



Raspberry Pi, Cars, and AppleTV

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DerbyCon 3.0
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DERBYCON

Requisite Background

- Senior Consultant at Intrepidus Group
 - Wholly owned by NCC Group
- Mobile app and OS testing and research
 - I focus on iOS
 - Others have more Android focus
 - Including three other guys presenting at this very con
- Also web app testing, pen testing, physical security reviews, etc.
- Interested in any of that? We're also hiring! :)

Remember these?



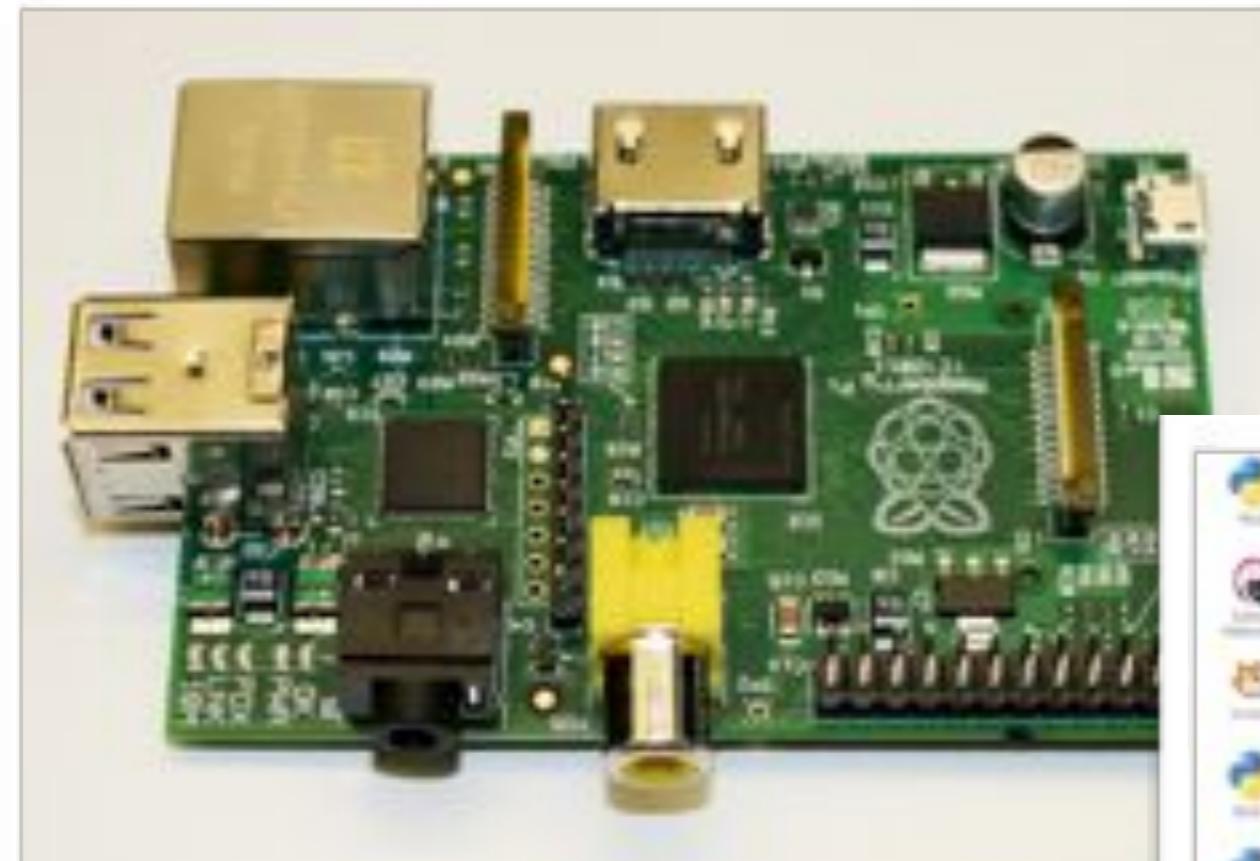
Nostalgia can't compete

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- My boys LOVE minecraft
- Just build, explore, tear down...
 - (and lately, shoot chickens)
- This past spring, had a great idea:
 - Let's put an access point in the car!
- Then...I got a little feature crazy.
- Quick overview of some features
- Deep dive into integration with Apple TV

What do you need



- Hardware:
 - Logitech WUSB54GC
 - By luck, had one in a drawer
- Software:
 - iw: to verify your adapter will work
 - udhcpd: to provide IPs for clients
 - hostapd: set up access point
- Not worrying about NAT, FW, etc.
 - For now, it's a standalone (isolated) car network
- Step by step guides:
 - learn.adafruit.com
 - Pi-Point.co.uk

Tired of lugging DVDs?

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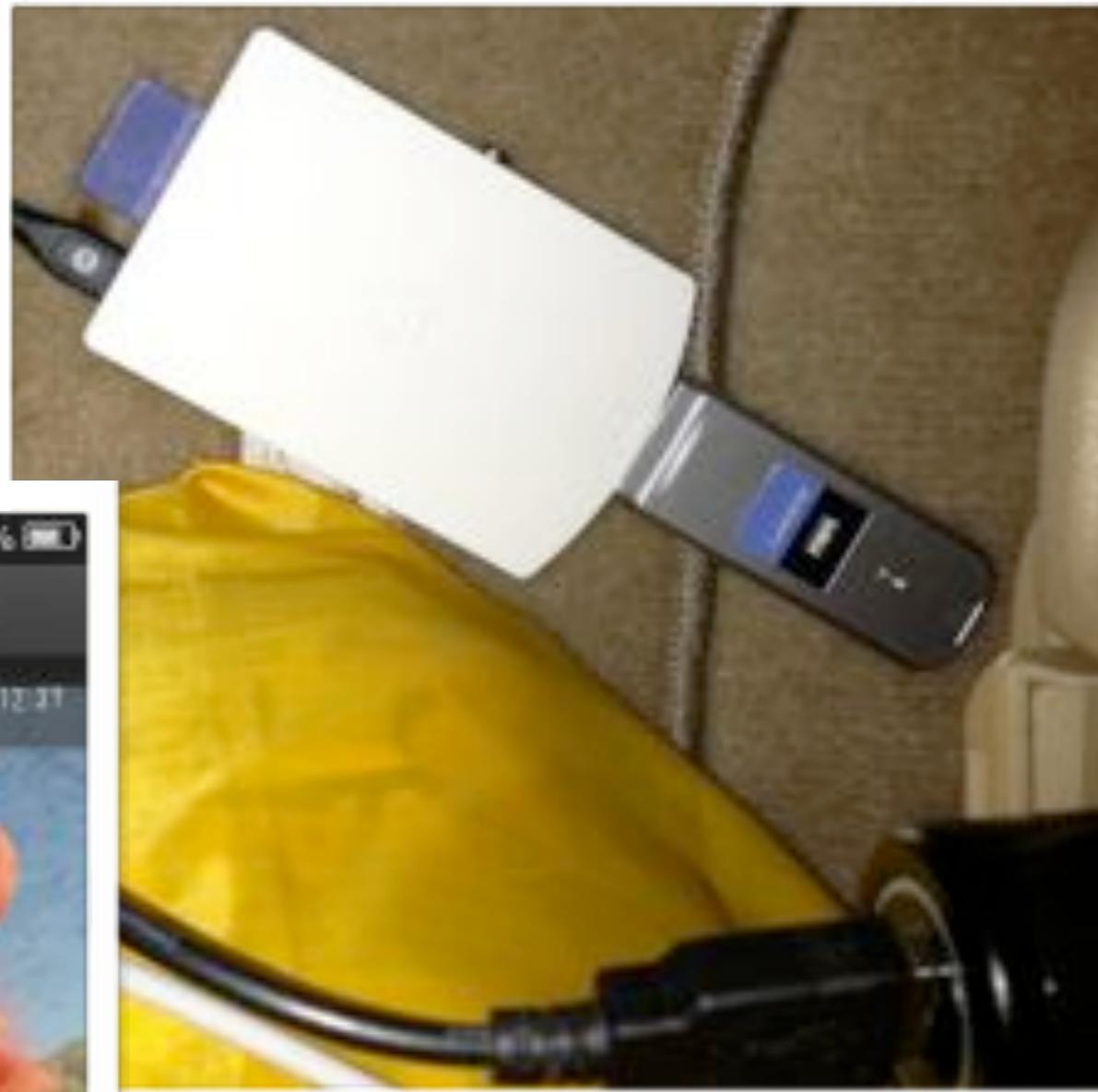
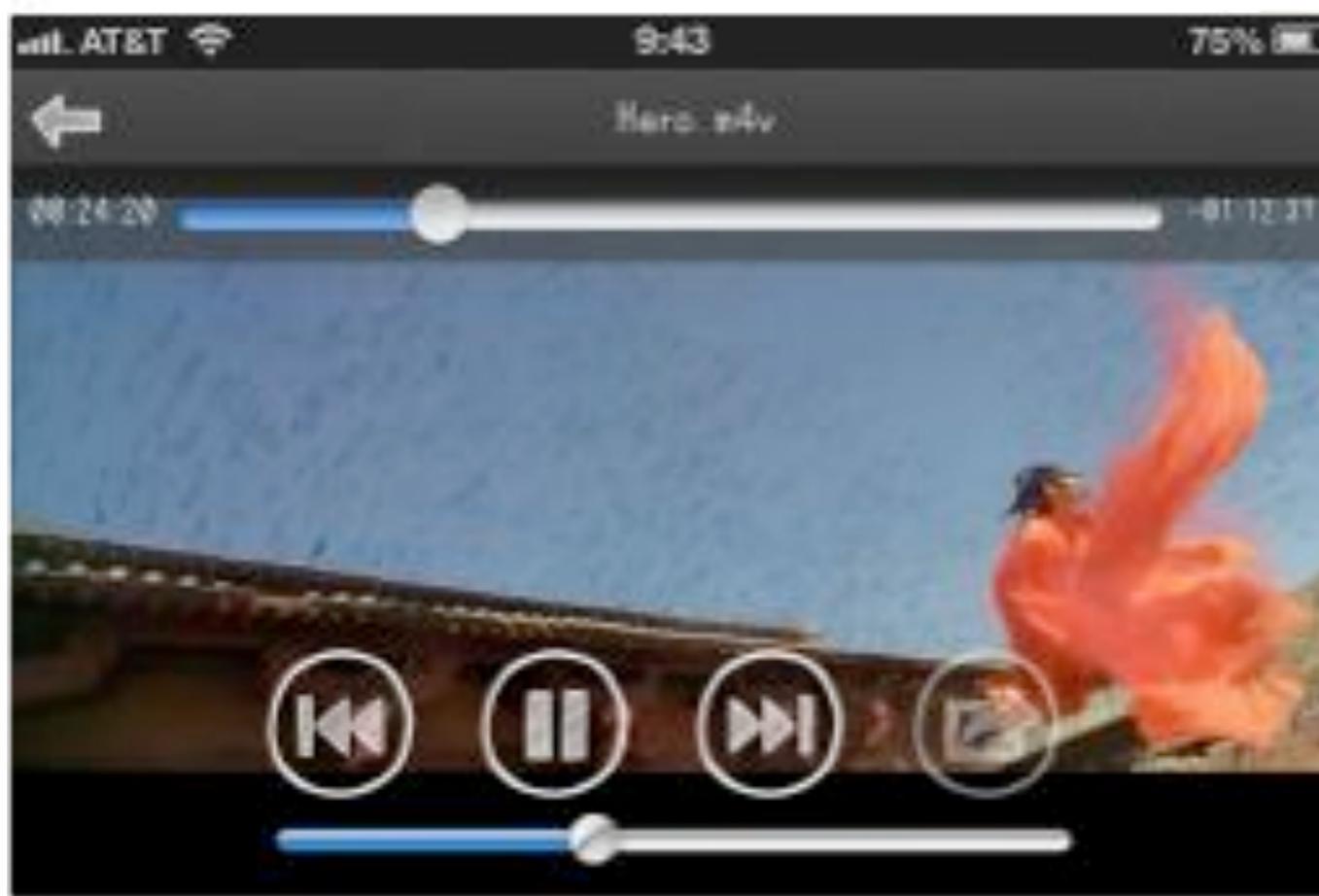


