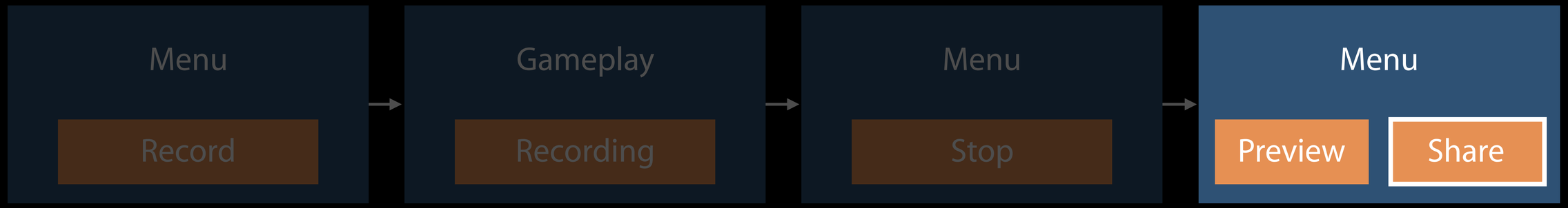


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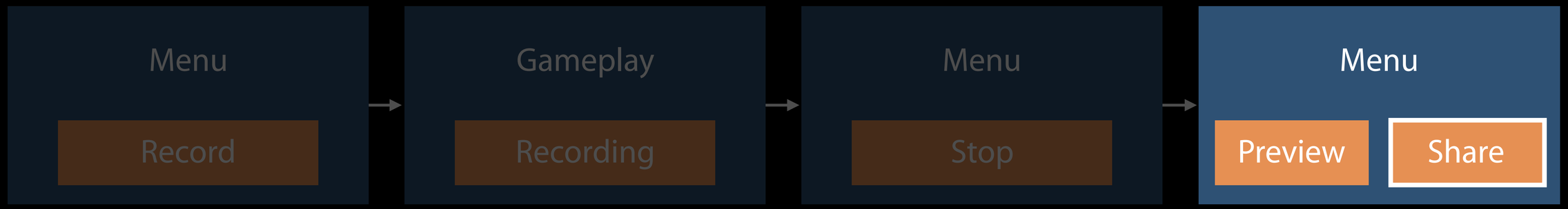
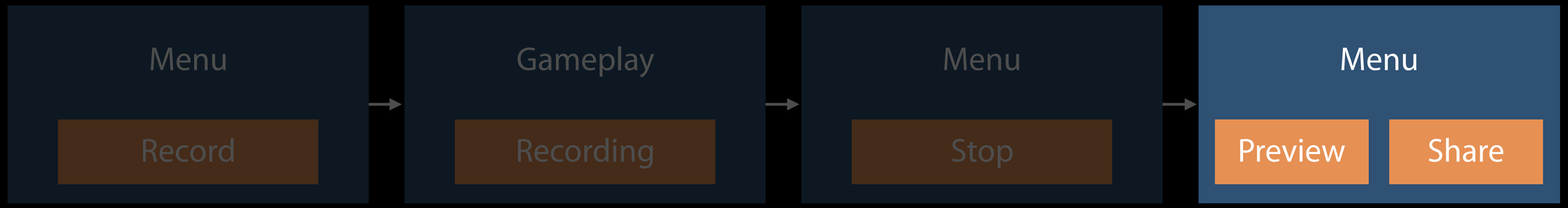



```
// RPPreviewViewController
public var mode: RPPreviewViewControllerMode
```

```
func didPressShareButton() {
    if let preview = previewViewController {
        preview.mode = .share
        self.present(preview, animated: true)
    }
}
```

# Dismissing Preview UI



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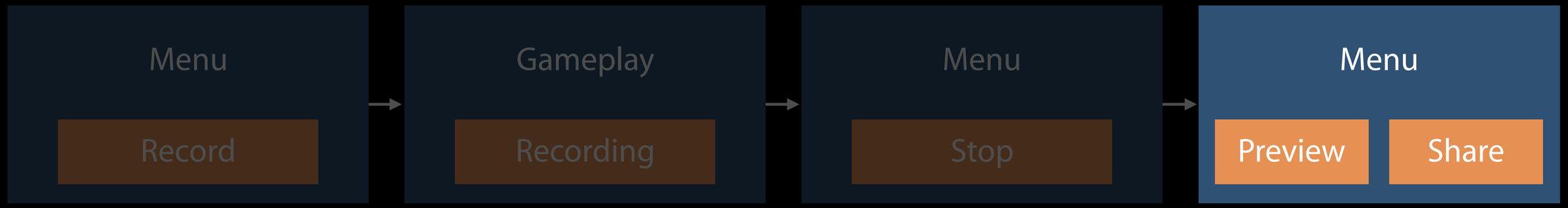



```
// RPPreviewViewControllerDelegate
func previewControllerDidFinish(_ previewController: RPPreviewViewController) {
    previewController.dismiss(animated: true)
}
```

# Discarding the Recording

Automatically discarded when new recording starts

- One recording allowed at a time, per app

Discard when preview no longer available

- Use discardRecording()

