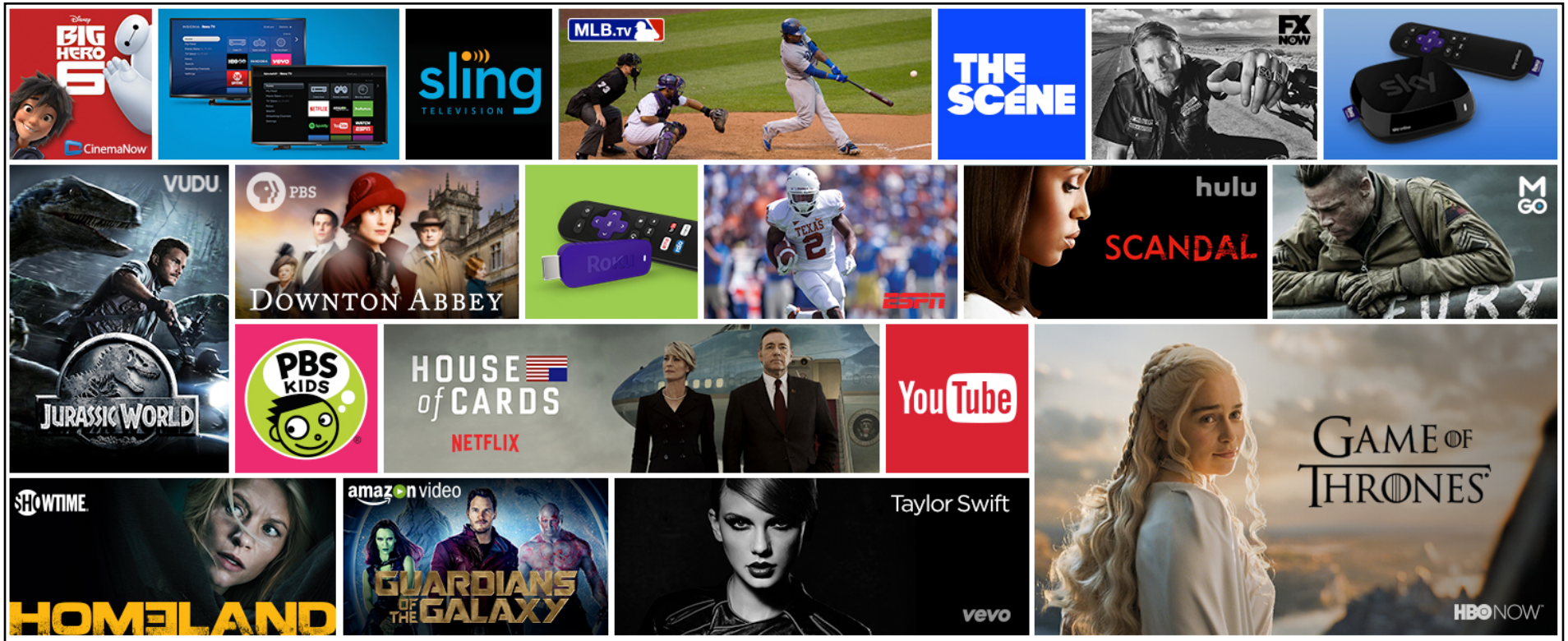


# How to Create a Channel on Roku

Chris Traganos | @ctraganos | November 17th | #SMWest

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# Session Overview @ #SMWest

## Business focus:

- Roku at-a-glance
- Features of Roku OS 7
- Monetization
- Channel Store 101

## Developer focus:

- The Roku platform
- SDK & Technical Concepts
- How to: Build a Channel
- *Q&A*

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{Quick Note:}

# Steps to follow along in the 2nd half of workshop

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# Developer Steps: **Building on the Roku Platform**

Prep work for the Roku Channel dev walk-through:

1. Create your Roku Account: **my.roku.com/signup**
2. Join Dev Program **developer.roku.com/home**
3. Download samples at **bit.ly/rokudevxml**

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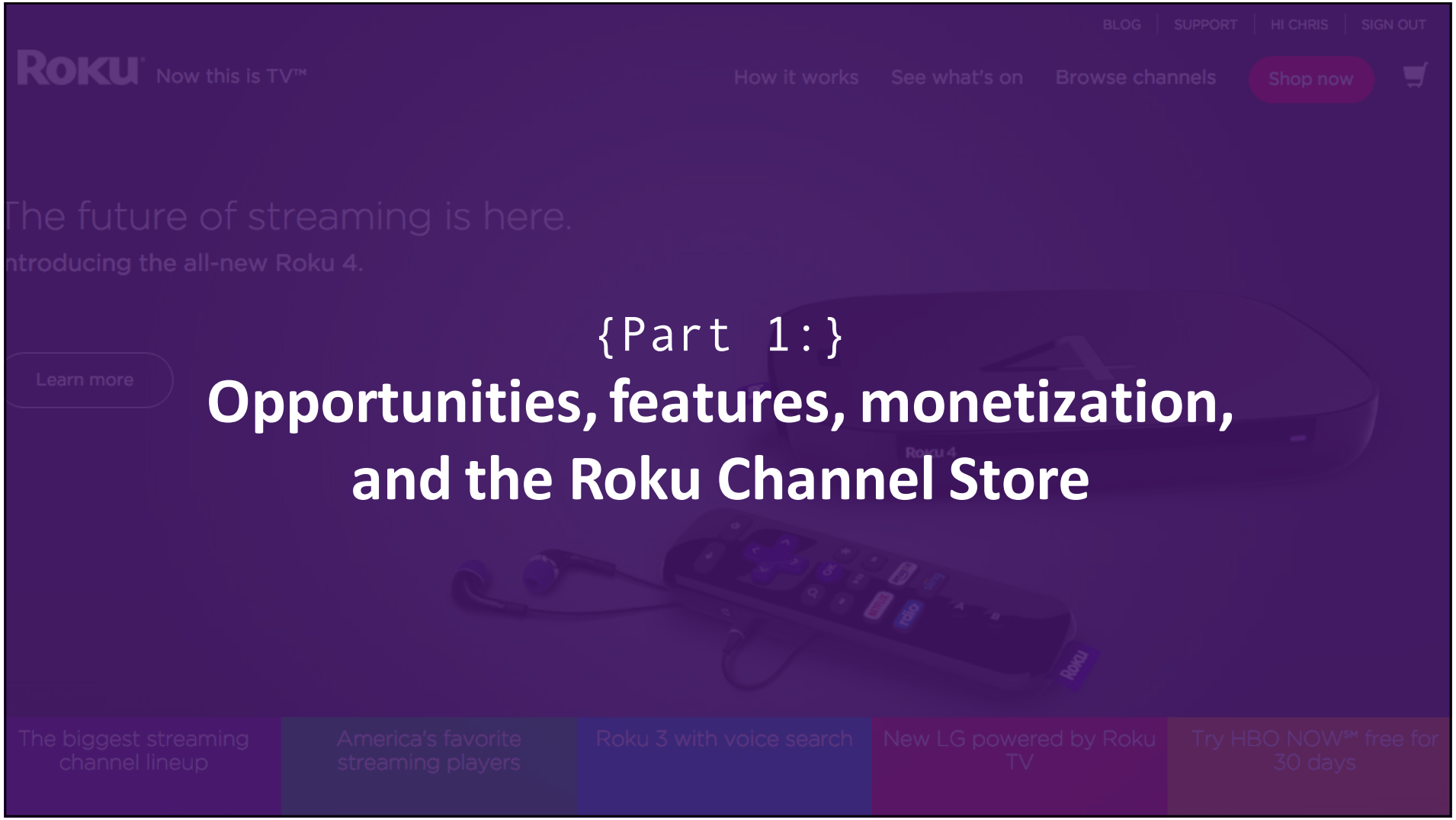


{Part 1:}

# Opportunities, features, monetization, and the Roku Channel Store

# Roku at-a-glance

- Roku OS is purpose-built for the TV
- Runs across Roku streaming players and (smart) Roku TVs
- Players sold in the US, UK, Ireland, Canada, Mexico & France
- Now with **4K UHD** capable devices too
- Nearly **3,000 channels** across **20+** genres (in the U.S.)
- Roku has **7.5M** active accounts today
- Roku accounts stream an average of **60 hours per month**

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# A broadly deployed platform

**Streaming Players**

**Roku TVs**

**Roku Powered solutions**

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# We focus on the User Experience

**Top Entertainment**

**Search and Discovery**

**Easy to Use**

# Wide breadth of content across all genres

The top shows, movies, and networks all streaming on the Roku platform

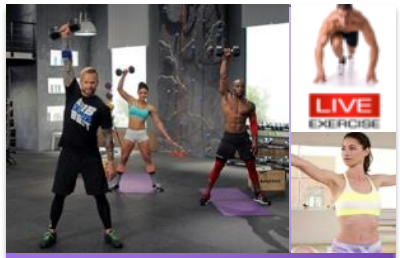
Movies &
TV episodes

Sports

News & Weather

Music

Kids & Family




Fitness

Foreign Language

Spirituality

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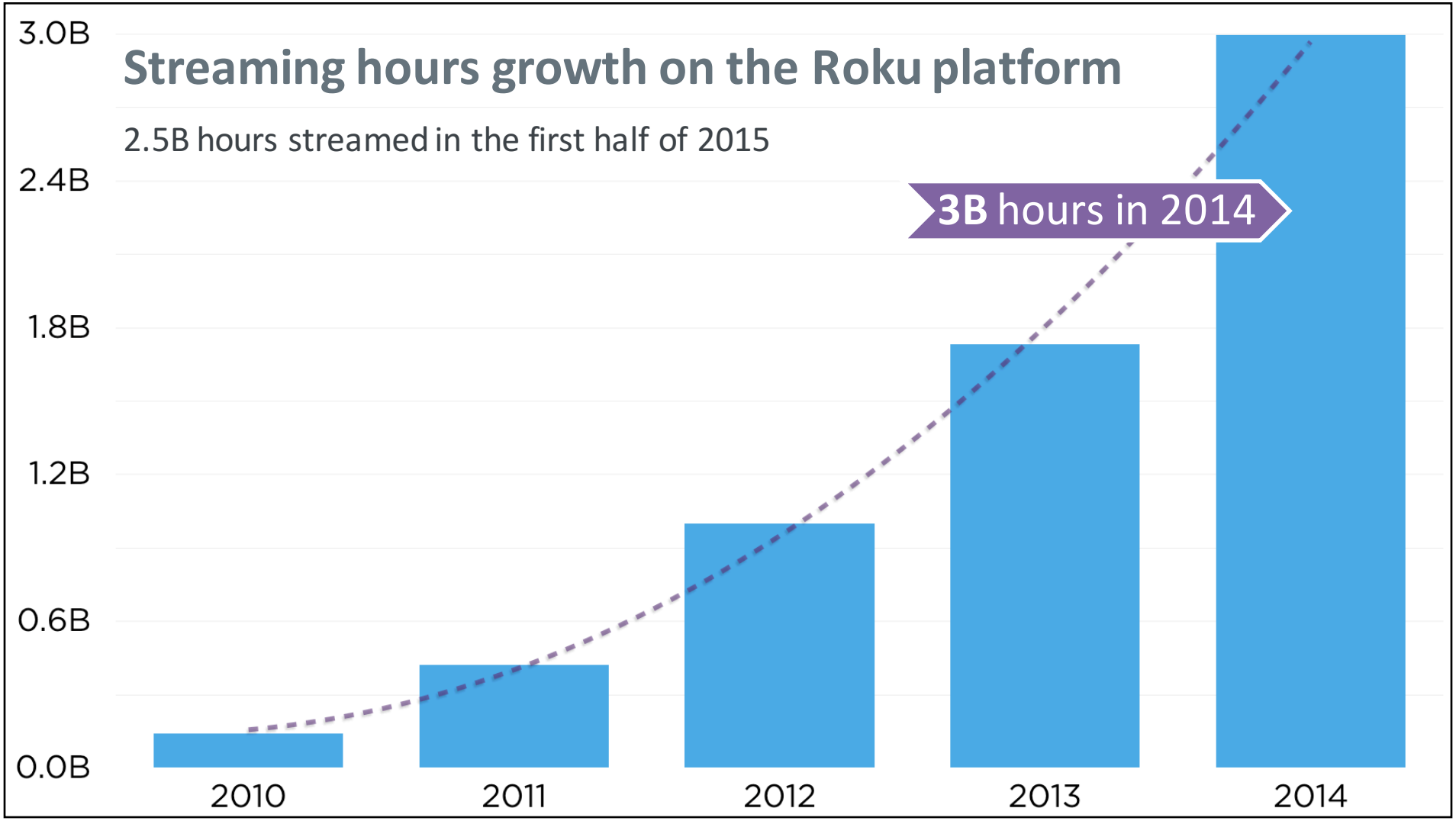
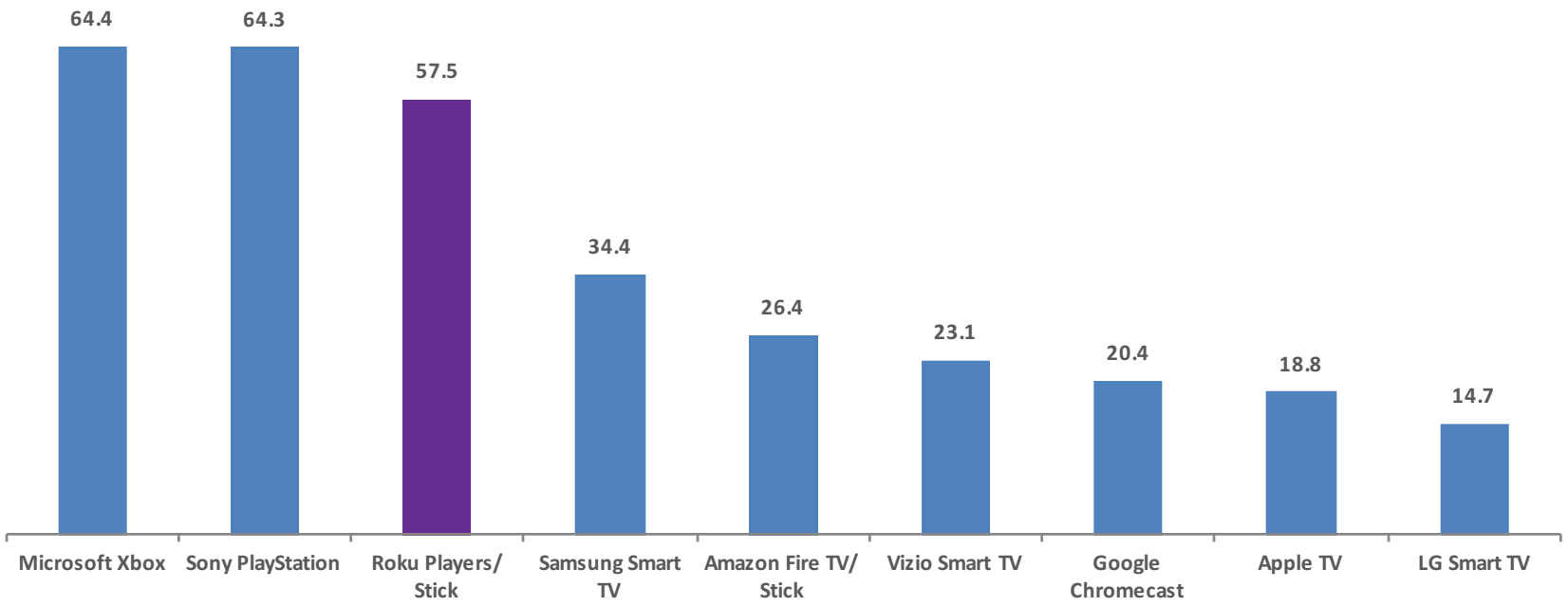

Streaming hours growth on the Roku platform
2.5B hours streamed in the first half of 2015
3B hours in 2014
3.0B
2.4B
1.8B
1.2B
0.6B
0.0B
2010
2011
2012
2013
2014