Let's put movies on rPI



- minidlna: the DLNA server itself
- /etc/minidlna.conf: media folder, network address, etc.
- Content: Whatever your clients can display
 - Using iOS devices -- m4v, etc. (Handbrake FTW)
- Clients: Whatever works
 - All kinds of DLNA clients on iOS
 - Most are... clunky.
 - Should also work with DLNA TVs
 - But they might be a bit large for the car

In Action!



And when the battery dies?



Media player on rPi!



- Several pre-built, dedicated images:
 - OpenELEC
 - Raspbmc
 - XBian
- Fast, clean, simple
 - Not as flexible -- replaces whole OS
- XBMC packages exist
 - michael.gorven.za.net/raspberrypi/xbmc
- Control with XBMC web interface

Metadata didn't like

- XBMC grabs program info “live”
- Not the iTunes tags I painstakingly added
- Sometimes, VERY wrong.
- Reading iTunes tags is a royal pain
- Many old and unmaintained libraries
- During this work, settled on a pair of utilities
 - But couldn't get them running on the rPI
- Someone: Please fix this!

Very low volume

- Had to tweak mixdown parameters

```
***** Verizon LTE          11:00 AM          8 69%
Linux raspberrypi 3.6.11+ #496 PREEMPT Thu Jul 11 00:09:56 BST 2013 armv6l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Fri Aug  9 15:45:09 2013 from 192.168.38.42
pi@raspberrypi ~ $ cat /usr/share/xbmc/system/advancedsettings.xml
<advancedsettings>
  <video>
    <defaultplayer>omxplayer</defaultplayer>
    <defaultdvdplayer>omxplayer</defaultdvdplayer>
  </video>
  <audio>
    <defaultplayer>omxplayer</defaultplayer>
    <streamsilence>false</streamsilence>
  <!-- Amount of gain (dB) to be applied to audio. Default is 12.0. Valid values are: -
96.0 to 96.0  -->
    <ac3downmixgain>24.0</ac3downmixgain>
  </audio>
</advancedsettings>
pi@raspberrypi ~ $
```

<!-- Amount of gain (dB) to be applied
96.0 to 96.0. -->
<ac3downmixgain>24.0</ac3downmixgain>
</audio>
</advancedsettings>

...and at the rental house?

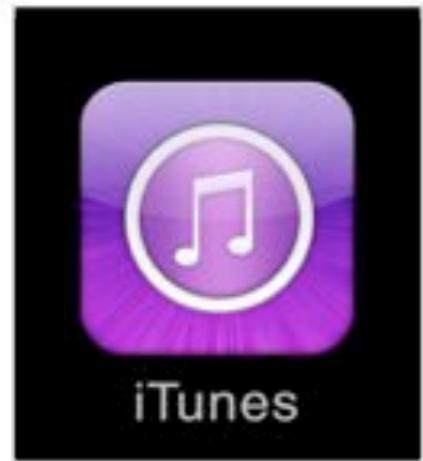


Bring the AppleTV!

- It's small
- It's got Netflix
- Many rental houses have WiFi
- But now I need to bring an iTunes server...



