

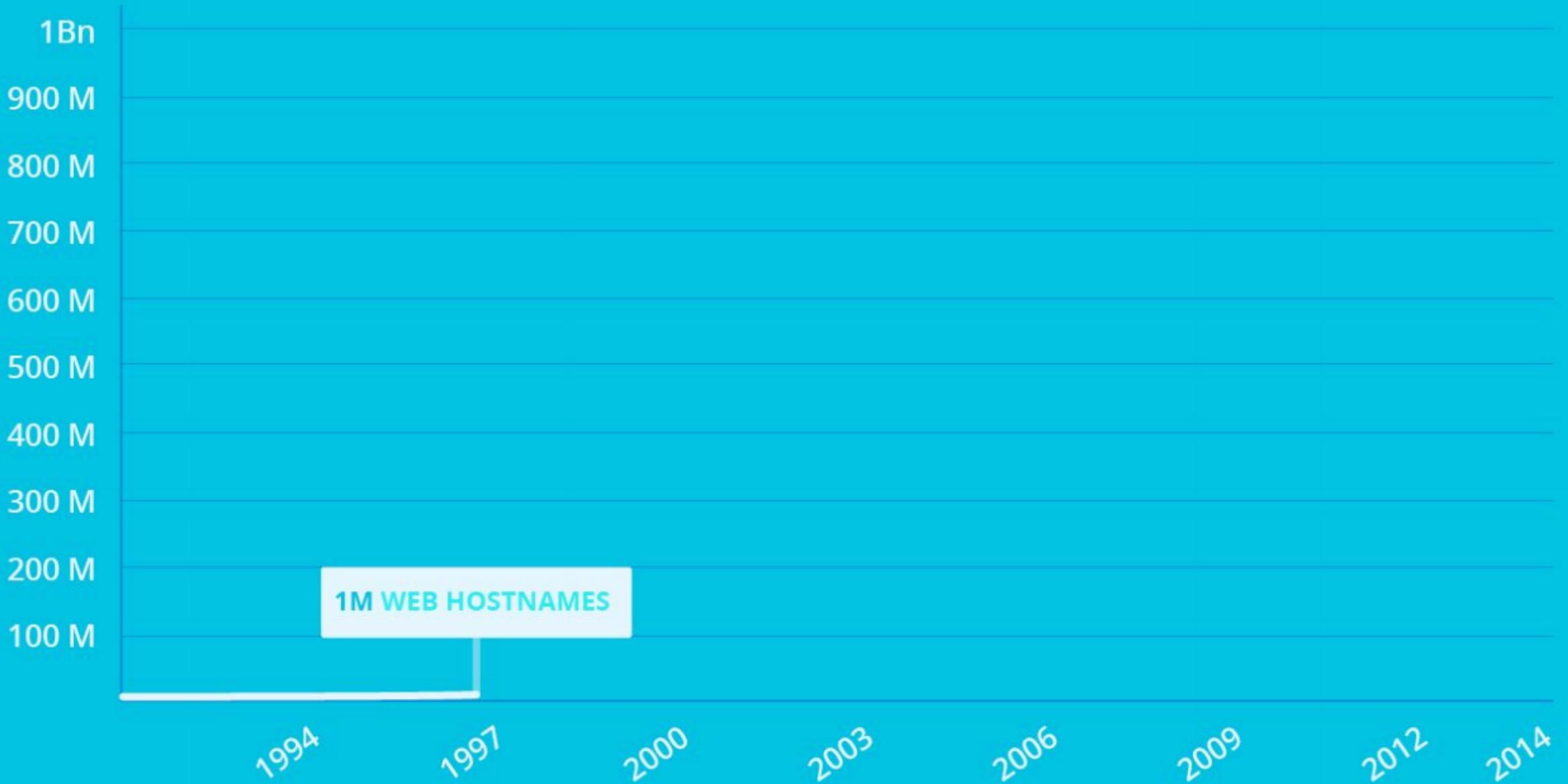
A photograph of a man with dark hair and a beard, wearing a red t-shirt with a large black pixelated heart graphic. He is laughing heartily, with his head tilted back and eyes closed. The background is a lush, green, rocky cliffside overlooking a body of water under a blue sky with white clouds.