# Roku leads all streaming players and smart TVs

## Total weekly video hours used (M) according to survey respondents




SOURCE: NPD Survey, 2015

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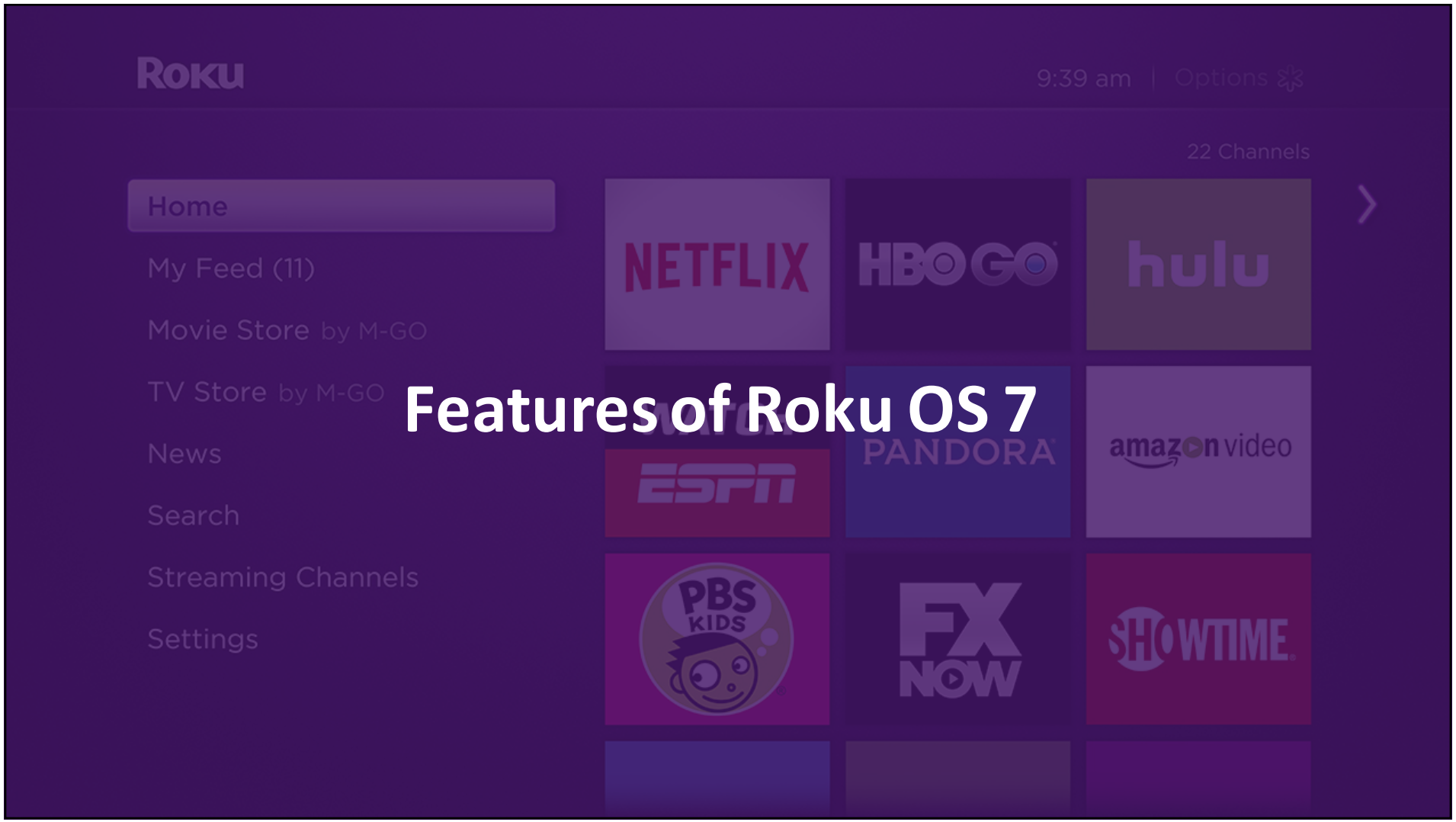


# Features of Roku OS 7

# Roku OS 7 – Containers and Codecs

## Specs:

- **Codecs:** H.264, H.265, AAC, PCM, WMA, MP3
  **Streaming:** MP4, DASH, HLS, Smooth, MPEG-TS

## Approach:

- All commonly used formats are supported on our platform
- Codec support is driven by **developer demand**

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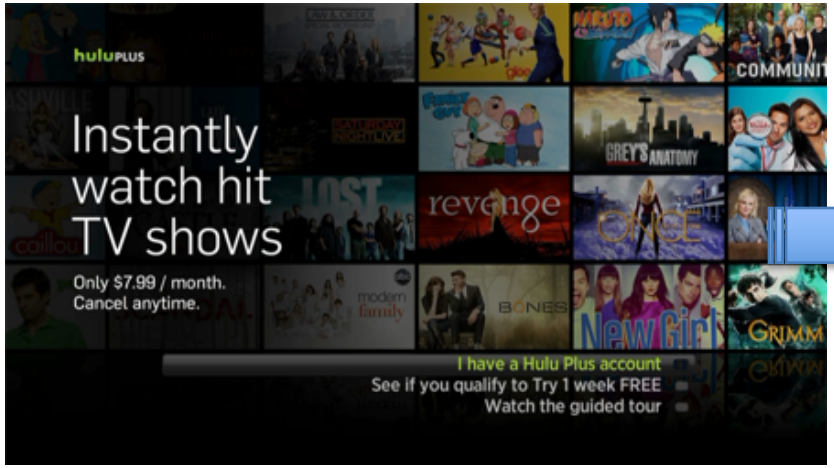
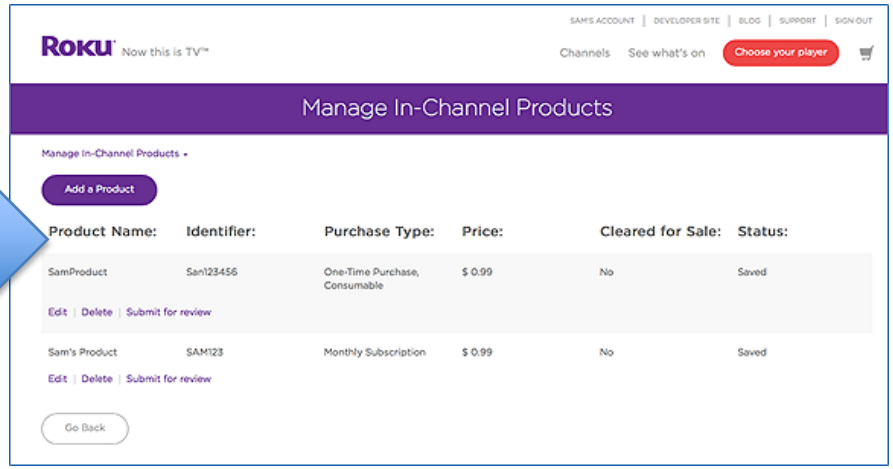
# Roku Billing: Frictionless signup + conversions




hulu PANDORA

NATIONAL GEOGRAPHIC KIDS

SHOWTIME

TENNIS CHANNEL

HBO NOW

daily burn

NFL NOW

In-app billing (One time, monthly, annual)
AVOD, TVOD, SVOD supported
& Trials can be offered to users

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# Ads: TV Ads on an OTT Platform

- Roku offers a rich toolset to acquire, grow and monetize your audience
- **Roku Ad Framework (RAF)** – Integrates advanced video ad functionality into the Roku OS
- 1st streaming platform to integrate **Nielsen Digital Ad Ratings**

nielsen

iab. COMPLIANT VAST DIGITALVIDEO

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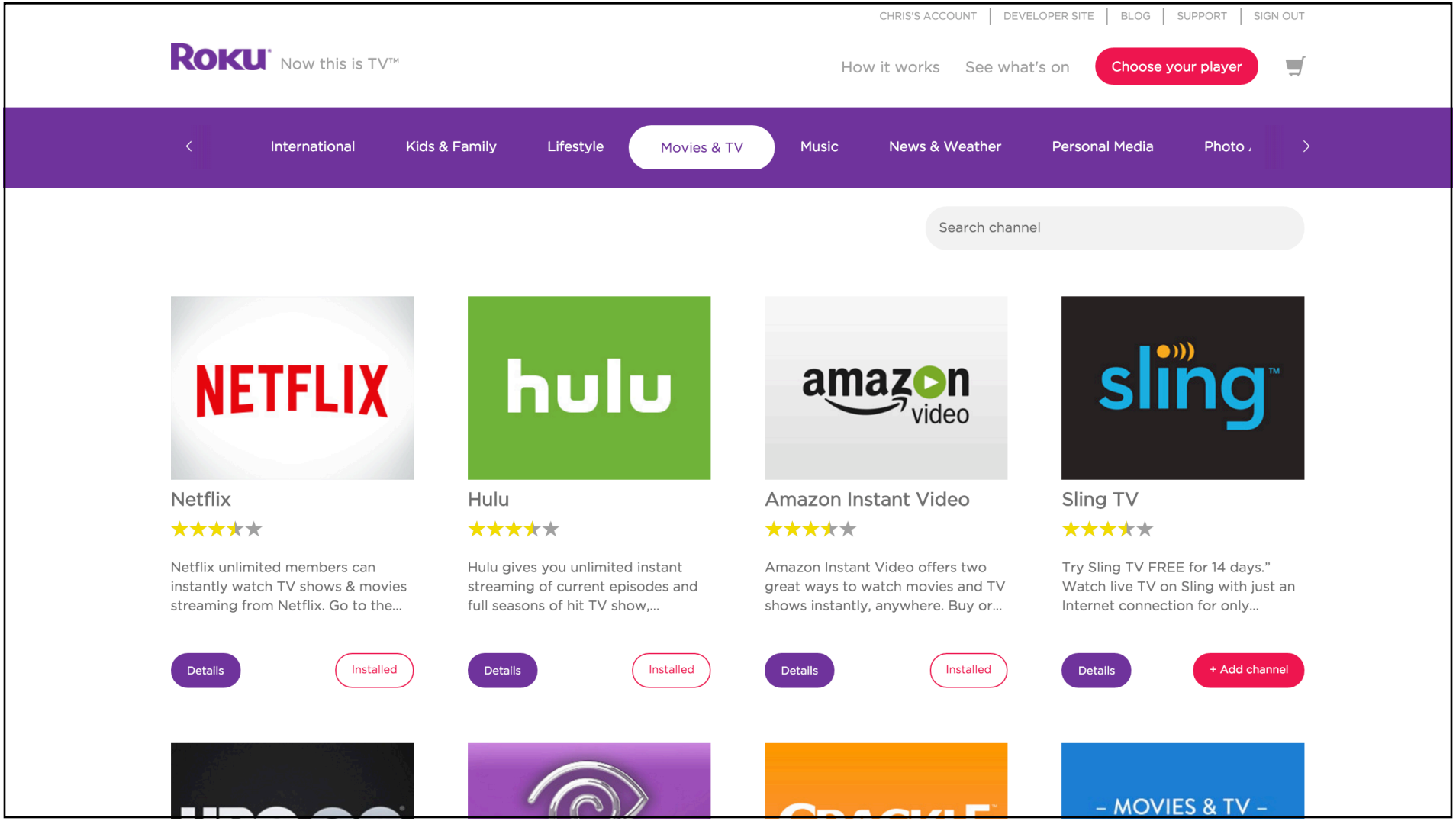
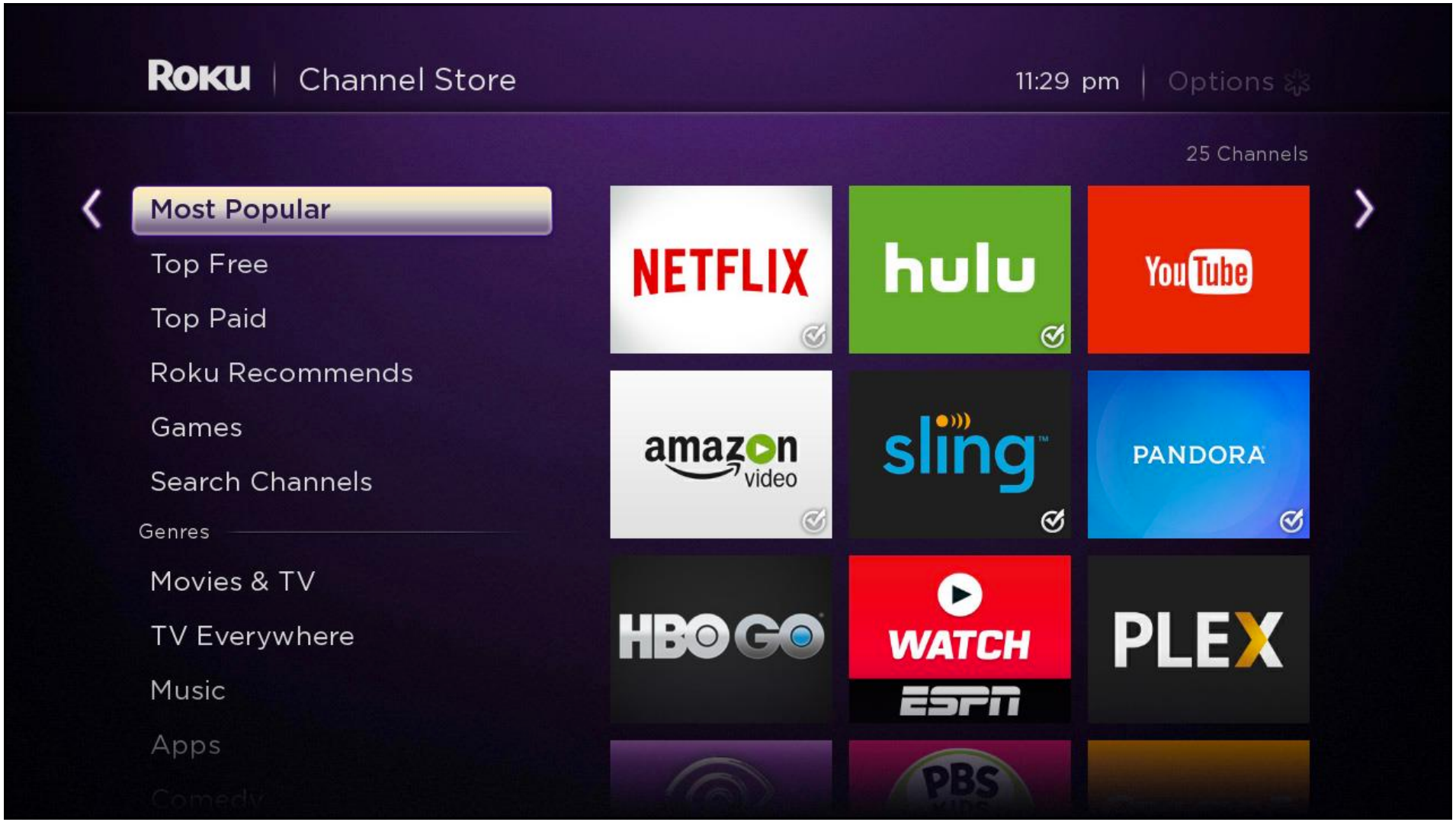
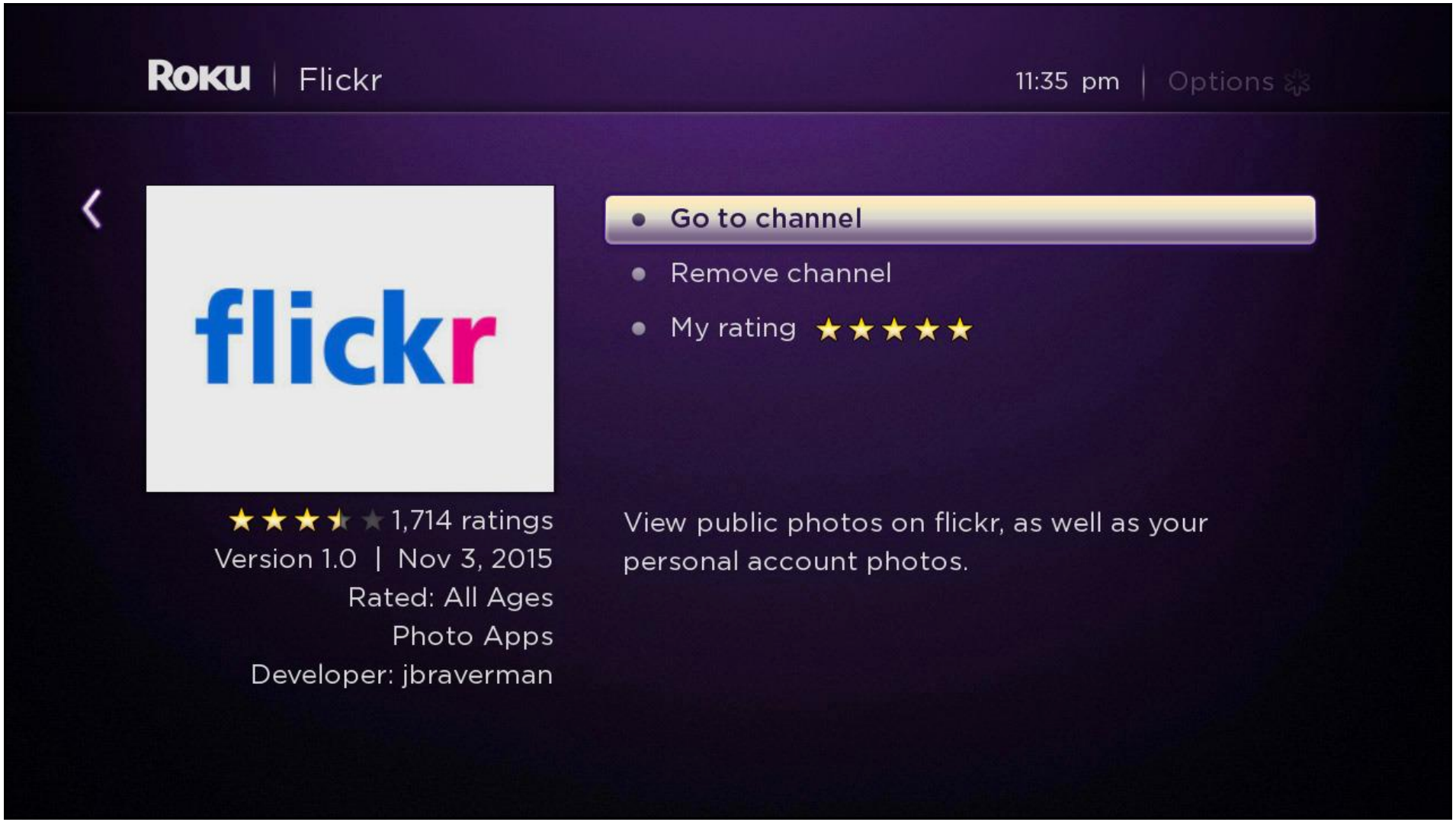
Roku Now this is TV™
CHRIS'S ACCOUNT | DEVELOPER SITE | BLOG | SUPPORT | SIGN OUT
M-GO
PREMIUM
Movies + TV
HBO NOW
FX NOW
SHO
ANYTIME
M-GO
HBO NOW
FXNOW
Showtime Anytime
M-GO is built right into your Roku player so it's easy to buy or rent the latest and greatest...
of HBO--every season, every...
best lineup of critically acclaimed...
SHOWTIME ANYTIME is available at no additional cost with your SHOWTIME subscription through...
Details
+ Add channel
Channel Store 101
channelstore.roku.com
tubitv
FREE TV & MOVIES
SHOWTIME
NBC
popcornflix
MOVIES. TV. FREE.
Tubi TV
SHOWTIME
NBC
Popcornflix


