

presents Swift Hackclub - Intermediate

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Introduction to tvOS app development

By
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&
Madhuri Koushik



**Apps that reveal
tvOS Potential!**

my list

popular

drama

funny

reality

abcd

news

live tv

shows a-z

settings

QUANTICO

QUANTICO
LAST NIGHT'S EPISODE



Discover the world's recipes

🔍 Search recipes...

Harvest Roasted Root
Vegetable Salad with
Fennel
by JESSICA GAVIN

♥ Popular Now

📅 Seasonal

⌚ Quick and Easy

🍽️ Weeknight Dinners



Spinach & Feta Stuffed Chick...
BBC GOOD FOOD



Baked Sweet Potato Fries
LOOKS GOOD LETS EAT



Ultimate Spaghetti Carbonara
BBC GOOD FOOD



Thai Chicken Nuggets
WITH A BLAST





Obao Noodles & Bar

Asian, BBQ

RESTAURANT INFO

★★★★★

\$\$\$\$\$

222 E 53rd St
(0.91 Miles away)

DELIVERY INFO

Delivers in 45 min.

\$0 Delivery fee

\$10 Minimum

Thai

Imperial Garden

★★★★★, \$\$\$\$\$, 45 minutes

Puff Cha

★★★★★, \$\$\$\$\$, 30 minutes

Chef's Secret

★★★★★, \$\$\$\$\$, 55 minutes

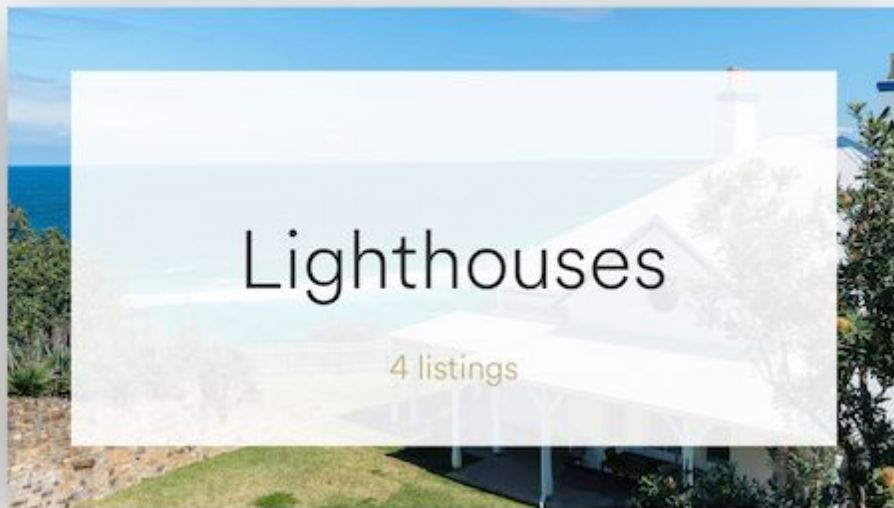
Obao Noodles & Bar

★★★★★, \$\$\$\$\$, 45 minutes

Thai Nam

★★★★★, \$\$\$\$\$, 15 minutes

Where are you going?



Nearby

Saved Searches

Saved Homes

Zillow TV

Search



Living Large in a Tiny Home



Nearby

Saved Searches

Saved Homes

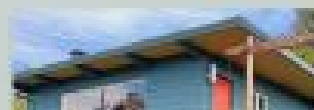
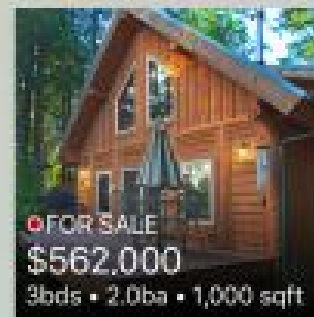
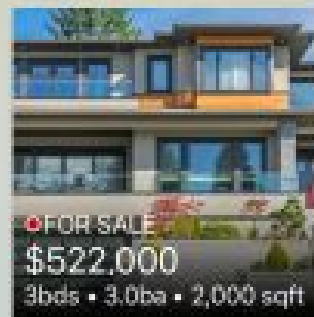
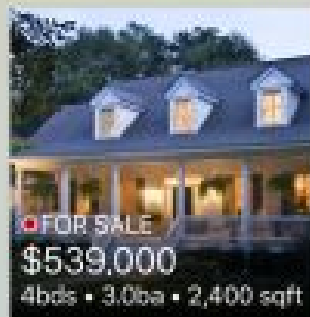
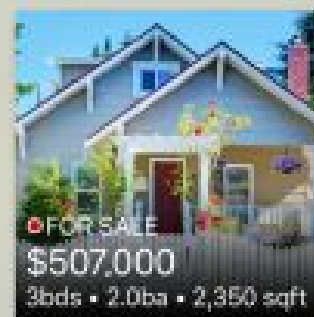
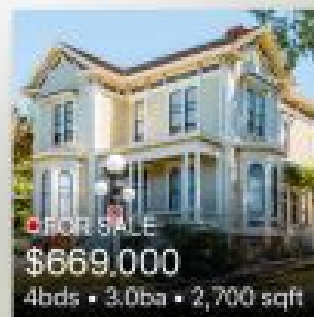
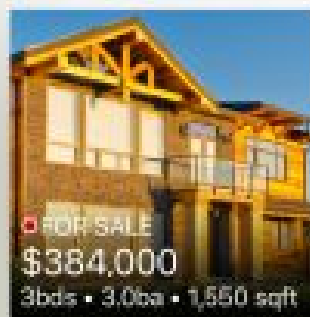
Zillow TV

Search

Edgewater, Seattle

Hazelwood, Seattle

Richmond, Seattle



Intro To: Workouts At Home

Unsure where to get started? We've handpicked a few basics to move you from the comfort of the couch towards your goals.

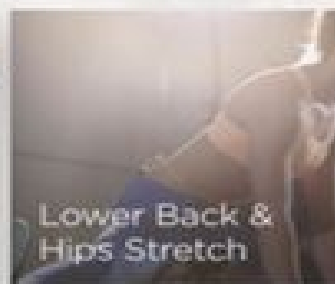
Living Room Zen

Find a little space in front of the TV. Slow it down, lower your heart rate and unwind with this collection of soothing stretches.

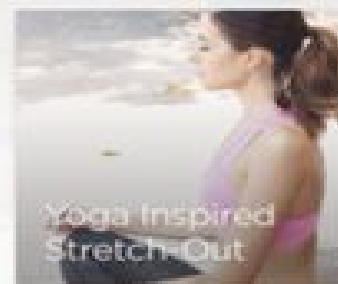


Simple Arm Stretches

16 mins 56 kcal



Lower Back & Hips Stretch



Yoga Inspired Stretch-Out



5-Minute Legs Stretch

Apartment Friendly

GILT



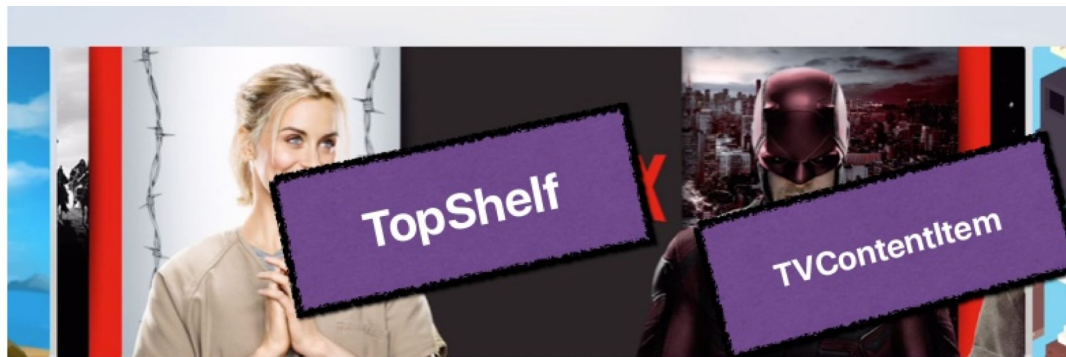
Today's Featured Sale

Vince

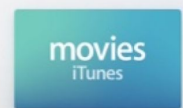
[Shop Now](#)