Let's put rPI on AppleTV

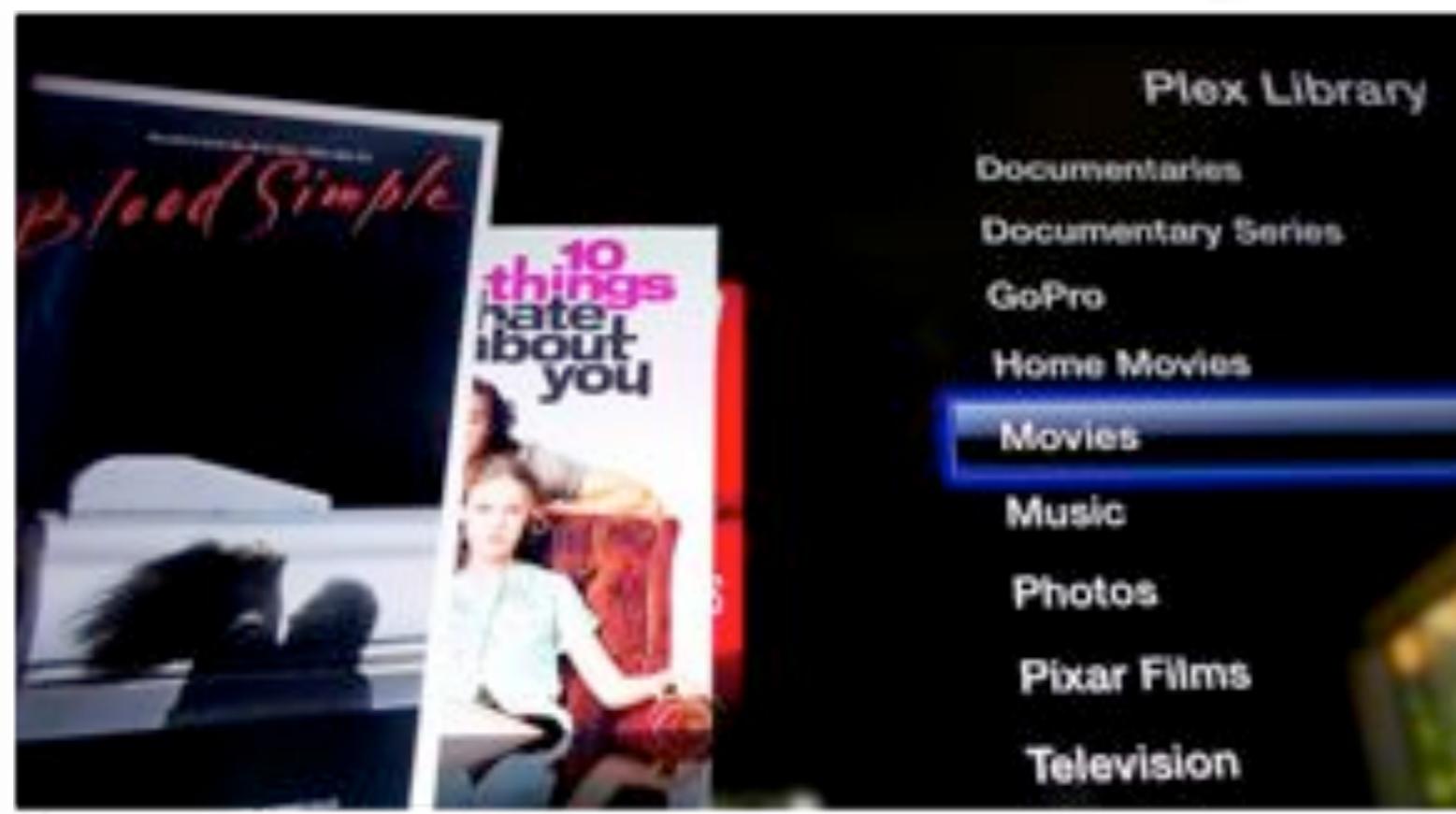


- Not compiled binaries
- Interface defined in XML
- Modified in JavaScript on client
- Fetched real time over the Internet

```
<!-- Item Detail -->
<xsi:element name="itemDetail">
  <xsi:complexType>
    <xsi:all>
      <xsi:element ref="title"/>
      <xsi:element ref="subtitle" minOccurs="0"/>
      <xsi:element name="image" type="imageWithStyleType"/>
      <xsi:element name="defaultImage" type="imageType"
minOccurs="0"/>
      <xsi:element name="rightImage" type="imageType" minOccurs="0"/>
      <xsi:element name="rating" type="xs:string" minOccurs="0"/>
      <xsi:element ref="summary"/>
      <xsi:element ref="footnote" minOccurs="0"/>
      <xsi:element ref="table" minOccurs="0"/>
      <xsi:element name="centerShelf" minOccurs="0">
        <xsi:complexType>
          <xsi:all>
```

Sneaking in

- Point DNS to your server
- Intercept trailers.apple.com
- Send your own XML content
- Used by PlexConnect, others

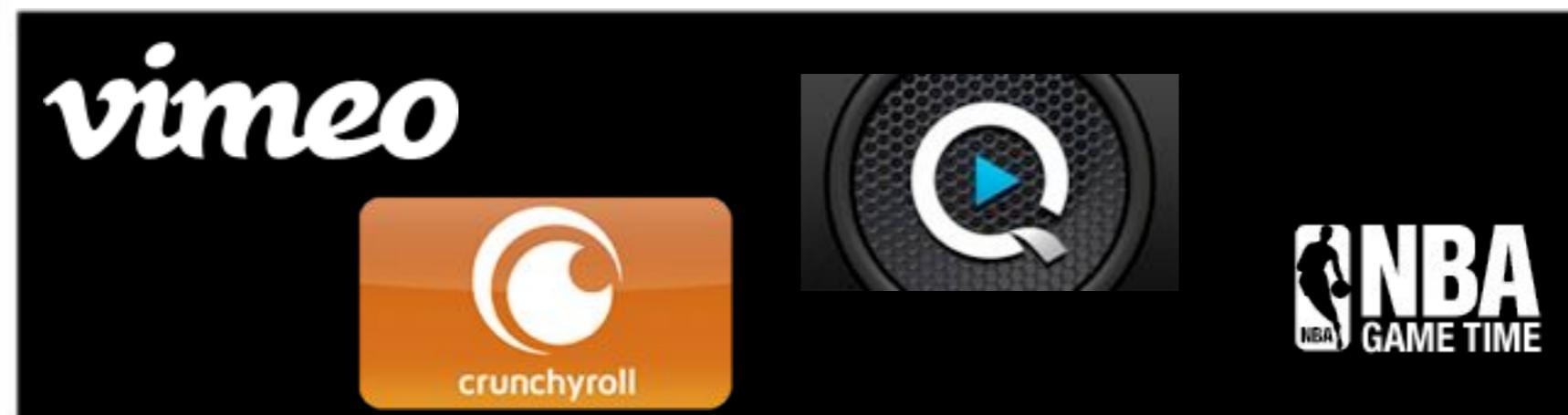


Some limitations

- Can't change the icon or name
- Only do this for one external app at a time
 - Unless you hijack additional channels
- Not great for externally hosted channels
- You lose the hijacked channel
 - I sorta like the Trailers app
- Changes by Apple can break it
 - Early September: changed to https for key files

Official Channels

- Netflix, Vimeo, MLB, SkyNews, etc.
- Must be working directly with Apple
- Does Apple develop the apps?
- If not....
- ...how do they test their code?



Use a simulator?

- Not sure one exists
- But everything is in XML
- And I actually *like* XSLT (yes, I'm the one)
- So....now I can simulate AppleTV
 - Ugly “proxy” hack
 - Fetches remote pages
 - Applies XSLT, uses CSS for layout
 - Returns to browser
- Works in Chrome, better in Safari
- Should be a dedicated app

The screenshot shows a mobile browser displaying a movie page for "Despicable Me 2". The URL in the address bar is `127.0.0.1:8000/www.FakeIosAppletStation/universal/despicablene2/index.html`. The page title is "Despicable Me 2" from "Universal Pictures". A PG rating is shown in the top right. The movie poster features two yellow minions. The synopsis describes the return of Gru (Steve Carell) and his team. Cast information includes Steve Carell as the Actor, Pierre Coffin and Chris Renaud as Directors. Below the poster, there are buttons for "Play" and "More".

Despicable Me 2
Universal Pictures

PG

Universal Pictures and Illumination Entertainment's worldwide blockbuster, Despicable Me, delighted audiences around the globe in 2010, grossing more than \$540 million and becoming the 10th-biggest animated motion picture in U.S. history. In Summer 2013, get ready for more minion madness in Despicable Me 2. Chris Meledandri and his acclaimed filmmaking team create an all-new comedy animated adventure featuring the return of Gru (Steve Carell), the girls, the unpredictably hilarious minions...and a host of new and outrageously funny characters.

Dubbed
Comedy
In Theaters 7/03
Rating 75
Now in iTunes

Actor: Steve Carell
Director: Pierre Coffin
Chris Renaud

Play More

More Comedy

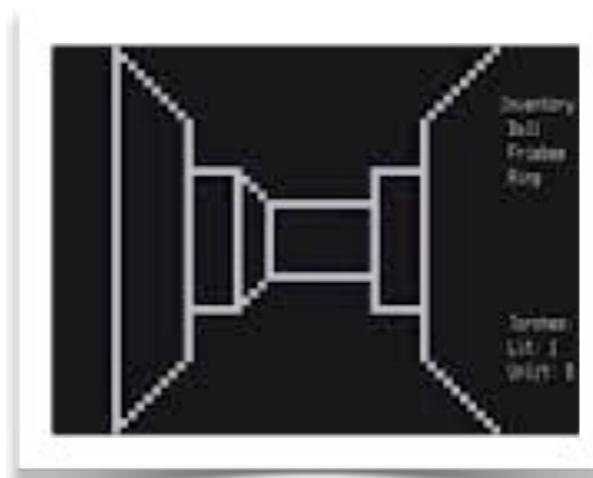
I Give It a Year
Grown Ups 2
Pawn Shop Chronicles
Hell Baby
The Spectacular Now
We're So Excited
Prince Avalanche
Drinking Buddies

How do you test ON DEVICE?

- Even a perfect simulator is just a simulator
- Essential to test on the device itself
- Can you side-load apps via USB?
 - Direct filesystem upload would've been noticed
 - Profile-based install? MDM?
- Or maybe a hidden menu somewhere
- Let's get a jailbroken ATV and start hacking!