CHRIS'S ACCOUNT | DEVELOPER SITE | BLOG | SUPPORT | SIGN OUT
Roku Now this is TV™
How it works
See what's on
Choose your player
International
Kids & Family
Lifestyle
Movies & TV
Music
News & Weather
Personal Media
Photo
Search channel
NETFLIX
Netflix
Netflix unlimited members can instantly watch TV shows & movies streaming from Netflix. Go to the...
Details
Installed
hulu
Hulu
Hulu gives you unlimited instant streaming of current episodes and full seasons of hit TV show,...
Details
Installed
amazon video
Amazon Instant Video
Amazon Instant Video offers two great ways to watch movies and TV shows instantly, anywhere. Buy or...
Details
Installed
sling
Sling TV
Try Sling TV FREE for 14 days." Watch live TV on Sling with just an Internet connection for only...
Details
+ Add channel
– MOVIES & TV –


Roku | Channel Store
11:29 pm | Options
25 Channels
Most Popular
Top Free
Top Paid
Roku Recommends
Games
Search Channels
Genres
Movies & TV
TV Everywhere
Music
Apps
Comedy
NETFLIX
hulu
YouTube
amazon video
sling
PANDORA
HBO GO
WATCH ESPN
PLEX
PBS


Roku | Flickr
11:35 pm | Options
flickr
Go to channel
Remove channel
My rating
1,714 ratings
Version 1.0 | Nov 3, 2015
Rated: All Ages
Photo Apps
Developer: jbraverman
View public photos on flickr, as well as your personal account photos.

# Details for **Roku Channels**

## Public Channels:

- QA certification process
- Listed in Roku Channel Store
- Ratings, description, screenshots, & **“+add channel”**

***Note:*** *Private channels are available for beta testing*

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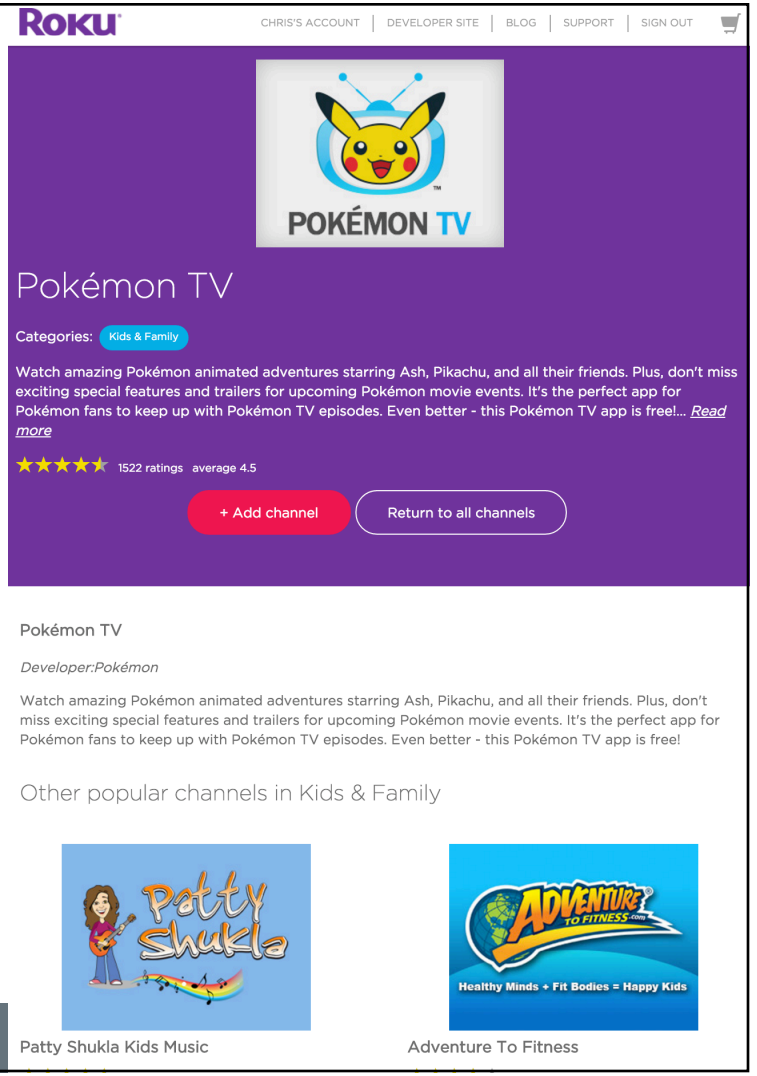
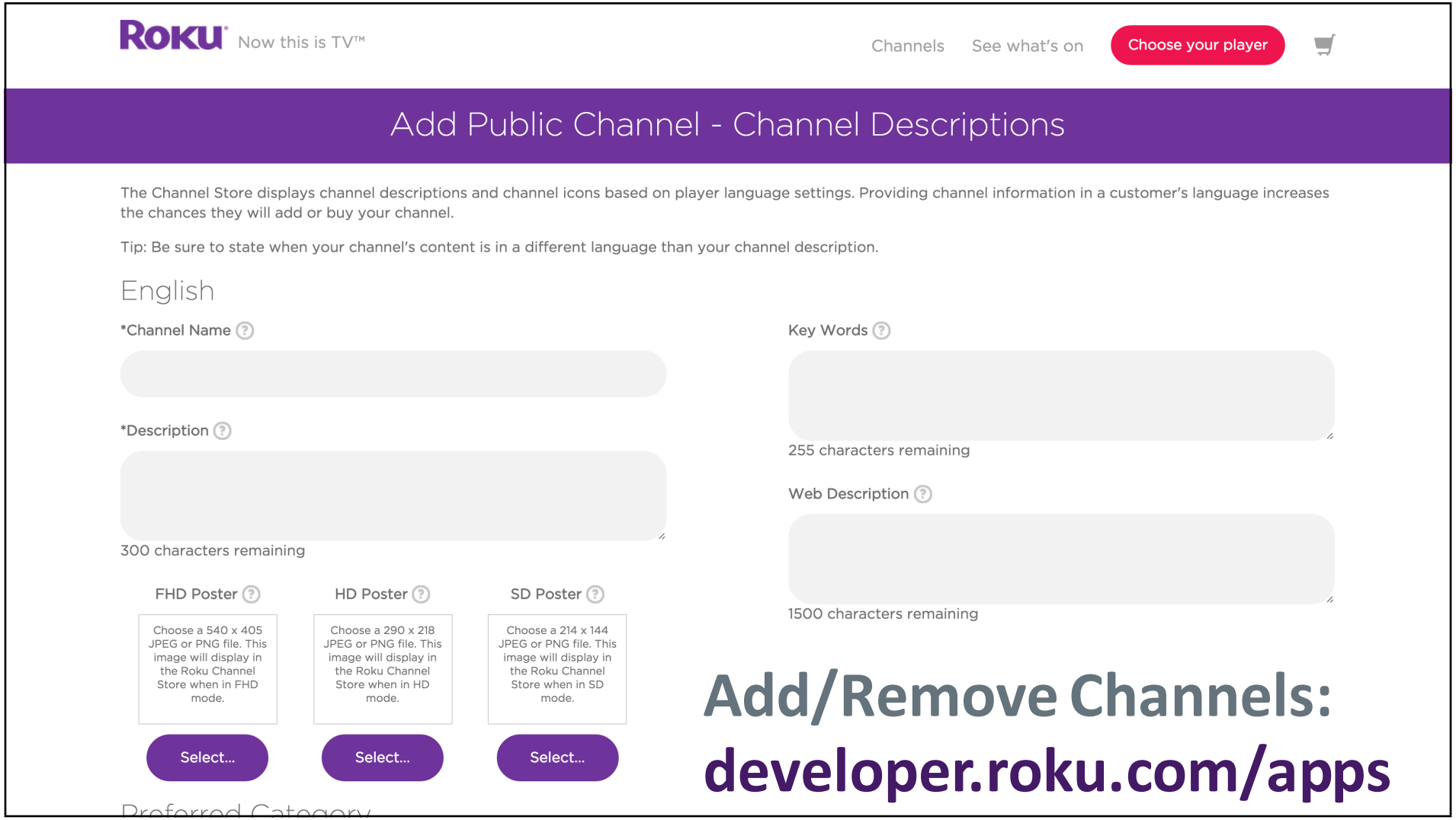
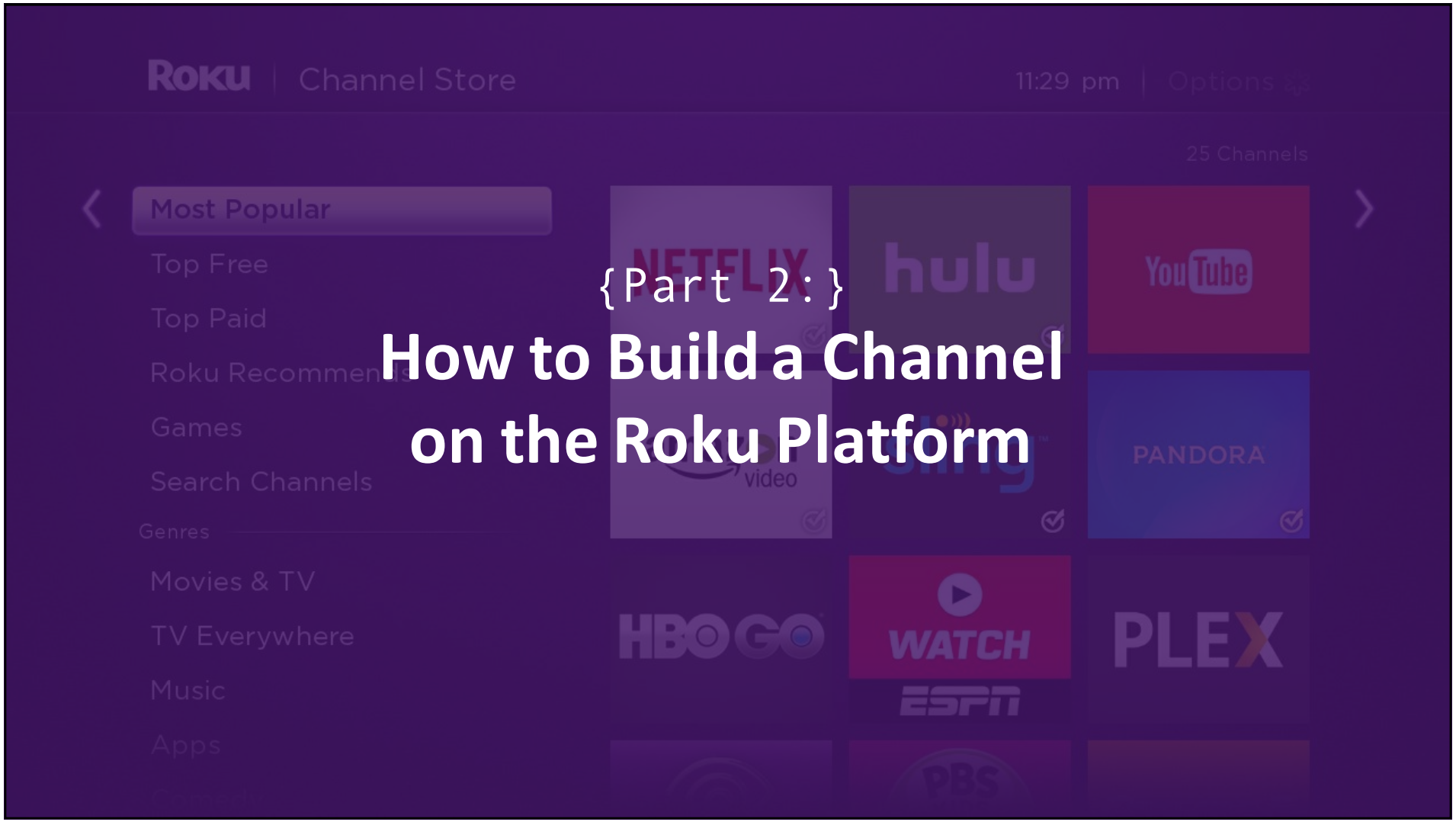



ROKU
Now this is TV™
Channels
See what's on
Choose your player
Add Public Channel - Channel Descriptions
The Channel Store displays channel descriptions and channel icons based on player language settings. Providing channel information in a customer's language increases the chances they will add or buy your channel.
Tip: Be sure to state when your channel's content is in a different language than your channel description.
English
*Channel Name
*Description
300 characters remaining
Key Words
255 characters remaining
Web Description
1500 characters remaining
FHD Poster
Choose a 540 x 405 JPEG or PNG file. This image will display in the Roku Channel Store when in FHD mode.
Select...
HD Poster
Choose a 290 x 218 JPEG or PNG file. This image will display in the Roku Channel Store when in HD mode.
Select...
SD Poster
Choose a 214 x 144 JPEG or PNG file. This image will display in the Roku Channel Store when in SD mode.
Select...
Add/Remove Channels:
developer.roku.com/apps




{Part 2:}

# How to Build a Channel on the Roku Platform

# Building a **Roku Channel**

## Core Requirements:

- Roku player
- Roku user account
- Internet access
- sdkdocs.roku.com

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# Building a **Roku Channel**

## Software Requirements:

- Text Editor / IDE
- Ability to “zip” files
- Command line app + telnet access

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# Basic Roku Development

## Core Concepts:

- **BrightScript:** Roku's scripting language similar to Visual Basic in which Roku channels are built
- **Roku SceneGraph:** an XML based rendering framework for building channels with Roku OS
- **Side-Loading:** Devs build + test apps on Roku devices
- ***Packaging:*** Roku devices prepare apps for publishing

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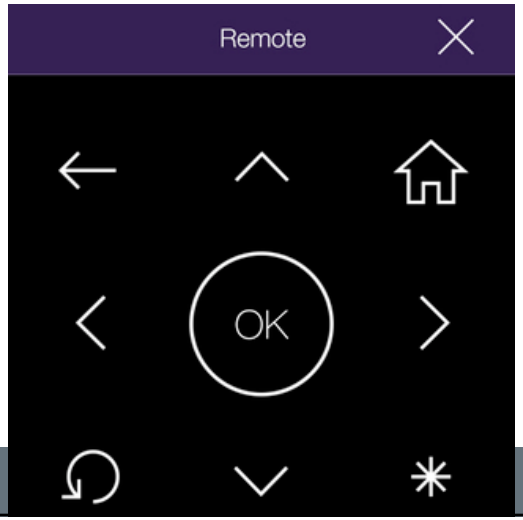
# Get your Roku device into “Developer Mode”!