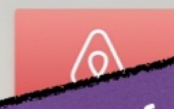
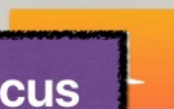
Anatomy of Apple TV Home Screen



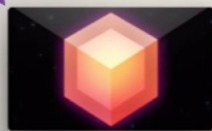
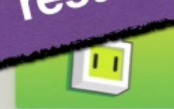
top row



in Focus



rest of apps



Choose your programming style

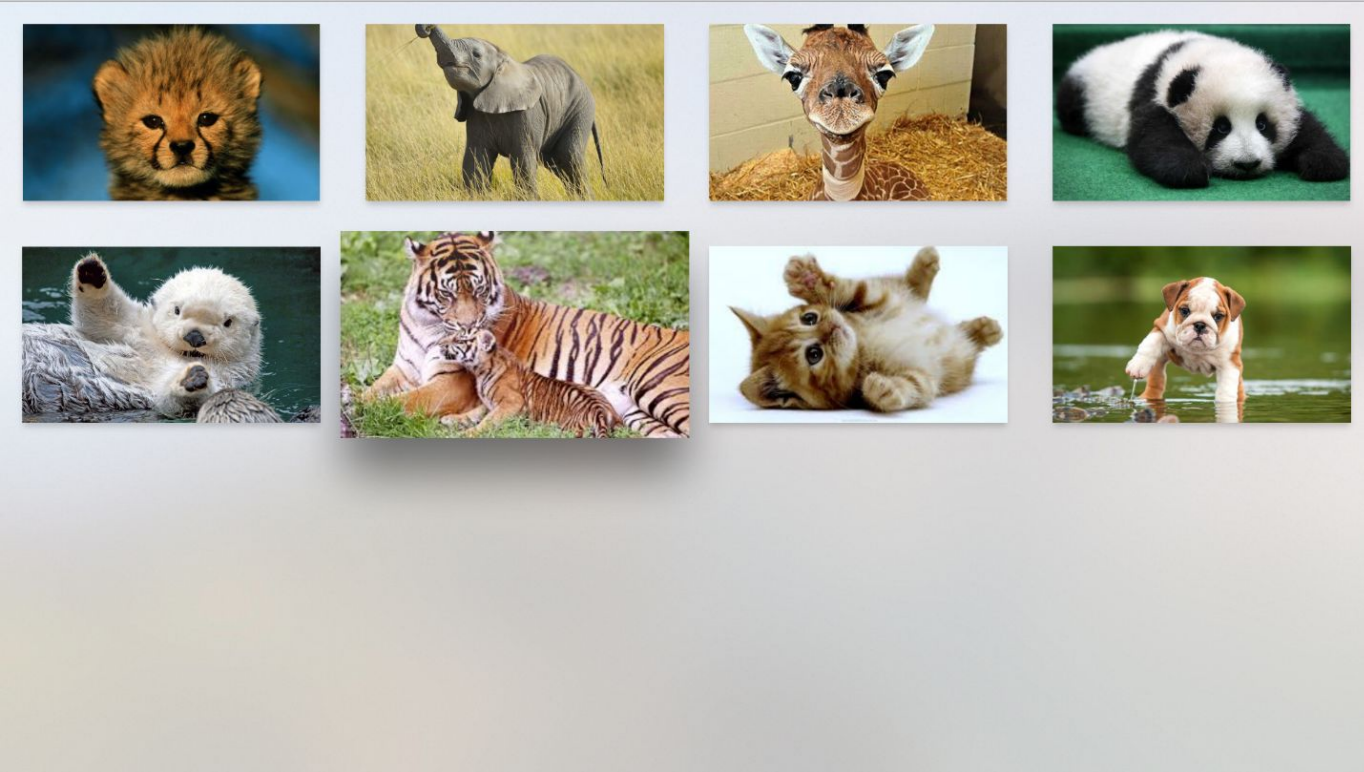
- ***TVML Apps:***

- The first uses an entirely new process utilizing TVML, TVJS and TVMLKit. *TVML* is a form of XML and stands for “Television Markup Language”.
- *TVJS* is set of JavaScript APIs which provide you with the means to display apps created with TVML.
- *TVMLKit* is the glue between TVML, JavaScript, and your native tvOS application.

- ***Custom Apps:***

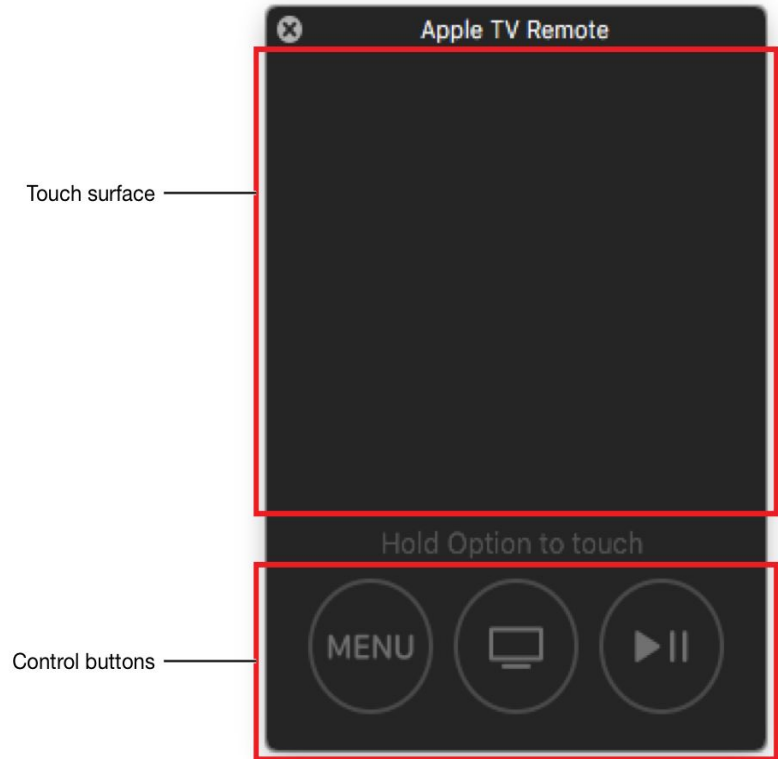
- The second uses familiar iOS frameworks and concepts you know and love like Storyboards, UIKit, and Auto Layout.
- Leverage many of the same frameworks, technologies, and concepts that you are already familiar developing with for iOS.