# Mobile Search: Making your mobile apps stand out

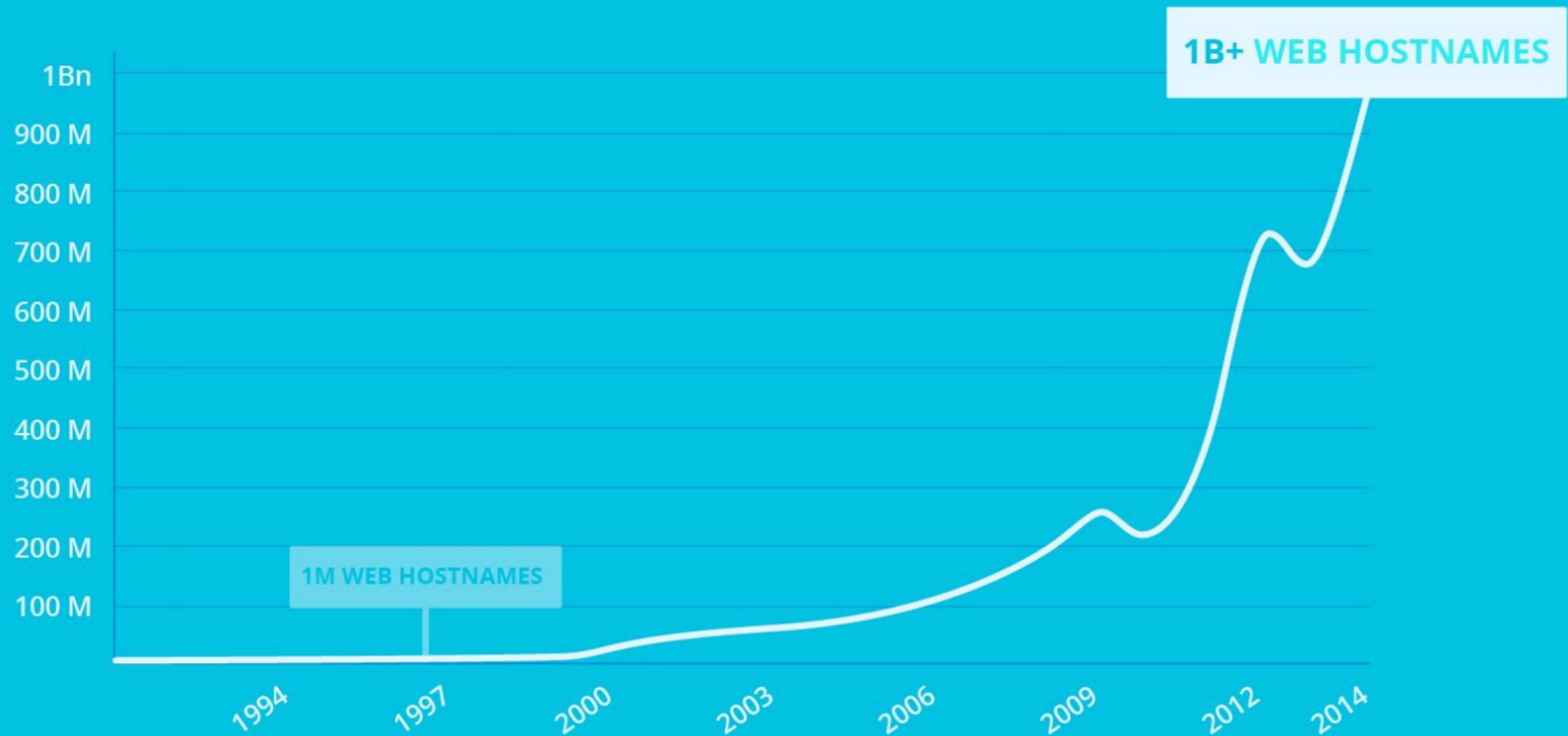
James Montemagno  
@JamesMontemagno

✖ EVOLVE16

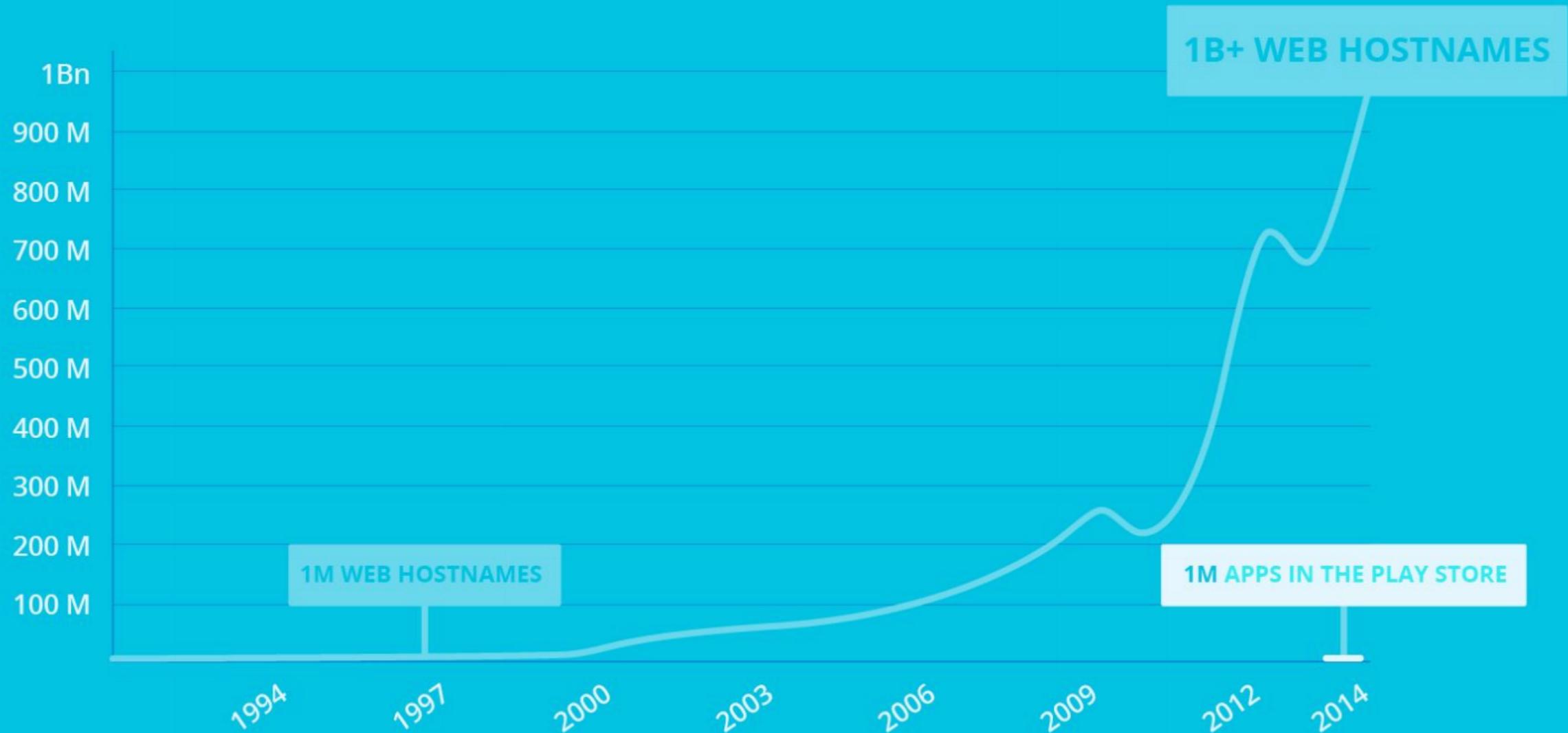
# Number of Web Hostnames 1991-2014



## Number of Web Hostnames 1991-2014



## Number of Web Hostnames 1991-2014



# We ❤️ Apps!

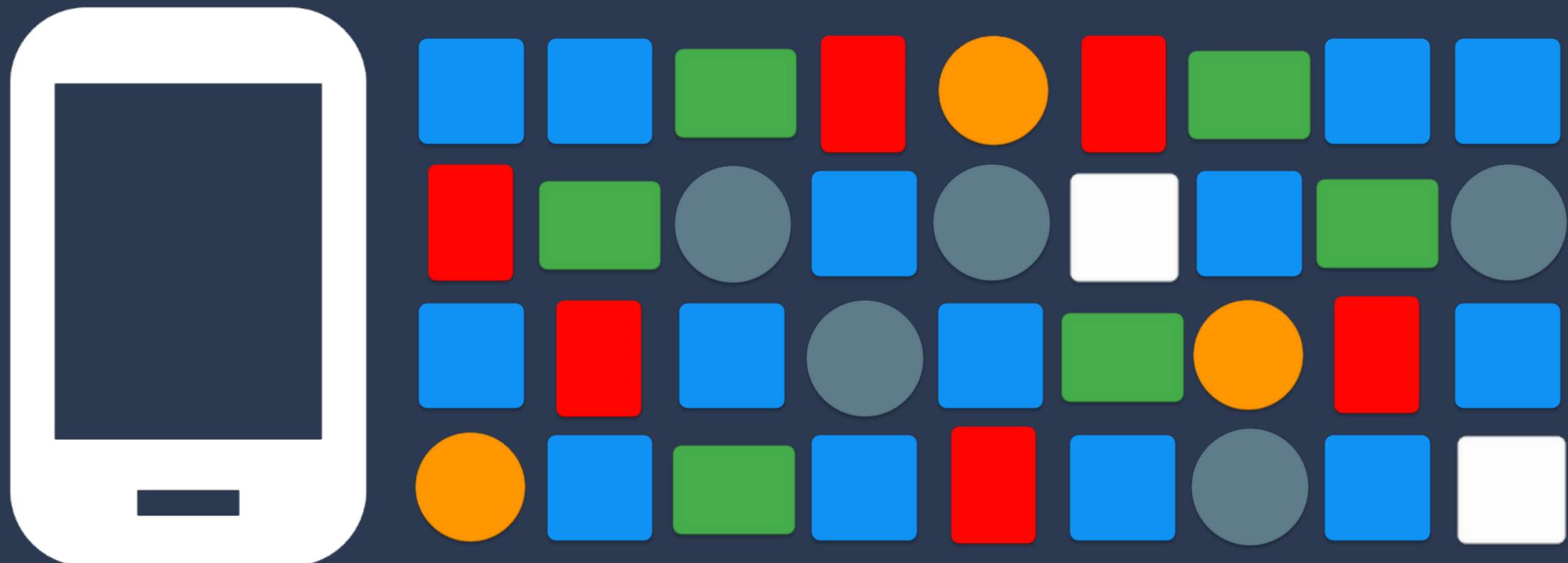
189M  
downloads  
a day

200  
mins on  
phone

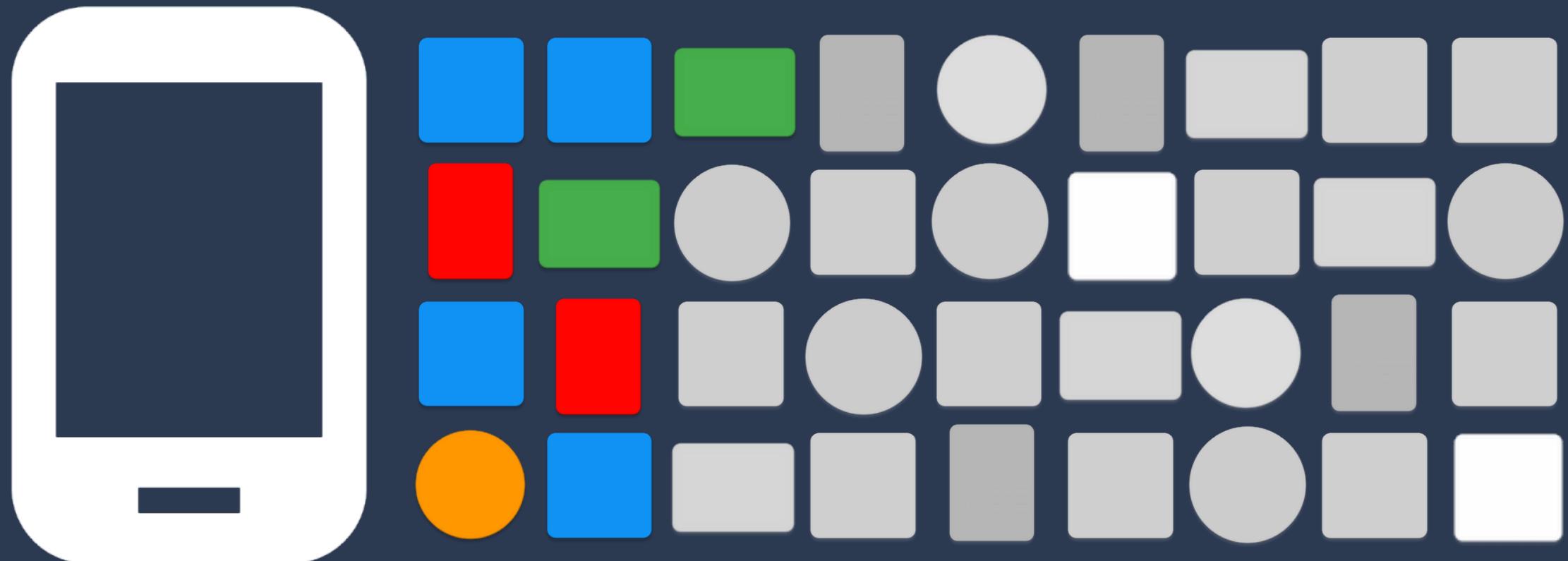
127  
mins in  
apps

How many do  
we **actually** use?