Using our super secret code on your Roku remote:



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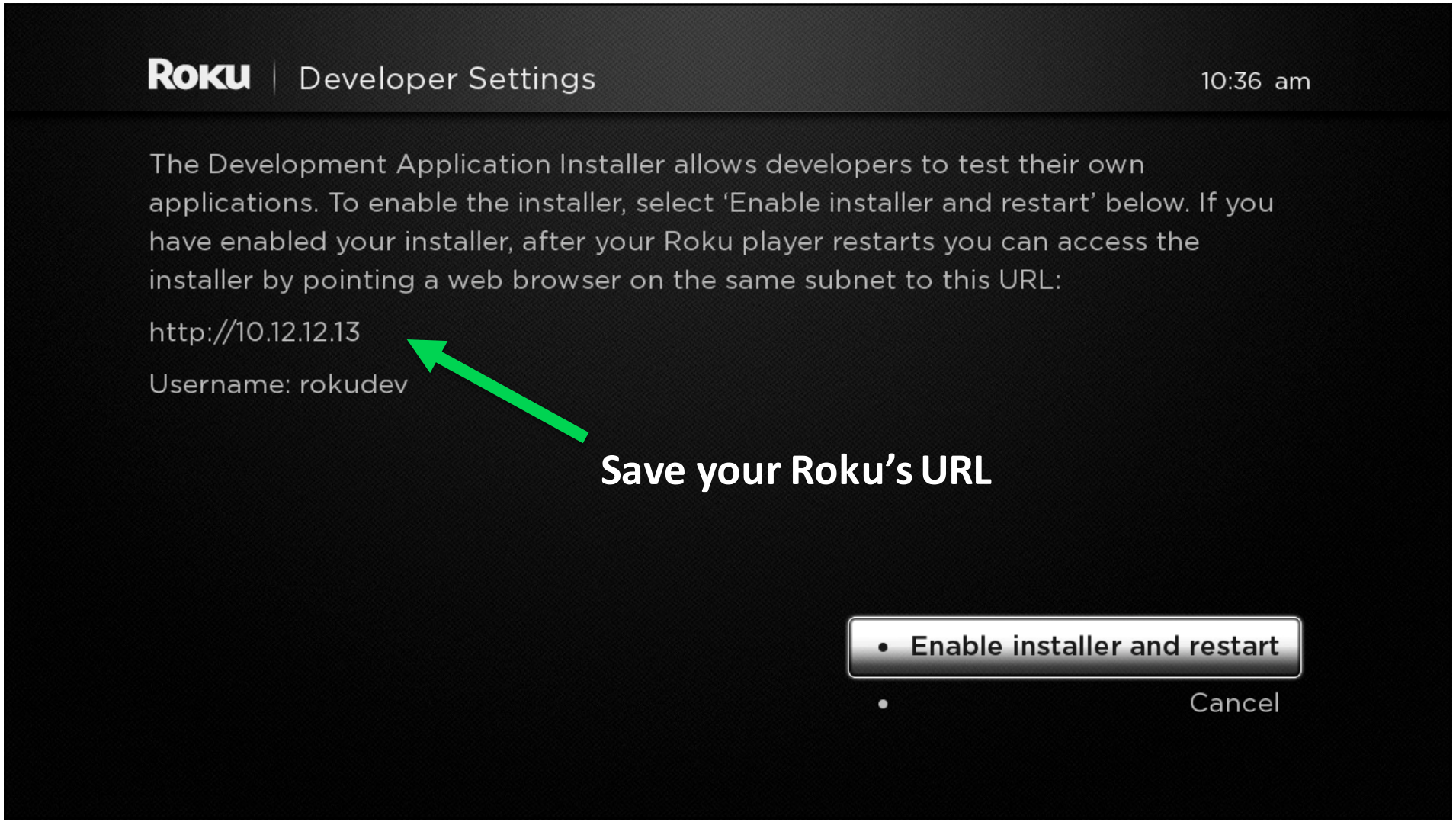
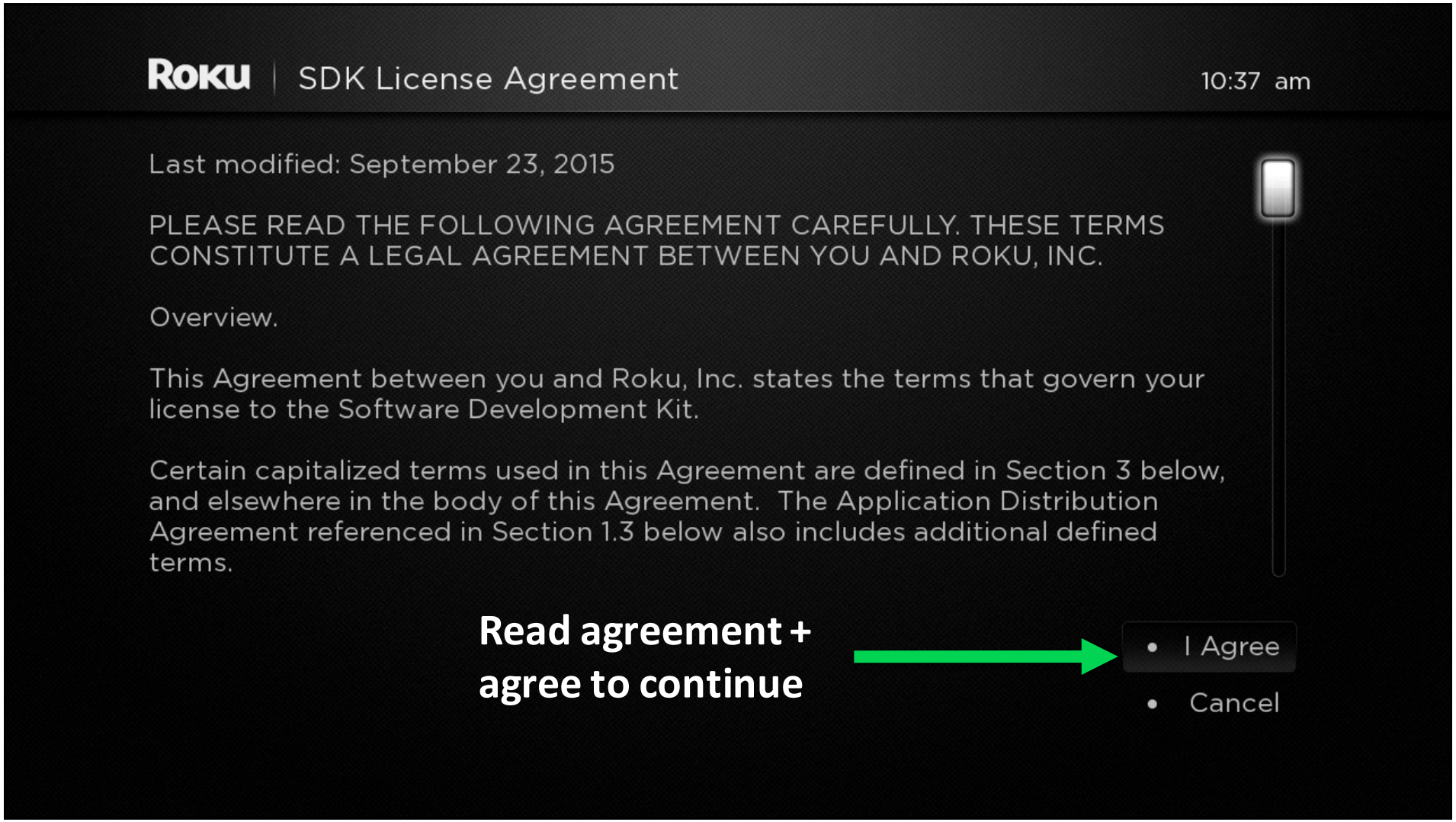
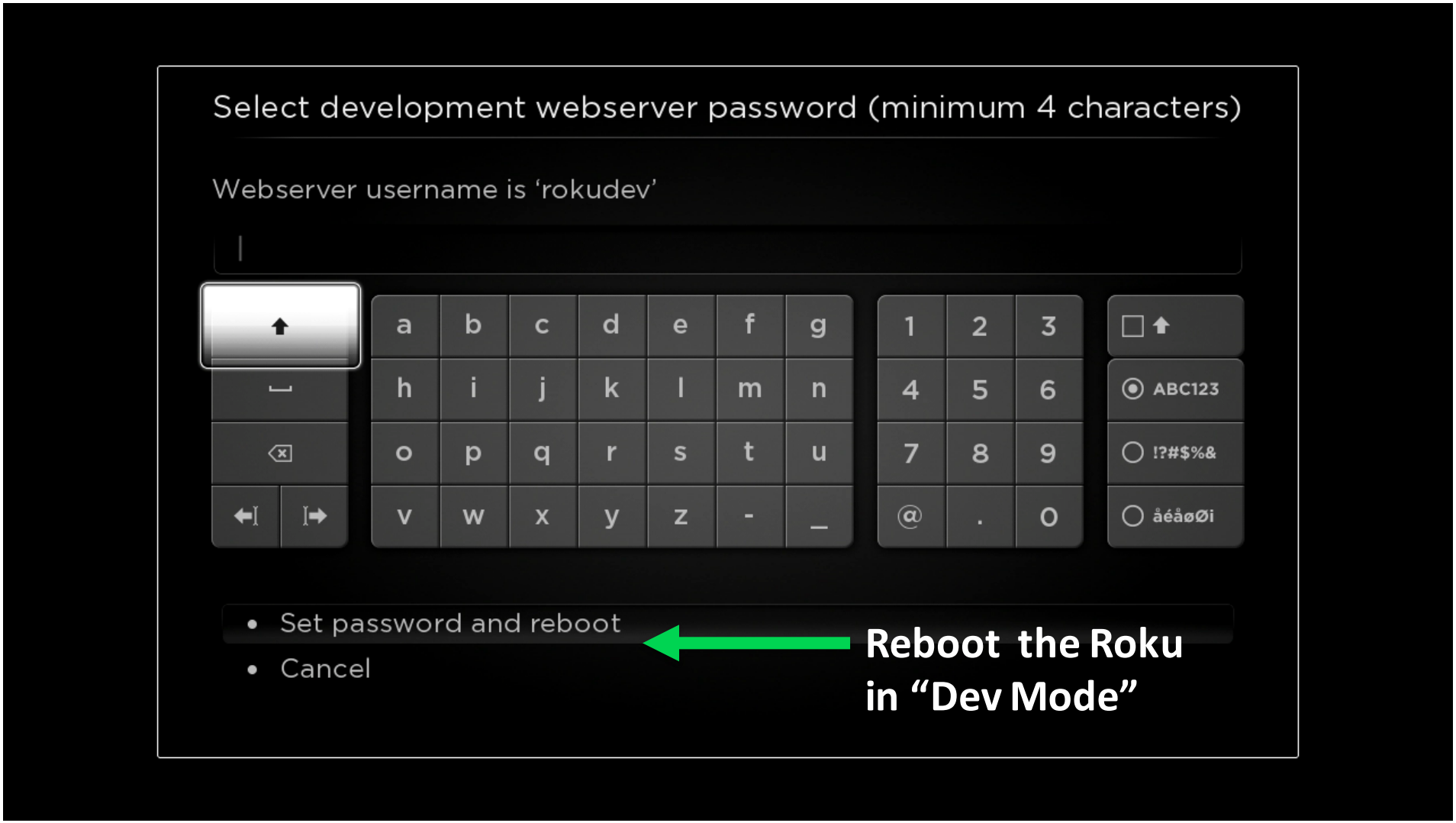
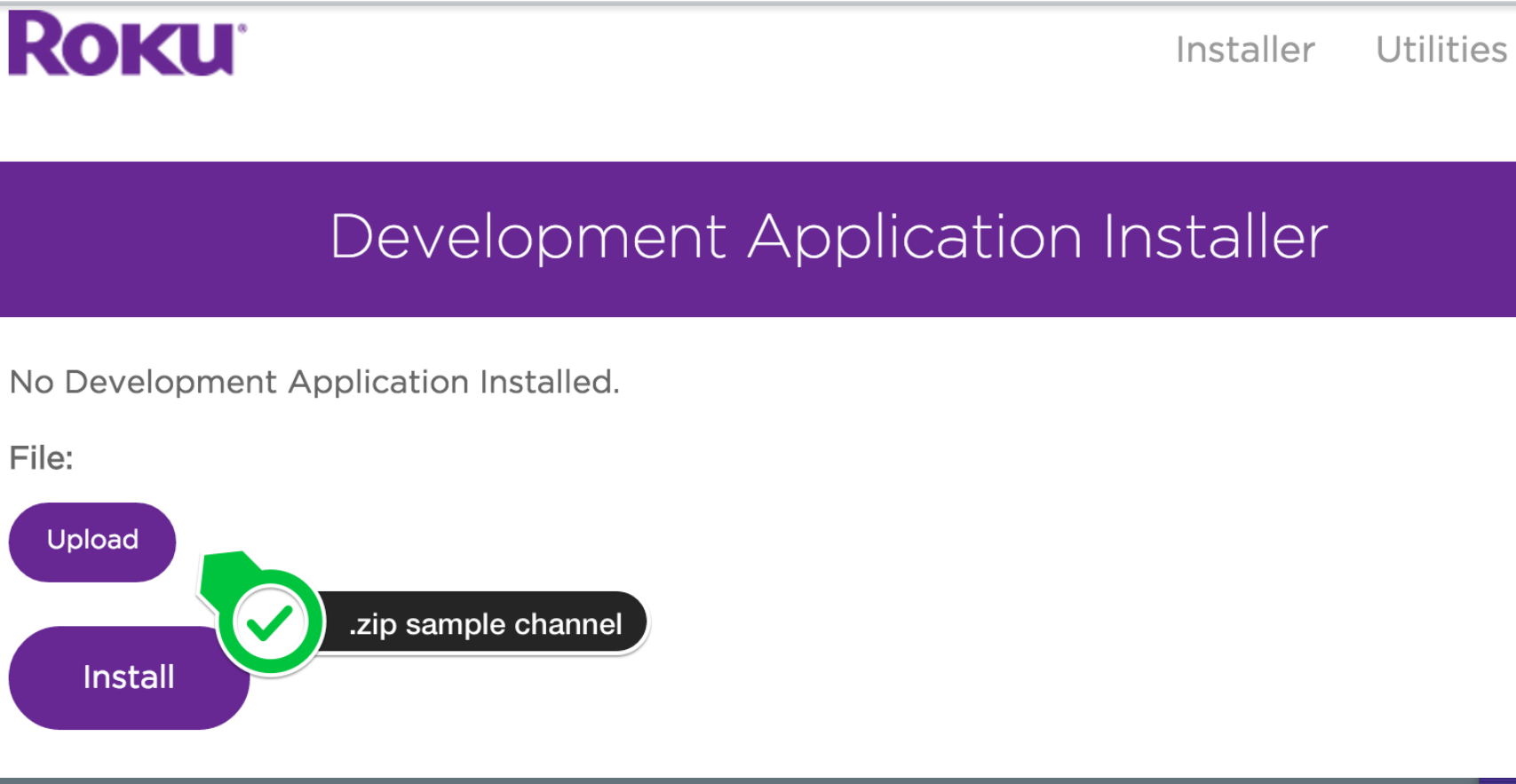

Roku | Developer Settings
10:36 am
The Development Application Installer allows developers to test their own applications. To enable the installer, select 'Enable installer and restart' below. If you have enabled your installer, after your Roku player restarts you can access the installer by pointing a web browser on the same subnet to this URL:
http://10.12.12.13
Username: rokudev
Save your Roku's URL
Enable installer and restart
Cancel