TVOS UICollectionView and Detail view demo



tvOS Simulator and Remote

- Touch Surface
- Buttons
- Microphone
- Gyroscope



Focus

- **Preferred Focus Environments**

- `canBecomeFocused()`
- Focus Engine APIs
 - `isEnabled` automatically changes the Focus property
 - `restoresFocusAfterTransition`
- Focus API gives us full control over how the views can interact with each other and with the UX

<https://developer.apple.com/videos/play/wwdc2016/215/?time=2103>

ZARA



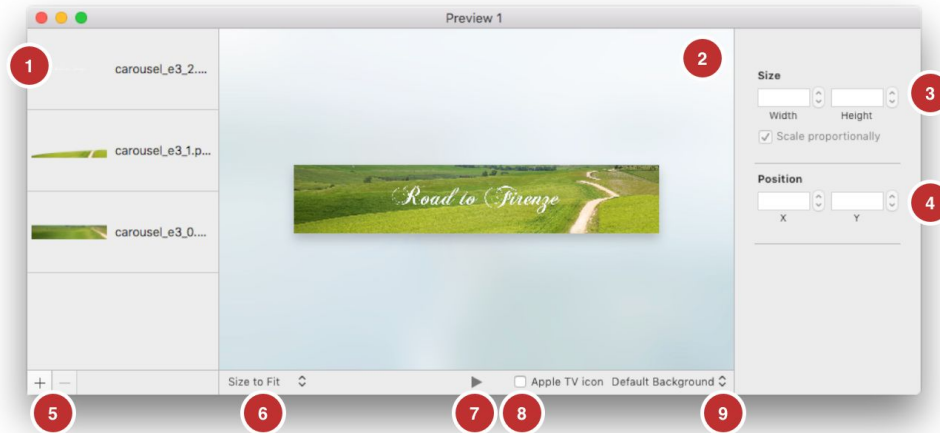
SUEDE EFFECT DRESS
Suede effect dress, Contrasted lace.
\$79

Parallax

- Creating Parallax image

(https://developer.apple.com/library/tvos/documentation/General/Conceptual/AppleTV_PG/CreatingParallaxArtwork.html#//apple_ref/doc/uid/TP40015241-CH19-SW1)

- Parallax Previewer



Detail View



Tiger Cub

Tigers are the largest members of the cat family and are renowned for their power and strength. The tiger is capable of killing animals over twice its size; it is one of nature's most feared predators. Like its ancestor, the sabre-tooth cat, the tiger relies heavily on its powerful teeth for survival. If it loses its canines (tearing teeth) through injury or old age, it can no longer kill and is likely to starve to death. Tigers live alone and aggressively scent-mark large territories (up to 100sq km in size) to keep their rivals away. They are powerful nocturnal hunters that travel many miles to find buffalo, deer, wild pigs, and other large mammals. A Bengal tiger can eat 21kg of meat in a night and can kill the equivalent of 30 buffaloes a year.

Back

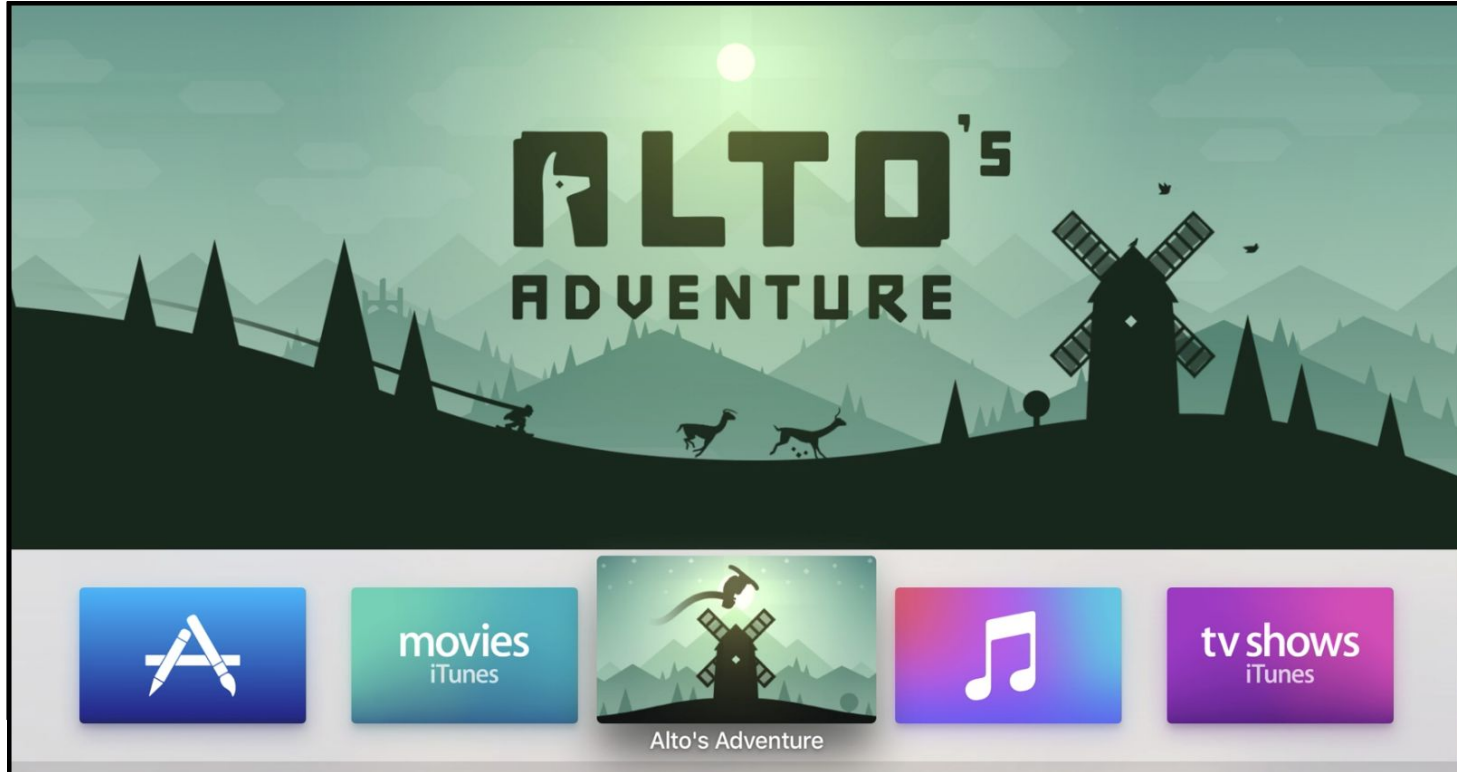
1/4

Next

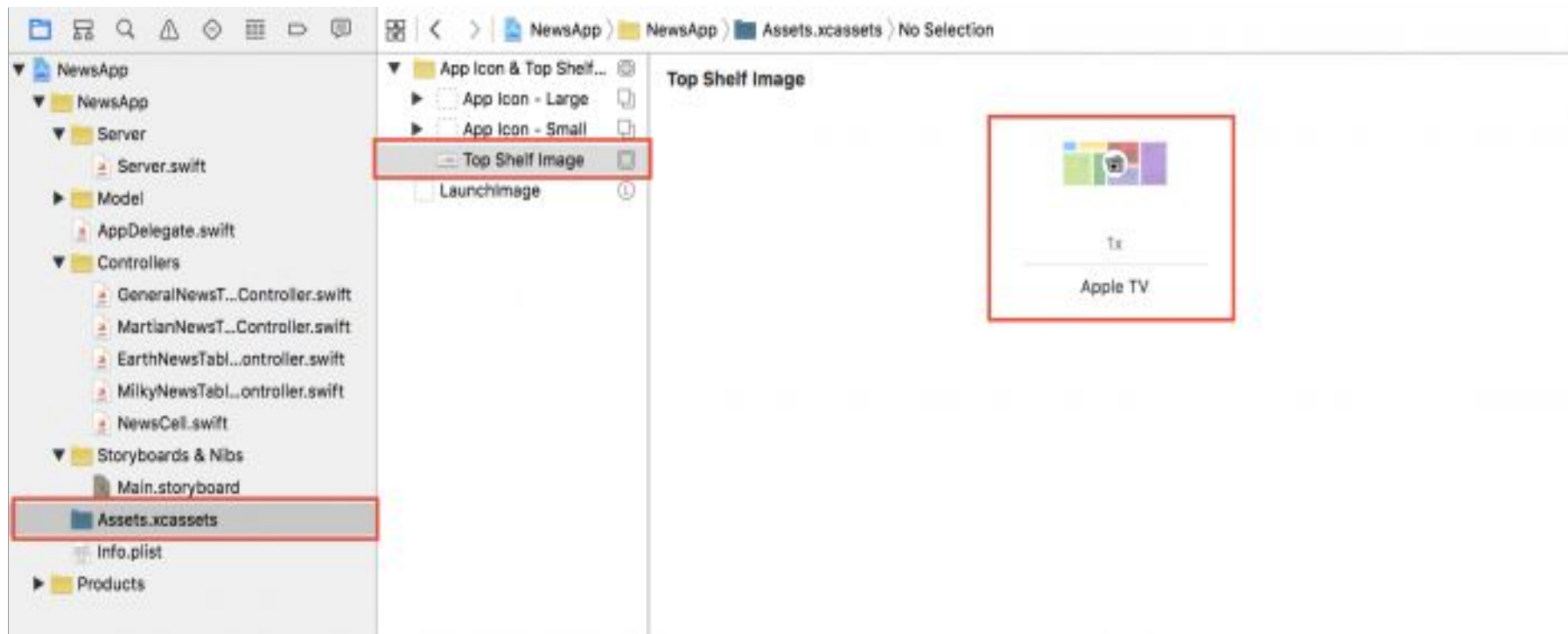
Top Shelf - more than “second app icon”