# ReplayKit on Apple TV

Record your app video and audio content

- Microphone reserved by system

Preview and share the recording

Same simple API as iOS

New in tvOS 10

# Live Broadcast

Edwin Iskandar Software Engineer

# Live Broadcast

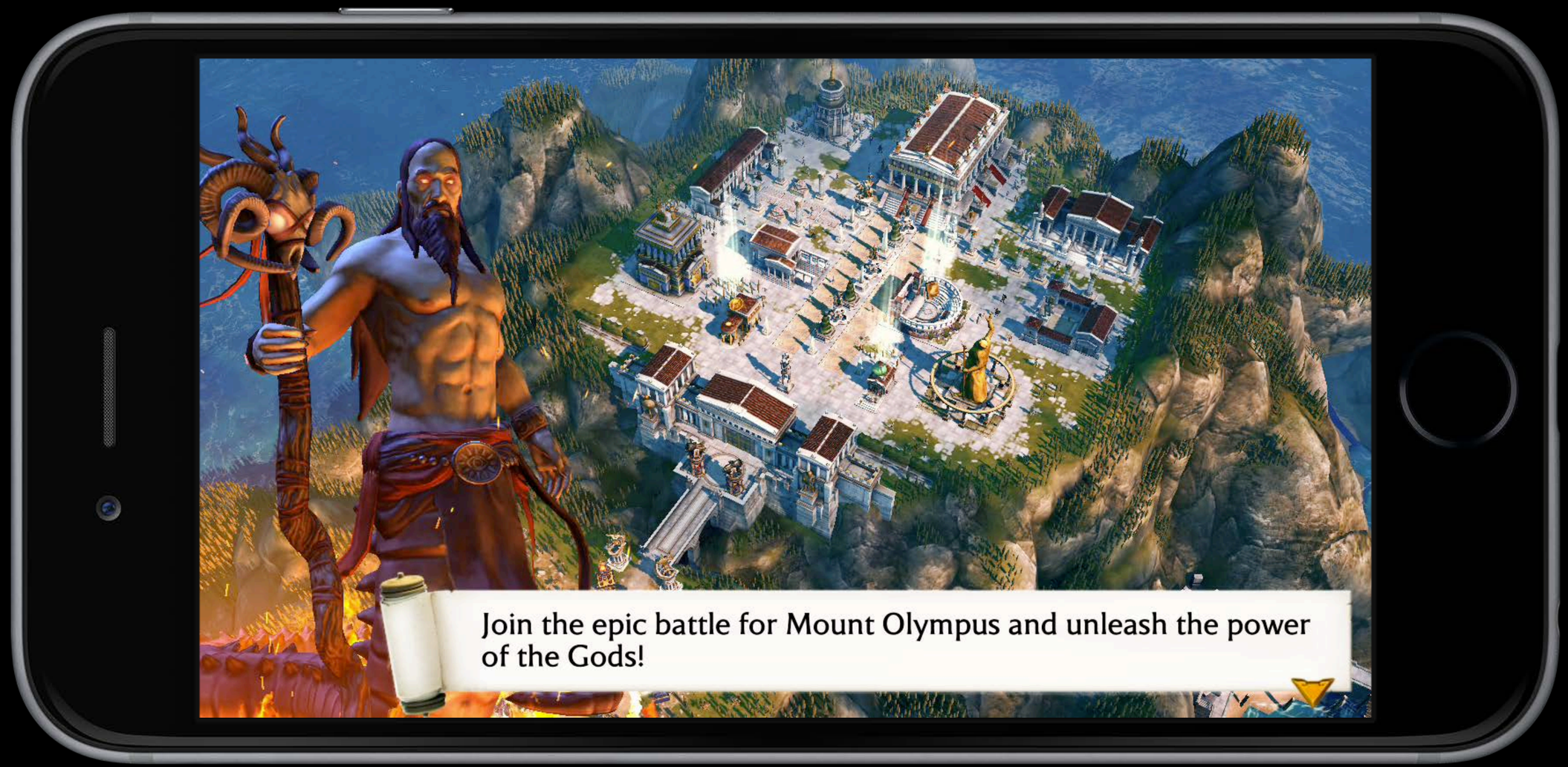
NEW

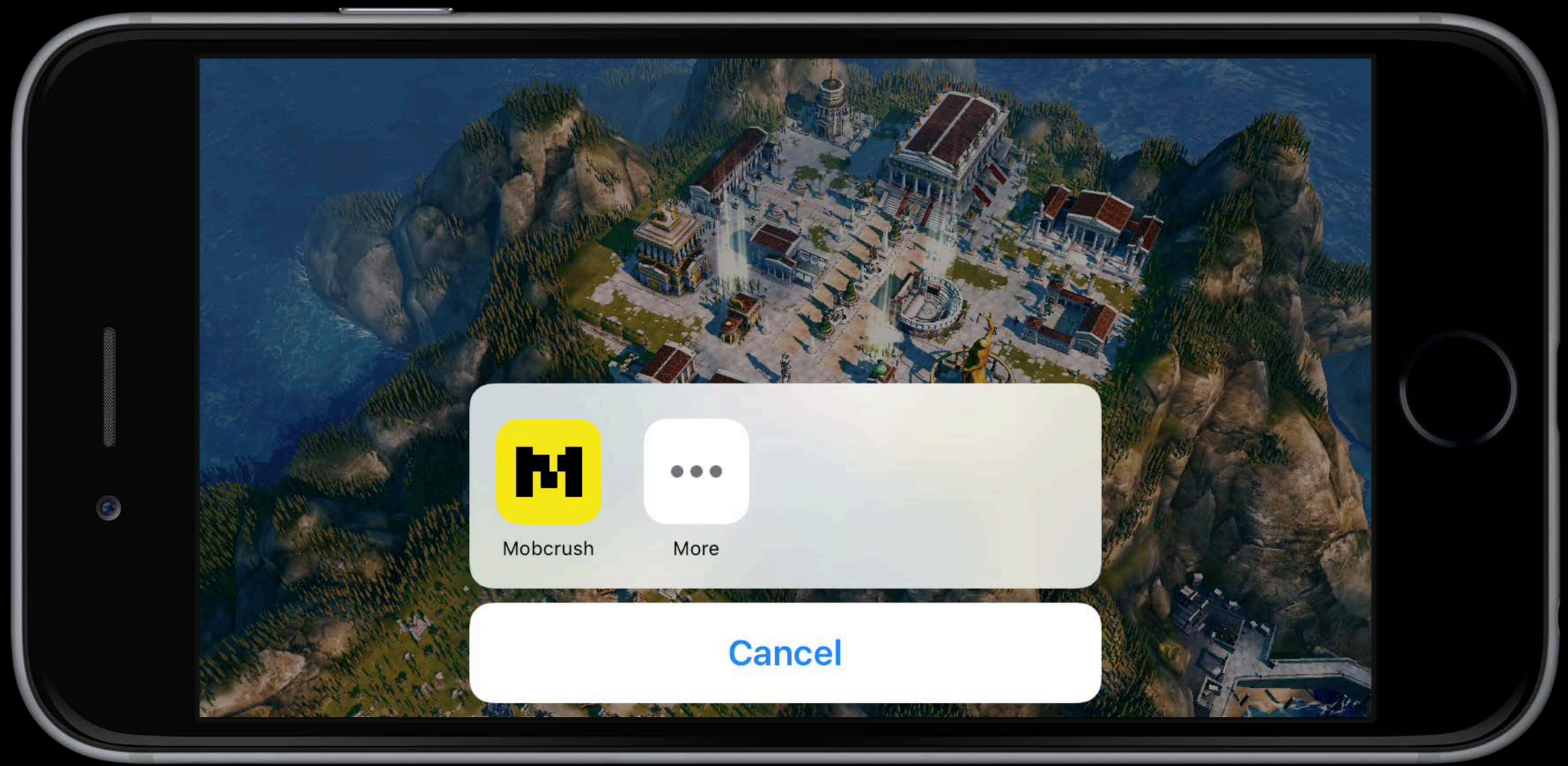
Broadcast live to 3rd party broadcast services

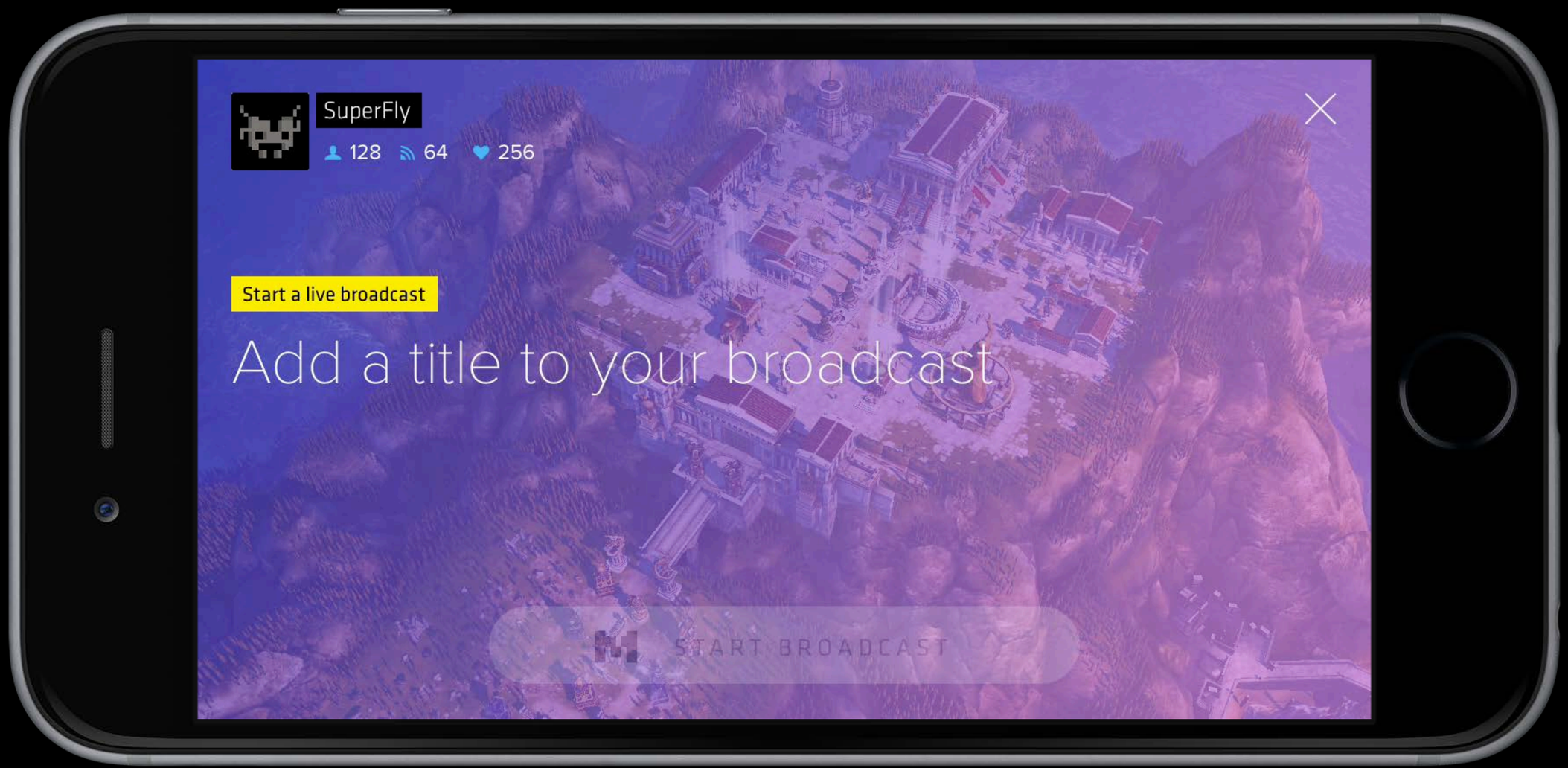
Directly from iOS / tvOS device

Provide commentary with mic and camera (iOS)

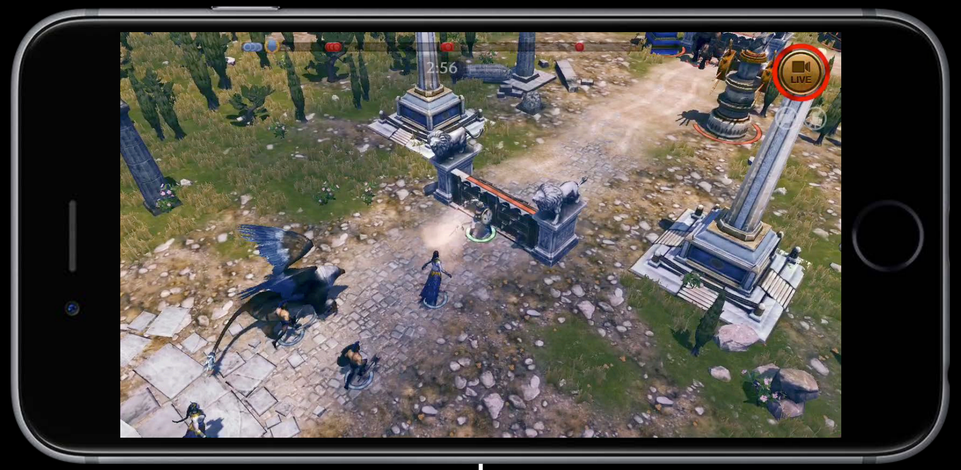
Content is secure and only accessible to the broadcast service

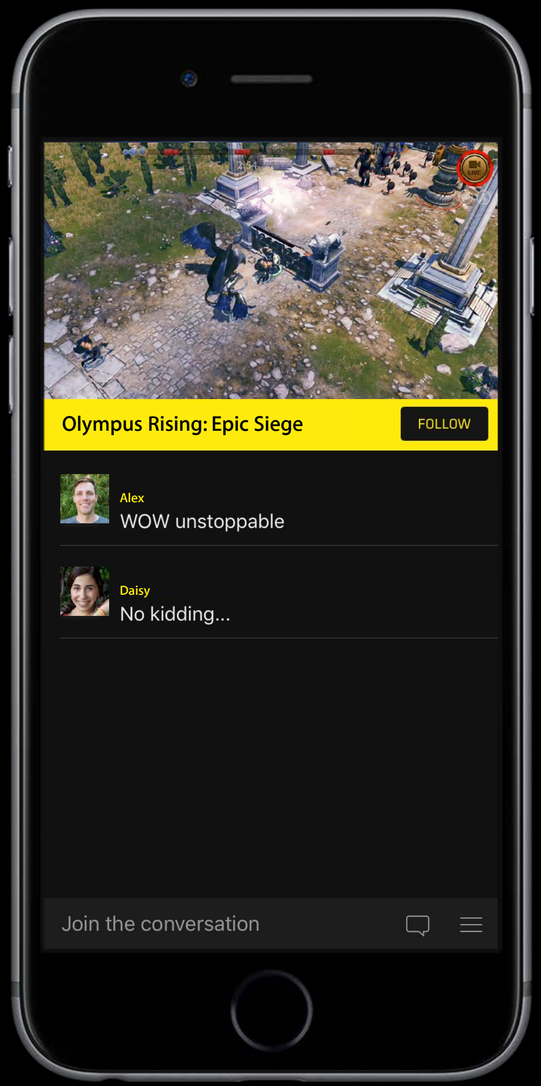

Join the epic battle for Mount Olympus and unleash the power of the Gods!

