

Playing With Fire(base)

Eric Fung

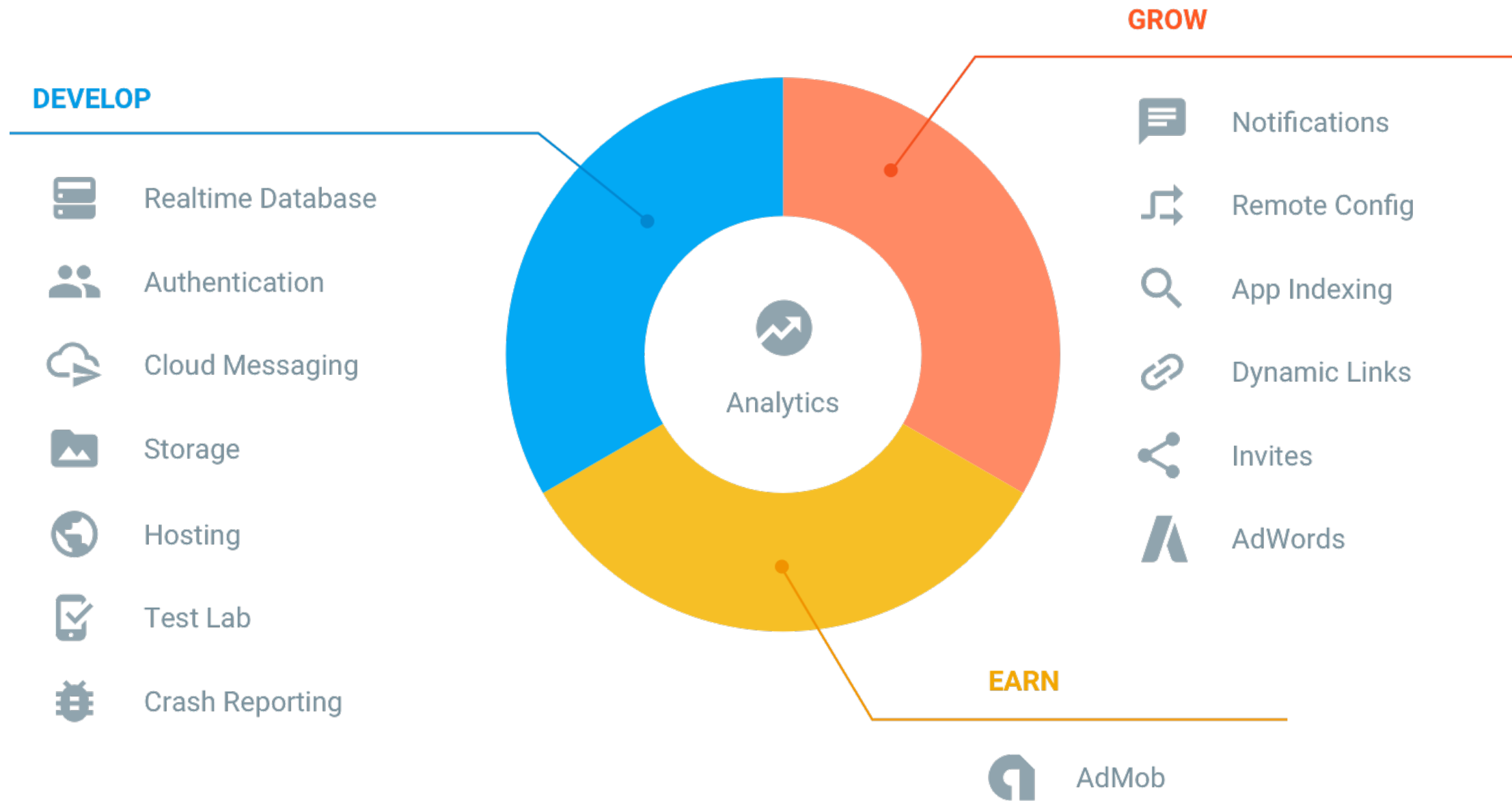