- Content showcase area above the top row of apps on the Apple TV Home screen
- The user can decide which apps are in the top row. When one of these apps is brought into focus, the top shelf displays featured content specific to that app.
- Unique opportunity for your app to highlight new, featured, or useful content and let the user jump directly to it.

Static Top Shelf



Top Shelf Image





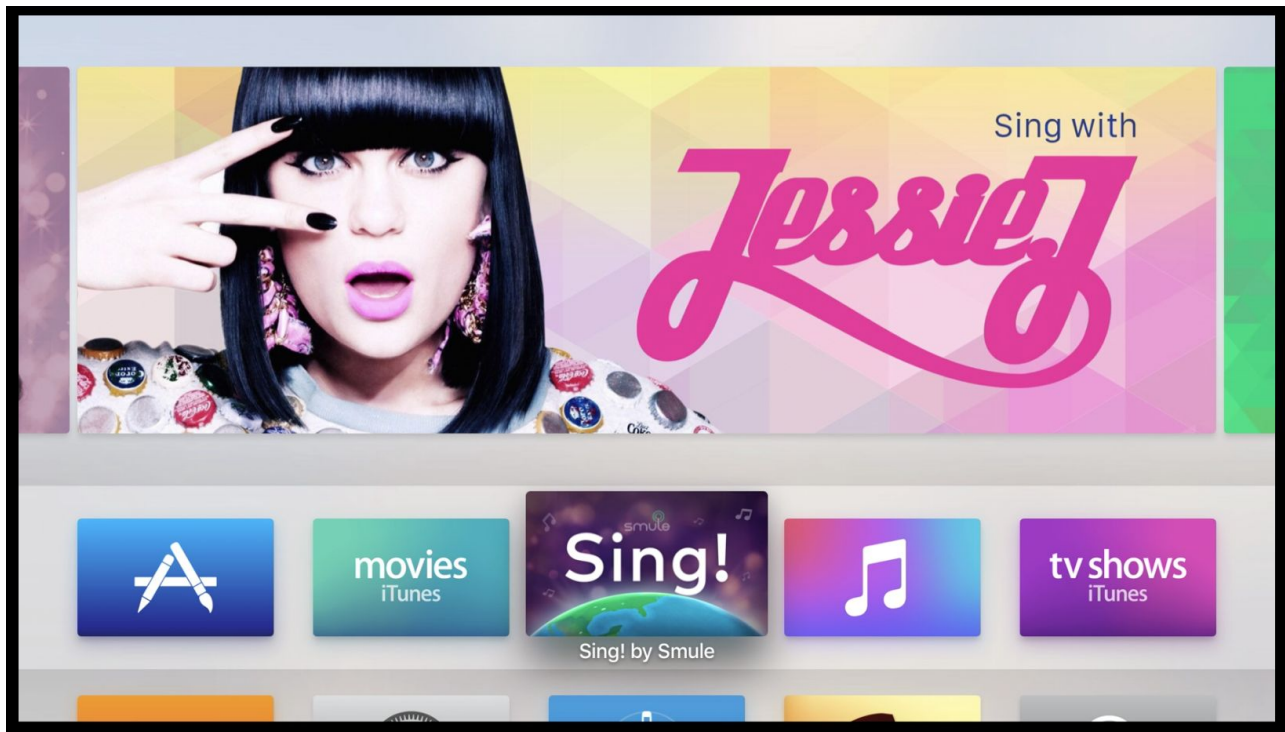
NewsApp

Dynamic Content

- Interactive top shelf
- Choice of Inset Banner or Content Row
- Provides shortcuts to the content
- Can be personalized

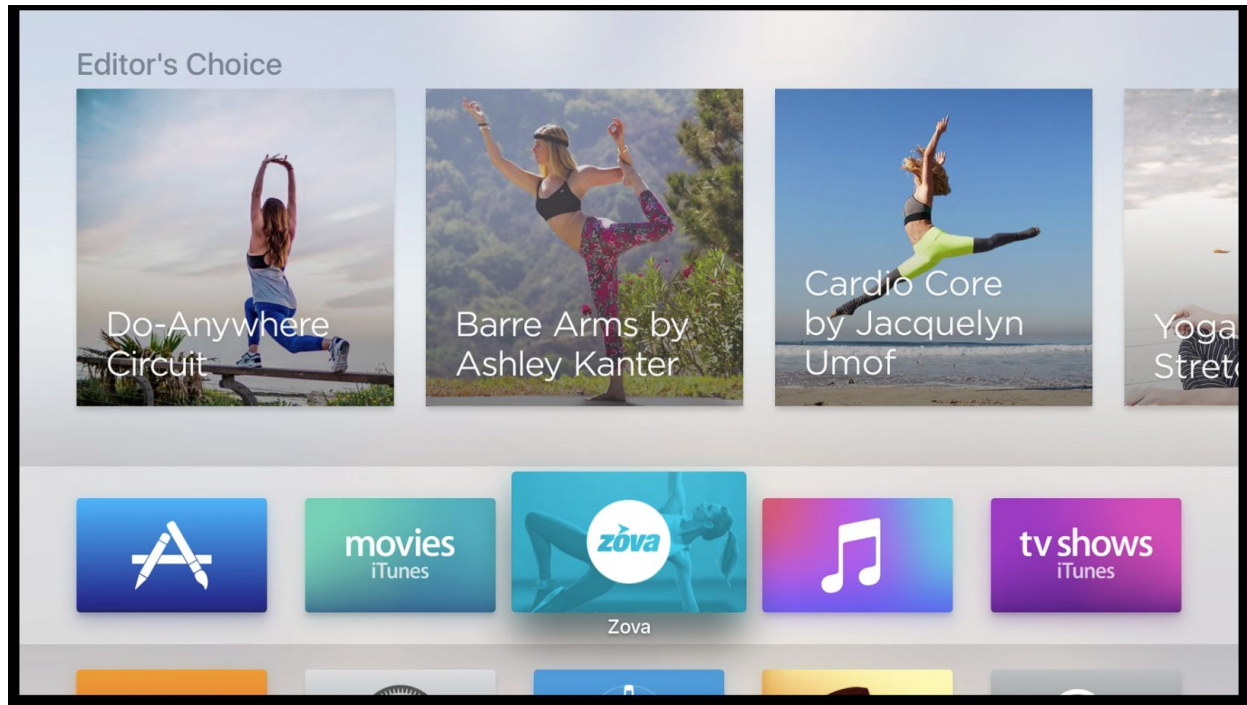
Inset top shelf

- great choice to display the overarching themes of your app
- Both layouts let the user scroll and browse through the your content
- For ex: Game app

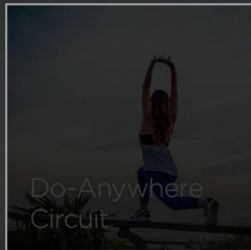


Sectioned top shelf

- Great choice to show grouped Information
- Feed information as quickly as possible
- For ex: New articles