- Been working with iOS for a while now
- First time using a jailbroken AppleTV
- Plex hack inspired to dig deeper
- Looked closely at AppleTV.app
- Found quite a few neat tricks

- 1978: key combinations and algebra
- 1981: hexdump, disassembler, paper
- 1993: strings command and dwrites
- 2013: strings, IDA, mobileconfig



Interesting Strings

- EnableAddSite
- menu-title, menu-icon-url, root-url
- loaded-via-addsite
- AddProfile

com.apple.appletv.addsite
com.apple.appletv.addsitename
com.apple.appletv.addsiteurl
ExtraInternetCategories.plist

MEInternetAddSiteController: Unable to load extra Internet
Enter the URL. If pointing to a vendor bag then verify the

bag.plist

Site Name

Enter the Site Name.

Application Settings

- Property list files
- Page templates, app preferences
- User credentials
- App history

```
Apple-TV:/User/Library/Application Support/Front Row/Merchants root# ls
NHL/
apollo/
apple_events/
dot-mac/
e.mc/
flagstaff/
flickr/
fox-news/
hulu/
internet-add-site/
internet-podcasts/
internet-radio-stations/
internet-youtube/
itms/
movie-trailers-v2/
nba/
netflix/
photo-stream/
sample-xml/
show.atv/
vimeo/
wsj/
```

Config settings

- Managed.Configuration framework

- AllowedDefaults.plist

- EnableFeatureEnabler
- PrintBitRate
- UserDeviceName
- HS.Diagnostics.Enabled
- EnableDPLogs

```
* plutil ManagedConfiguration.framework/A.plist | sed -n '/frontrow/,/)/p'  
"com.apple.frontrow" = {  
    SentLogPaths,  
    EnableFeatureEnabler,  
    EnableCoreMediaLogging,  
    PrintBitRate,  
    SkipWhatsNew,  
    UserDeviceName,  
    SleepTimeout,  
    MusicStoreFrontID,  
    "nz-platform",  
    ATVSUINormalCheckInterval,  
    ATVSUJPostponedCheckDelay,  
    "_BRUpdateVersionFileURL",  
    SWULastRetailType,  
    "_ATV_SWU_Developer",  
    LastUpdatedFromATV,  
    LastUpdatedFromOS,  
    LastUpdatedFromOSBuild,  
    SWUManualServerIPAddress,  
    SWUMoreOptions,  
    SWUEnableLog,  
    AutoSubmit,  
    AirPlaneSecurityType
```

Mobileconfig snippet

```
<key>PayloadContent</key>
<array>
  <dict>
    <key>PayloadIdentifier</key>
    [....]
    <key>PayloadContent</key>
    <array>
      <dict>
        <key>DefaultsDomainName</key>
        <string>com.apple.frontrow</string>
        <key>DefaultsData</key>
        <dict>
          <key> [setting name goes here] </key>
          <true/> [or false, or <string>...<string>, etc.]
        </dict>
      </dict>
    </array>
  </dict>
</array>
```

Testing new settings

- Install profiles using Configurator app
 - Power-on with USB connected
 - Install profile
 - Disconnect, reboot
- Lots of keys to try - this'll take forever
- How else can we load a profile?

MDM, of course!

The slide features a dark background with a red vertical bar on the left. At the top left is the Intrepidus Group logo. To the right of the logo is the title 'Inside Apple's MDM Black Box'. Below the title is a yellow square icon containing a black silhouette of a wizard or jester. To the right of the icon, the author's name 'David Schuetz, Senior Consultant' and contact information 'david.schuetz@intrepidusgroup.com' and '@schuetzdj' are listed. At the bottom right is the Black Hat USA+2011 logo.

INTREPIDUS GROUP
MOBILE SECURITY

Inside Apple's MDM Black Box



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blackhat usa+2011
DISCORDING SECURITY

Not supported

- Profile installed....
-but device wouldn't enroll
- Can manually force a poll of MDM server
- So rewrote my MDM server to fuzz profiles

```
{'CommandUUID': 'f951DD4D-e2a5-4104-a240-ddaace64c9ba',
 'QueryResponses': {'AvailableDeviceCapacity': 4.1766815105546875,
                    'BatteryLevel': 0.10000000149011612,
                    'BluetoothMAC': '--redacted--',
                    'BuildVersion': '10B144b',
                    'CellularTechnology': 0,
                    'DeviceCapacity': 6.037982177734375,
                    'DeviceName': 'Apple TV',
                    'Model': 'MC572LL',
                    'modelName': 'AppleTV',
                    'OSVersion': '6.1',
                    'ProductName': 'AppleTV2,1',
                    'SerialNumber': '--redacted--',
                    'UDID': '--redacted--',
                    'WiFiMAC': '--redacted--'},
 'Status': 'Acknowledged',
 'UDID': '--redacted--'}
```

- MDM sends new profile with each poll
- Changes key, iterates through values
 - That which doesn't produce an error is interesting
- Fuzzing: Worked!
- Setting testing: Not so much.
 - AppleTV profile daemon is very forgiving
 - Hardly throws any errors
 - FreeMoviesForLife = True is accepted
 - (Doesn't do anything though)

Let's go IDA

- Dumped a 238 MB decompiled C file
- Slowed Sublime editor to a crawl
- Found some fun stuff



Hidden Remote Tricks

```
// SettingsGeneralViewController - (char)brEventAction:(id)
char __cdecl -(SettingsGeneralViewController brEventAction:)(struct SettingsGeneralViewController *self, SEL a2, id a3)
{
    void *v3; // r5@1

[....]

    v15 = objc_msgSend(v12, "row");
    v16 = objc_msgSend(v3, "_adjustIndexBasedOnHiddenItemsForIndex:", v15);
    v17 = objc_msgSend(v4, "remoteAction");
    v18 = v17 == (void *)10;
    if ( v17 == (void *)10 )
        v18 = v16 == (void *)9;
    if ( v18 )
    {
        v19 = (const char **)selRef_showInstalledProfiles;
    }
}
```

SettingsGeneralViewController brEventAction

We're in the General menu, and pushed a remote button

Hidden Remote Tricks

```
// SettingsGeneralViewController - (char)brEventAction:(id)
char __cdecl-[SettingsGeneralViewController brEventAction:](struct SettingsGeneralViewController *self, SEL a2, id a3)
{
    void *v3; // r5@1

[....]

v15 = objc_msgSend(v12, "row");
v16 = objc_msgSend(v3, "_adjustIndexBasedOnHiddenItemsForIndex:", v15);
v17 = objc_msgSend(v4, "remoteAction");
v18 = v17 == (void *)10;
if ( v17 == (void *)10 )
    v18 = v16 == (void *)9;
if ( v18 )
{
    v19 = (const char **)selRef__showInstalledProfiles;
}
```

Get the number of the item the cursor is on.

Adjust in case there are hidden menu items displayed.

Hidden Remote Tricks

```
// SettingsGeneralViewController - (char)brEventAction:(id)
char __cdecl-[SettingsGeneralViewController brEventAction:](struct SettingsGeneralViewController *self, SEL a2, id a3)
{
    void *v3; // r5@1

[....]

    v15 = objc_msgSend(v12, "row");
    v16 = objc_msgSend(v3, "_adjustIndexBasedOnHiddenItemsForIndex:", v15);
    v17 = objc_msgSend(v4, "remoteAction");
    v18 = v17 == (void *)10;
    if ( v17 == (void *)10 )
        v18 = v16 == (void *)9;
    if ( v18 )
    {
        v19 = (const char **)selRef_showInstalledProfiles;
    }
}
```

v17 = [v4 remoteAction]

What did we just do?

Hidden Remote Tricks

```
// SettingsGeneralViewController - (char)brEventAction:(id)
char __cdecl-[SettingsGeneralViewController brEventAction:](struct SettingsGeneralViewController *self, SEL a2, id a3)
{
    void *v3; // r5@1

[....]

    v15 = objc_msgSend(v12, "row");
    v16 = objc_msgSend(v3, "_adjustIndexBasedOnHiddenItemsForIndex:", v15);
    v17 = objc_msgSend(v4, "remoteAction");
    v18 = v17 == (void *)10;
    if ( v17 == (void *)10 )
        v18 = v16 == (void *)9;
    if ( v18 )
    {
        v19 = (const char **selRef_showInstalledProfiles:
    }
```

if v17 (action) = 10 (“Play” button) ... and
v18 (current row) = 9 (“Send data to Apple” item)...
... then go to the “showInstalledProfiles” screen.