The average app user has **36** apps installed on his or her phone.



Only 1/4 are **used daily**:



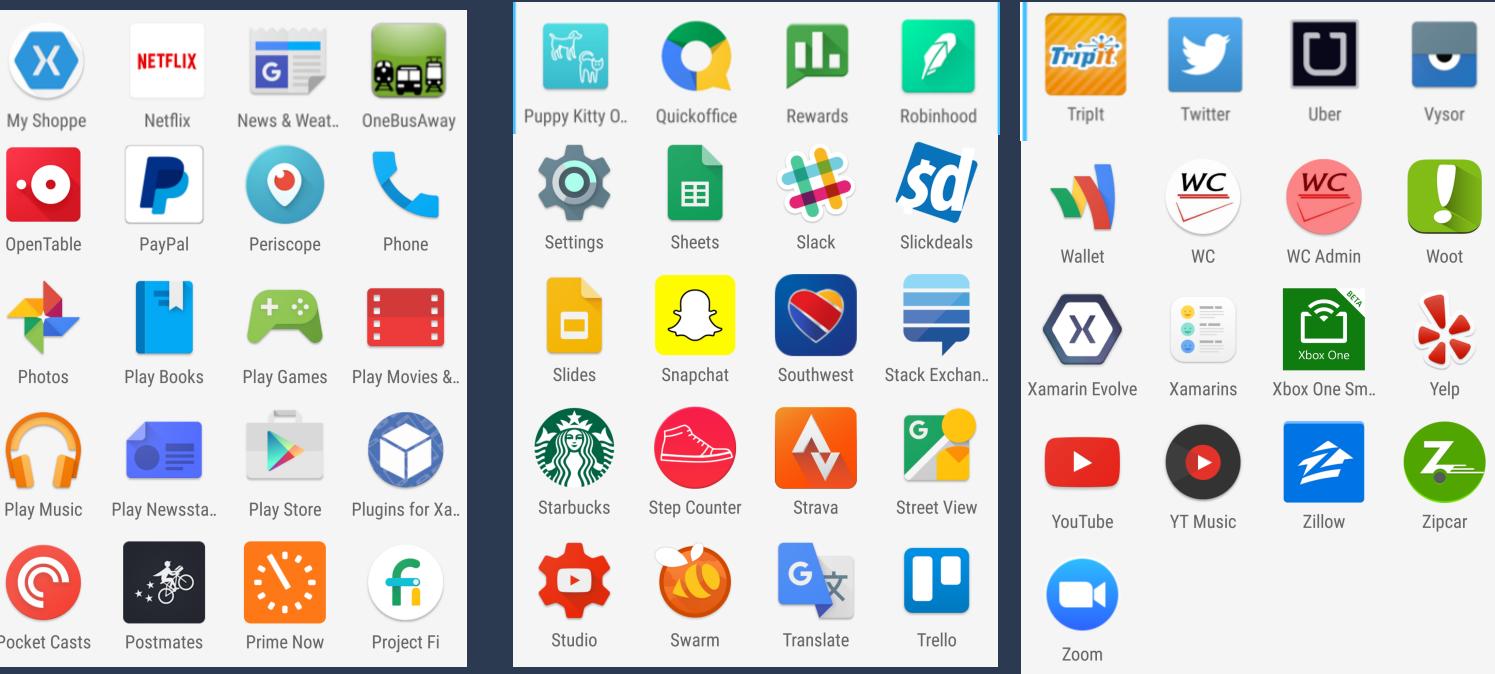
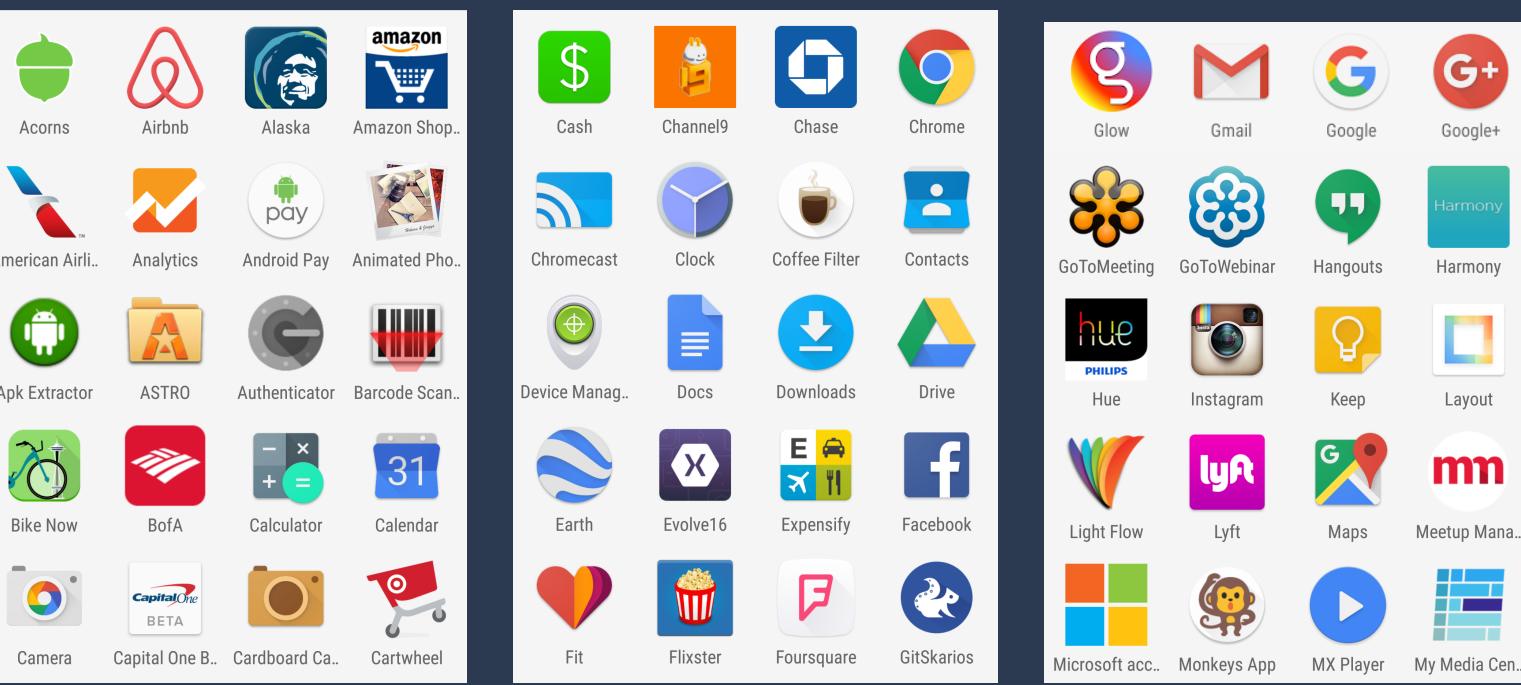
# 1/4 of apps are **never used**!



# My Phone

117 Apps

107 “Non-system” Apps!