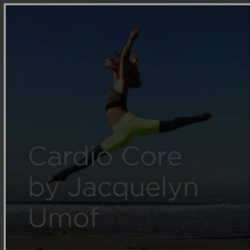
Editor's Choice



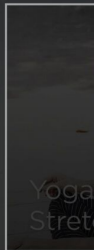
500 x 500 - Unfocused

608 x 608 - Largest Size

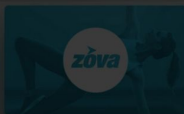
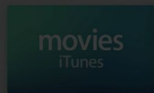
Barre Arms by
Ashley Kanter



Cardio Core
by Jacquelyn
Umof



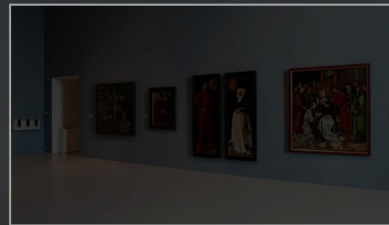
Yoga
Stretch



Zova

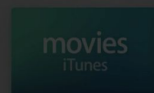
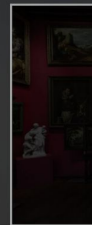


Featured Shows



782 x 440 - Unfocused

908 x 512 - Largest Size



Artsy Shows



Top Movies

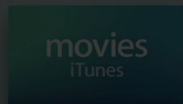


333 x 500

Unfocused

404 x 608

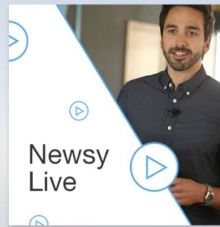
Largest Size



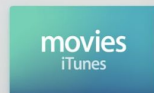
Movies



Newsy Live



Top Stories

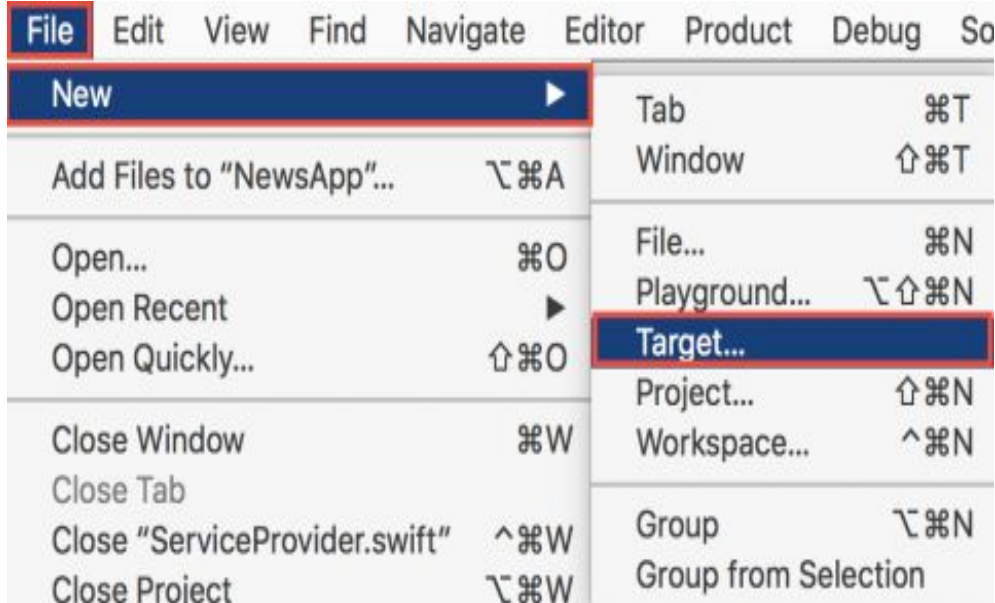


Newsy




Let's Learn how to add top shelf ! -

- Download code from <https://github.com/patilsnehal/tvOSTopShelf>
- Run the project - News app
- Add a target to this project



TV Services Extension

Choose a template for your new target:

| | |
|-----------------------|---|
| iOS | |
| Application | |
| Framework & Library | |
| Application Extension |  |
| Test | |
| watchOS | |
| Application | |
| Framework & Library | |
| tvOS | |
| Application | |
| Framework & Library | |
| Application Extension | |
| Test | |
| OS X | |
| Application | |
| Framework & Library | |
| Application Extension | |

TV Services Extension
This template builds a TV Service application extension.

Cancel Previous Next

Choose options for your new target:

Product Name: TopShelf

Organization Name: RayWenderlich

Organization Identifier: com.RayWenderlich.NewsApp

Bundle Identifier: com.RayWenderlich.NewsApp.TopShelf

Language: Swift

Project: NewsApp

Embed in Application: NewsApp

Cancel Previous Finish

Principle Class - ServiceProvider

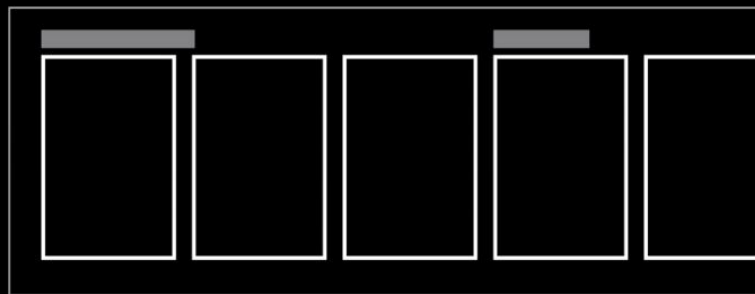
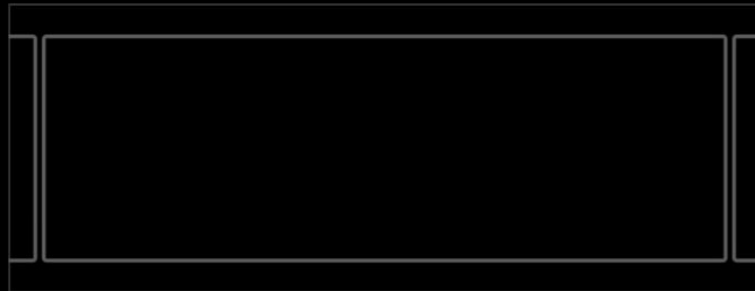
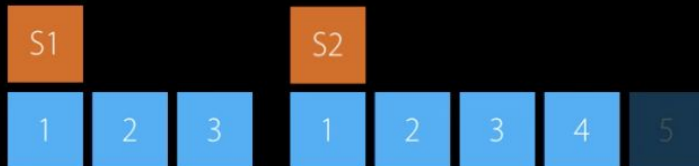
- ServiceProvider.swift should be created automatically for you
- TVTopShelfProvider protocol
- TVTopShelfContentStyle - Sectioned / Inset
- TVContentItem array - actual metadata
 - Content identifier
 - Title
 - Imageurl
 - imageShape
 - Display url
 - Play url
 - topshelfItem