- **SettingsAboutViewController**
 - Using WiFi and remoteAction=3
 - toggleWiFiDetails
- **SettingsGeneralViewController**
 - Highlighted “About” item
 - remoteActions: 7, 7, 6, select: toggleRetailMode
 - Highlighted “Send Data to Apple” item
 - remote action 7: toggleShowInverseDeviceID
 - remote action 10: showInstalledProfiles



About

| | |
|-------------------|-----------------|
| Name | Apple TV |
| Model | MC572LL/A |
| Serial Number | C07FVF33D0RS |
| Apple TV Software | 5.2 (6010.96) |
| TV Resolution | 720p HD - 60Hz |
| Wi-Fi Network | MyNetwork |
| IP Address | my.ip.address |
| Wi-Fi Address | My:wif:ad:dr:ss |
| Signal Strength | ■■■■□ |
| Wi-Fi Channel | 6 |

Right arrow: Diag ID



Add Profile

- Highlight “Send Data to Apple”
- Hit “Play”

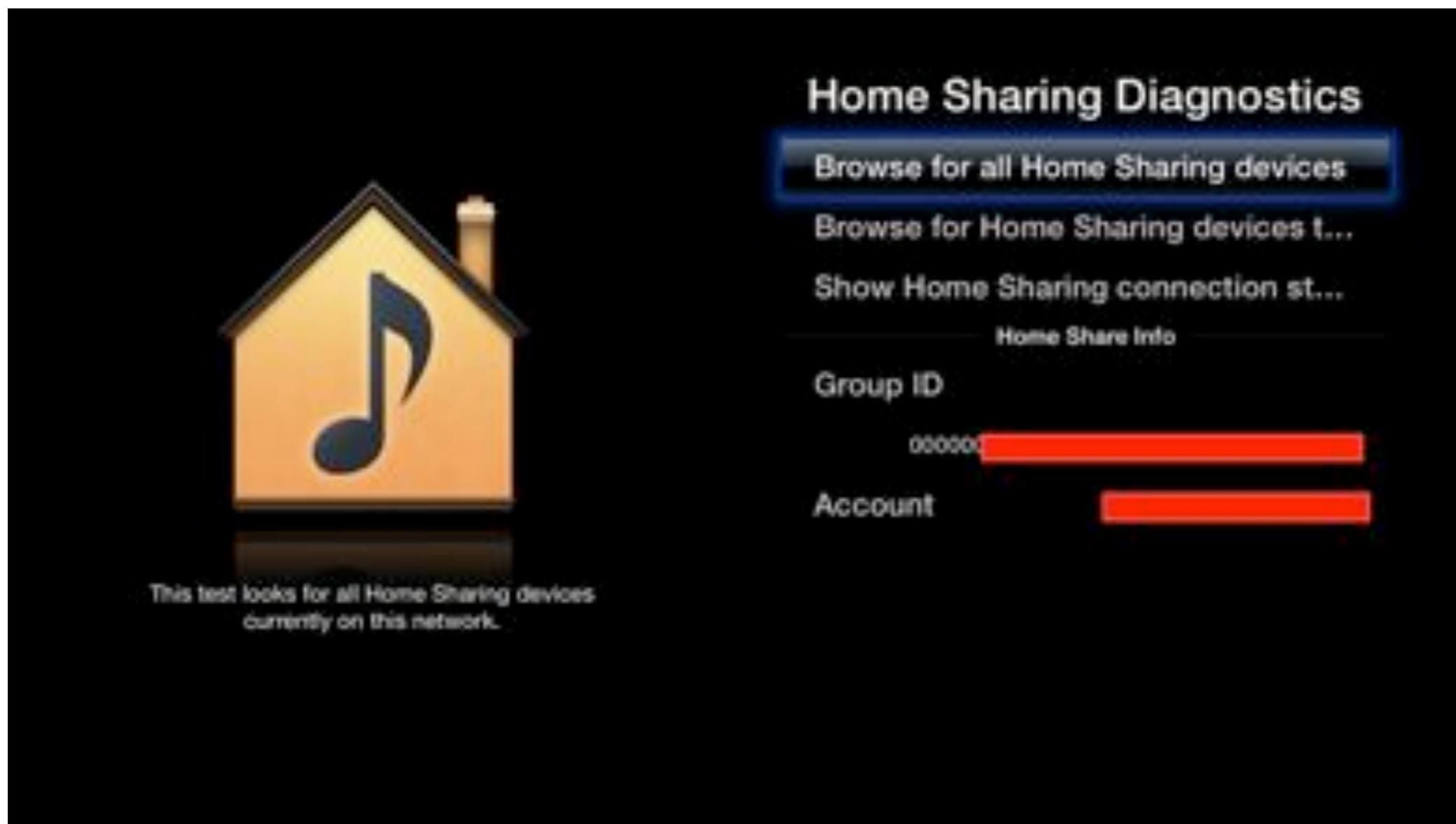


PrintBitRate = True

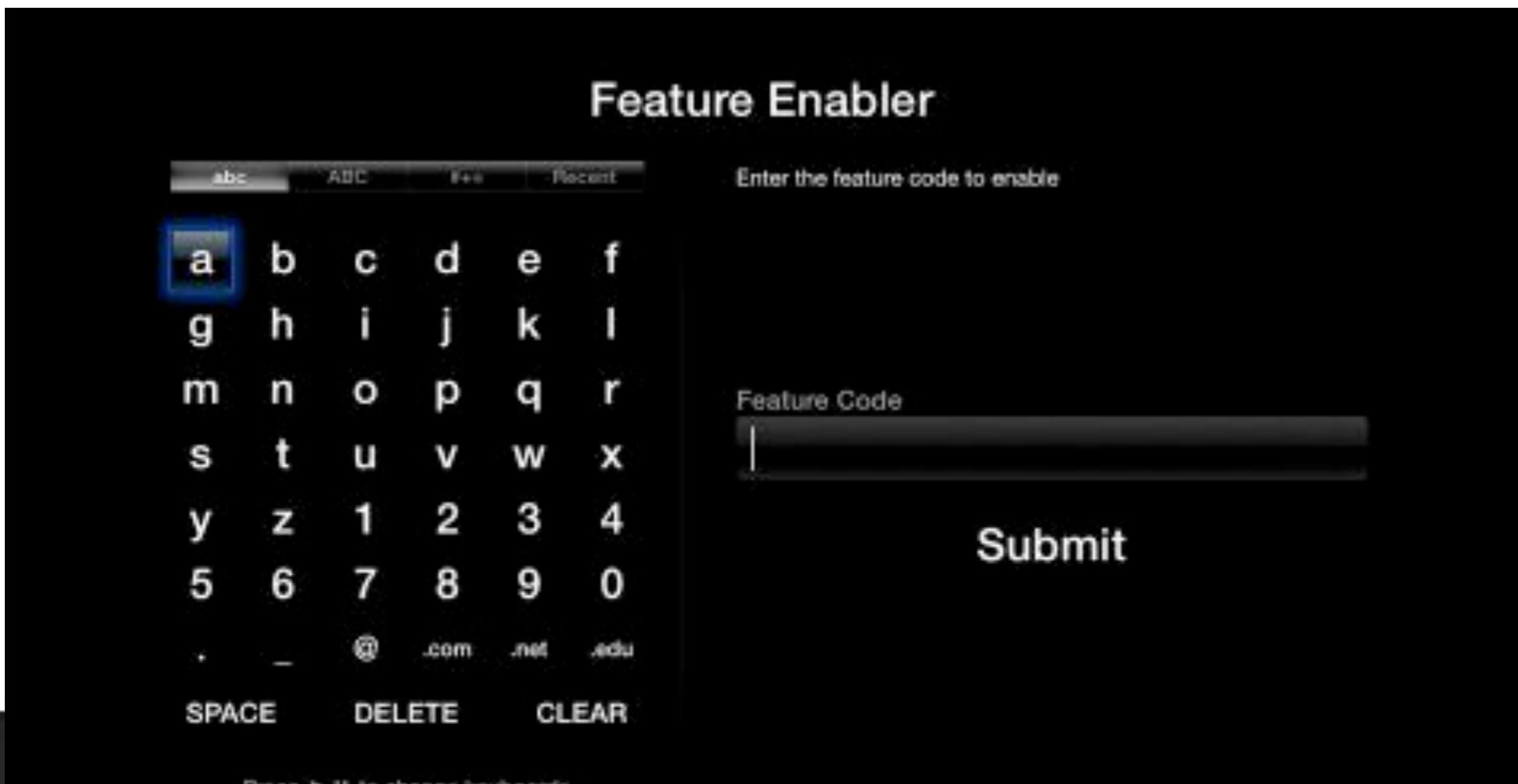


Home Sharing Diagnostics

- `HSDiagnosticsEnabled = True`
- Menu appears in “Computers”