Roku | SDK License Agreement
10:37 am
Last modified: September 23, 2015
PLEASE READ THE FOLLOWING AGREEMENT CAREFULLY. THESE TERMS CONSTITUTE A LEGAL AGREEMENT BETWEEN YOU AND ROKU, INC.
Overview.
This Agreement between you and Roku, Inc. states the terms that govern your license to the Software Development Kit.
Certain capitalized terms used in this Agreement are defined in Section 3 below, and elsewhere in the body of this Agreement. The Application Distribution Agreement referenced in Section 1.3 below also includes additional defined terms.
Read agreement + agree to continue
I Agree
Cancel


Select development webserver password (minimum 4 characters)
Webserver username is 'rokudev'
a b c d e f g
h i j k l m n
o p q r s t u
v w x y z - _
1 2 3
4 5 6
7 8 9
@ . 0
ABC123
!?#$%&
åéåøØi
Set password and reboot
Cancel
Reboot the Roku in "Dev Mode"

# Go to your Roku device **URL** in a browser

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# “Side Loading” a Roku Channel

## Core Concepts:

- Channel sent to Roku device as **.zip** via uploader
- Only one developer channel at a time, new uploads replace the previous one
- Script runs and if successful, channel will launch
- Dev channel lives in “**My Channels**”

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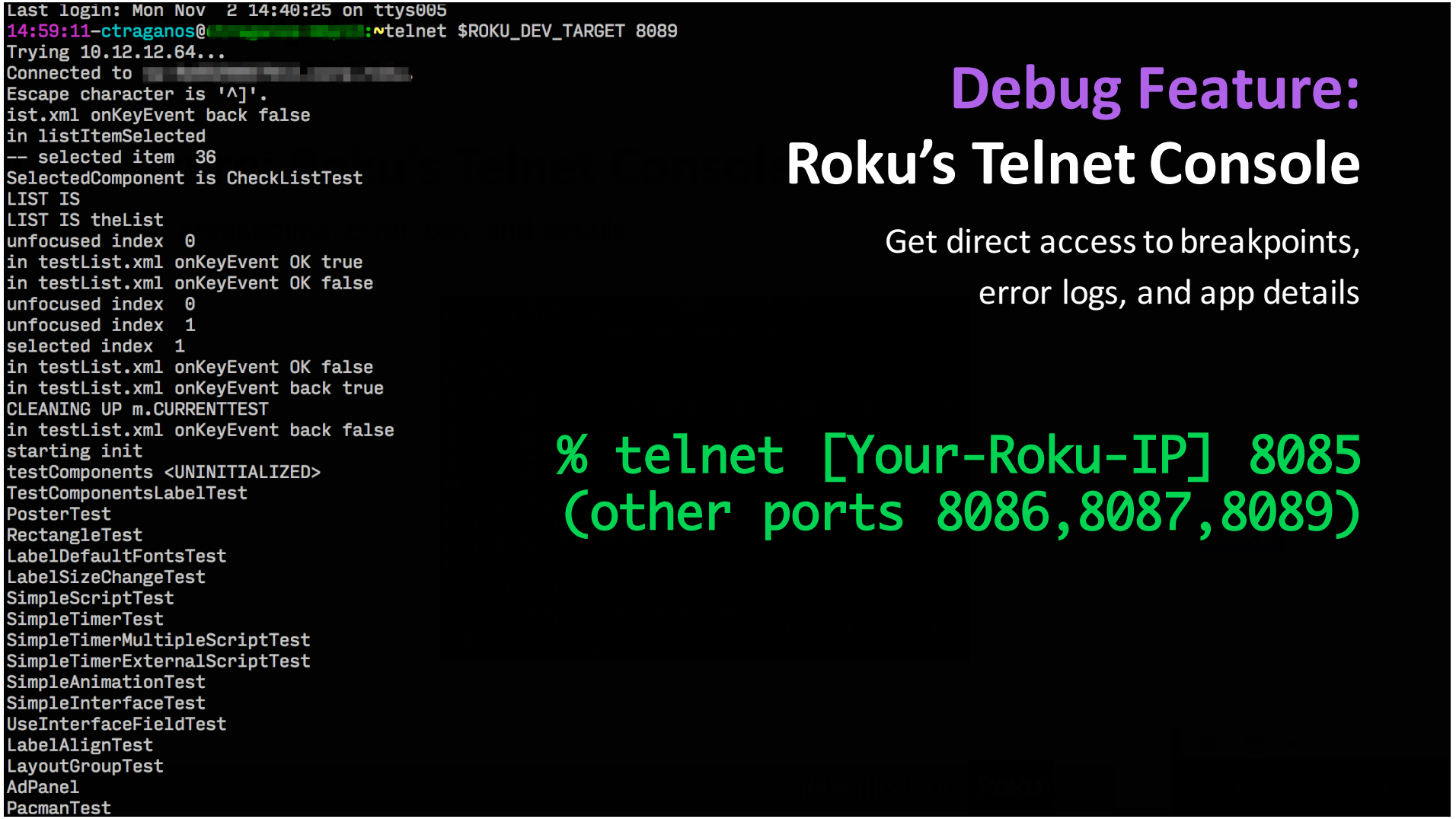
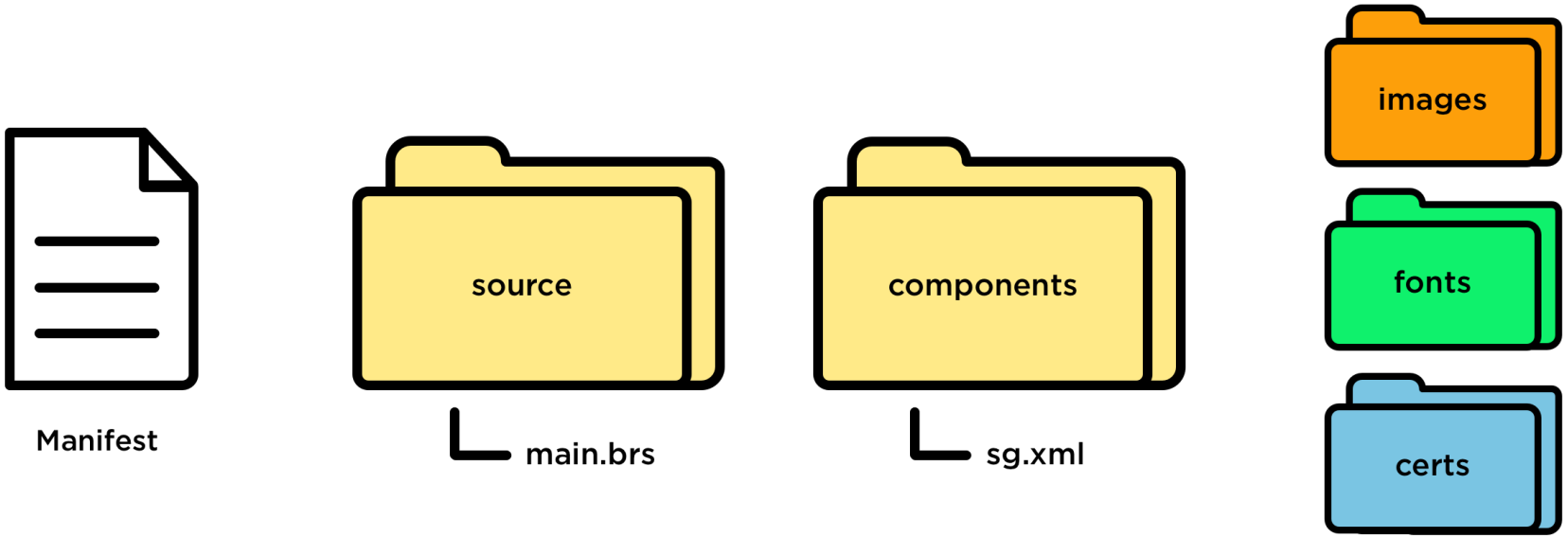

Last login: Mon Nov 2 14:40:25 on ttys005
14:59:11-ctraganos@ :~telnet $ROKU_DEV_TARGET 8089
Trying 10.12.12.64...
Connected to
Escape character is '^]'.
ist.xml onKeyEvent back false
in listItemSelected
-- selected item 36
SelectedComponent is CheckListTest
LIST IS
LIST IS theList
unfocused index 0
in testList.xml onKeyEvent OK true
in testList.xml onKeyEvent OK false
unfocused index 0
unfocused index 1
selected index 1
in testList.xml onKeyEvent OK false
in testList.xml onKeyEvent back true
CLEANING UP m.CURRENTTEST
in testList.xml onKeyEvent back false
starting init
testComponents <UNINITIALIZED>
TestComponentsLabelTest
PosterTest
RectangleTest
LabelDefaultFontsTest
LabelSizeChangeTest
SimpleScriptTest
SimpleTimerTest
SimpleTimerMultipleScriptTest
SimpleTimerExternalScriptTest
SimpleAnimationTest
SimpleInterfaceTest
UseInterfaceFieldTest
LabelAlignTest
LayoutGroupTest
AdPanel
PacmanTest
Debug Feature:
Roku's Telnet Console
Get direct access to breakpoints,
error logs, and app details
% telnet [Your-Roku-IP] 8085
(other ports 8086,8087,8089)

# What's inside a **Roku Channel**?

File structure of a .zip directory




*Max channel size = 2MB; Typical size 500kB*

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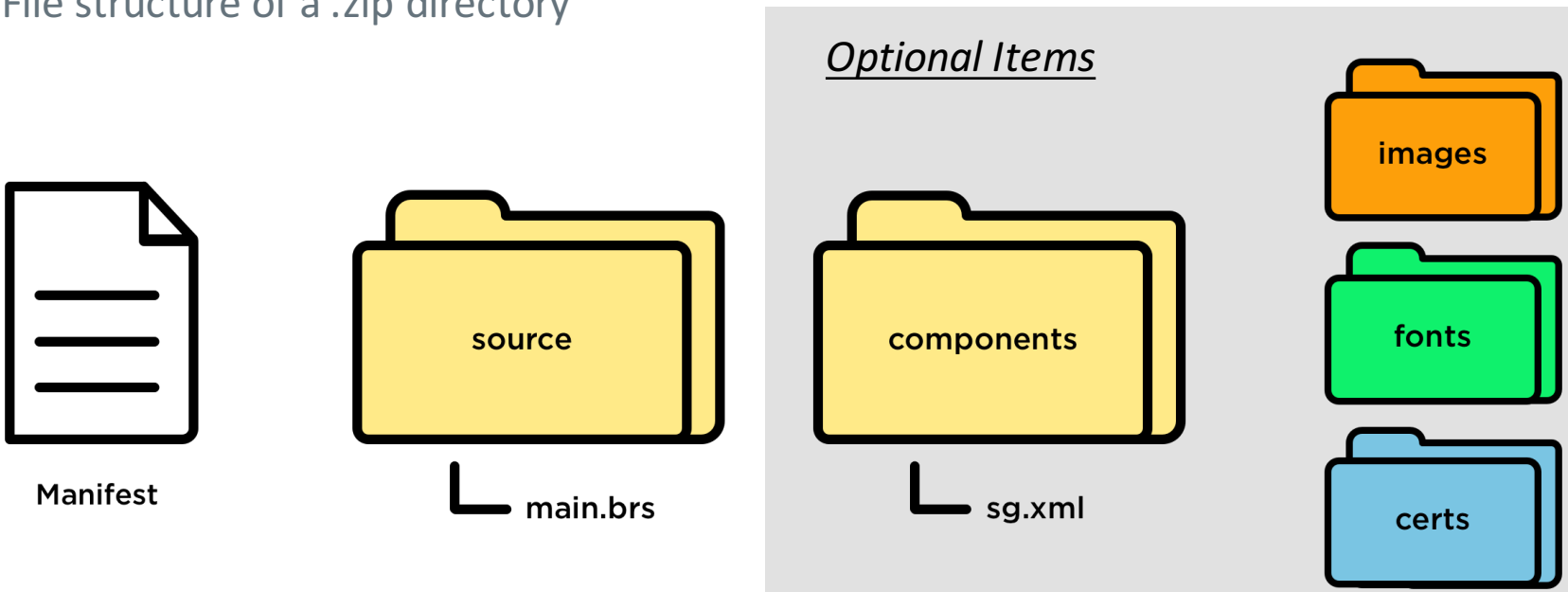
# What's inside a **Roku Channel**?

File structure of a .zip directory




*Max channel size = 2MB; Typical size 500kB*

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# The channel **Manifest** file

Attributes + versioning for channel

Manifest

manifest

```
1  title=Scene Graph Dev App
2  subtitle=Building a basic app for Roku
3  major_version=1
4  minor_version=0
5  build_version=00001
6
7  mm_icon_focus_hd=pkg:/images/MainMenu_Icon_Center_HD.png
8  mm_icon_side_hd=pkg:/images/MainMenu_Icon_Side_HD.png
9  mm_icon_focus_sd=pkg:/images/MainMenu_Icon_Center_SD43.png
10 mm_icon_side_sd=pkg:/images/MainMenu_Icon_Side_SD43.png
11
12 splash_screen_fhd=pkg:/images/splash_fhd.png
13 splash_screen_sd=pkg:/images/splash_sd.jpg
14 splash_screen_hd=pkg:/images/splash_hd.jpg
15 splash_color=#000000
16 splash_min_time=1
17
18
19
20
```

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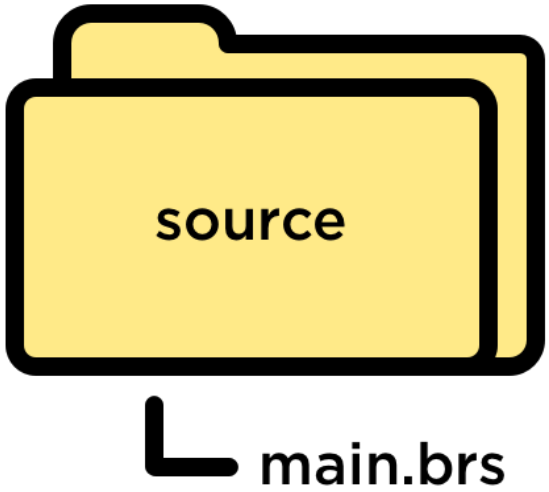
# The channel source files

The starting point for Roku channels




```
'**********************************************************
'** Application: Template Scene
'** File: Main.brs
'** Copyright (c) 2015 Roku, Inc.  All rights reserved.
'**********************************************************

sub Main()
    print "in showChannelSGScreen"
    screen = CreateObject("roSGScreen")
    m.port = CreateObject("roMessagePort")
    screen.setMessagePort(m.port)
    scene = screen.CreateScene("TemplateScene")
    screen.show()

    while(true)
        msg = wait(0, m.port)
    msgType = type(msg)
        if msgType = "roSGScreenEvent"
            if msg.isScreenClosed() then return
        end if
    end while
end sub
```

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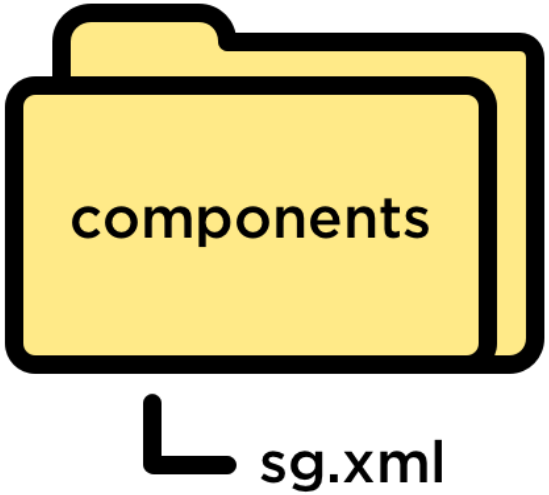
# The XML components

Loading **SceneGraph** to draw screens

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manifest | labelTest.xml

```
<?xml version="1.0" encoding="utf-8" ?>
<component name="LabelTest" extends="Scene">
  <children>
    <Group>
      <Rectangle
        id="SampleRectangle"
        color="0x7A44A2FF"
        width="200"
        height="200"
        translation="[900,425]">
      </Rectangle>

      <Poster
        id="testPoster"
        uri="pkg:/images/roku_streaming_stick.png"
        width="0.0"
        height="0.0"
        translation="[820,20]" />

      <Label
        translation="[50, 50]"
        text="Building apps on the Roku Platform"
        font="font:MediumSystemFont"
        color="0x1ACF4199" >
      </Label>
      <Label
        translation="[50, 100]"
        text="For updates, check out twitter.com/RokuDev"
        font="font:LargeBoldSystemFont"
        color="0xFFFFFFFF">
      </Label>
      <Label
        translation="[50, 175]"
        color="0xFFFFFFFF"
        text="Welcome to..."
        font="font:MediumSystemFont" >
      </Label>
      <Label
        translation="[350, 575]"
```