TVContentItem

Inset



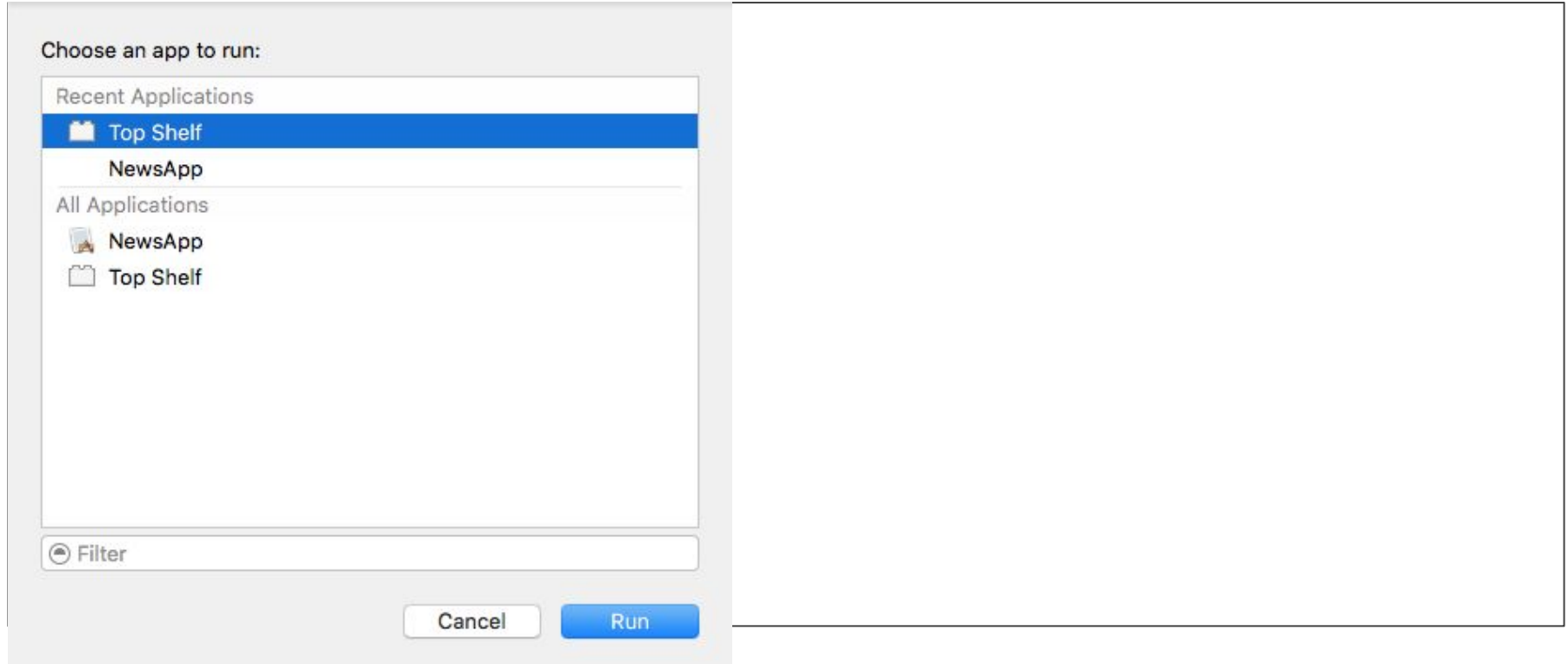
Sectioned



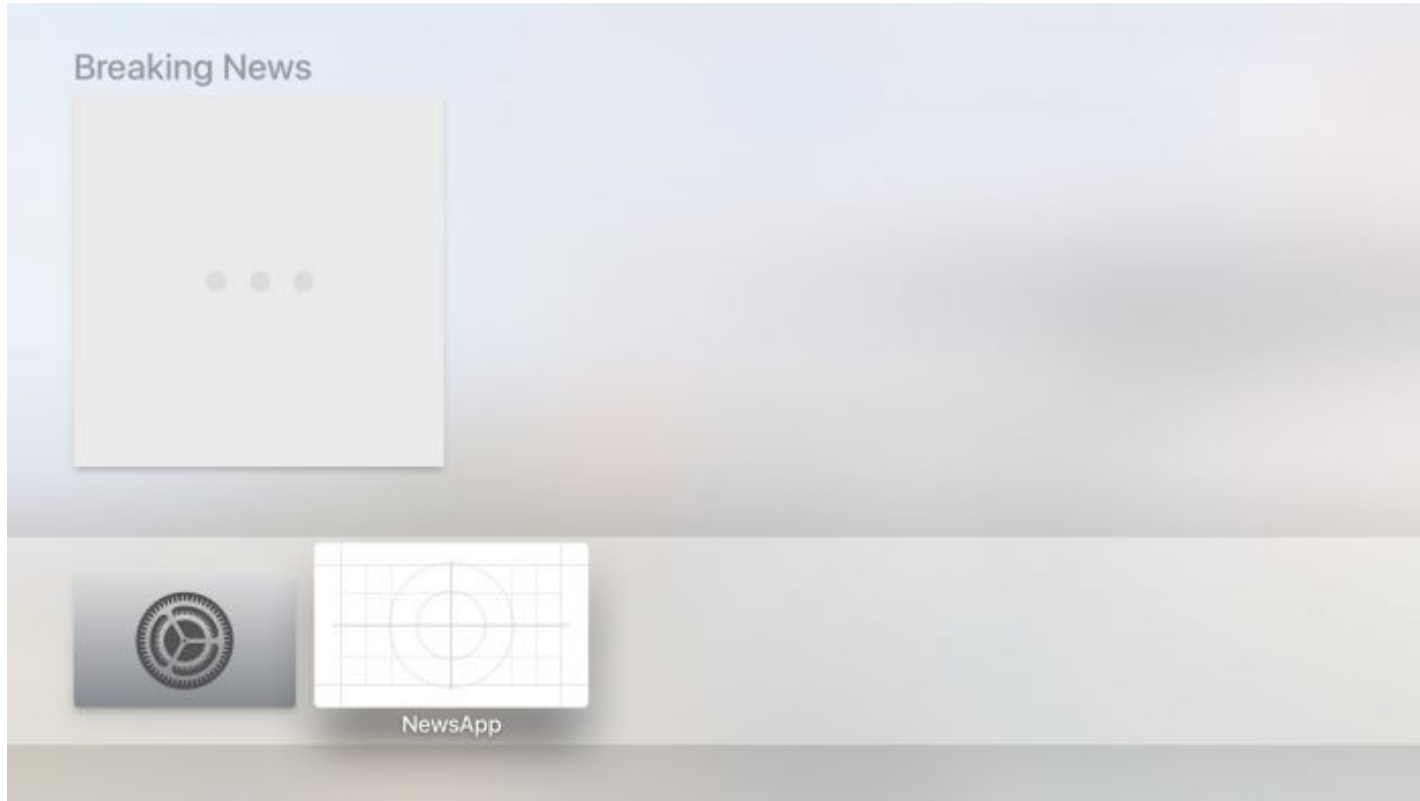
topShelfItem

```
var topShelfItems: [TVContentItem] {  
    // 1  
    let breakingNewsIdentifier = TVContentIdentifier(identifier:  
        "Breaking News", container: nil)!  
    let breakingNewsSection = TVContentItem(contentIdentifier:  
        breakingNewsIdentifier)!  
    breakingNewsSection.title = "Breaking News"  
  
    // 2  
    let martianRiotIdentifier = TVContentIdentifier(identifier:  
        "Martians Riot", container: nil)!  
    let martianRiotItem = TVContentItem(contentIdentifier:  
        martianRiotIdentifier)!  
  
    // 3  
    breakingNewsSection.topShelfItems = [martianRiotItem]  
  
    return [breakingNewsSection]  
}
```