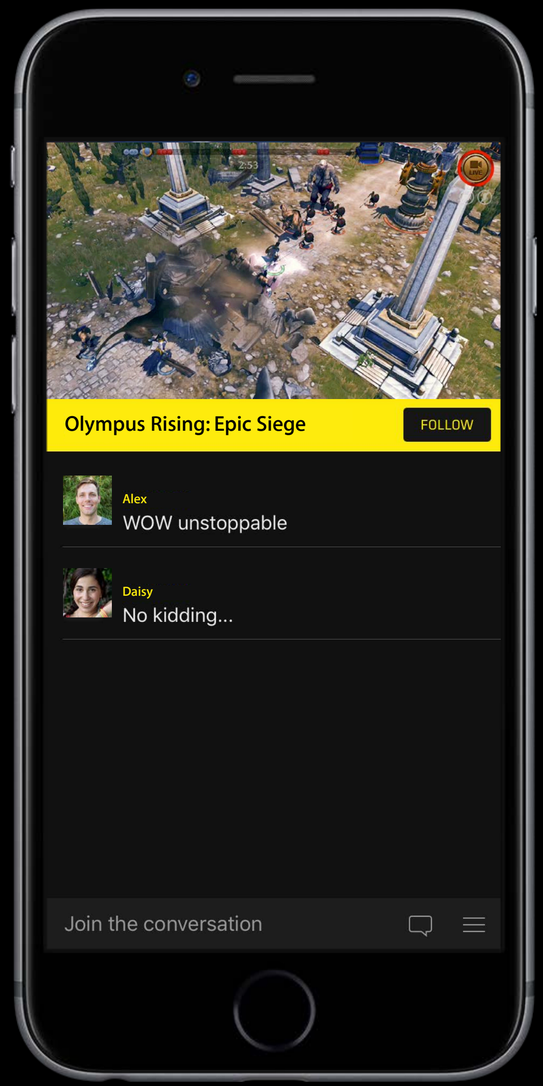

Mobcrush
More
Cancel


SuperFly
128
64
256
Start a live broadcast
Add a title to your broadcast
START BROADCAST


2:56
LIVE


2:56
LIVE


Olympus Rising: Epic Siege
FOLLOW
Alex
WOW unstoppable
Daisy
No kidding...
Join the conversation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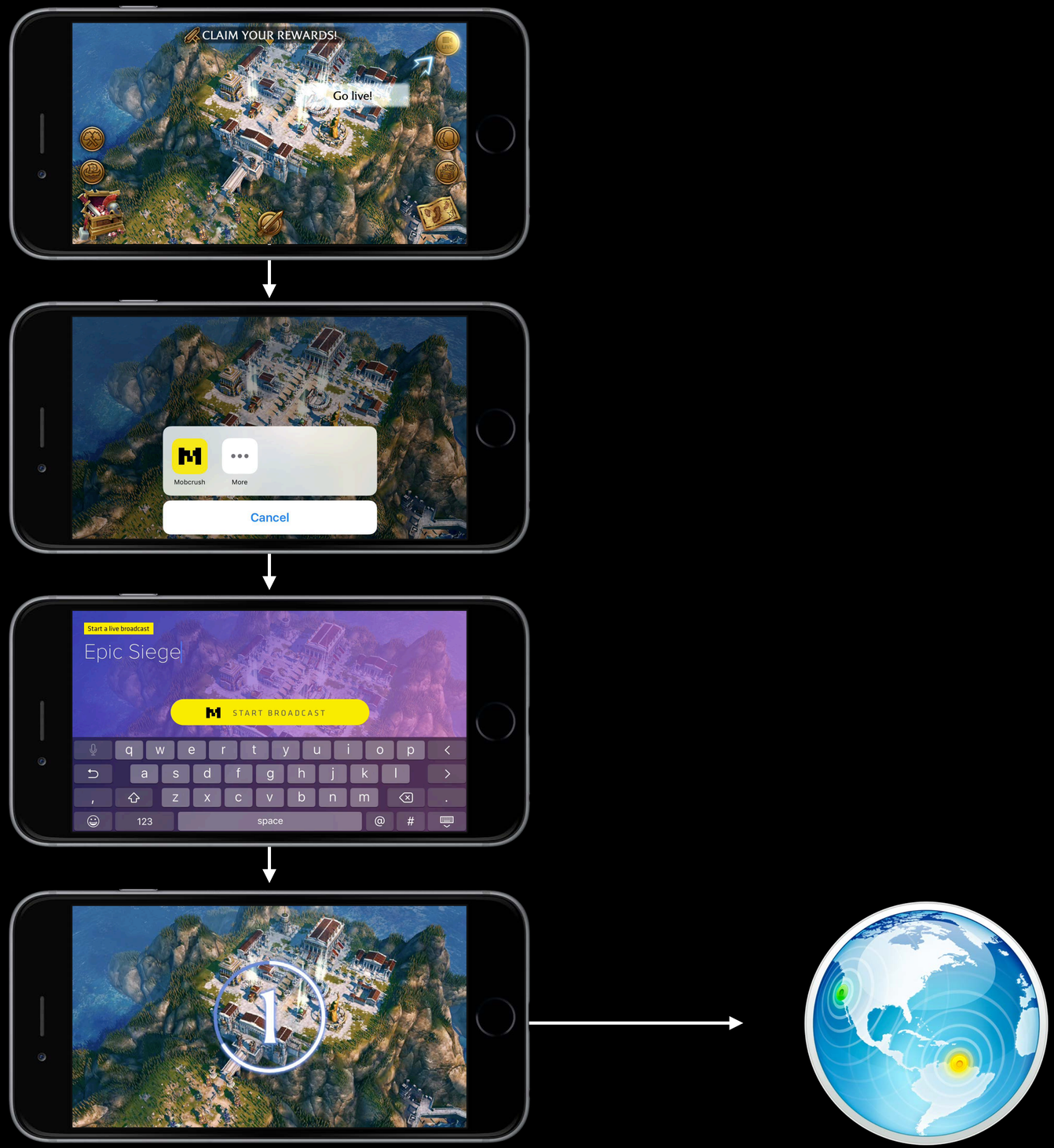
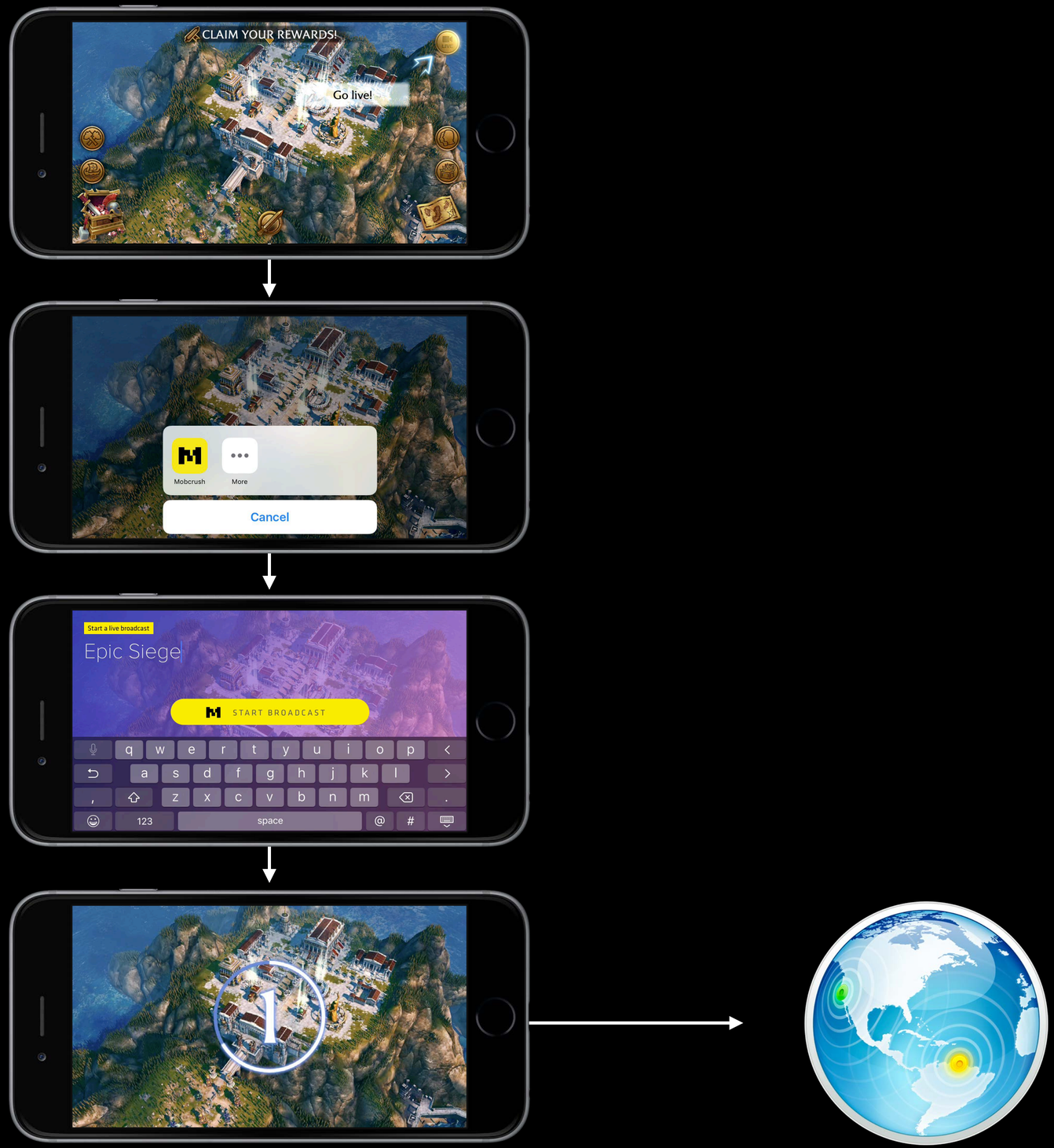
# Game Implementation