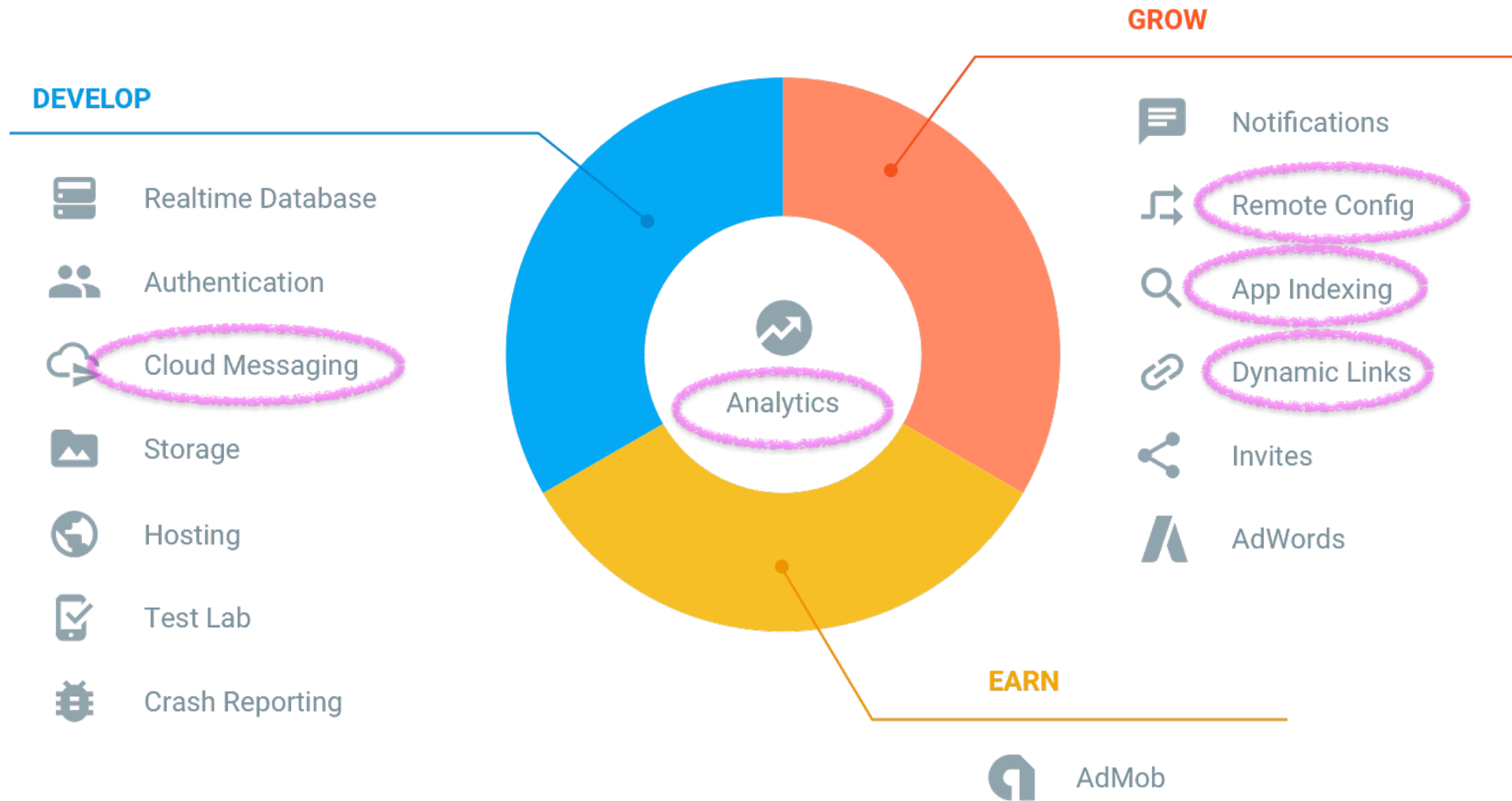
ENTREPRENEUR'S DIGEST