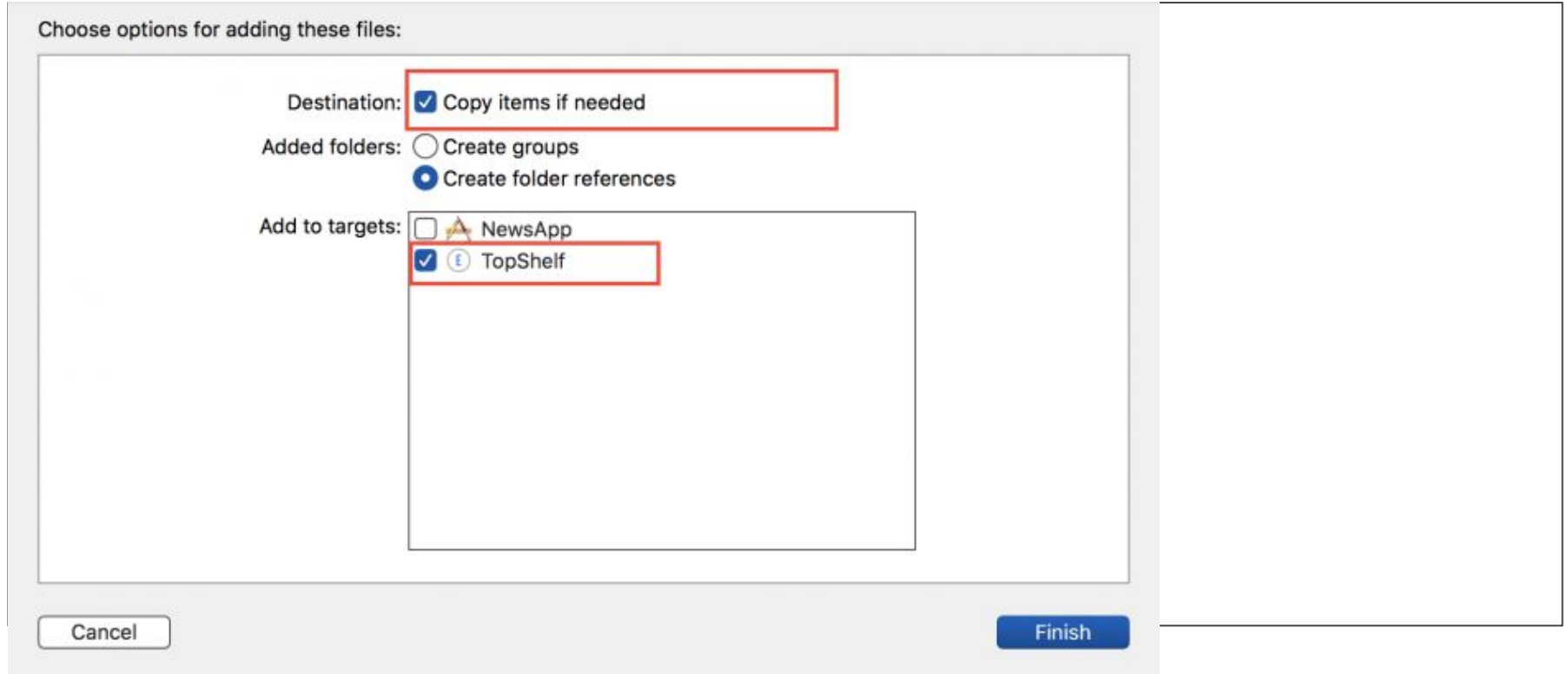
Running the top shelf



NewsApp and TopShelf

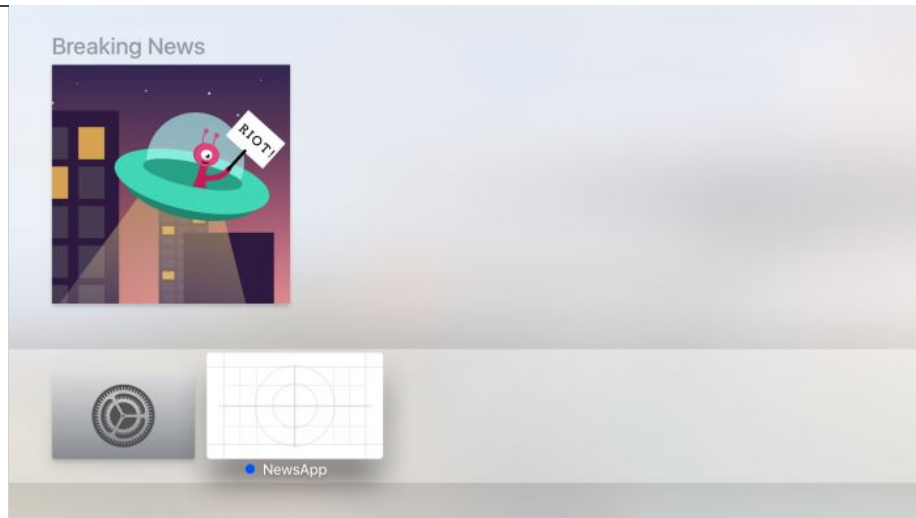


Add image for topshelf



ImageURL

```
martianRiotItem.imageUrl =  
NSBundle.mainBundle().URLForResource(  
    "sectionedMartians", withExtension:  
    "png")
```



Adding more news items

```
// 1
let milkyWayNewsIdentifier = TVContentIdentifier(identifier:
    "Milky Way News", container: nil)!
let milkyWaySection = TVContentItem(contentIdentifier:
    milkyWayNewsIdentifier)!
milkyWaySection.title = "Milky Way"

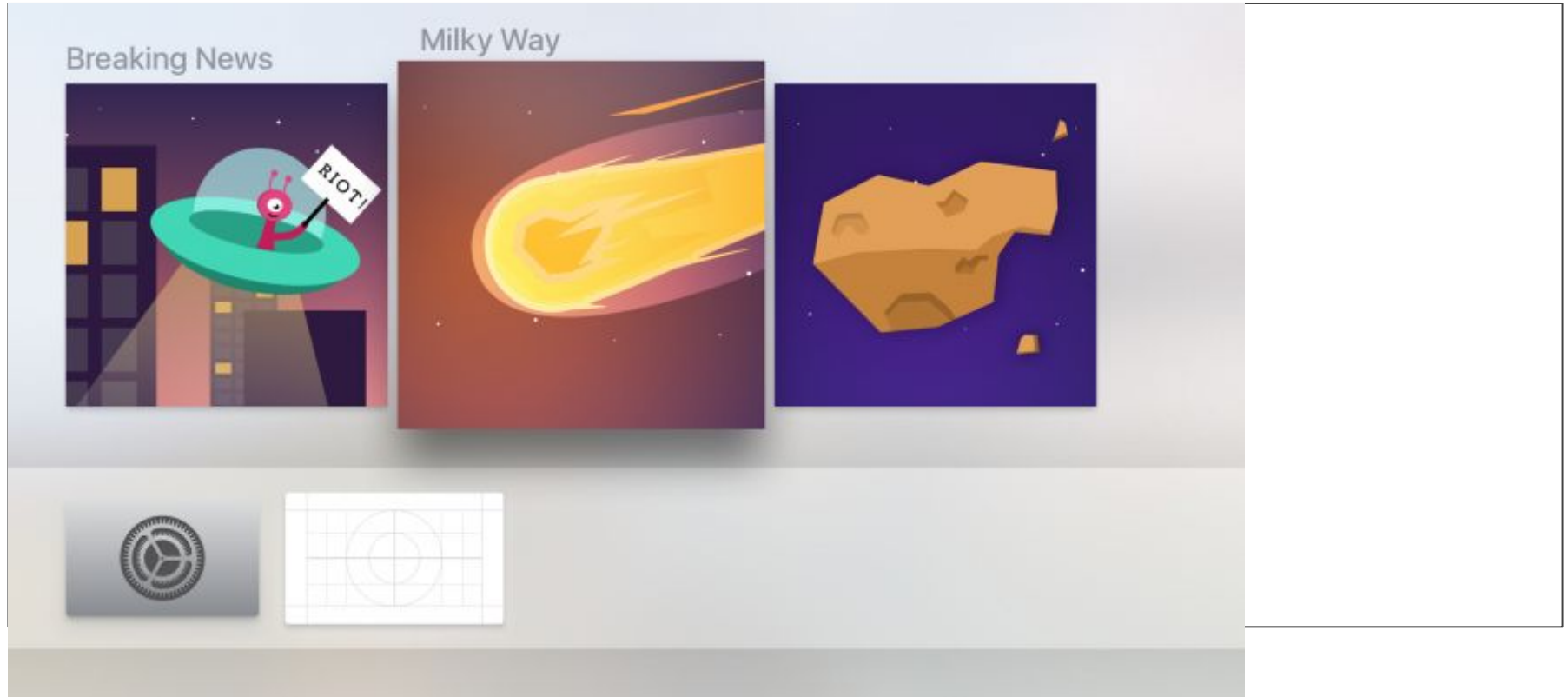
// 2
let cometIdentifier = TVContentIdentifier(identifier:
    "An odd comet", container: nil)!
let cometItem = TVContentItem(contentIdentifier:
    cometIdentifier)!
cometItem.imageURL = NSBundle.mainBundle().URLForResource(
    "comet", withExtension: "png")

// 3
let asteroidIdentifier = TVContentIdentifier(identifier:
    "Asteroid Light Speed", container: nil)!
let asteroidItem = TVContentItem(contentIdentifier:
    asteroidIdentifier)!
asteroidItem.imageURL = NSBundle.mainBundle().URLForResource(
    "asteroid", withExtension: "png")

// 4
milkyWaySection.topShelfItems = [cometItem, asteroidItem]

return [breakingNewsSection, milkyWaySection]
```