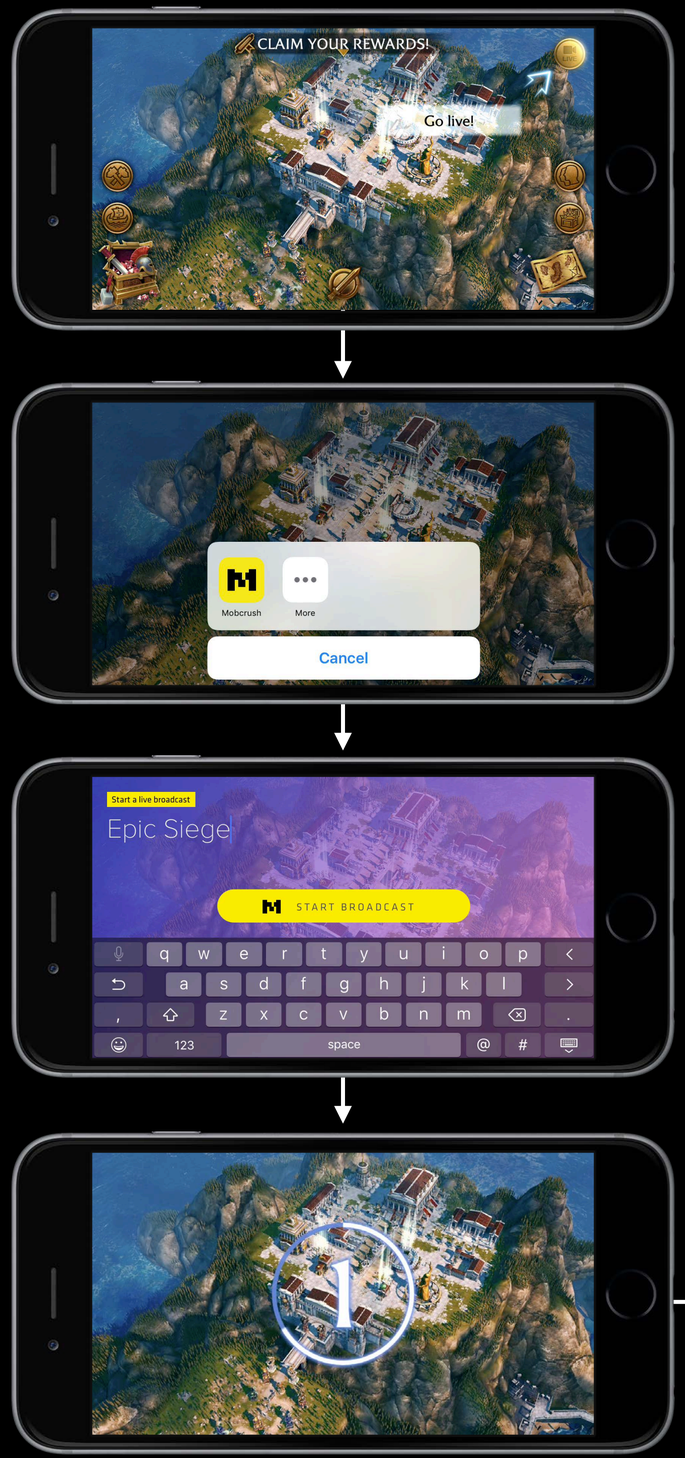

CLAIM YOUR REWARDS!
Go live!
Mobcrush
More
Cancel
Start a live broadcast
Epic Siege
START BROADCAST
q w e r t y u i o p
a s d f g h j k l
z x c v b n m
123
space
@
#
1