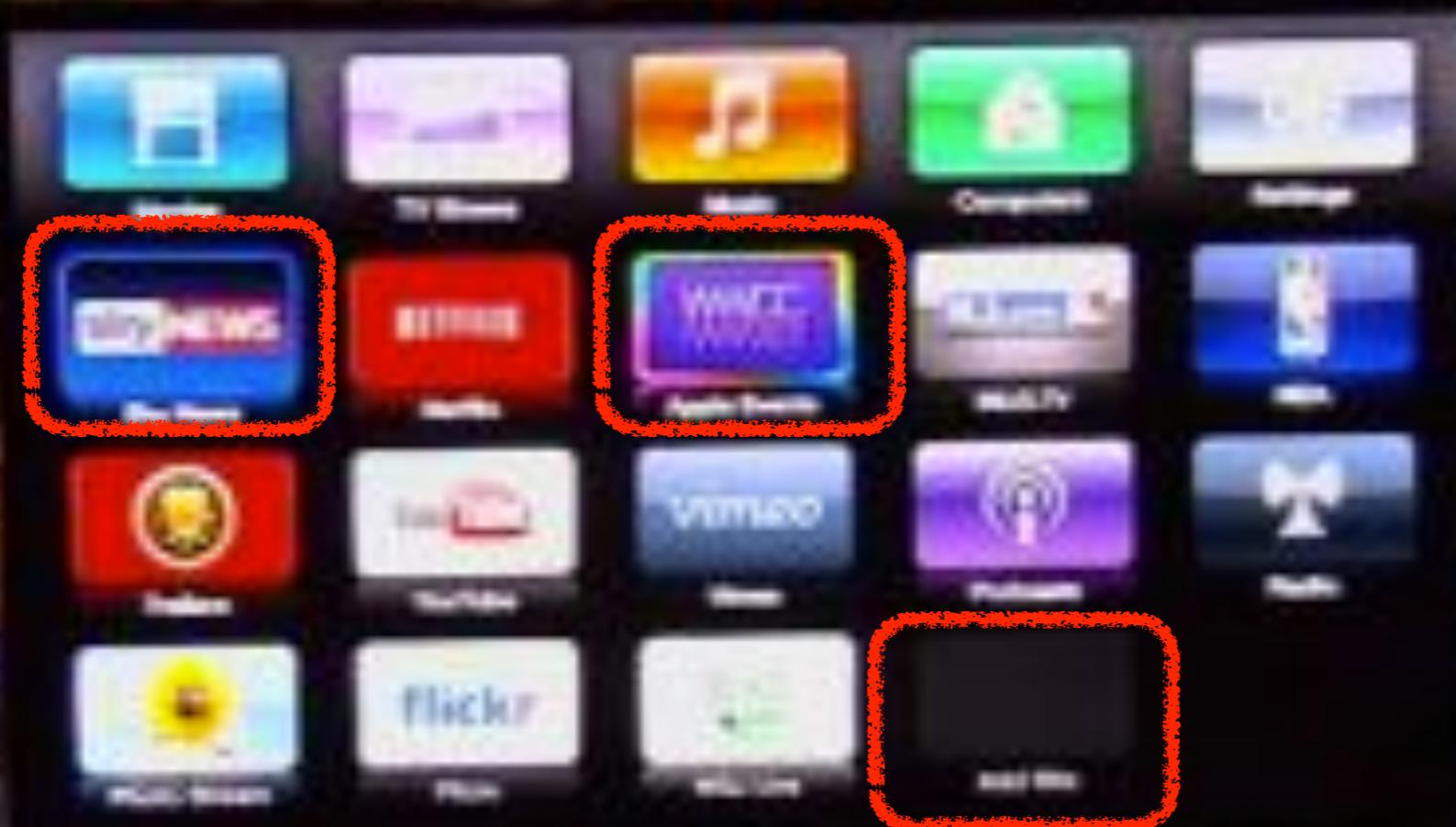
- Some channels have a “Feature” code
- Maybe to preview new official channels?



- Build a Wi-Fi configuration profile
 - iPhone Configuration Utility or Configurator
- Include an HTTP proxy
- Install (while still on wired ethernet)
- Unplug ethernet, now you're MITM
- iTunes links break though
 - Tried bypassing certificate pinning
 - Haven't yet tried fake “*.apple.com” certs
 - Breaks main screen -- hence load-and-switch

- But what does EnableAddSite do?
- Secret started leaking out:
 - SkyNews video from June 19
 - Announcing AppleTV app
 - Shows AppleTV screen, with:
 - WWDC app (so filmed in early to mid June)
 - SkyNews app
 - Something else interesting...

Sky news image



- Key by itself doesn't work
- Something else is happening
- Where is the code that tests for that key...
- ...what could it be named....?

```
— (0025B7E8) —
SettingsFacade - (char)addSiteIsEnabled
_cdecl - [ATVSettingsFacade addSiteIsEnabled](str,
SEL a2)

v2; // r0@0
§ *v3; // r0@1
§ *v4; // r5@1
§ *v5; // r0@1
r v6; // r4@2
§ *v7; // r0@3

= objc_msgSend(&OBJC_CLASS__BRPreferences, "shar
= objc_msgSend(v3, "objectForKey:", off_B389D4(0)
= objc_msgSend(&OBJC_CLASS__NSDictionary, "class
```

What does it MEAN?!?

```
//---- (002587E8) -----
// ATVSettingsFacade - (char)addSiteEnabled
char __cdecl-[ATVSettingsFacade addSiteEnabled](struct ATVSettingsFacade
*self, SEL a2)
{
```

v3 = [BRPreferences sharedFrontRowPreferences]

Get preferences list.

```
v3 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreferences
");
v4 = objc_msgSend(v3, "objectForKey:", off_B389D4[0].isa);
v5 = objc_msgSend(&OBJC_CLASS__NSDictionary, "class");
if ( (unsigned int)objc_msgSend(v4, "isKindOfClass:", v5) & 0xFF )
{
    v6 = (unsigned int)objc_msgSend(v4, "boolForKey:defaultValue:", off
_B389D8[0].isa, 0, v2);
}
else
{
    v7 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreference
s");
    v6 = 0;
    objc_msgSend(v7, "setObject:forKey:", 0, off_B389D4[0].isa, v2);
}
return v6;
}
```

What does it MEAN?!?

```
//---- (002587E8) -----
// ATVSettingsFacade - (char)addSiteEnabled
char __cdecl-[ATVSettingsFacade addSiteEnabled](struct ATVSettingsFacade
*self, SEL a2)
{
```

v4 = [v3 objectForKey: <addr>]

Look for key “F2BE6C81-66C8-4763-BDC6-385D39088028”

```
v3 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreferences
");
v4 = objc_msgSend(v3, "objectForKey:", off_B389D4[0].isa);
v5 = objc_msgSend(&OBJC_CLASS__NSDictionary, "class");
if ( (unsigned int)objc_msgSend(v4, "isKindOfClass:", v5) & 0xFF )
{
    v6 = (unsigned int)objc_msgSend(v4, "boolForFeedKey:defaultValue:", off
_B389D8[0].isa, 0, v2);
}
else
{
    v7 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreference
s");
    v6 = 0;
    objc_msgSend(v7, "setObject:forKey:", 0, off_B389D4[0].isa, v2);
}
return v6;
}
```

What does it MEAN?!?

```
//---- (002587E8) -----
// ATVSettingsFacade - (char)addSiteEnabled
char __cdecl-[ATVSettingsFacade addSiteEnabled](struct ATVSettingsFacade
*self, SEL a2)
{
```

if [v4 isKindOfClass: [NSDictionary class]] ...