# Roku BrightScript

# Roku BrightScript

- Roku's interpreted language
- Optimized for our hardware & OS
- Dynamically typed

- Booleans, Integers, Floats, Doubles, Strings (ASCII), Objects
- Loops, OOP patterns, associative arrays

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# BrightScript flow control

## Loops:

- If / else
- For
- For each
- While

```
'**********************************************************
'** Application: Template Scene
'** File: Main.brs
'** Copyright (c) 2015 Roku, Inc.  All rights reserved.
'**********************************************************

sub Main()
    print "in showChannelSGScreen"
    screen = CreateObject("roSGScreen")
    m.port = CreateObject("roMessagePort")
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        msg = wait(0, m.port)
    msgType = type(msg)
        if msgType = "roSGScreenEvent"
            if msg.isScreenClosed() then return
        end if
    end while
end sub
```

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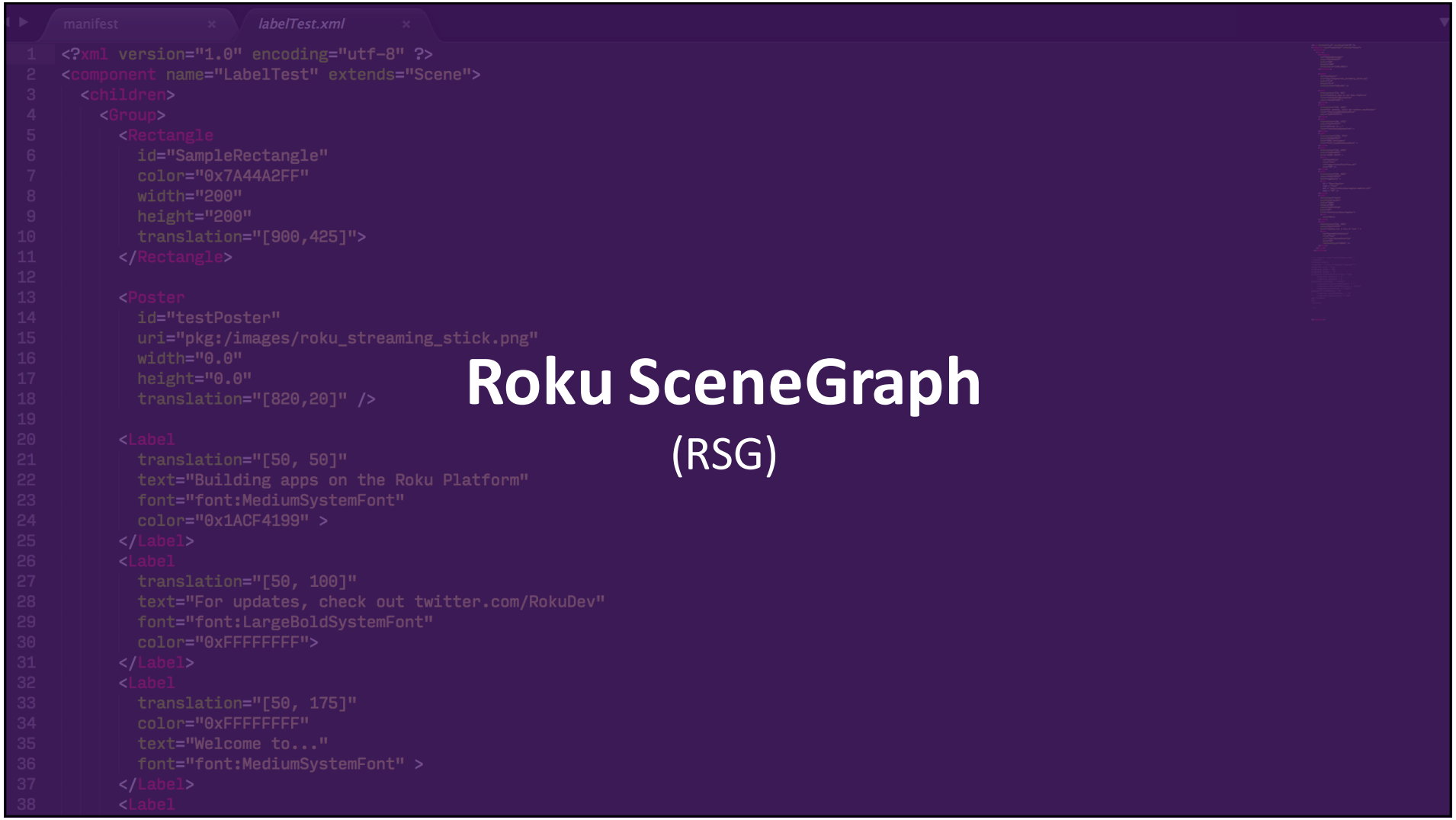


# Roku SceneGraph

(RSG)

# Roku SceneGraph

- **XML-based** framework for building apps on Roku devices
- Screens are rendered from **XML markup**
- Pre-built **components**
- **Multi-resolution support** w/ fallbacks for legacy screens
- **Custom fonts**, XML tree inheritance, **animations**

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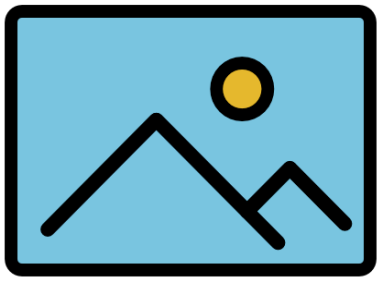
# SceneGraph: There are four visible “nodes”

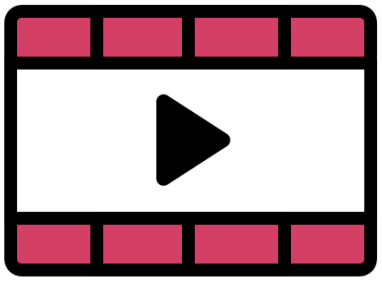
Block level elements in the XML tree

**Rectangles**

**Labels** (text)



**Posters** (images)



**Videos**

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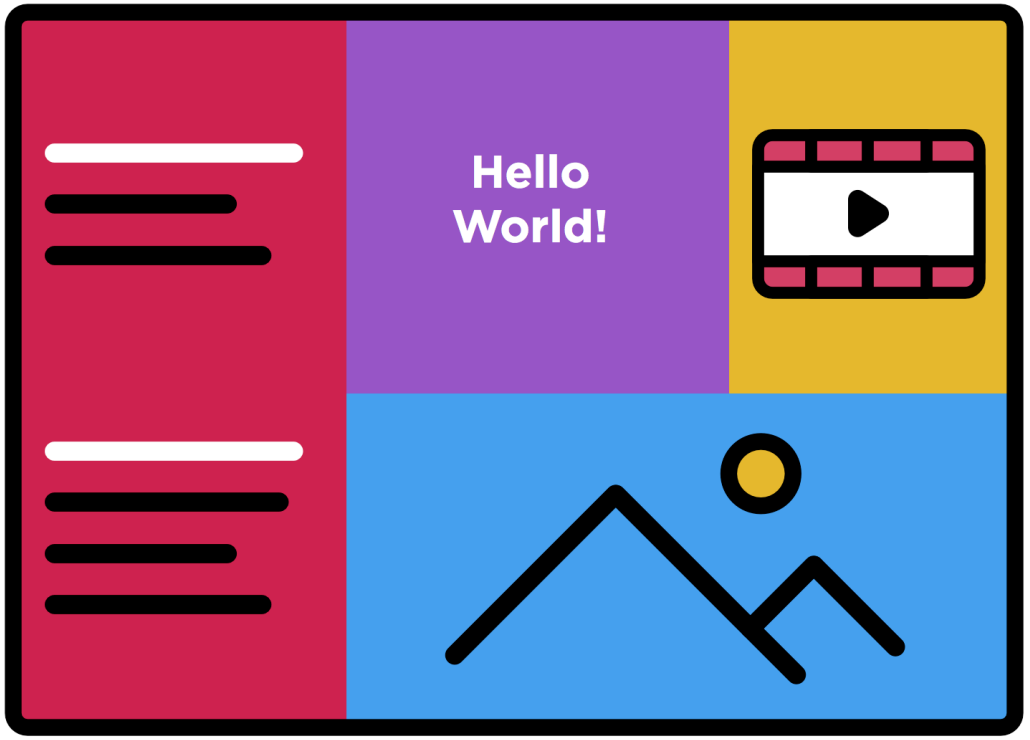
# SceneGraph Draws multiple nodes on screen

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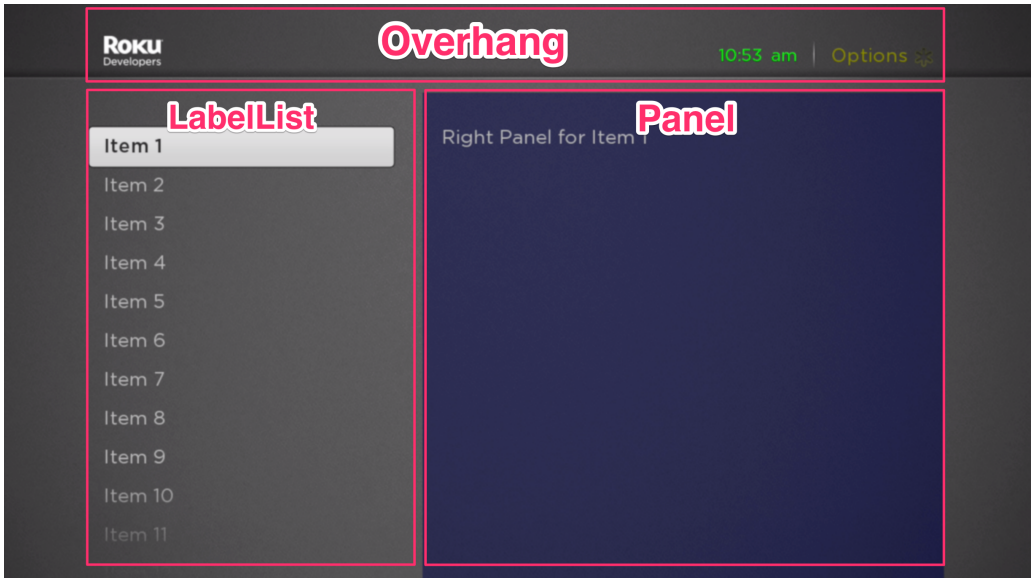
# Combining nodes, we get **pre-built components**

- Lists
- Buttons
- In-app Keyboards
- Number pads
- Dialog boxes

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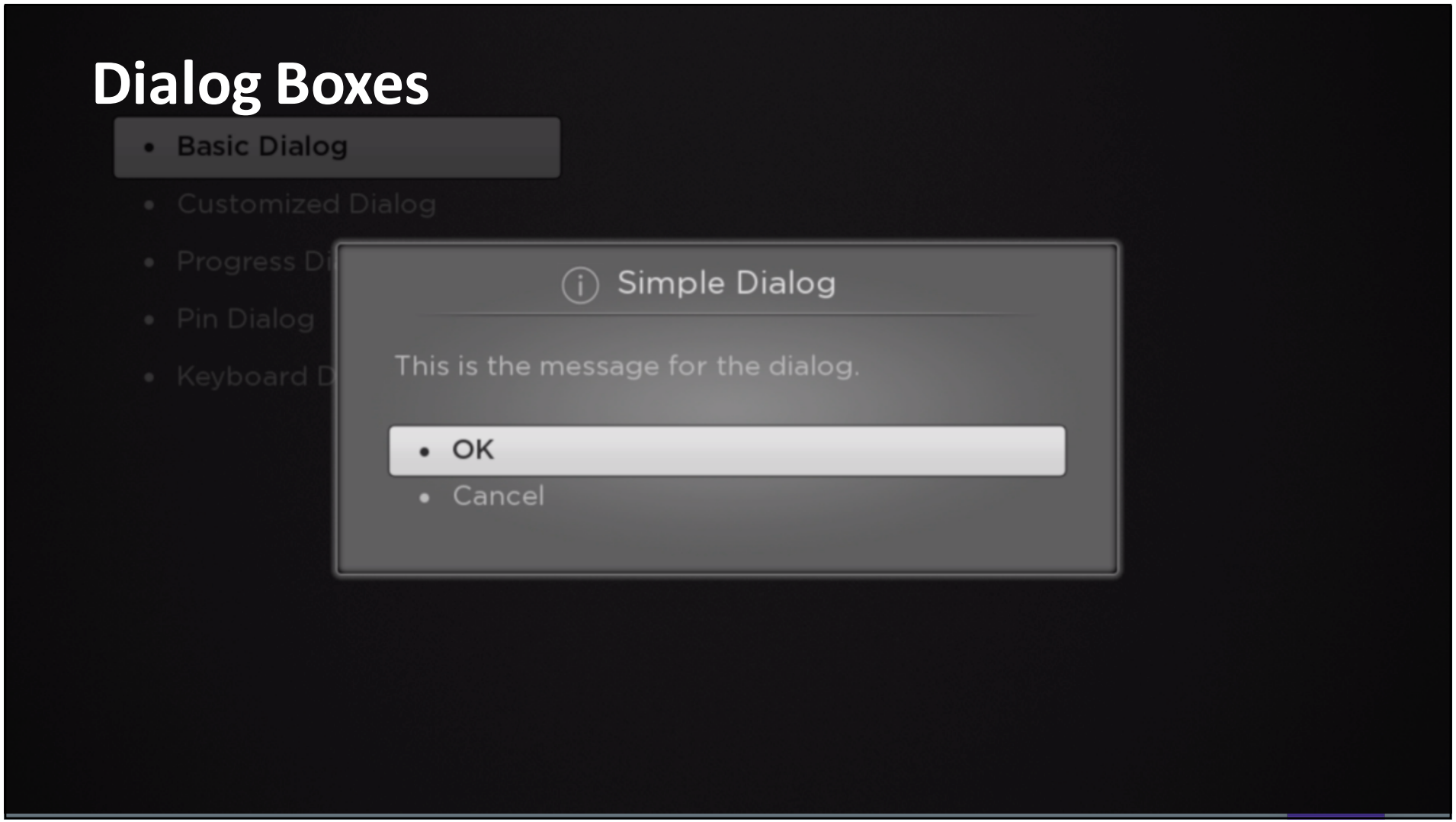
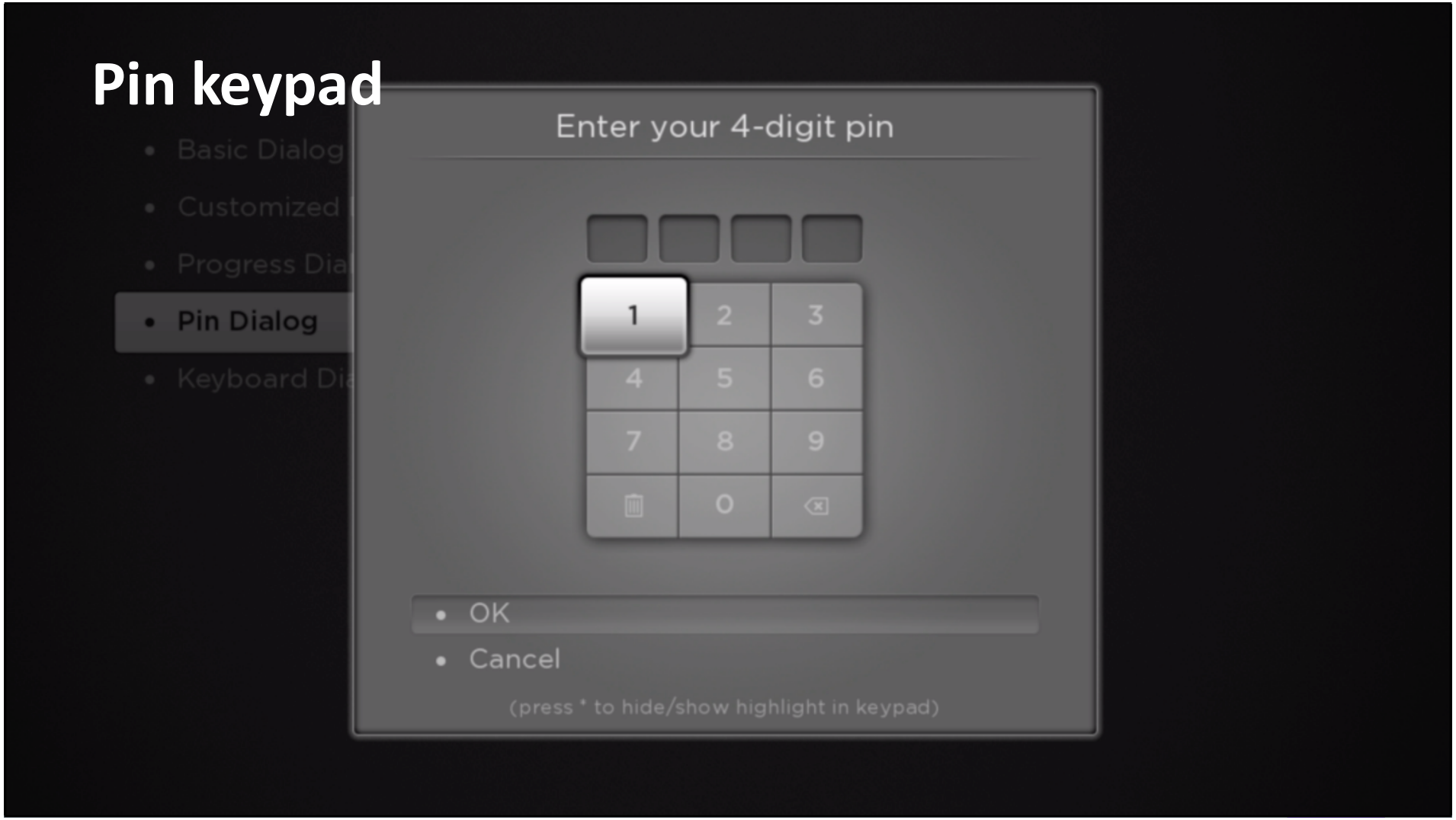
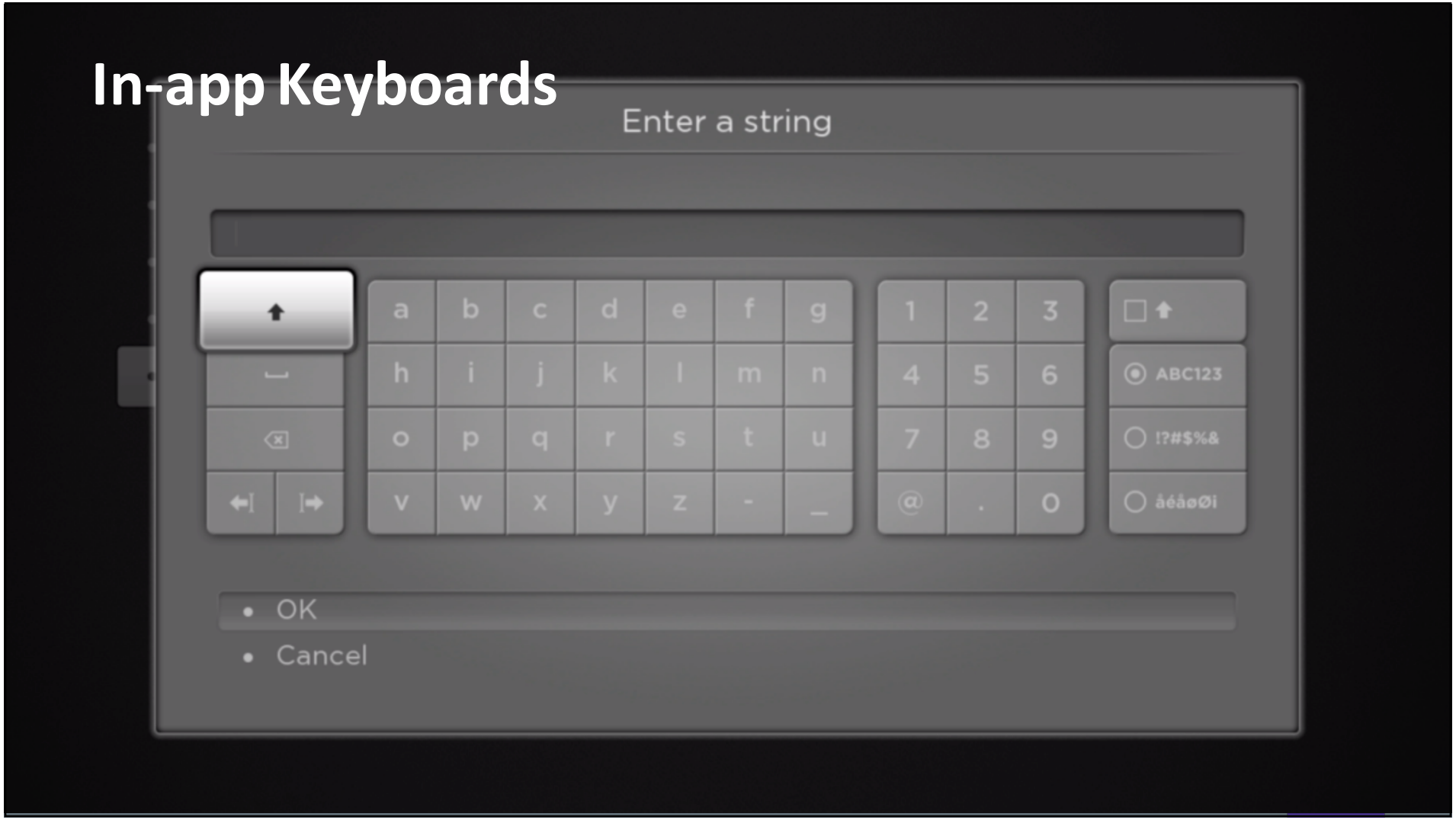
# Dialog Boxes