# Initiate Broadcast



Initiate Broadcast

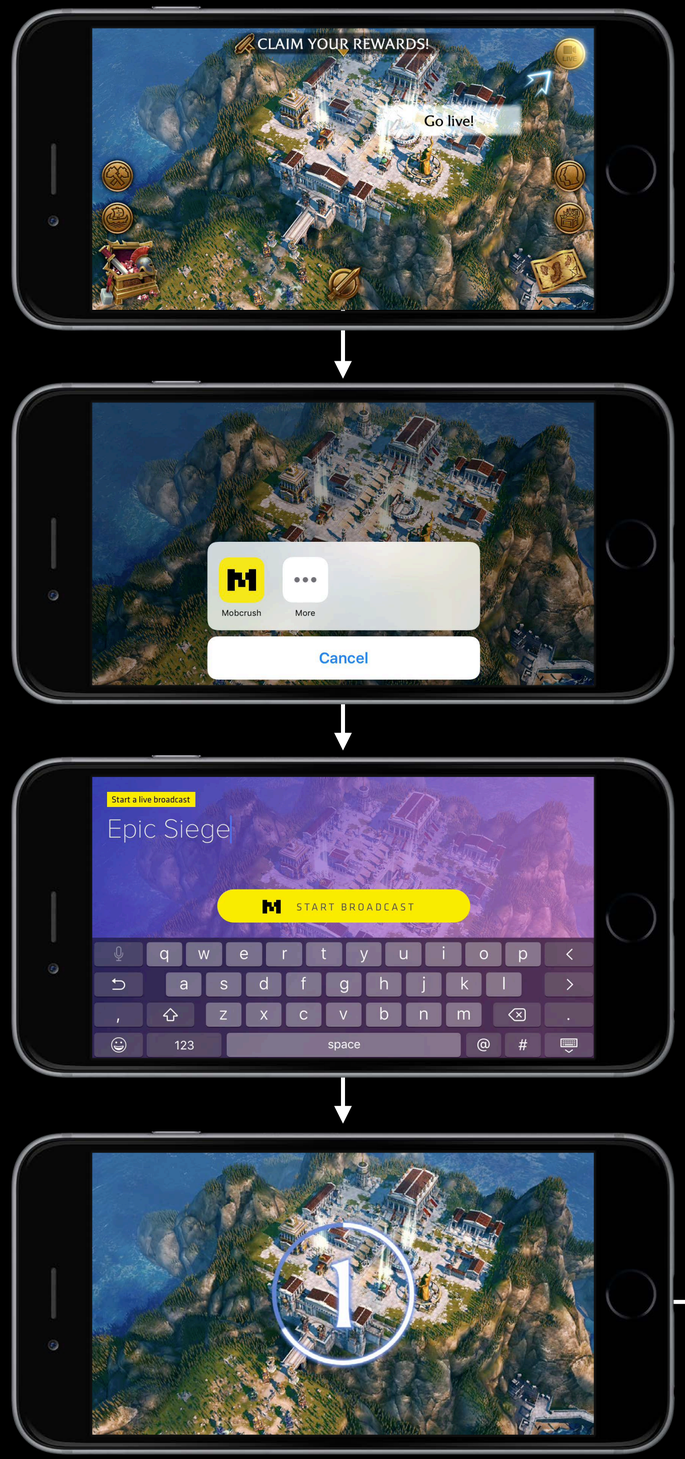
Select a Broadcast Service




Initiate Broadcast

Select a Broadcast Service

Set Up a Broadcast



Initiate Broadcast

Select a Broadcast Service

Set Up a Broadcast

Start and Stop a Broadcast

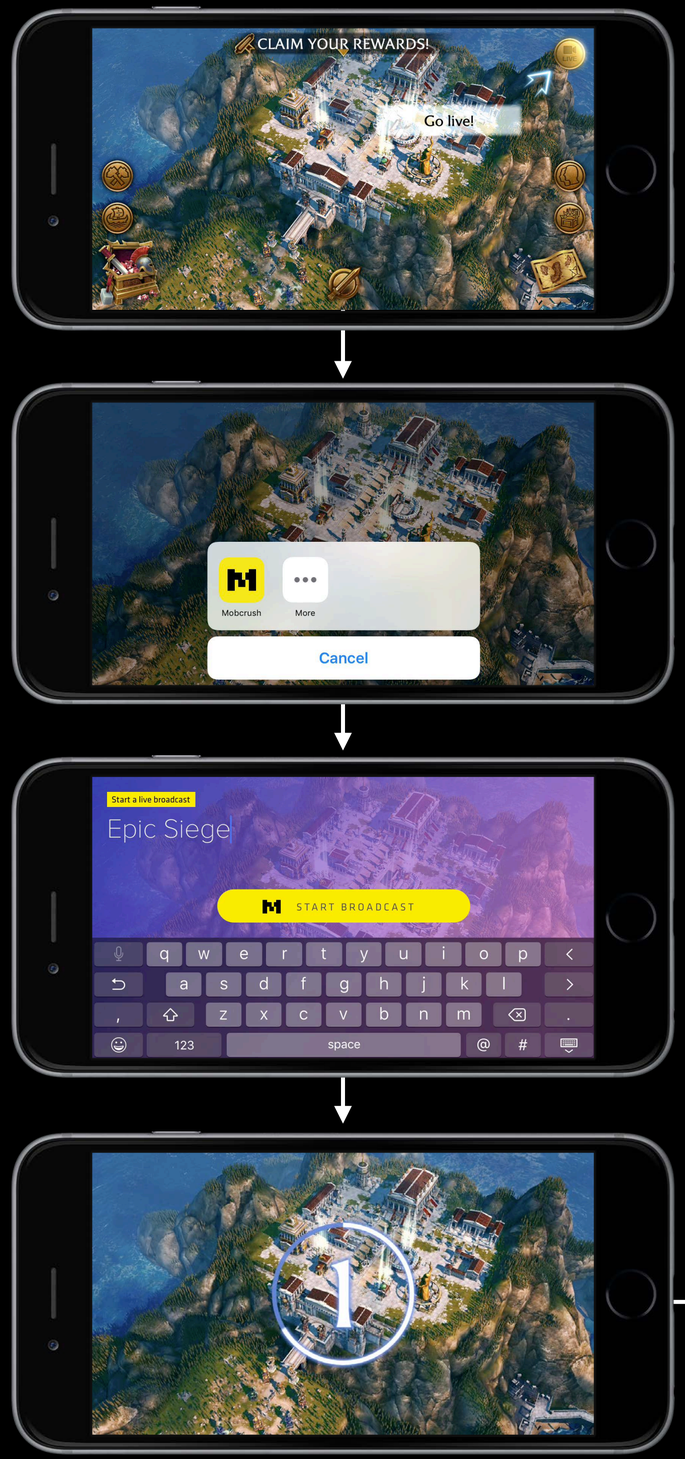

Initiate Broadcast

Select a Broadcast Service

Set Up a Broadcast

Start and Stop a Broadcast

Indicate Broadcast



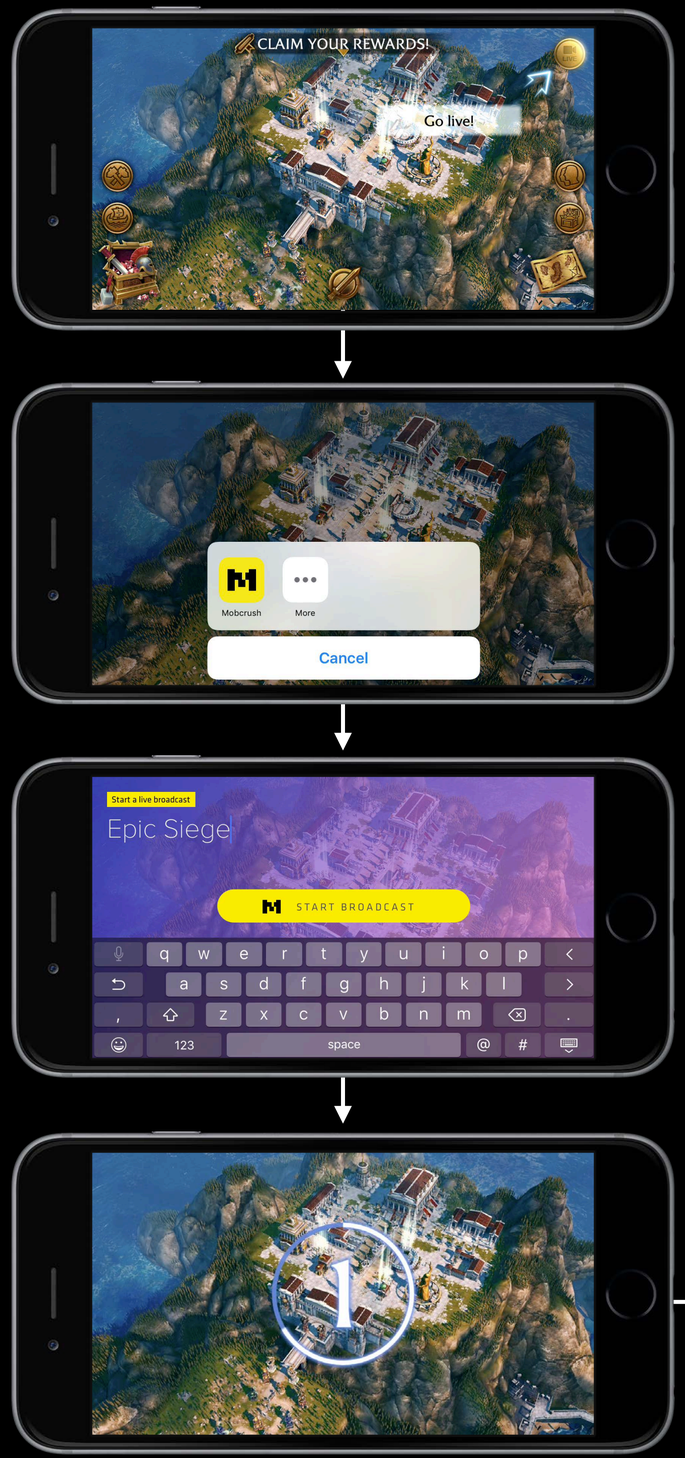
Initiate Broadcast

Select a Broadcast Service

Set Up a Broadcast

Start and Stop a Broadcast

Indicate Broadcast




Upload

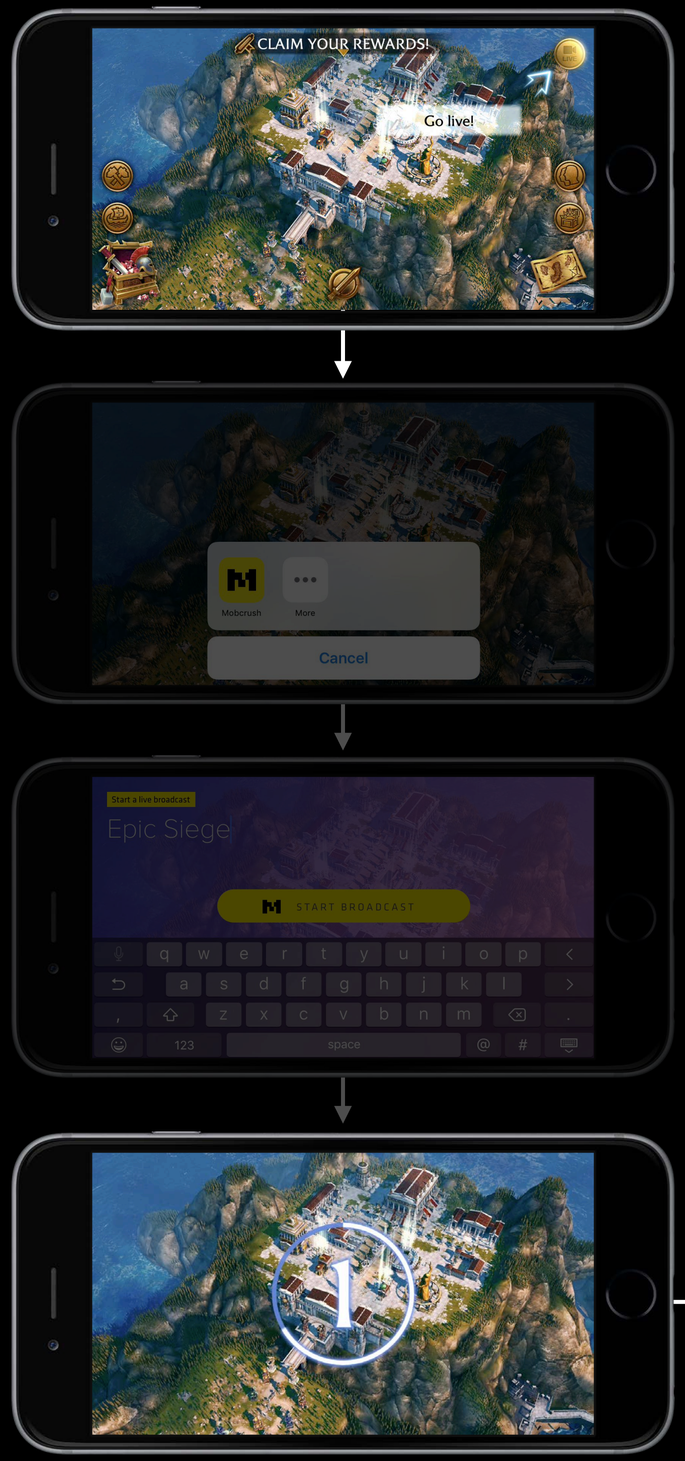
Initiate Broadcast

Select a Broadcast Service

Set Up a Broadcast

Start and Stop a Broadcast

Indicate Broadcast




Upload

# Initiating a Broadcast


```
func didPressBroadcastButton() {

     RPBroadcastActivityViewController.load { broadcastAVC, error in

          if let broadcastAVC = broadcastAVC {
               broadcastAVC.delegate = self
               self.present(broadcastAVC, animated: true)
          }
     }
}
```

# Initiating a Broadcast


```
func didPressBroadcastButton() {

    RPBroadcastActivityViewController.load { broadcastAVC, error in

        if let broadcastAVC = broadcastAVC {
            broadcastAVC.delegate = self
            self.present(broadcastAVC, animated: true)
        }
    }
}
```

# Initiating a Broadcast


```
func didPressBroadcastButton() {

     RPBroadcastActivityViewController.load { broadcastAVC, error in

          if let broadcastAVC = broadcastAVC {
               broadcastAVC.delegate = self
               self.present(broadcastAVC, animated: true)
          }
     }
}
```

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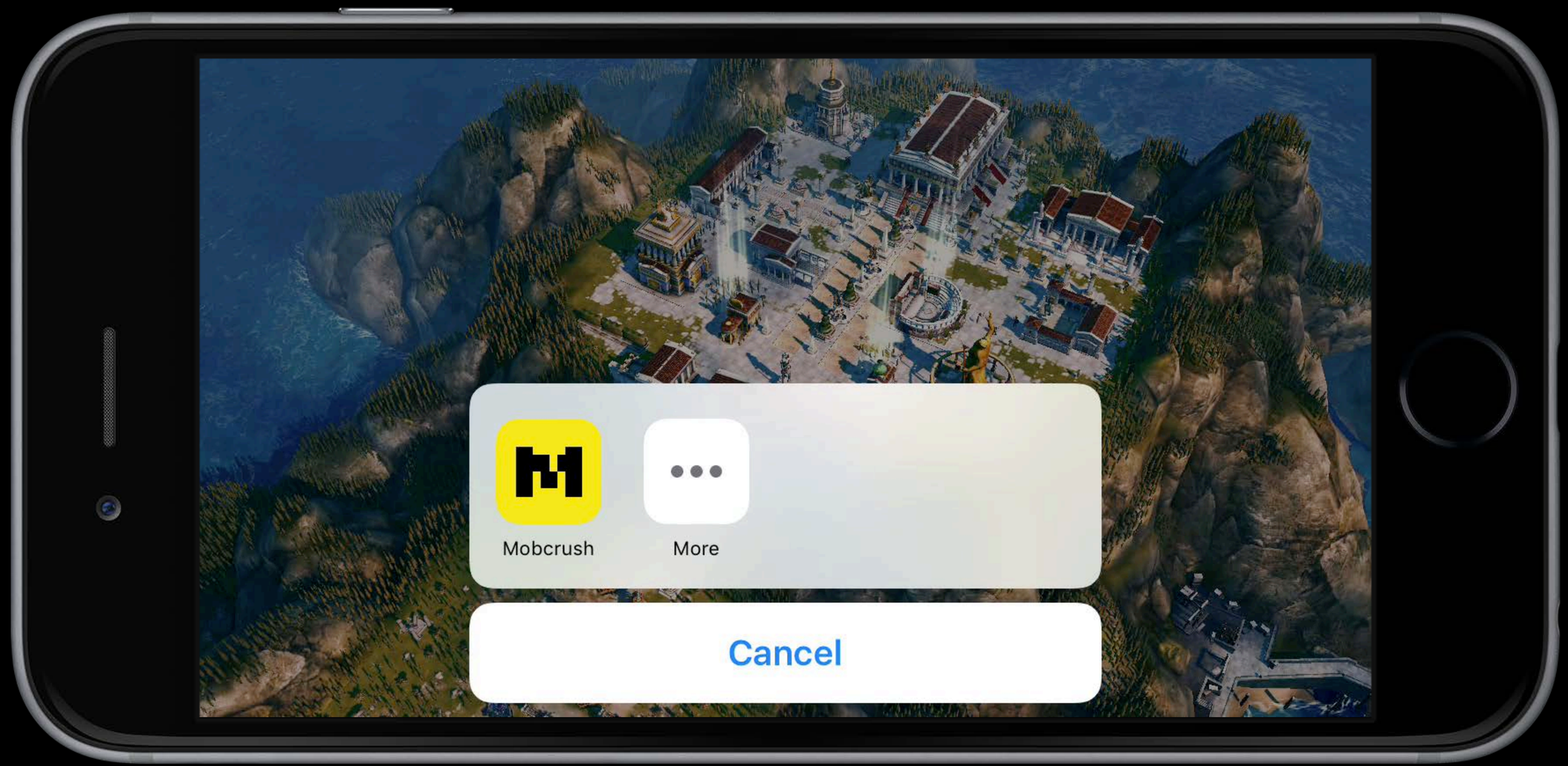
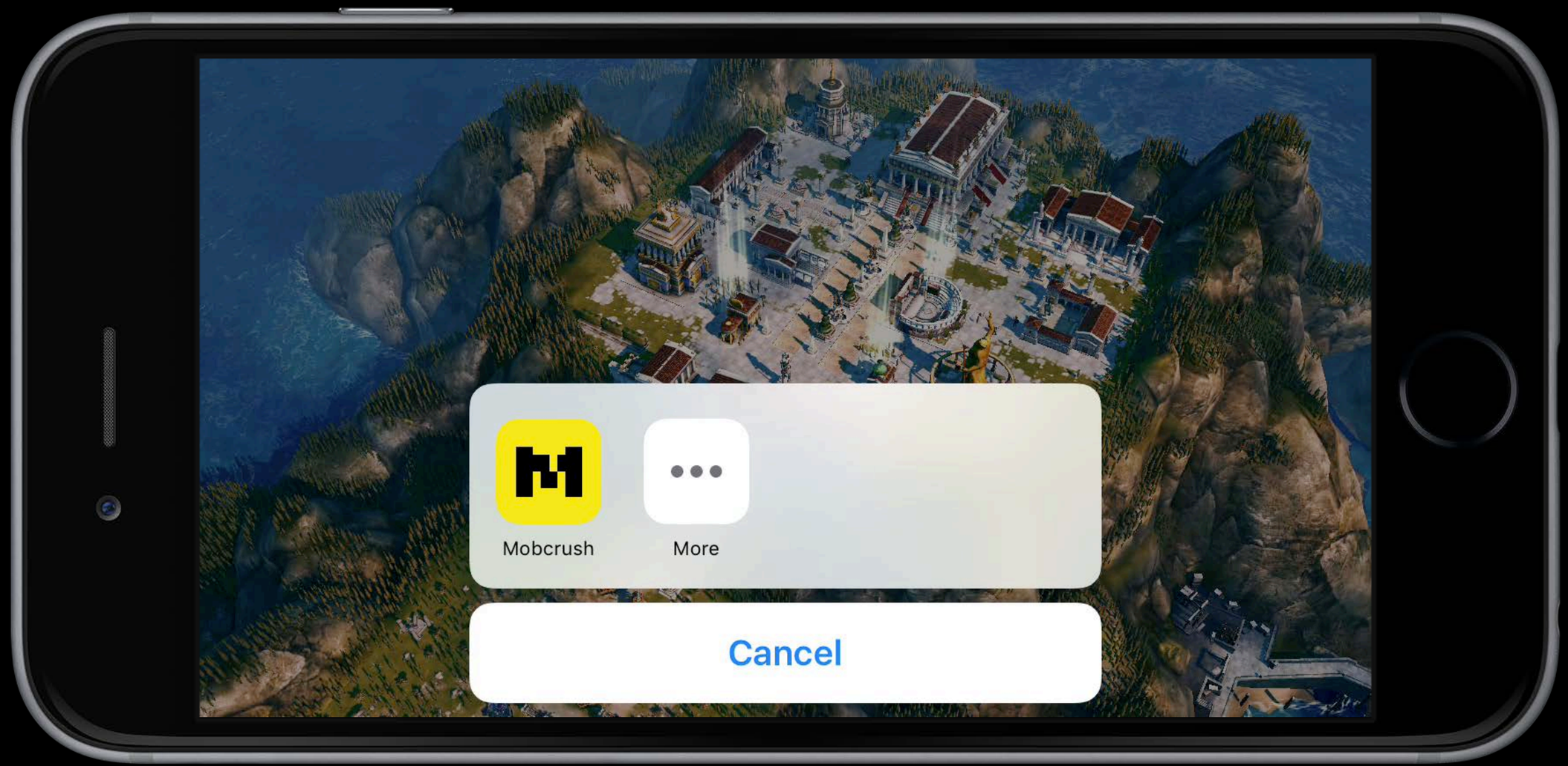