# Used Today

# 17



BofA



Chase



Chrome



Expensify



GitSkarios



Gmail



Instagram



Photos



Play Music



Robinhood



Slack



Snapchat



Swarm



Twitter



Zillow

**Mobile search is a key way for users to *discover* and *engage* with your app's content.**

Back to Messages 17:26 evolve.xamarin.com

Sessions Session Details

## Building a Universal Windows App in Visual Studio

April 27, 3:30 PM–4:15 PM

FOLLOW

Add to Calendar

Add to Favorites

ABSTRACT

Visual Studio 2015 makes it easy to build

••••• T-Mobile 17:26

Messages Antonio

Today 17:25

Hey Vini, this is the session I was talking to you about:

[https://evolve.xamarin.com/  
session/building-a-universal-  
windows-app-in-visual-studio](https://evolve.xamarin.com/session/building-a-universal-windows-app-in-visual-studio)

••••• T-Mobile 22:21

building a universal wind

EVOLVE16

Building a Universal W  
Visual Studio 2015 make  
Universal Windows appli

SUGGESTED WEBSITE

Check out the Build D  
Great Introduction to t

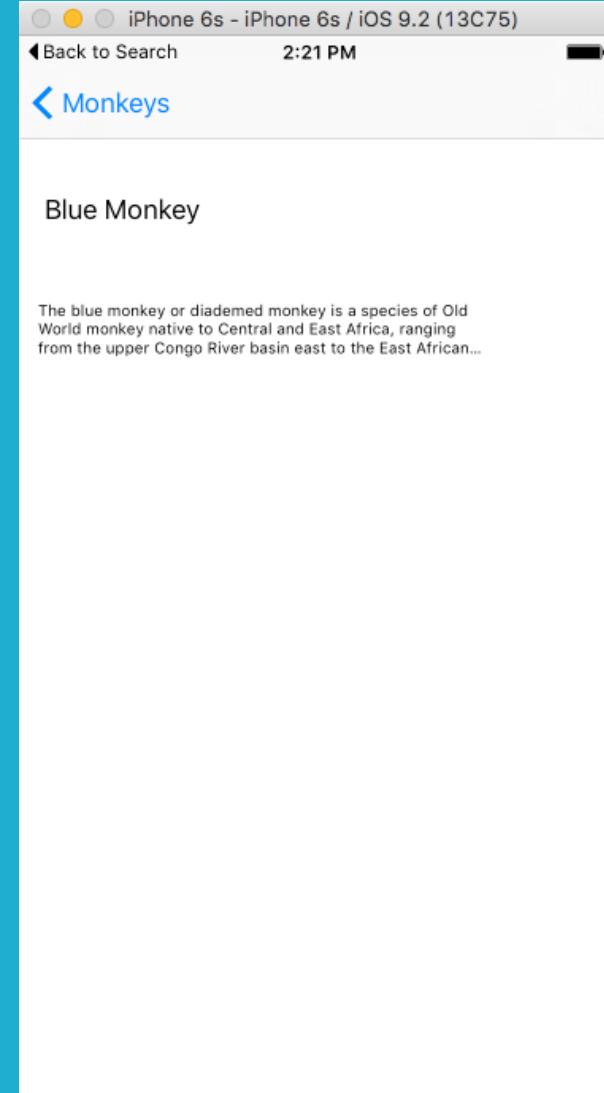
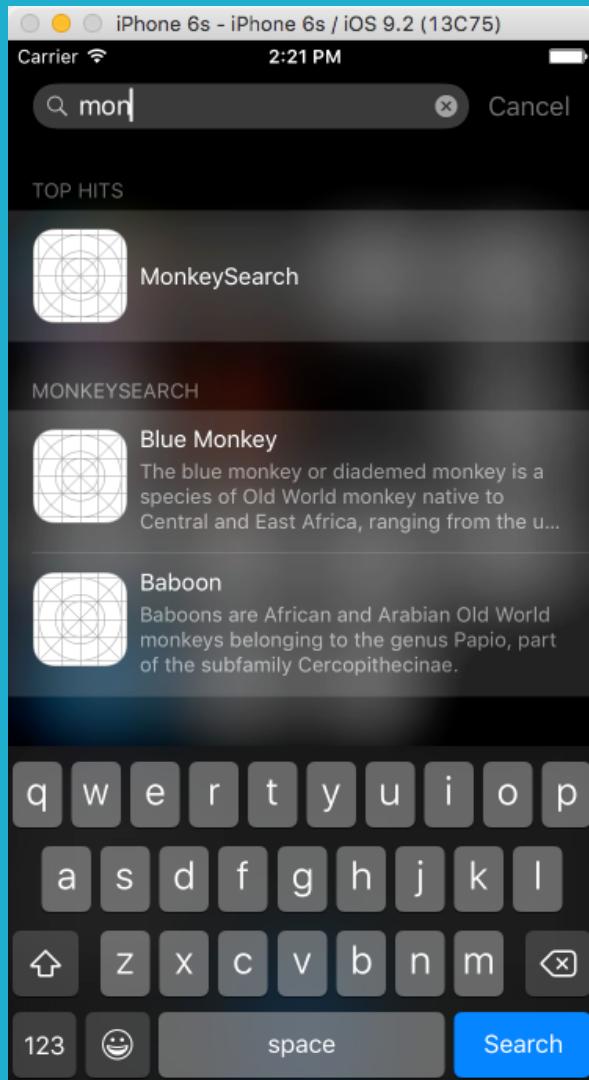
# Optimal Search Experience

iOS  
Android  
Xamarin.Forms

# iOS Search APIs

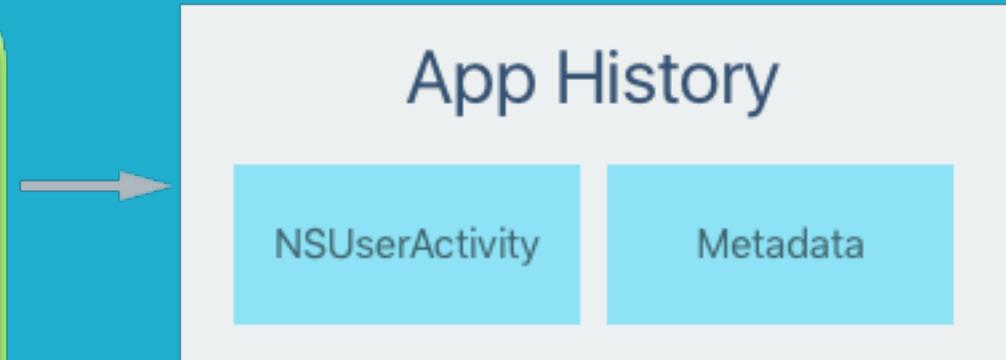
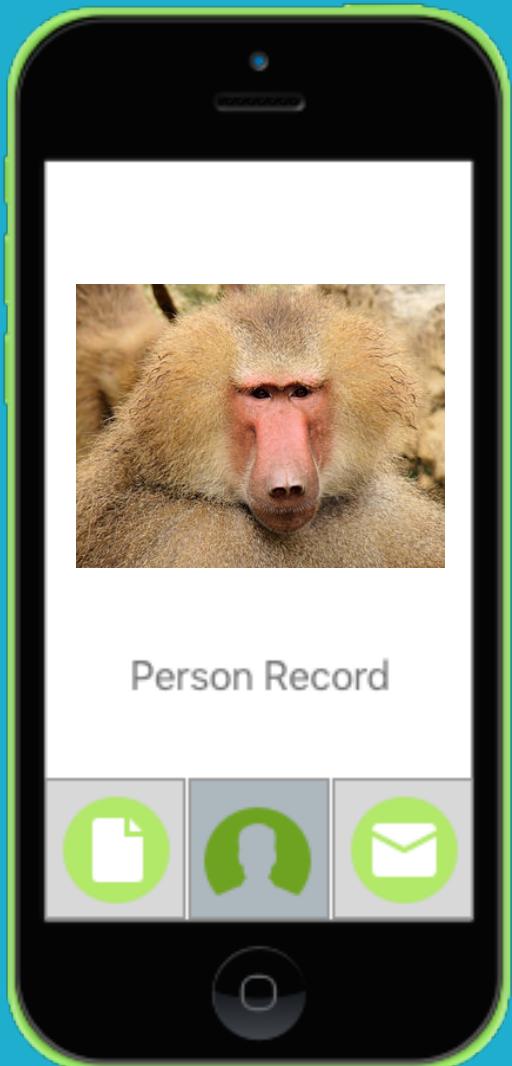
- Handoff Enabled
- Pieces of Content & Pages
- When user views
- Ability to save state of screen
- Less Data
- More Functionality
- Pre-Indexing Entire App's Content
- Full set or Part of set
- More Data
- Less Functionality
- Deep linking from web

# NSUserActivity: Index Activities



# NSUserActivity

- Set “UserActivity”
- Add metadata
- Save “UserActivity”



# Create NSUserActivity

```
NSUserActivity CreateActivity()
{
    var activity = new NSUserActivity("com.xamarin.monkeys.monkey");
    activity.EligibleForSearch = true;
    activity.EligibleForPublicIndexing = true;
    activity.EligibleForHandoff = false;
    activity.Title = monkey.Name;

    activity.Keywords = new NSSet<NSString>()
        { new NSString(monkey.Name), new NSString("Monkey") };

    var attributeSet = new CoreSpotlight.CSAttributeSet();
    attributeSet.ContentDescription = monkey.Details;
    activity.ContentAttributeSet = attributeSet;

    var info = NSDictionary.FromObjectAndKey(new NSString(monkey.Name),
                                              new NSString("Name"));
    activity.AddUserInfoEntries(info);

    return activity;
}
```