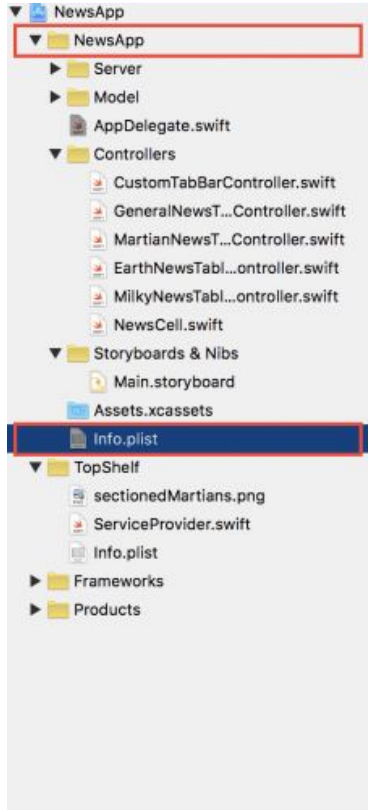
Multiple Section in top shelf



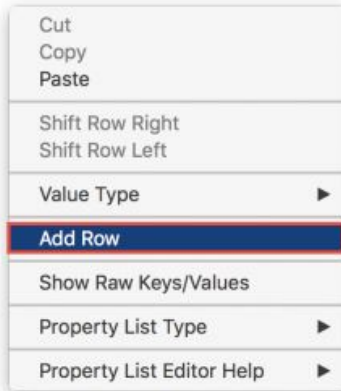
Adding User Interaction

- Unfortunately you can not call IBAction event handling
- *AppDelegate.swift* will call *application:openURL:options* when a user selects anything in the top shelf
- Provide displayURL for detail view
- Provide playURL to direct playback or launch into action
- The top shelf can listen to two events on the remote: a press on the touch screen, and a press on the play button.
- Add custom url scheme to your app's *Info.plist* file

Event Handling



| Key | Type | Value |
|---------------------------------------|------------|-------------------------------|
| ▼ Information Property List | Dictionary | (12 items) |
| Localization native development re... | String | en |
| Executable file | String | \$(EXECUTABLE_NAME) |
| Bundle identifier | String | \$(PRODUCT_BUNDLE_IDENTIFIER) |
| InfoDictionary version | String | 6.0 |
| Bundle name | String | \$(PRODUCT_NAME) |
| Bundle OS Type code | String | APPL |
| Bundle versions string, short | String | 1.0 |
| Bundle creator OS Type code | String | ???? |
| Bundle version | String | 1 |
| Application requires iPhone enviro... | Boolean | YES |
| Main storyboard file base name | String | Main |
| ► Required device capabilities | Array | (1 item) |



plist file modification

| | | | | | |
|----------------|-------|---|---|------------|-------------|
| ▼ URL types | ⬆ ⬇ ⬆ | + | - | Array | ⬇ (1 item) |
| ▼ Item 0 | | + | - | Dictionary | (1 item) |
| URL identifier | | | ⬆ | String | |
| ▼ URL types | ⬆ | | | Array | (1 item) |
| ▼ Item 0 | | | | Dictionary | (2 items) |
| ▼ URL Schemes | ⬆ | | | Array | (1 item) |
| Item 0 | | | | String | newsapp |
| URL identifier | ⬆ | | | String | NewsApp URL |

Hooking up the AppDelegate

Adding the URLs

```
martianRiotItem.displayURL = urlForIdentifier("martianRiot")  
cometItem.displayURL = urlForIdentifier("comet")  
asteroidItem.displayURL = urlForIdentifier("asteroid")
```

Helper Method

```
private func urlForIdentifier(identifier: String) -> NSURL {  
    let components = NSURLComponents()  
    components.scheme = "newsapp"  
    components.queryItems = [NSURLQueryItem(name: "identifier",  
        value: identifier)]  
  
    return components.URL!  
}
```


AppDelegate.swift

```
let newsTab = 0
let martianTab = 1
let earthTab = 2
let milkyWayTab = 3

func application(app: UIApplication, openURL url: NSURL,
options: [String: AnyObject]) -> Bool {
    guard let initialViewController = window?.rootViewController
        as? UITabBarController else { return false }

    switch url.absoluteString {
    case "newsapp:?identifier=martianRiot":
        initialViewController.selectedIndex = martianTab
    case "newsapp:?identifier=comet",
        "newsapp:?identifier=asteroid":
        initialViewController.selectedIndex = milkyWayTab
    default:
        return false
    }
    return true
}
```

Tips and Tricks

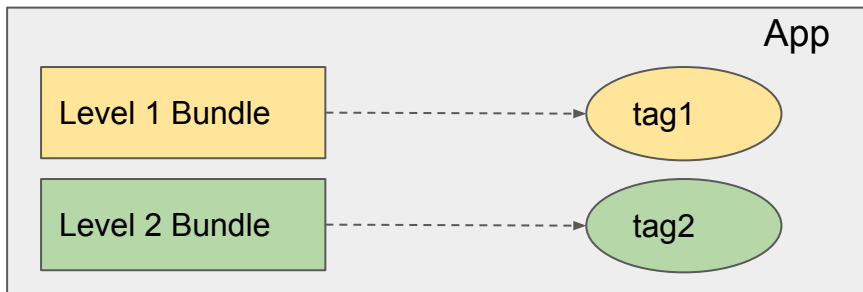
- Provide both `displayURL` and `playURL`
- Post `TVTopShelfItemsDidChangeNotification`
- Use `NSUserDefaults` and set up App Group to share data between app and extension

Managing Resources - iCloud and ODR

- Storage on Apple TV is limited < 200MB
- No guarantee that information stored on the device will be available the next time a user opens your app
- Need to store user information somewhere else than Apple TV so that it can be accessed by our application on other devices
- iCloud Key-Value Storage (KVS) and CloudKit.
- 1M < use iCloud KVS. iCloud KVS automatically synchronizes information across all of a user's devices. Only the owner of the app is able to access the information stored by iCloud KVS.
- 1MB > use CloudKit. CloudKit allows information stored by one user to be accessed by another user.

On Demand Resources

- tvOS apps have a maximum initial download size of 200 MB, and any additional resources must be available through ODR.
- Only retrieves the resources it's needed up to that point. (For ex. Download resources for level 1 game)
- Why to use ODR?
 - Faster initial download
 - Smaller app size



References

- <https://www.raywenderlich.com>
- <https://www.youtube.com/watch?v=k4pSxIEnFqM&index=1&list=PLiRG83hKoub9vYDmeyXh50U9ZYbNJ6PZF>
- https://developer.apple.com/library/tvos/documentation/General/Conceptual/AppleTV_PG/YourFirstAppleTVApp.html
- <https://developer.apple.com/videos/techtalks-apple-tv/>

Q & A

Thank you!