Mobcrush
More
Cancel


Mobcrush
More
Cancel

# Starting a Broadcast


```
func broadcastActivityViewController(
                          _ broadcastAVC: RPBroadcastActivityViewController,
        didFinishWith broadcastController: RPBroadcastController?,
                                    error: NSError?) {

        broadcastAVC.dismiss(animated: true) {

            self.startCountDownTimer {
                broadcastController?.startBroadcast { error in
                    // broadcast started!
                }
            }
```

# Starting a Broadcast


```
func broadcastActivityViewController(
                          _ broadcastAVC: RPBroadcastActivityViewController,
        didFinishWith broadcastController: RPBroadcastController?,
                                    error: NSError?) {

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```

# Indicating a Broadcast

Animate to indicate activity

Merge with controls if space constrained

Required during broadcast

```
broadcastController.isBroadcasting
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Animate to indicate activity

Merge with controls if space constrained

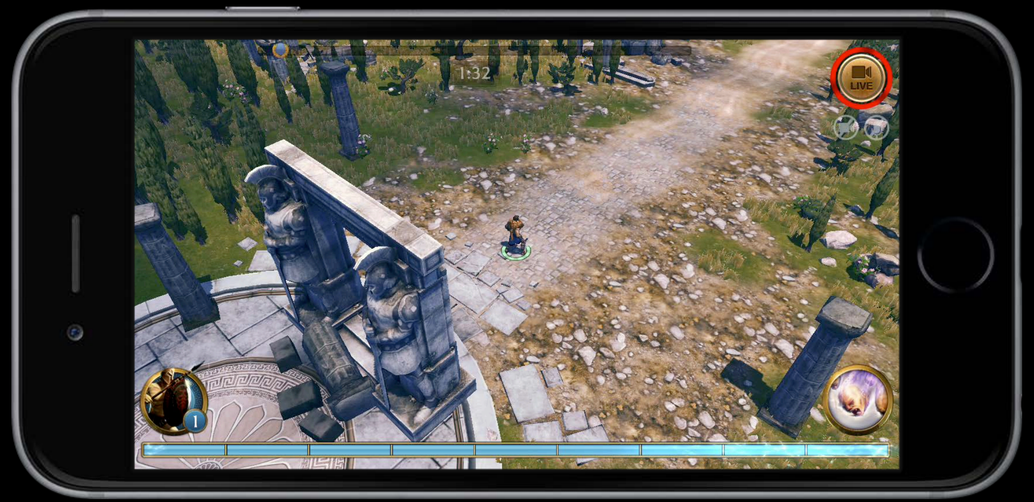
Required during broadcast


```
broadcastController.isBroadcasting
```

```
func updateBroadcastButton() {

     if self.broadcastController?.isBroadcasting == true {
         self.startAnimateIndicator()
     } else {
         self.stopAnimatingIndicator()
     }
 }
```

# Finish Broadcast

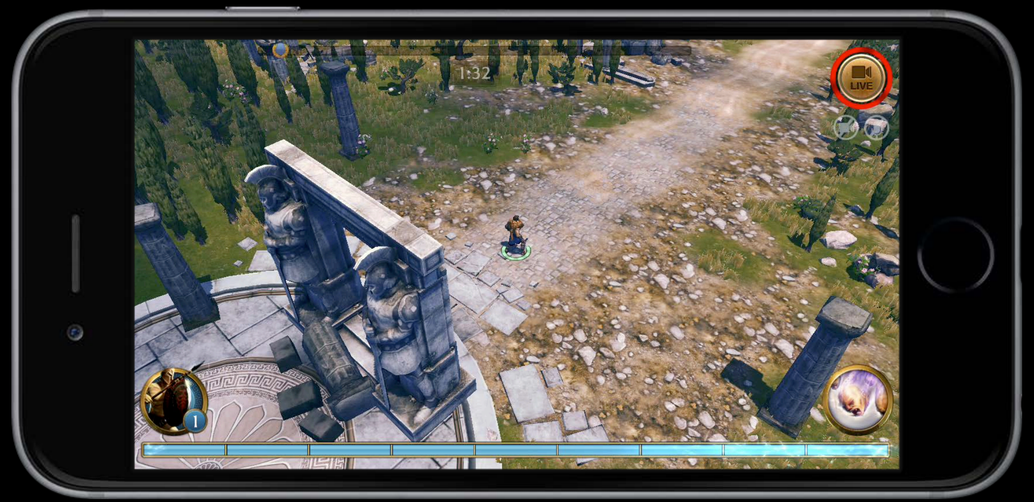



```
func didPressBroadcastButton() {

    self.broadcastController?.finishBroadcast { error in

          if error == nil {
               // broadcast finished!
               self.updateBroadcastUI()
          }
    }
}
```

# Finish Broadcast

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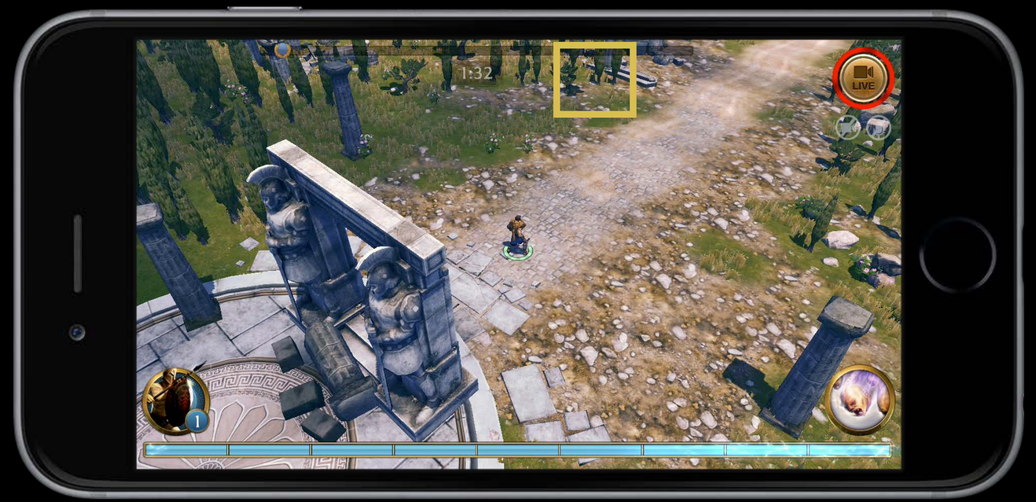


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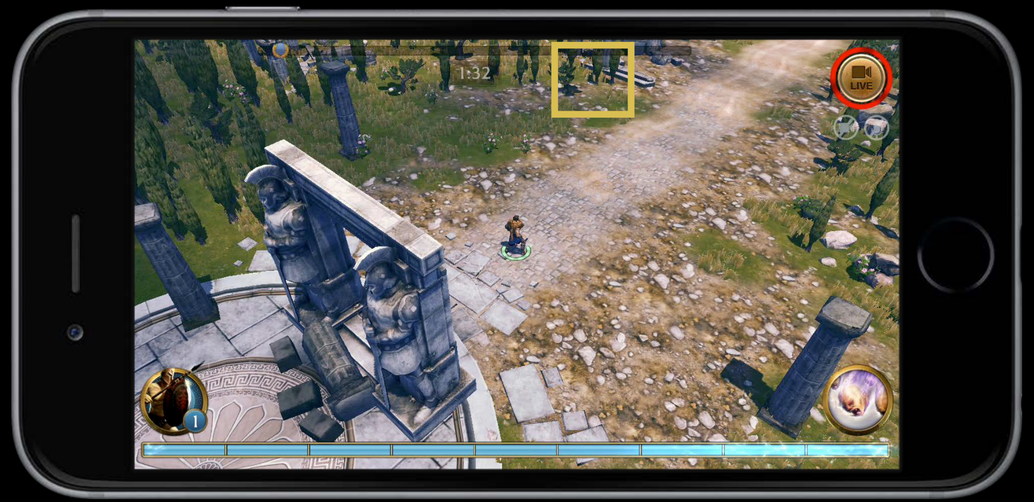