# Set Activity

```
public override void viewDidAppear()
{
    base.viewDidAppear();

    UserActivity = CreateActivity();
    UserActivity.BecomeCurrent();
}

public override void viewWillDisappear(bool animated)
{
    base.viewWillDisappear(animated);
    UserActivity.ResignCurrent();
}
```

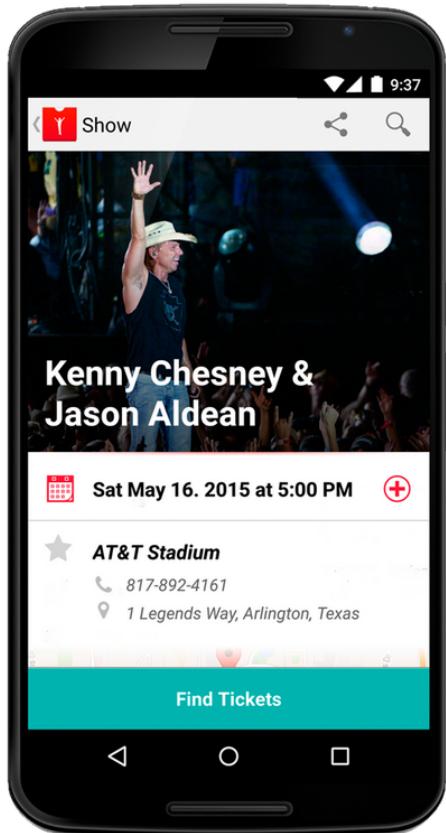
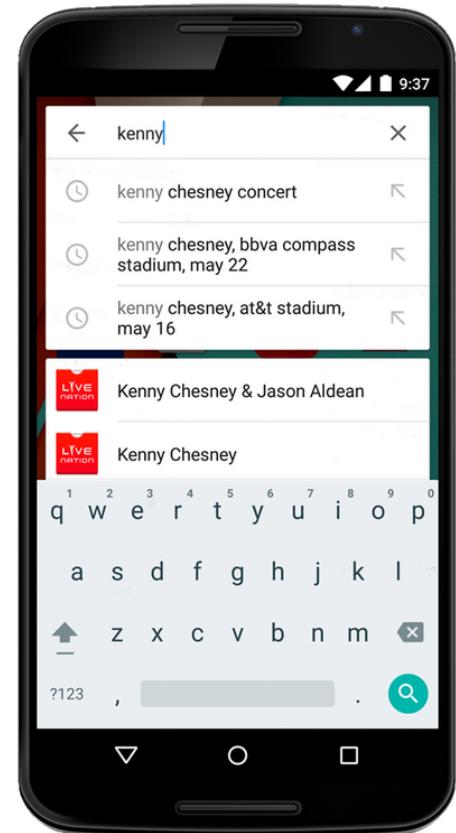
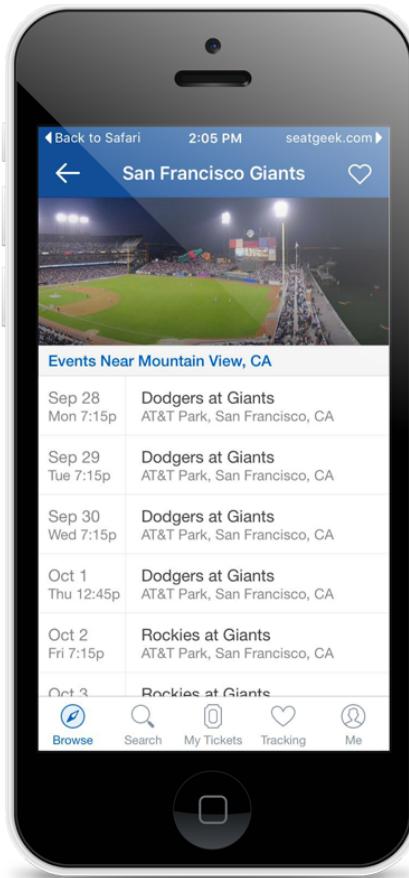
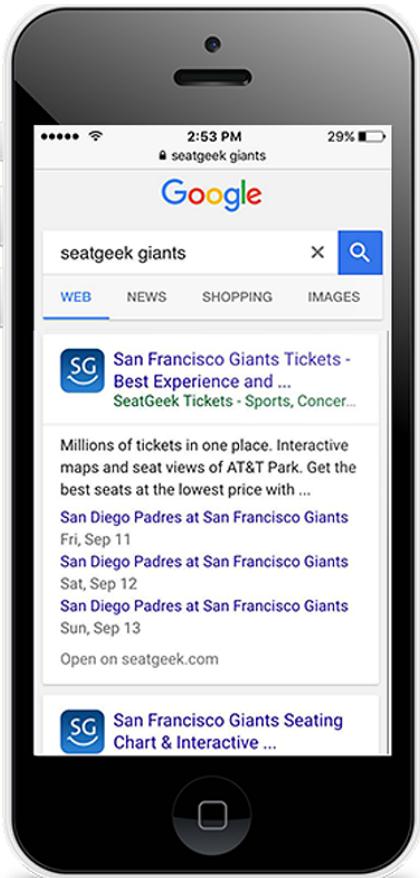
# Respond

```
public override bool ContinueUserActivity (UIApplication application,
    NSUserActivity userActivity, UIApplicationRestorationHandler completionHandler)
{
    // Take action based on the activity type
    switch (userActivity.ActivityType) {
        case "com.xamarin.monkeys.monkey":
            var uid = userActivity.UserInfo.ObjectForKey((NSString)"Name").ToString();
            break;
    }

    return true;
}
```