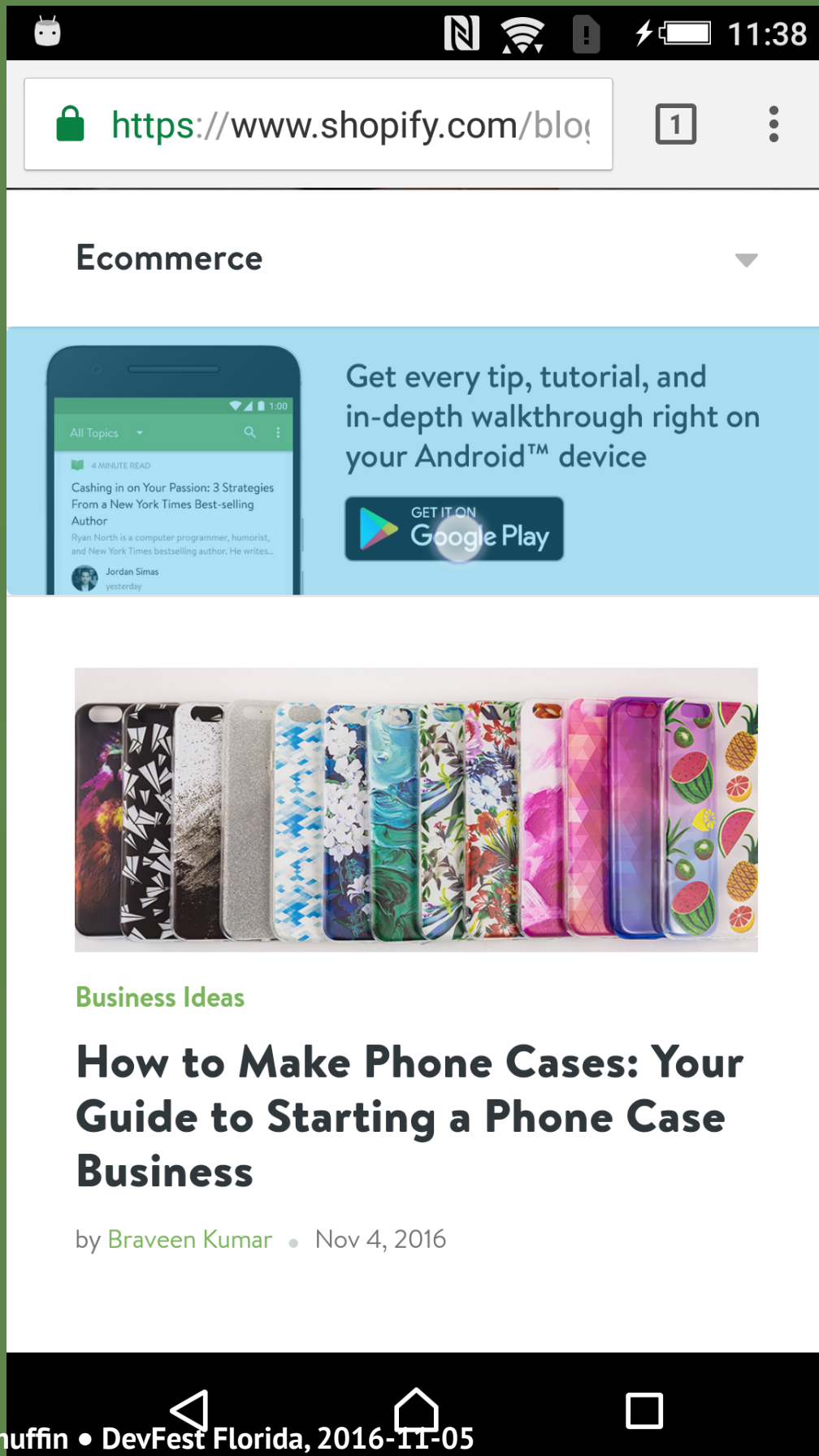
POWERED BY  **shopify**

Let's Try Firebase!