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    self.broadcastController?.finishBroadcast { error in
        if error == nil {
            // broadcast finished!
            self.updateBroadcastUI()
        }
    }
}
```

```
// Error Handling

func broadcastActivityViewController(
      _ broadcastActivityViewController: RPBroadcastActivityViewController,
      didFinishWith broadcastController: RPBroadcastController?,
                                  error: NSError?) {

    self.broadcastController = broadcastController

    // set a delegate to be notified of errors
    self.broadcastController?.delegate = self
}
```

```
// Error Handling

func broadcastActivityViewController(
      _ broadcastActivityViewController: RPBroadcastActivityViewController,
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                                  error: NSError?) {

    self.broadcastController = broadcastController

    // set a delegate to be notified of errors
    self.broadcastController?.delegate = self
}
```

```
// Error Handling

func broadcastController(
                _ broadcastController: RPBroadcastController,
            didFinishWithError error: NSError?) {

    if error != nil {

        // error occurred during broadcast
        self.showErrorMessage(message: error!.localizedDescription)

        // update UI to indicate the broadcast is stopped
        self.updateBroadcastUI()
    }
}
```

```
// Error Handling

func broadcastController(
                _ broadcastController: RPBroadcastController,
            didFinishWithError error: NSError?) {

    if error != nil {

        // error occurred during broadcast
        self.showErrorMessage(message: error!.localizedDescription)

        // update UI to indicate the broadcast is stopped
        self.updateBroadcastUI()
    }
}
```

```swift
// Application Backgrounding

    func applicationWillResignActive() {
        // ReplayKit will automatically pause the broadcast
    }

    func applicationDidBecomeActive() {
        if self.broadcastController?.isBroadcasting == true {
            self.promptUserToResumeBroadcast { userWantsToResume in
                if (userWantsToResume == true) {
                    // user wants to resume
                    self.broadcastController?.resumeBroadcast()
                    self.updateBroadcastUI()
                } else {
                    // user does not want to resume
                    self.broadcastController?.finishBroadcast { error in
                        self.updateBroadcastUI()
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```