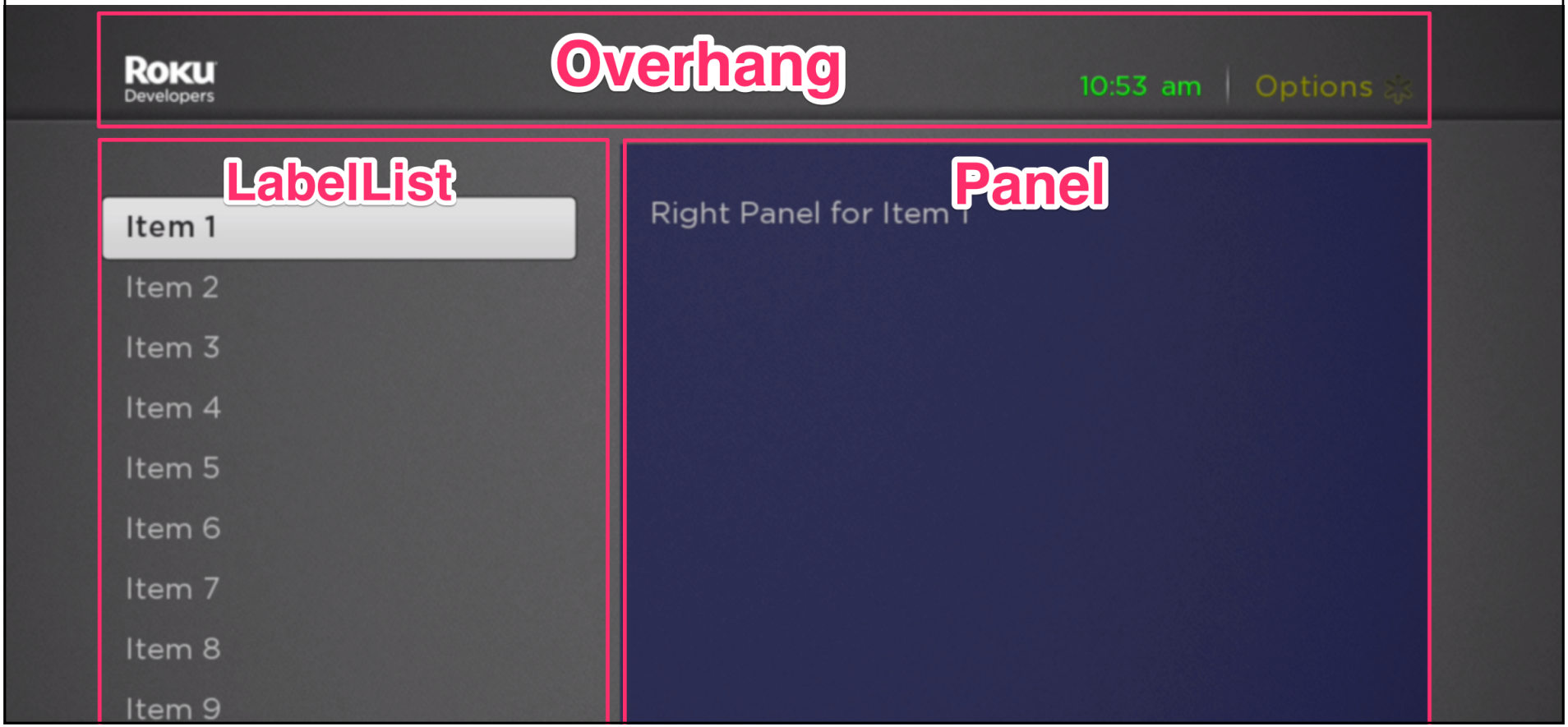
# Pin keypad


Basic Dialog
Customized
Progress Dia
Pin Dialog
Keyboard Di
Enter your 4-digit pin
1
2
3
4
5
6
7
8
9
0
OK
Cancel
(press * to hide/show highlight in keypad)

# In-app Keyboards



# Containers for the channel are “Scenes”



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Roku Now this is TV™

How it works See what's on Choose your player

# 500px

Categories: Photo Apps

Explore 500px photos on your TV. With a 500px account, access your own photos, your favorites, and your friends albums... *Read more*

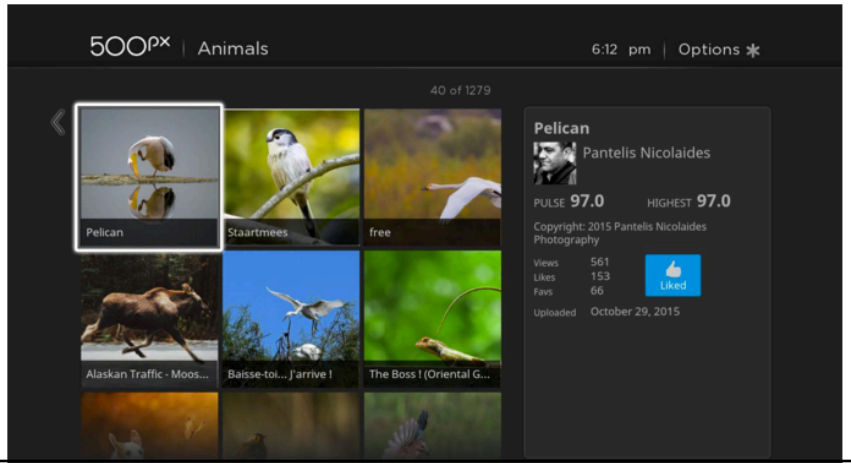
★★★★½ 5 ratings average 4.5

+ Add channel Return to all channels

## 500px

*Developer:RokuDeveloper*

Explore 500px photos on your TV. With a 500px account, access your own photos, your favorites, and your friends albums.



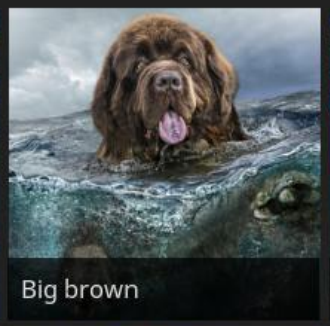
500px | Highest Rated 6:14 pm | Options

5000 photos

- Underwater
- Urban Exploration
- Wedding

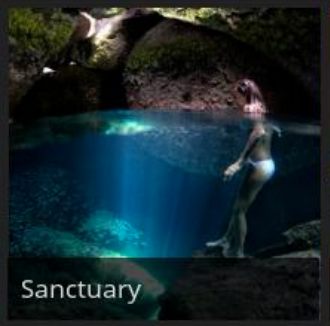
- All Categories
- Abstract
- Animals
- Black and White
- Celebrities
- City and Architecture
- Commercial
- Concert