Did the key return a dictionary?

```
v3 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreferences
");
v4 = objc_msgSend(v3, "objectForKey:", off_B389D4[0].isa);
v5 = objc_msgSend(&OBJC_CLASS__NSDictionary, "class");
if ( (unsigned int)objc_msgSend(v4, "isKindOfClass:", v5) & 0xFF )
{
    v6 = (unsigned int)objc_msgSend(v4, "boolForKey:defaultValue:", off
_B389D8[0].isa, 0, v2);
}
else
{
    v7 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreference
s");
    v6 = 0;
    objc_msgSend(v7, "setObject:forKey:", 0, off_B389D4[0].isa, v2);
}
return v6;
}
```

What does it MEAN?!?

```
//---- (002587E8) -----
// ATVSettingsFacade - (char)addSiteEnabled
char __cdecl-[ATVSettingsFacade addSiteEnabled](struct ATVSettingsFacade
*self, SEL a2)
{
```

v6 = [v4 boolForFeedKey: <addr> defaultValue: 0]

Look for boolean value “EnableAddSite”

```
v3 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreferences
");
v4 = objc_msgSend(v3, "objectForKey:", off_B389D4[0].isa);
v5 = objc_msgSend(&OBJC_CLASS__NSDictionary, "class");
if ( (unsigned int)objc_msgSend(v4, "isKindOfClass:", v5) & 0xFF )
{
    v6 = (unsigned int)objc_msgSend(v4, "boolForFeedKey:defaultValue:", off
_B389D8[0].isa, 0, v2);
}
else
{
    v7 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreference
s");
    v6 = 0;
    objc_msgSend(v7, "setObject:forKey:", 0, off_B389D4[0].isa, v2);
}
return v6;
}
```

What does it MEAN?!?

```
//---- (002587E8) -----
// ATVSettingsFacade - (char)addSiteEnabled
char __cdecl-[ATVSettingsFacade addSiteEnabled](struct ATVSettingsFacade
*self, SEL a2)
{
    return v6
}
```

return v6

If the boolean was true, then, yes, AddSite is Enabled.

```
v3 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreferences
");
v4 = objc_msgSend(v3, "objectForKey:", off_B389D4[0].isa);
v5 = objc_msgSend(&OBJC_CLASS__NSDictionary, "class");
if ( (unsigned int)objc_msgSend(v4, "isKindOfClass:", v5) & 0xFF )
{
    v6 = (unsigned int)objc_msgSend(v4, "boolForKey:defaultValue:", off
_B389D8[0].isa, 0, v2);
}
else
{
    v7 = objc_msgSend(&OBJC_CLASS__BRPreferences, "sharedFrontRowPreference
s");
    v6 = 0;
    objc_msgSend(v7, "setObject:forKey:", 0, off_B389D4[0].isa, v2);
}
return v6;
```

Mobileconfig snippet

```
<key>PayloadContent</key>
<array>
    <dict>
        <key>DefaultsDomainName</key>
        <string>com.apple.frontrow</string>
        <key>DefaultsData</key>
        <dict>
            <key>F2BE6C81-66C8-4763-B0C6-385D39088028</key>
            <dict>
                <key>EnableAddSite</key>
                <true/>
                <key>AddSiteLoggingURL</key>
                <string>http://my.server.com/log</string>
            </dict>
        </dict>
    </dict>
</array>
```

Adding a site

- After loading the profile, restart AppleTV
- Click on Add Site
- Enter a “vendor bag” (ends with bag.plist)
 - Or enter the app’s root URL and name individually
- Doesn’t have to be an app you developed...

Sneaking an early peak

- August 21: Rumors of Vevo app on AppleTV
- Try multiple URLs:
 - atv.vevo.com, appletv.vevo.com, etc.
 - appletv.vevo.com gives a server error
 - Add /bag.plist to URL - Success!
- Add to AppleTV
- Total elapsed time: Like a minute.

Loaded beta app



What is bag.plist?

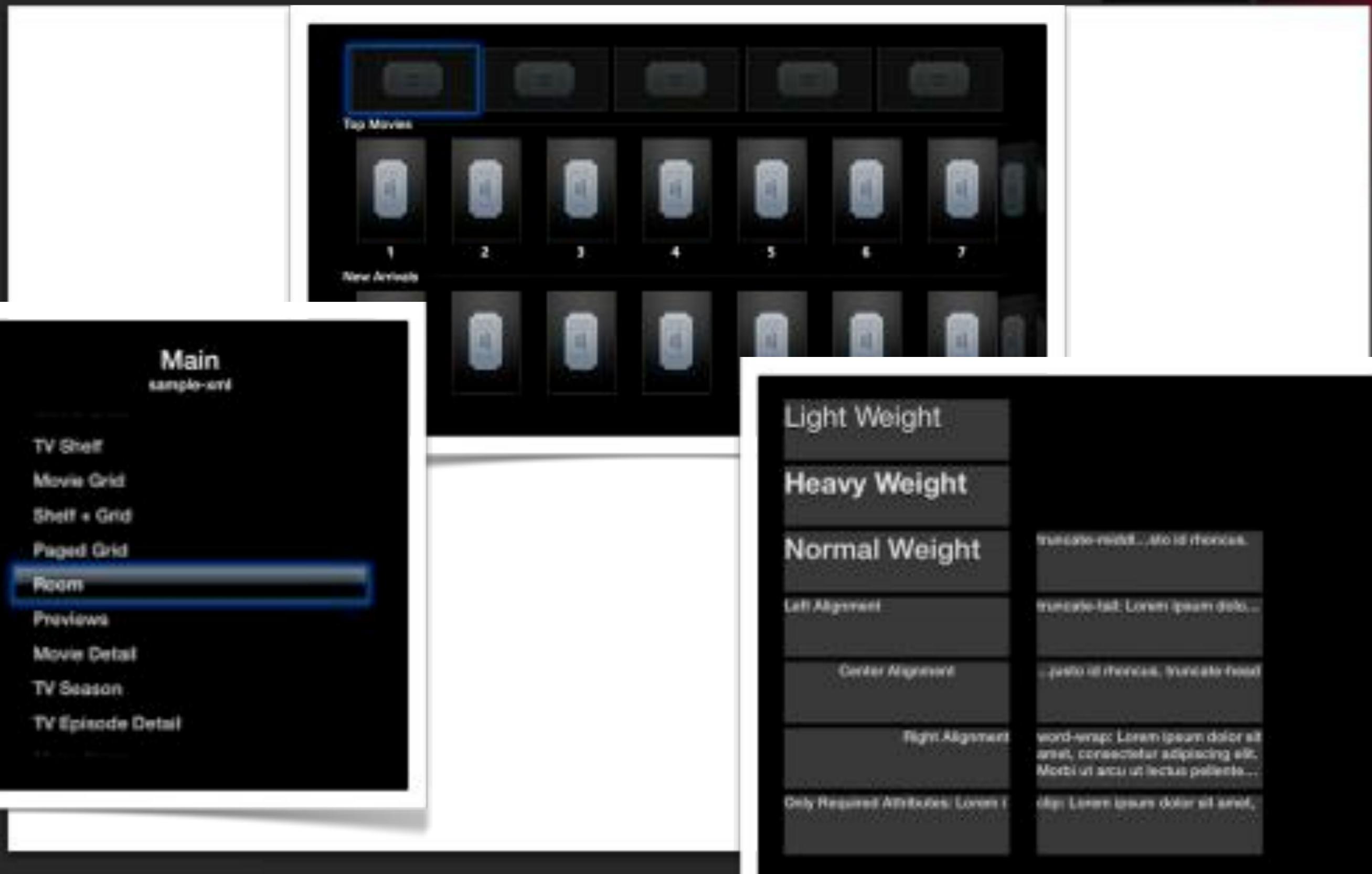
- Property list file, defines the “app”
- Screensaver settings
- Menu title, merchant name, root URLs
- Examples: hunt for existing ATV feeds
(trailers, Qello, etc.)

```
<plist version="1.0">
<dict>
    <key>auth-type</key>
    <string>joe</string>
    <key>enabled</key>
    <string>YES</string>
    <key>menu-title</key>
    <string>Trailers</string>
    <key>merchant</key>
    <string>trailers</string>
    <key>root-uri</key>
    <string>http://trailers.apple.com/appletv/us/nav.xml</string>
```

How is an app built?

- XSD schema on AppleTV filesystem
 - /Applications/AppleTV.app/atv.xsd
- Look at existing apps
 - Trailers app for example
- Google search for AppleTV and bag.plist
 - Found unfinished Fox News app
 - Linked to S3 copy of sample AppleTV app
 - Newer version in Plex forum

AppleTV sample-xml App





Demo

Add Profile



Enter the URL of the profile to add, e.g., http://
appleid.apple.com/AppleTV/Profiles/profile.mc

URL:

...://192.168.0.13:8080/atv/addsite.mc|

Submit

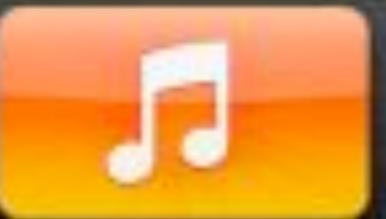
Demo: Success!