# Classes and Protocols

## Game API

# Classes and Protocols

## Game API

`RPBroadcastActivityViewController`

- Present installed broadcast services

`RPBroadcastActivityViewControllerDelegate`

- Notified when broadcast setup is complete

# Classes and Protocols

## Game API

`RPBroadcastActivityViewController`

- Present installed broadcast services

`RPBroadcastActivityViewControllerDelegate`

- Notified when broadcast setup is complete

`RPBroadcastController`

- Start and finish broadcast
- Check if broadcast is in-progress

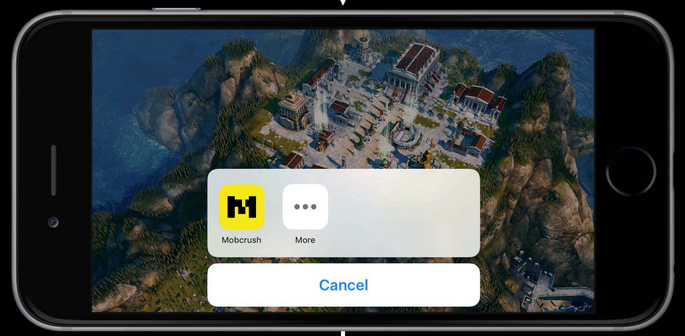
`RPBroadcastControllerDelegate`

- Handle errors during broadcast

# Broadcast Services

Initiate Broadcast


Select a Broadcast Service




Set Up a Broadcast


Start and Stop a Broadcast

Indicate Broadcast

Upload

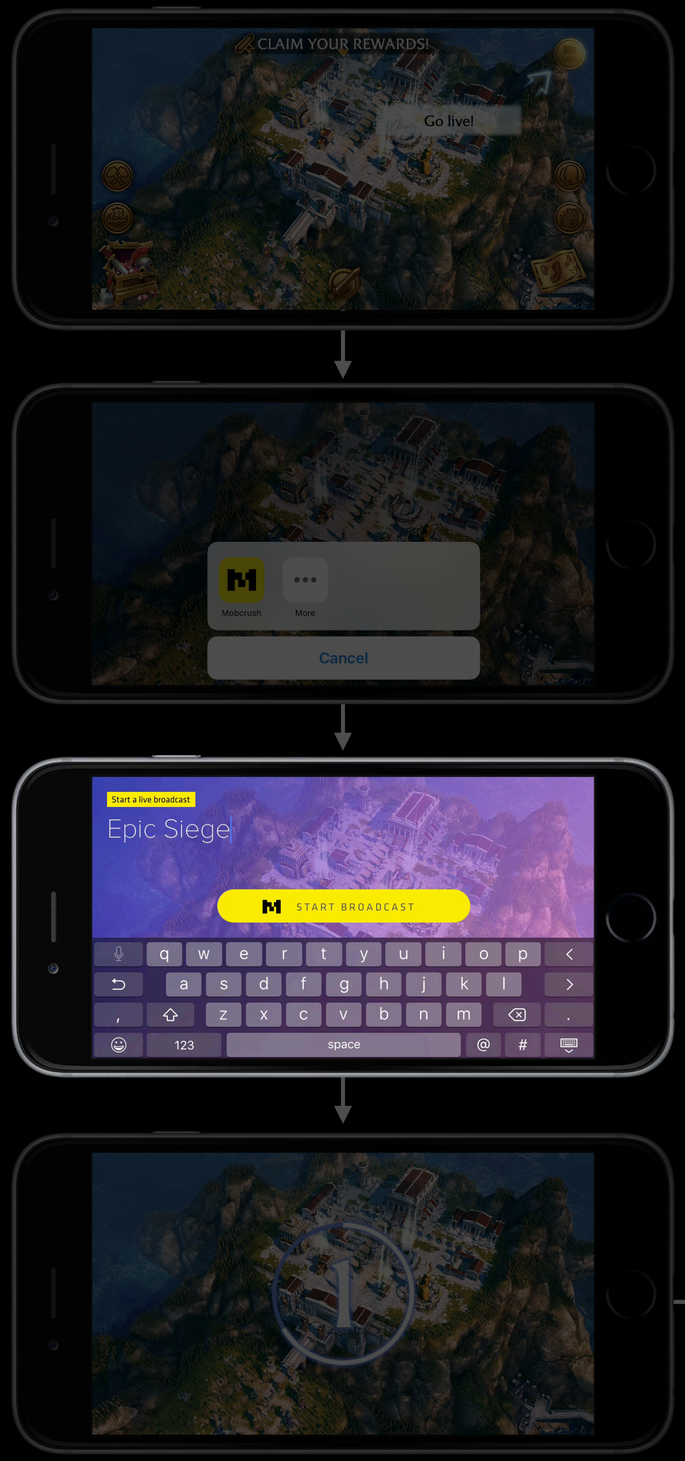
Initiate Broadcast

Select a Broadcast Service

Set Up a Broadcast

Start and Stop a Broadcast

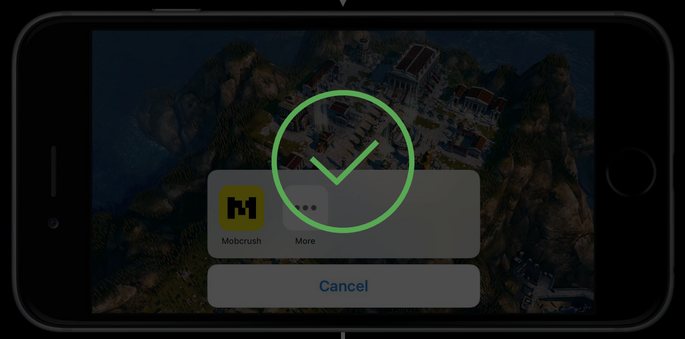
Indicate Broadcast




Upload

Initiate Broadcast


Select a Broadcast Service




Set Up a Broadcast


Start and Stop a Broadcast

Indicate Broadcast

Upload

# Broadcast Services

## Broadcast UI Extension

- Set up broadcast

## Broadcast Upload Extension

- Process and upload video and audio data

Set Up a Broadcast


Upload

# Broadcast Extensions

Embedded in your application

Execute alongside other application processes

Can share data between parent application

Limited in resources compared to applications

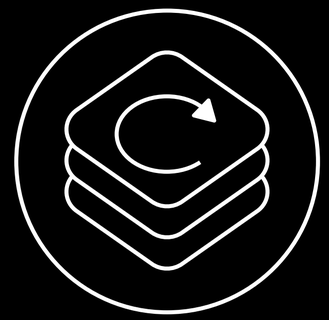
# Xcode Templates

New Target templates available in Xcode

Add Target -> iOS/tvOS -> Application Extension

Pre-configured with NSExtension properties in info.plist

Broadcast UI Extension



Broadcast Upload

# Broadcast UI Extension

Authenticate the user and provide sign-up

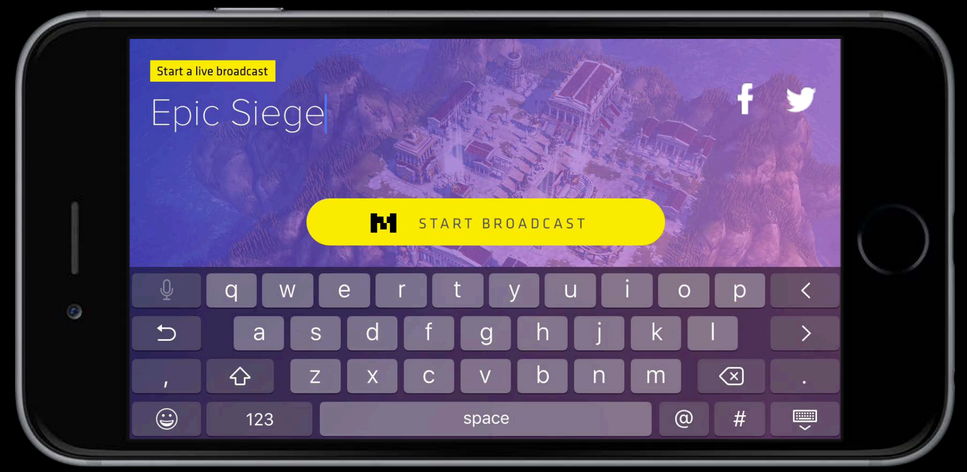
Accept terms and conditions

Set up the broadcast

Optionally share via social media

Notify setup is complete

Set Up a Broadcast



# Broadcast Upload Extension

Receive and process video and audio data

Upload to server

Implementation to be defined by broadcast services

Work together with us

Initiate Broadcast

Select a Broadcast Service

Set Up a Broadcast

Start and Stop a Broadcast

Indicate Broadcast


Upload

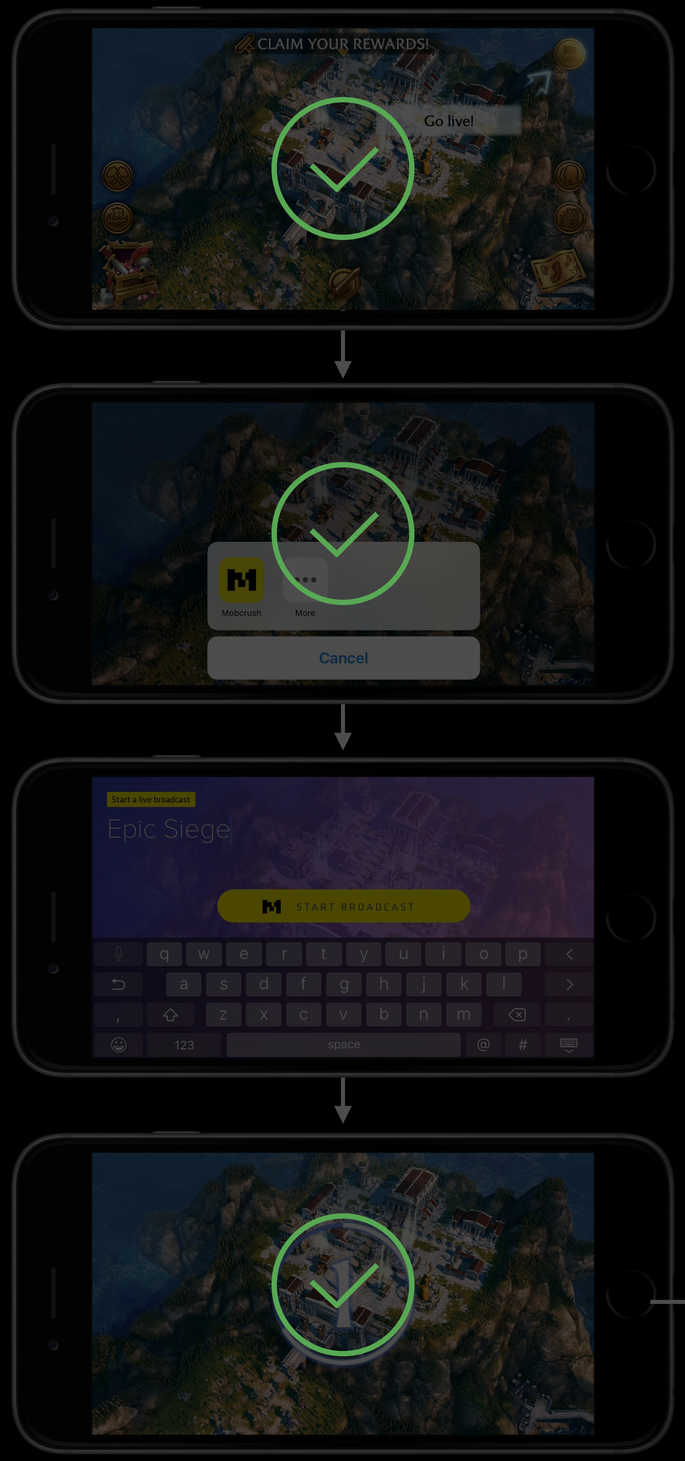
Initiate Broadcast

Select a Broadcast Service

Set Up a Broadcast

Start and Stop a Broadcast

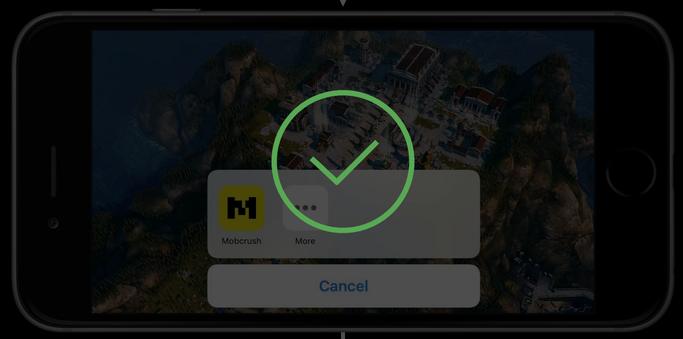
Indicate Broadcast



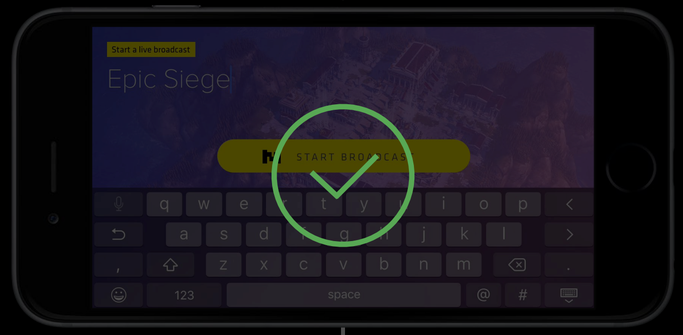

Upload

Initiate Broadcast


Select a Broadcast Service



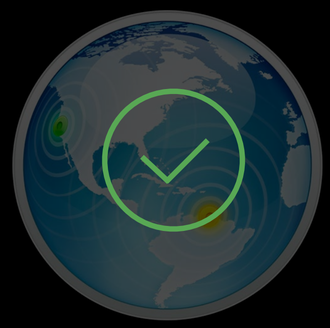

Set Up a Broadcast




Start and Stop a Broadcast

Indicate Broadcast

Upload



# Responsibilities

Initiate Broadcast

Start and Stop a Broadcast

Indicate Broadcast

Select a Broadcast Service

Set Up a Broadcast

Upload

# Responsibilities

| Game | ReplayKit | Broadcast Service |
| --- | --- | --- |
| Initiate Broadcast | Select a Broadcast Service | Set Up a Broadcast |
| Start and Stop a Broadcast | | Upload |
| Indicate Broadcast | | |

# Live Broadcasting

# Expanded Commentary Options

FaceTime camera support

Flexible microphone recording

Available in iOS 10

# FaceTime Camera Support

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# FaceTime Camera Support

```
RPScreenRecorder.shared().isCameraEnabled
```

Camera preview view available in RPScreenRecorder

Subclass of UIView

Position to not obstruct gameplay

Optionally allow the user to move it

# FaceTime Camera Support

```
RPScreenRecorder.shared().isCameraEnabled
```

Camera preview view available in RPScreenRecorder

Subclass of UIView

Position to not obstruct gameplay

Optionally allow the user to move it

```
RPScreenRecorder.shared().isCameraEnabled = true
```

# FaceTime Camera Support

```
RPScreenRecorder.shared().isCameraEnabled
```

Camera preview view available in RPScreenRecorder

Subclass of UIView

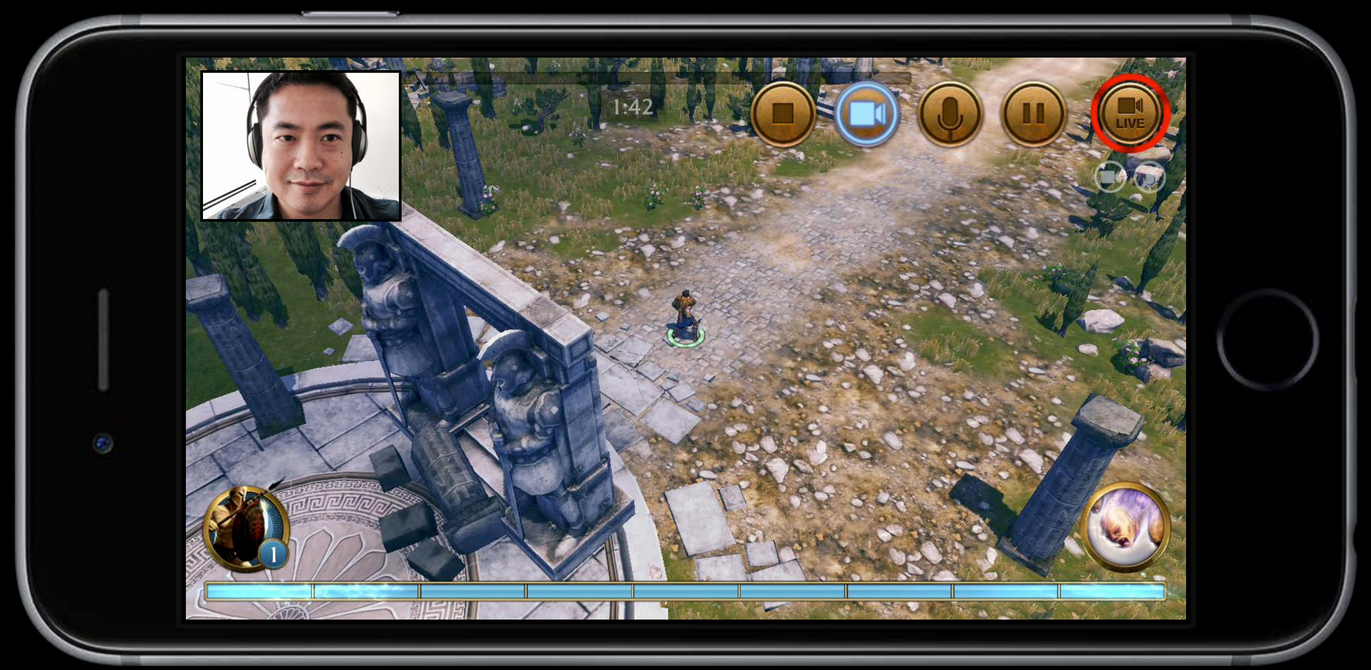
Position to not obstruct gameplay

Optionally allow the user to move it

```
RPScreenRecorder.shared().isCameraEnabled = true
```

```
if let cameraPreview = RPScreenRecorder.shared().cameraPreviewView {
    cameraPreview.frame = CGRect(…)
    self.view.addSubview(cameraPreview)
}
```

# Microphone Support



```
// Microphone Recording


    func enableMic {
        RPScreenRecorder.shared().isMicrophoneEnabled = true
    }

    func disableMic {
        RPScreenRecorder.shared().isMicrophoneEnabled = false
    }
```

# Summary

Apple TV support

Live broadcasting

Expanded commentary options

# More Information

https://developer.apple.com/wwdc16/601

# Related Sessions

| | | |
|---|---|---|
| What's New in GameplayKit | Pacific Heights | Thursday 9:00AM |
| What's New in SpriteKit | Presidio | Thursday 5:00PM |
| What's New in Game Center | Mission | Friday 10:00AM |

# Labs

| | | |
|---|---|---|
| ReplayKit Lab | Graphics Lab A | Tuesday 12:00PM |
| ReplayKit Lab | Graphics Lab B | Wednesday 9:00AM |

WWDC16