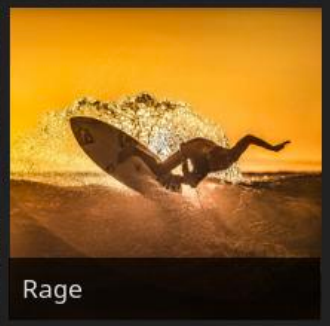
set me free

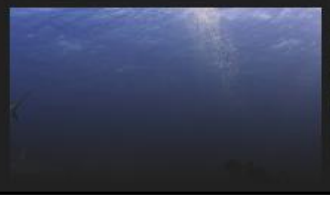

Big brown

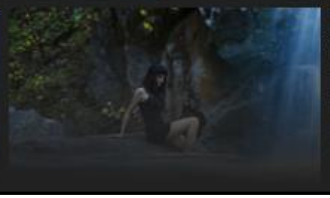
Curtain of Light

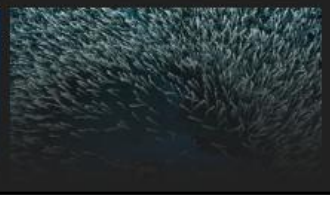
Immersion


Sanctuary


Rage

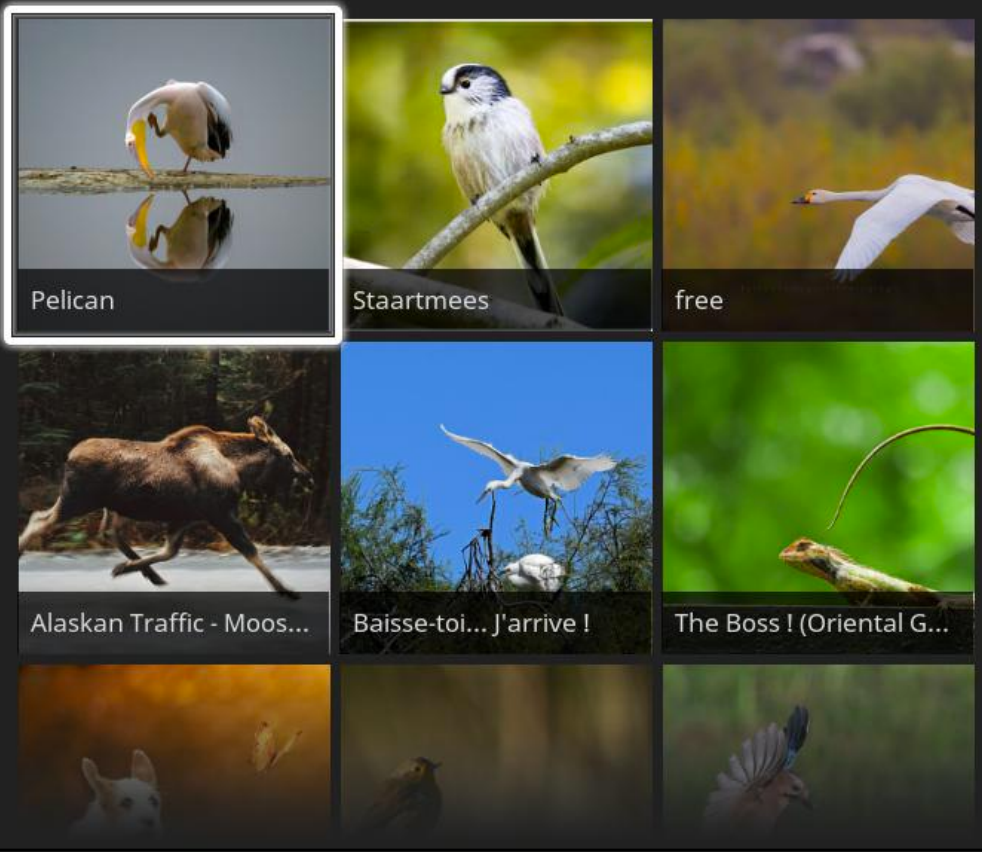






500px | Animals 6:12 pm | Options *

40 of 1279




## Pelican

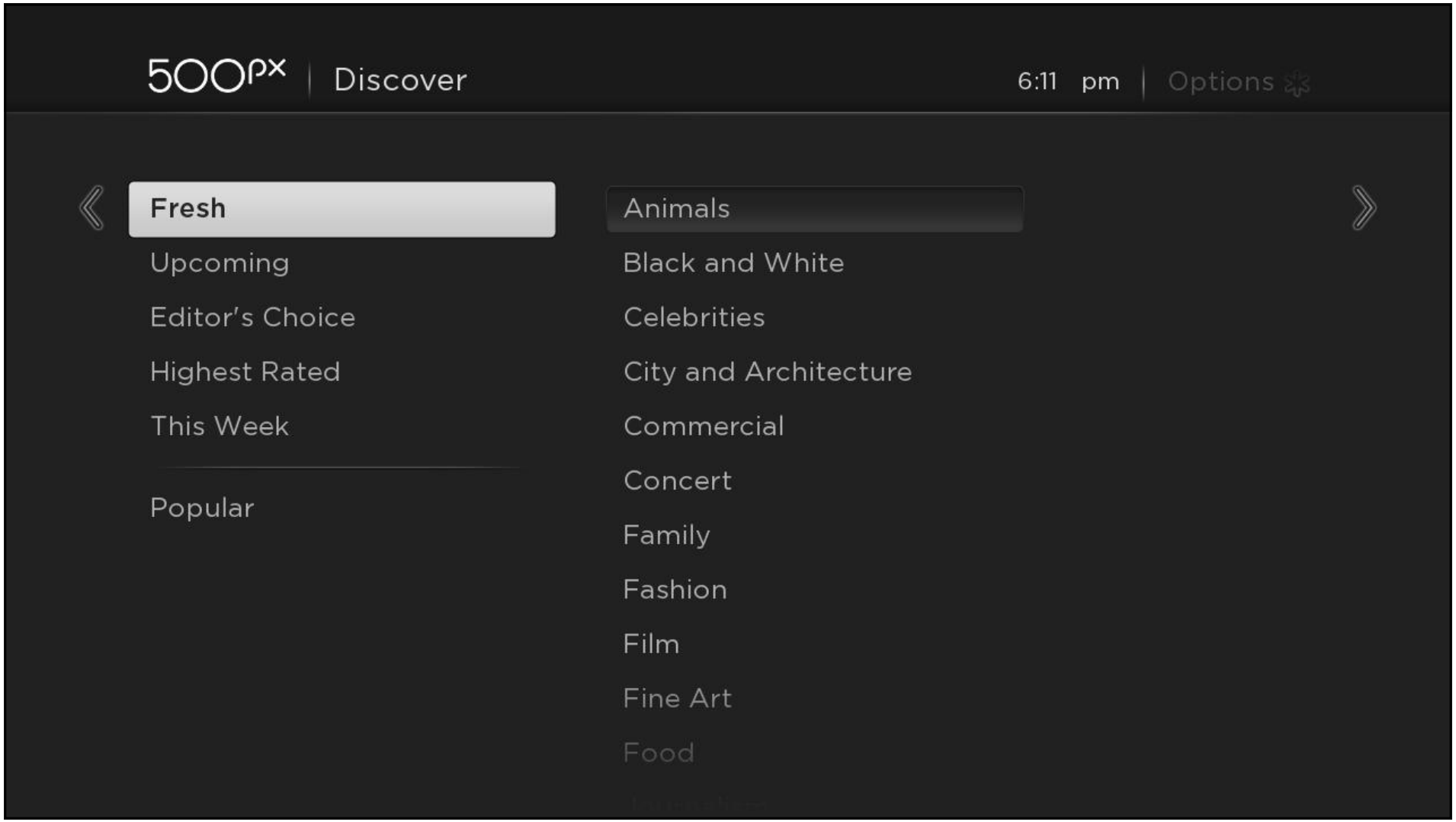
Pantelis Nicolaides

PULSE **97.0** HIGHEST **97.0**

Copyright: 2015 Pantelis Nicolaides Photography

| | |
|---|---|
| Views | 561 |
| Likes | 153 |
| Favs | 66 |
| Uploaded | October 29, 2015 |

Liked


500px | Discover
6:11 pm | Options
Fresh
Upcoming
Editor's Choice
Highest Rated
This Week
Popular
Animals
Black and White
Celebrities
City and Architecture
Commercial
Concert
Family
Fashion
Film
Fine Art
Food

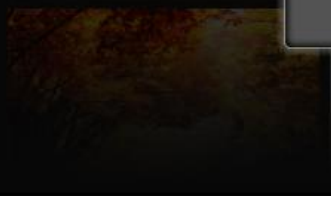
500px | All Categories 6:13 pm | Options

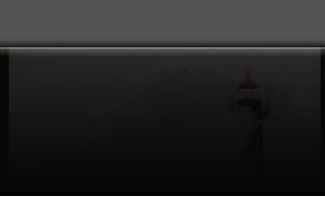
A Different Angle

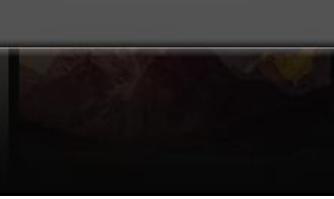
- **Favorite**
- Like
- Follow
- About Ole Henrik Skjelstad
- OK

A Different Angle

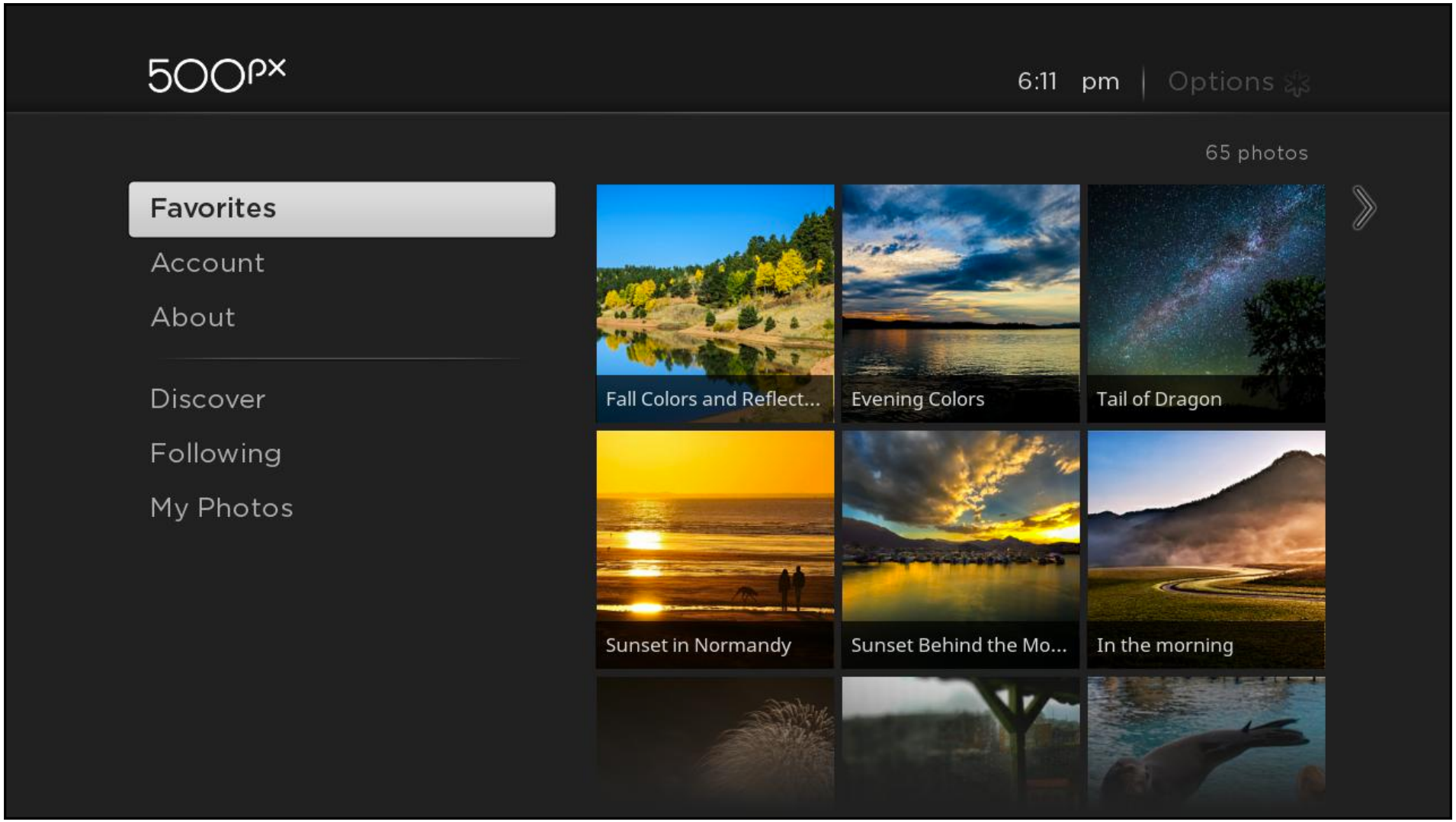
Capadocia





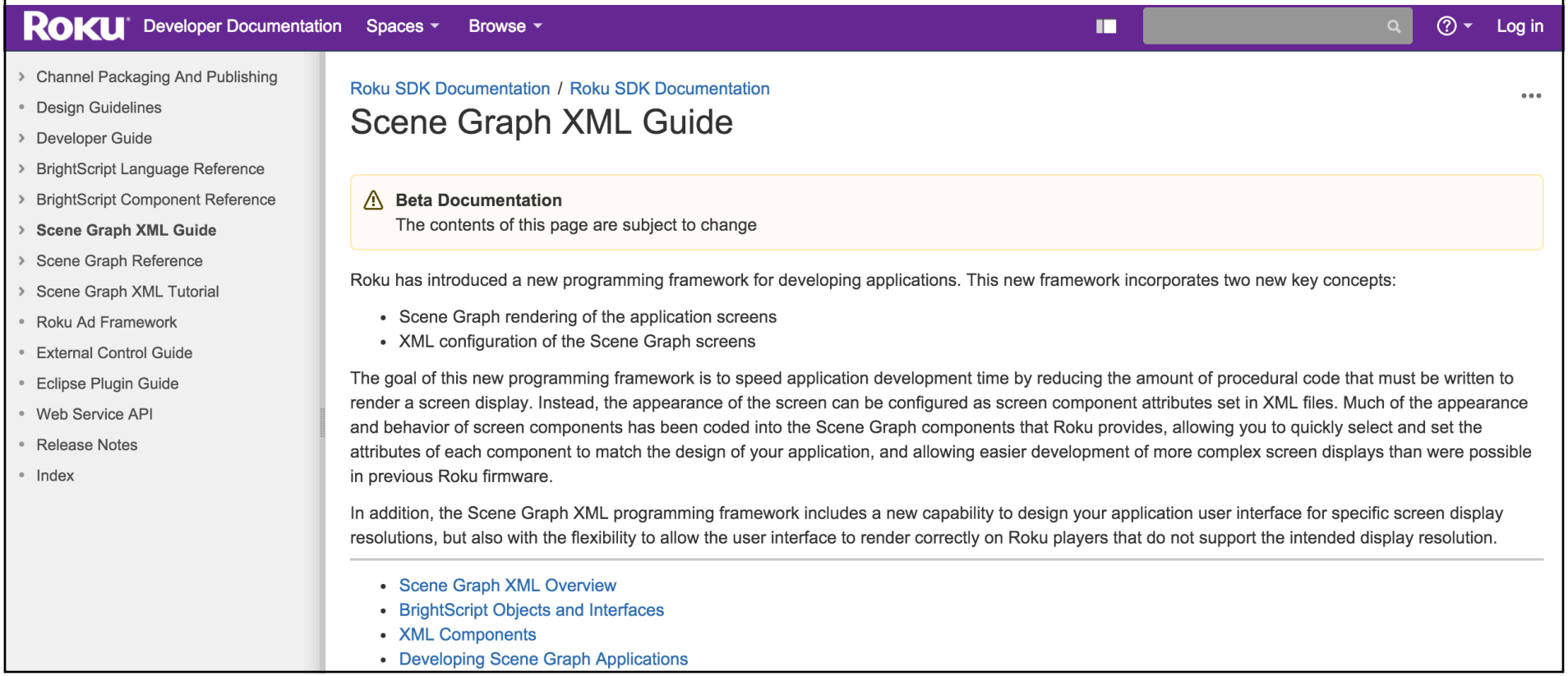


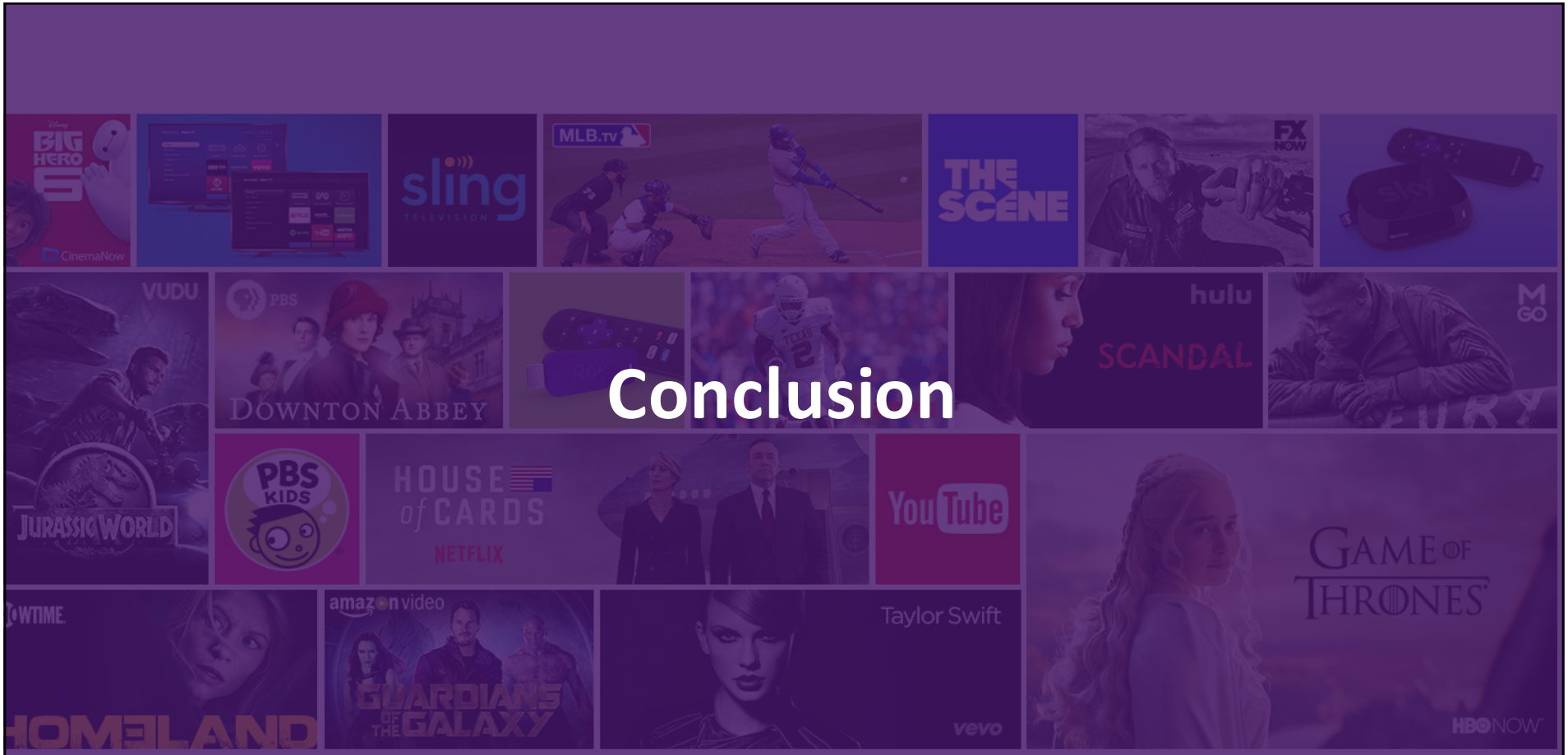
gle
k Skjelstad
HIGHEST 99.7
to the right from
, 2015
, 2015
mm F4 OSS
SO 100


500px
6:11 pm | Options
65 photos
Favorites
Account
About
Discover
Following
My Photos
Fall Colors and Reflect...
Evening Colors
Tail of Dragon
Sunset in Normandy
Sunset Behind the Mo...
In the morning

# For more RSG, dig into our **developer docs**

sdkdocs.roku.com






# Conclusion

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# Wrapping up

- Read the **Roku Developer Guide** + docs
- Review the **Channel Package/Publisher Guide** docs
- Test the workflow for building your channel
- Reach out and show off your channels via **@rokudev** on Twitter

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# Thanks for Building on the Roku Platform!

***Questions?***

Chris Traganos @ctraganos

@rokudev

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Roku
NOW THIS IS TV