Movies



TV Shows



Music



Computers



Settings



Trailers



YouTube



Vimeo



Podcasts



Radio



Photo Stream



Flickr



WSJ Live



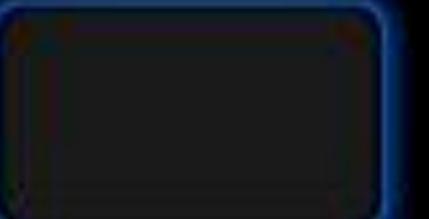
Qello



HBO GO



Crunchyroll



Add Site

Demo: Add new channel

URL



Enter the URL. If pointing to a vendor bag then verify the URL suffix is bag.plist

URL

Submit

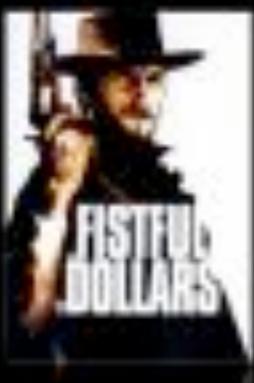
Press ▶ II to change keyboards

Demo: Success!



Demo: We got movies!

Movies



Demo: Movie Detail



Blade Runner R

Warner Bros. Pictures

In the smog-choked dystopian Los Angeles of 2019, blade runner Rick Deckard is called out of retirement to snuff a quartet of replicants, who have escaped to Earth seeking their creator for a way to extend their short life spans.

Details

Sci-Fi & Fantasy

Actors

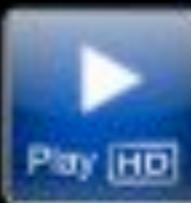
Harrison Ford
Rutger Hauer
Sean Young
Edward James Olmos

Directors

Ridley Scott

Producers

Michael Deeley



Sci-Fi & Fantasy



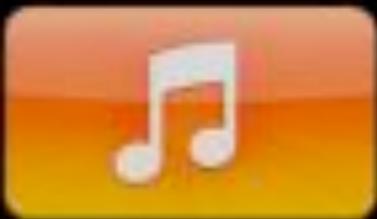
Demo: Not just movies



Movies



TV Shows



Music



Computers



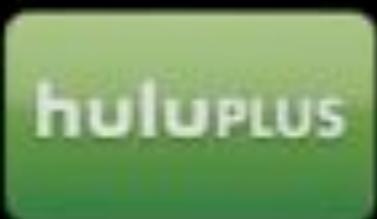
Settings



MLB.TV



Netflix



Hulu Plus



Trailers



NHL



Raspberry Pi



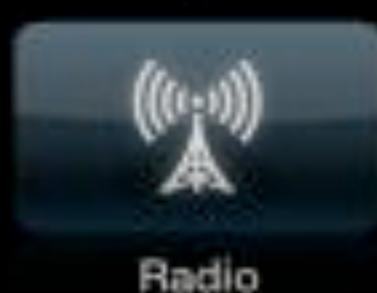
InfoSec Cons



YouTube



Podcasts



Radio



NBA



Flickr



WSJ Live



Qello



Crunchyroll

Demo: Pick a conference

Conferences

Topics

Search

About



DEF CON
DerbyCon
HOPE
PasswordsCon
QuahogCon
SOURCE
Security Bsides
ShmooCon
SummerCon
Thotcon

Demo: Pick a year

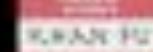


ShmooCon

ShmooCon V - 2009

Wardman Park Marriott, Washington DC

Feb. 6, 2009



ShmooCon VI - 2010

Wardman Park Marriott, Washington, DC

Feb. 5, 2010

ShmooCon VII - 2011

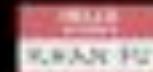
Washington Hilton, Washington DC

Jan. 28, 2011

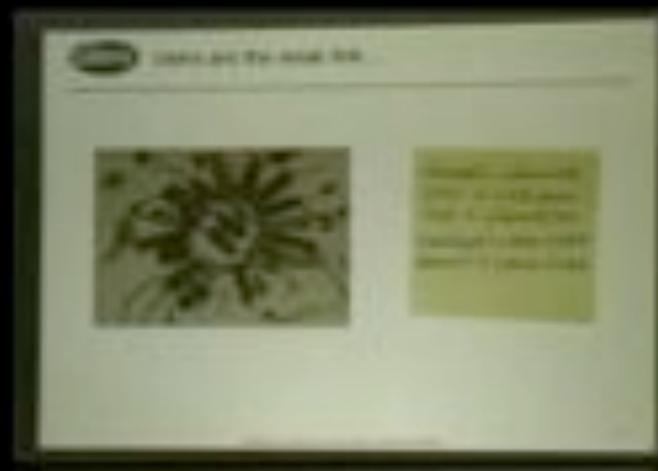
ShmooCon IX - 2013

Hyatt Regency Capitol Hill, Washingt...

Feb. 15, 2013



Demo: Talks and abstracts



Peter Zatko

Keynote - Analytic Framework for Cyber Security

DARPA, the Defense Advance Research Project Agency, directs billions of dollars towards research. One of these research areas is Cyber. In 2010 DARPA hired "Mudge", the hacker who led the early hackerspace L0pht @stake, to create, direct, and manage cyber research efforts for the Department of Defense.

This talk presents the new approaches that the agency is embracing and types of research efforts and how they diverge from traditional cyber efforts. Much of the existing and historic security solutions are focused on buying tactical breathing space without driving towards convergence with the actual c...

ShmooCon VII - 2011

Jan. 28, 2011 ▶

4:30 p.m.

Gone in 60 Minutes: Stealing Sensitive...

Gavin

5 p.m.

?

Long

5:30 p.m.

ZigBee Security: Find, Fix, Finish

Melgares, Spears

6 p.m.

Are you receiving me? Recent issues in...

Whalen

6:30 p.m.

Analytic Framework for Cyber Security

Zatko

- Can't remove channels
- Sometimes a little flaky
- Logging setting is chatty
 - General facility -- includes all apps
 - Might include credentials or other sensitive info
- Adding feeds is manual - can't push a profile
- Limited to AppleTV interface
 - Not a generic SDK
 - But still some control using JS -- see sample app
 - Weather Channel app uses custom layouts

Security concerns

- Log leakage
- All channels run in same context
 - Break out of js sandbox
 - Read credentials for other feeds
- Finding unreleased apps

What will Apple do?

- Good job. Have fun. Don't bitch if it breaks.
- D'oh. Next update will need a signed profile.
- Coming soon: an official channel store!

What DID Apple do?

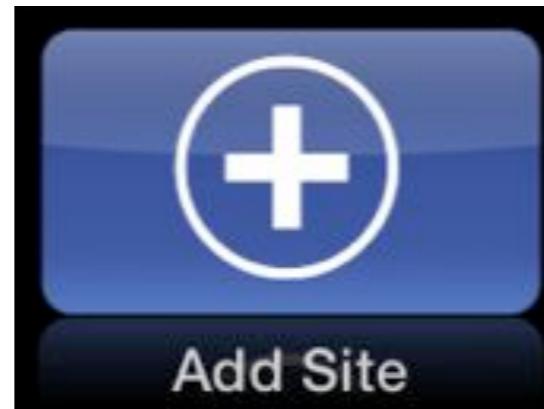
- iOS 7 (ATV 6.0) released last week
- Gone:
 - AllowedDefaults.plist
- Looks like a lot of interesting bits added:
 - resource:// URL type
 - FeedResource.archive - app format?
 - Full Add Site Manager - Add, list, delete sites
 - Site Verification - perhaps to limit unauthorized use
 - Sounds awfully close to a “channel store” interface

But does it still WORK?

- Not Yet.
 - sad panda. sad trombone. etc.
- All the custom profile-enabled settings broke
 - Not just Add Site
- Suspect it's a question of profile details
 - Was PayloadType: com.apple.frontrow
 - Now... ???
- Hopefully this shouldn't take community too long to figure out...

New icon!

- Just appeared on my 5.2 and 5.3 devices
- Was just a blank tile before
- Was there always a hook somewhere?
 - Apple just finally put the icon on their server
- Maybe finally getting ready for public channel management?



What will hackers do?

- Amazon Prime Video
 - Please?
- Educational Videos
 - NASA, Ted, etc.
 - Instructables, CBT
- Other networks
 - PBS, Discovery
- Chromecast clone





What's
Next?

- Recognize home AP and bind there
 - Automatic sync
 - Built-in battery, automatic shutdown after sync
- Cellular hotspot
 - Service to all the kids' iPod-class devices
- Minecraft server :)

- Added 120 GB external SSD
- Better hardware
 - Louder output volume
 - Faster processor
 - SATA
 - On-board WiFi
- Hard to find mix of everything
 - Especially SATA, and composite + HDMI video
 - Opportunity for Yet-Another-Single-Board-System

Conclusion

- Fun little toy
- Used it on a couple of trips already
- rPI capable, but a little limited
- Excited about potential with AppleTV
- Really hope we see official (and DIY) channel store soon

Further Reading

- Intrepidus Group blog:
<http://intrepidusgroup.com/insight/2013/09/rpi-atv/>
- Github Site:
<https://github.com/intrepidusgroup/rpi-atv>

Thanks!