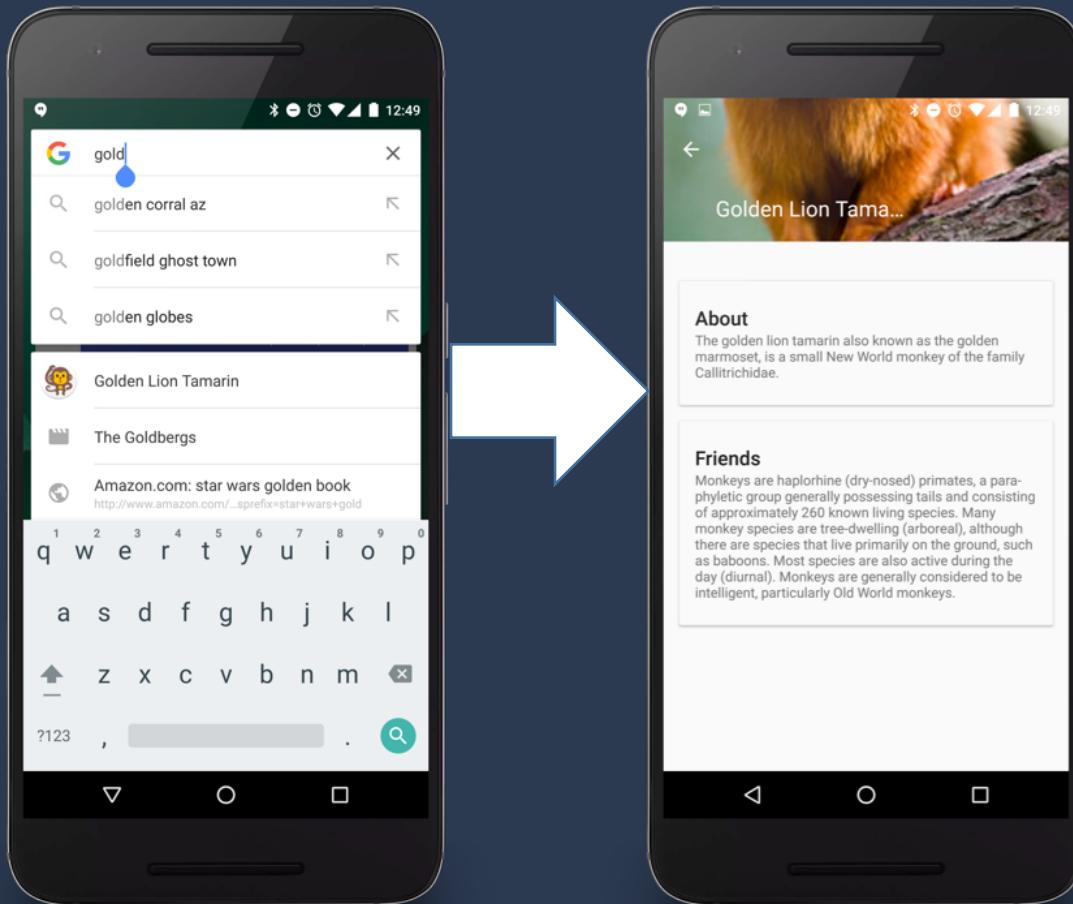
# Google App Indexing

- Put your app in front of users in Google Search



# Search Better

In Google Search



- Connect your Site to App

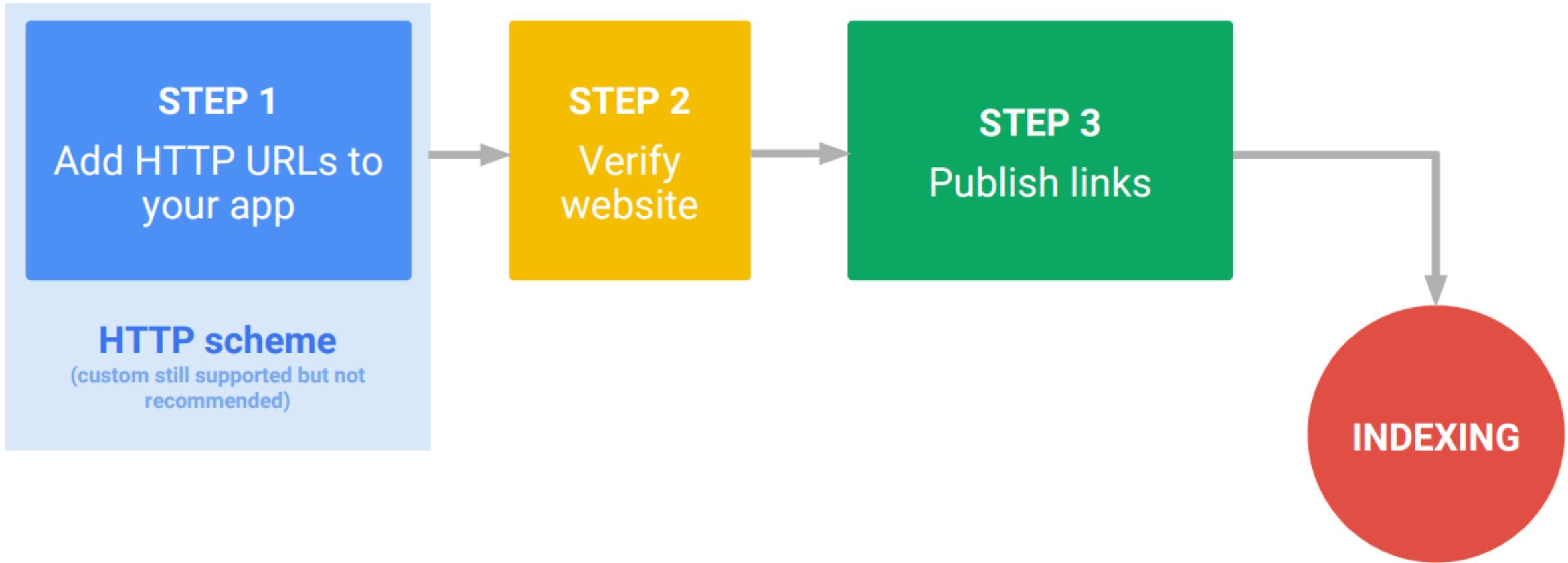
A screenshot of a Google search results page. The search bar at the top contains the query "monkeys app golden lion". Below the search bar, there are several search filters: ALL (which is selected), IMAGES, SHOPPING, VIDEOS, NEWS, and MAP. The first search result is a link to "Golden Lion Tamarin - Monkeys App" with the subtitle "Monkeys App app". The snippet below the link describes the golden lion tamarin as a small New World monkey. The second search result is a link to "Golden Lion Tamarin Fact Sheet - National Zoo Smithsonian Institution" with the subtitle "nationalzoo f...". The snippet below the link states that about 1,500 golden lion tamarins live in the wild and provides links to the Animal Program, Newsroom, Events, Volunteers, and Careers sections of the National Zoo website.

## STEP 1

Add HTTP URLs to  
your app

### HTTP scheme

(custom still supported but not  
recommended)



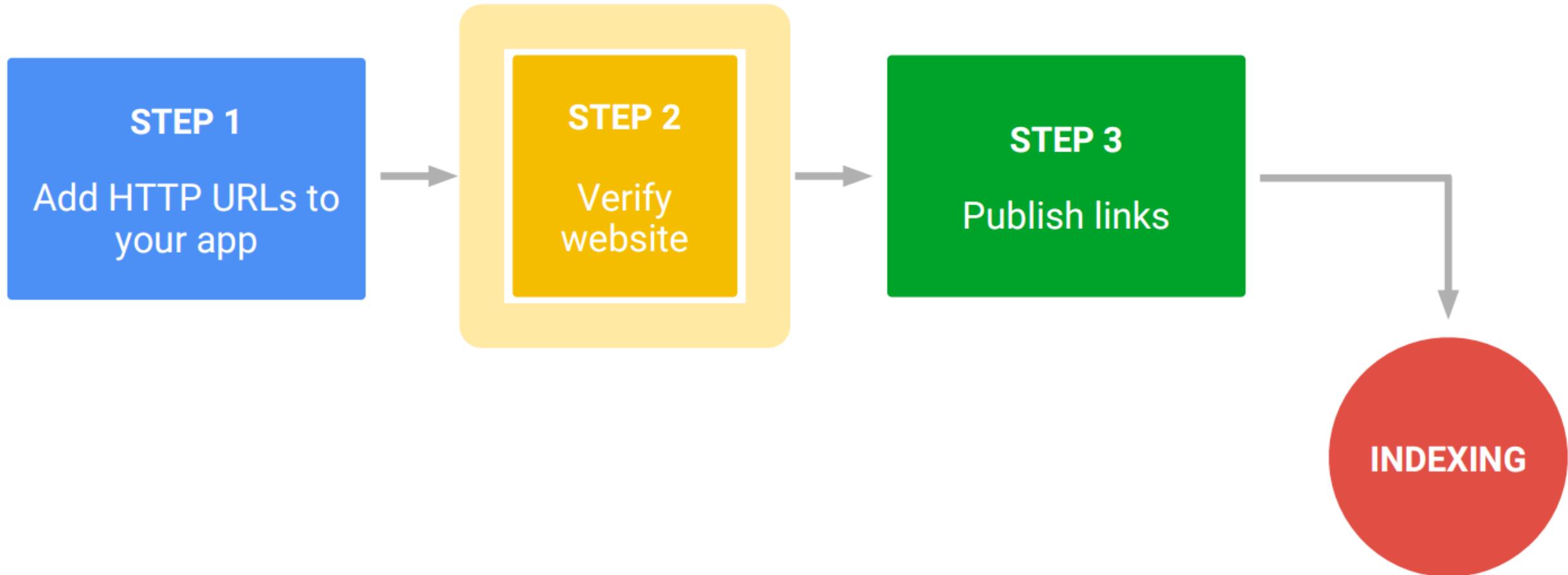
# Add IntentFilter

```
[IntentFilter(new []{ Intent.ActionView },
    Categories = new []
{
    Android.Content.Intent.CategoryDefault,
    Android.Content.Intent.CategoryBrowsable
},
DataScheme = "http",
DataHost = "monkeysapp.com",
DataPathPrefix ="/Home/Detail/")]
public class MainActivity : BaseActivity
{}
```

# Handle Intent

```
protected override void OnNewIntent(Intent intent)
{
    base.OnNewIntent(intent);
    var action = intent.Action;
    var data = intent.DataString;
    if (Intent.ActionView != action || string.IsNullOrWhiteSpace(data))
        return;
    //only if deep linking
    if (!data.Contains("/Home/Detail/"))
        return;

    var monkeyId = data.Substring(
        data.LastIndexOf("/", StringComparison.Ordinal) + 1).Replace("%20", " ");
    if (!string.IsNullOrWhiteSpace(monkeyId))
    {
        var i = new Intent(this, typeof(DetailsActivity));
        i.PutExtra("Name", monkeyId);
        StartActivity(i);
    }
}
```



Cloud Test Lab

Promotions

APK

Store Listing

Content Rating

Pricing & Distribution

In-app Products

**Services & APIs**

## APP INDEXING FROM GOOGLE SEARCH

### Deep link into your app from Google search

Through App Indexing, Google will add deep links to your app in Google Search results on Android. Just like your website, your app needs to be indexed by Google before this can happen. To get started, verify your official website by clicking on the button below.

**Verify website**

<http://www.monkeysapp.com/>



<http://monkeysapp.com/>



If your app supports HTTP deep linking based on your website, indexing can start after verification completes. Contact your website's Webmaster to complete the verification process using [Google Webmaster Tools](#). Once indexing begins, app errors will be reported in Webmaster Tools alongside website errors in the "Crawl Errors" section.

To facilitate the indexing process, you can provide more details on which links your app supports through website markup, your sitemap, or the App Indexing API. For more information on these options, and for instructions on what to do if your app does not support HTTP deep linking, see our [App Indexing developer guidelines](#).

# google.com/webmasters

The screenshot shows the Google Search Console interface. At the top, there's a navigation bar with the Google logo, user profile (James), and various icons. Below it, the main header says "Search Console". On the left, a sidebar has links for "Home", "All Messages (122)", and "Other Resources". The main content area has a sorting section with buttons for "By property health", "Alphabetically", and a dropdown menu. A prominent red button on the right says "ADD A PROPERTY". Below this, a card for "Coffee Filter: Find Coffee Now" is shown, along with a "Recent messages" section. A large modal window is open in the center, titled "Add a property". It contains a text input field with the URL "android-app://com.refractore.monkeysapp" and two buttons: "Continue" (blue) and "Cancel". In the background, other property cards are visible, each with a "Manage property" dropdown.

Google

James

Help ▾

Search Console

ADD A PROPERTY

Home

All Messages (122)

Other Resources

Coffee Filter: Find Coffee Now Android App

Recent messages

Manage property ▾

Add a property

Enter the URL of a property you'd like to manage. Learn more.

android-app://com.refractore.monkeysapp

Continue Cancel

critical issues.

monkeysapp.com Website

Recent messages

Manage property ▾

 Monkeys App

Help



Search Console Preferences

Users and Property Owners

Verification Details

Associate a Website

## Associate a Website

Associating your app and a website creates a verified connection, so Google can better understand how your app relates to your website. Once such mapping exists, Google Search will surface your application pages in search results.

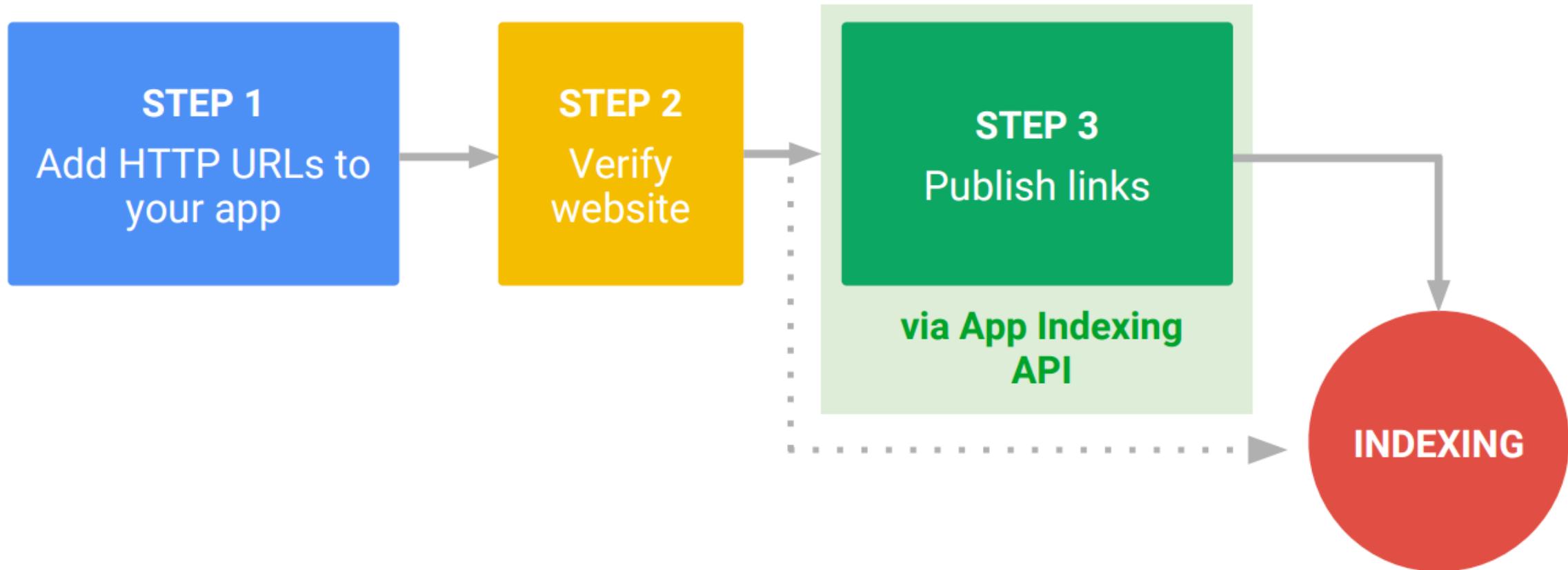
Associate my app with the site:

e.g. www.example.com

**ASSOCIATE**

### Associated Sites

<http://www.monkeysapp.com/>**Delete**<http://monkeysapp.com/>**Delete**



# Install App Indexing NuGet

Add Packages

nuget.org

Search: app indexing

 <b>Google APIs App Indexing iOS Library</b> C# bindings for Google APIs App Indexing iOS Library	131	<b>Xamarin Google Play Ser...</b> 27.0.0.0 Xamarin.Android Bindings for Google Play Services - AppIndexing  App Indexing helps you get your app found in Google Search. Once your app is indexed, mobile users who search for content related to your app can see an install button to your Android app in Search results. This helps you increase your install base.
 <b>Xamarin Google Play Services - App Indexing</b> Xamarin.Android Bindings for Google Play Services - AppIndexing	15,512	<b>Id</b> <a href="#">Xamarin.GooglePlayServices.AppIndexing</a>

# Create “Content Action”

```
GoogleApiClient client;
protected override void OnCreate(Android.OS.Bundle savedInstanceState)
{
    base.OnCreate(savedInstanceState);
    client = new GoogleApiClient.Builder(this).AddApi(AppIndex.API).Build();
}

public IndexingAction AppIndexAction
{
    get
    {
        var item = new Thing.Builder().SetName(title).SetDescription(description)
            .SetUrl(Android.Net.Uri.Parse(url)).SetType(schemaType).SetId(url).Build();

        var thing = new IndexingAction.Builder(IndexingAction.Typeview)
            .SetObject(item)
            .SetActionStatus(IndexingAction.StatusTypeCompleted)
            .Build();

        return thing.JavaCast<IndexingAction>();
    }
}
```

# Index the Content

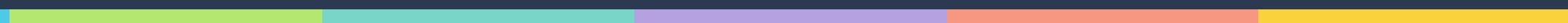
```
protected override async void OnStart()
{
    base.OnStart();
    client.Connect();
    await AppIndex.AppIndexApi.StartAsync(client, AppIndexAction);
}

protected override async void OnStop()
{
    base.OnStop();
    await AppIndex.AppIndexApi.EndAsync(client, AppIndexAction);
    client.Disconnect();
}
```

# Connecting Website

Android – DONE!

# Monkey Time!



# Connecting Website

**Android – DONE!**

**iOS – ALMOST!**

# Connecting Website – Step 1

▼ Associated Domains

Enable Associated Domains

Domains:

- (x) applinks:evolve.xamarin.com
- (x) applinks:www.evolve.xamarin.com
- (+) Add new entry

# Connecting Website – Step 2

iOS, tvOS, watchOS ▾

Certificates

- All
- Pending
- Development
- Production

Identifiers

App IDs

- Pass Type IDs
- Website Push IDs
- iCloud Containers
- App Groups
- Merchant IDs

## iOS App ID Settings

Setup and configure services for this App ID.

ID: com.xamarin.evolve

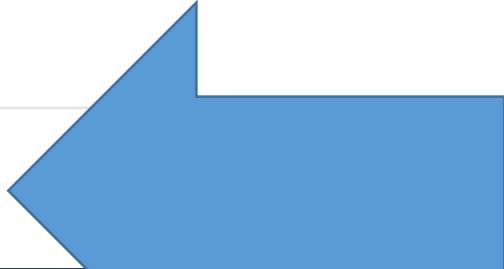
Name: Evolve Conference App

Enable Service

App Groups  
Disabled

Associated Domains  
Enabled

Edit



# Connecting Website – Step 3

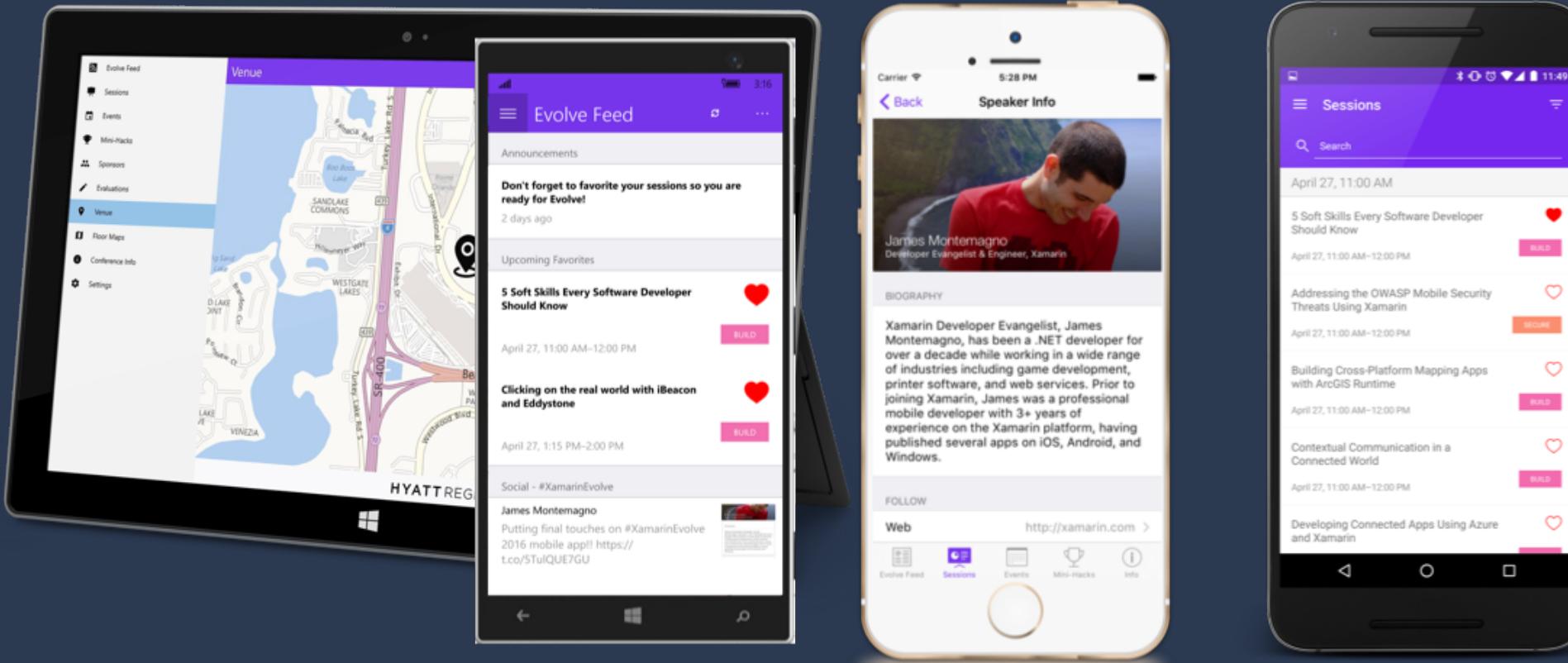
apple-app-site-association in web root

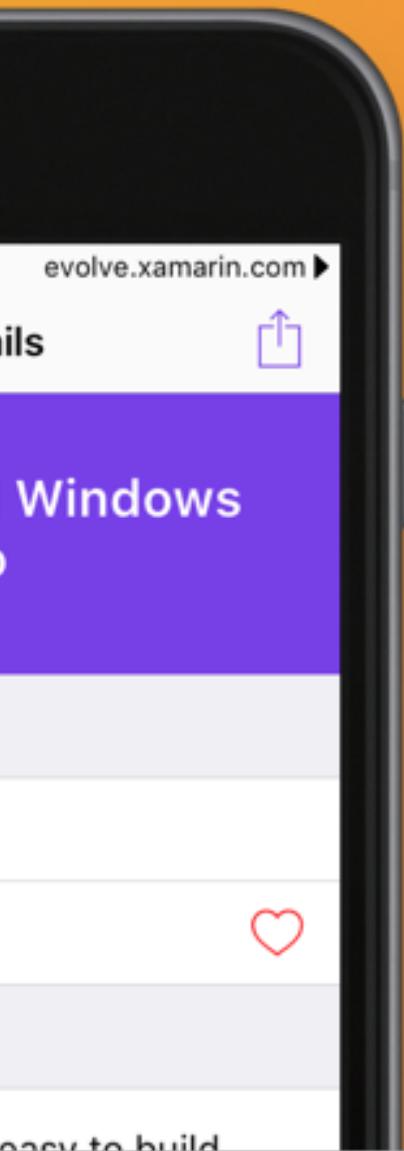
```
{  
    "applinks": {  
        "apps": [],  
        "details": [  
            {  
                "appID": "7V723M9SQ5.com.xamarin.evolve",  
                "paths": [ "/session/*" ]  
            }  
        ]  
    }  
}
```

Must be application/pkcs7-mime

# Done! Yay!

# What about Xamarin.Forms?





```
// in App.xaml.cs
override void OnAppLinkRequestReceived(Uri uri)
{
    ...
}
```

# App Links – Step 0 – Android NuGet

The screenshot shows the NuGet package page for `Xamarin.Forms.AppLinks`. The top navigation bar includes the NuGet logo, a search bar with placeholder text "Search Packages", and a "Register / Sign in" button. Below the navigation bar is a dark menu bar with links: Home, Packages (which is highlighted), Upload Package, Statistics, Documentation, Downloads, and Blog.

On the left side, there's a sidebar with the following statistics:

- A blue hexagonal icon with a white 'X' containing the number 32, labeled "Downloads".
- A blue hexagonal icon with a white '0' containing the number 0, labeled "Downloads of v 2.3.0.38-pre2".
- A blue hexagonal icon with a white '32' containing the number 32, labeled "Average downloads per day".
- The date "2016-04-27" followed by "Last published".

The main content area features a yellow callout box with the text "This is a prerelease version of `Xamarin.Forms.AppLinks`". The package name `Xamarin.Forms.AppLinks` is displayed in large bold text, followed by the version `2.3.0.38-pre2`. A brief description below the title states: "Add support for deep linking and indexing app content using Xamarin.Forms on the Android Platform". Instructions for installation are provided: "To install `Xamarin.Forms.AppLinks`, run the following command in the [Package Manager Console](#)". A black callout box at the bottom contains the command: `PM> Install-Package Xamarin.Forms.AppLinks -Pre`.

# App Links



## Part 1 – Android MainActivity

```
[IntentFilter(new []{ Intent.ActionView },
    Categories = new []
{
    Android.Content.Intent.CategoryDefault,
    Android.Content.Intent.CategoryBrowsable
},
DataScheme = "https",
DataHost = "evolve.xamarin.com")]
public class MainActivity : FormsAppCompatActivity
{
    protected override void OnCreate (Bundle savedInstanceState)
    {
        FormsAppCompatActivity.ToolbarResource = Resource.Layout.toolbar;
        FormsAppCompatActivity.TabLayoutResource = Resource.Layout.tabs;

        base.OnCreate(savedInstanceState);

        Forms.Init(this, savedInstanceState);
        FormsMaps.Init(this, savedInstanceState);

        AndroidAppLinks.Init(this);
    }
}
```

# App Links – Step 2 - Index



```
var url = $"http://evolve.xamarin.com/session/{session.Id}";  
  
var link = new AppLinkEntry  
{  
    Title = session.Title,  
    Description = session.Abstract,  
    AppLinkUri = new Uri(url, UriKind.RelativeOrAbsolute),  
    IsLinkActive = true,  
    Thumbnail = ImageSource.FromFile("Icon.png")  
};  
  
Application.Current.AppLinks.RegisterLink(link);
```



# App Links – Step 3 – Respond (App.cs)

```
protected override void OnAppLinkRequestReceived(Uri uri)
{
    var data = uri.ToString().ToLowerInvariant();
    //only if deep linking
    if (!data.Contains("/session/"))
        return;

    var id = data.Substring(data.LastIndexOf("/", StringComparison.Ordinal) + 1);
    //Navigate here

    base.OnAppLinkRequestReceived(uri);
}
```

# BOOM DONE!

# One More Thing

# Resources

- Monkeys App:
  - <https://github.com/jamesmontemagno/MonkeysApp-AppIndexing>
- Evolve App
  - <https://github.com/xamarinhq/app-evolve>
- iOS Search APIs
  - [https://developer.xamarin.com/guides/ios/platform\\_features/introduction\\_to\\_ios9/search/](https://developer.xamarin.com/guides/ios/platform_features/introduction_to_ios9/search/)

# Thank you!



James  
Montemagno  
Developer Evangelist, Xamarin

---

james@xamarin.com

motzcod.es

@JamesMontemagno