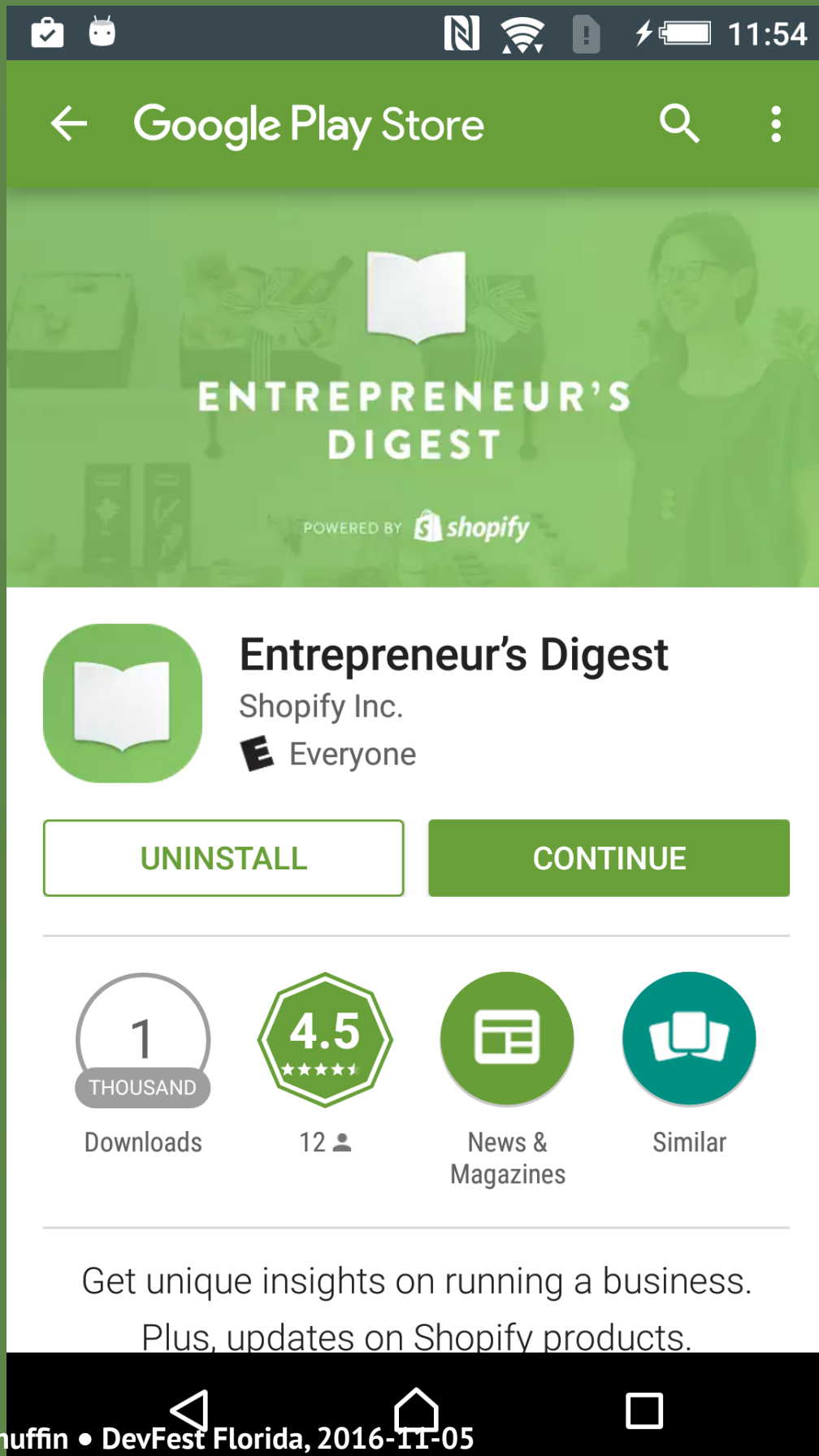
Let's Try Firebase!





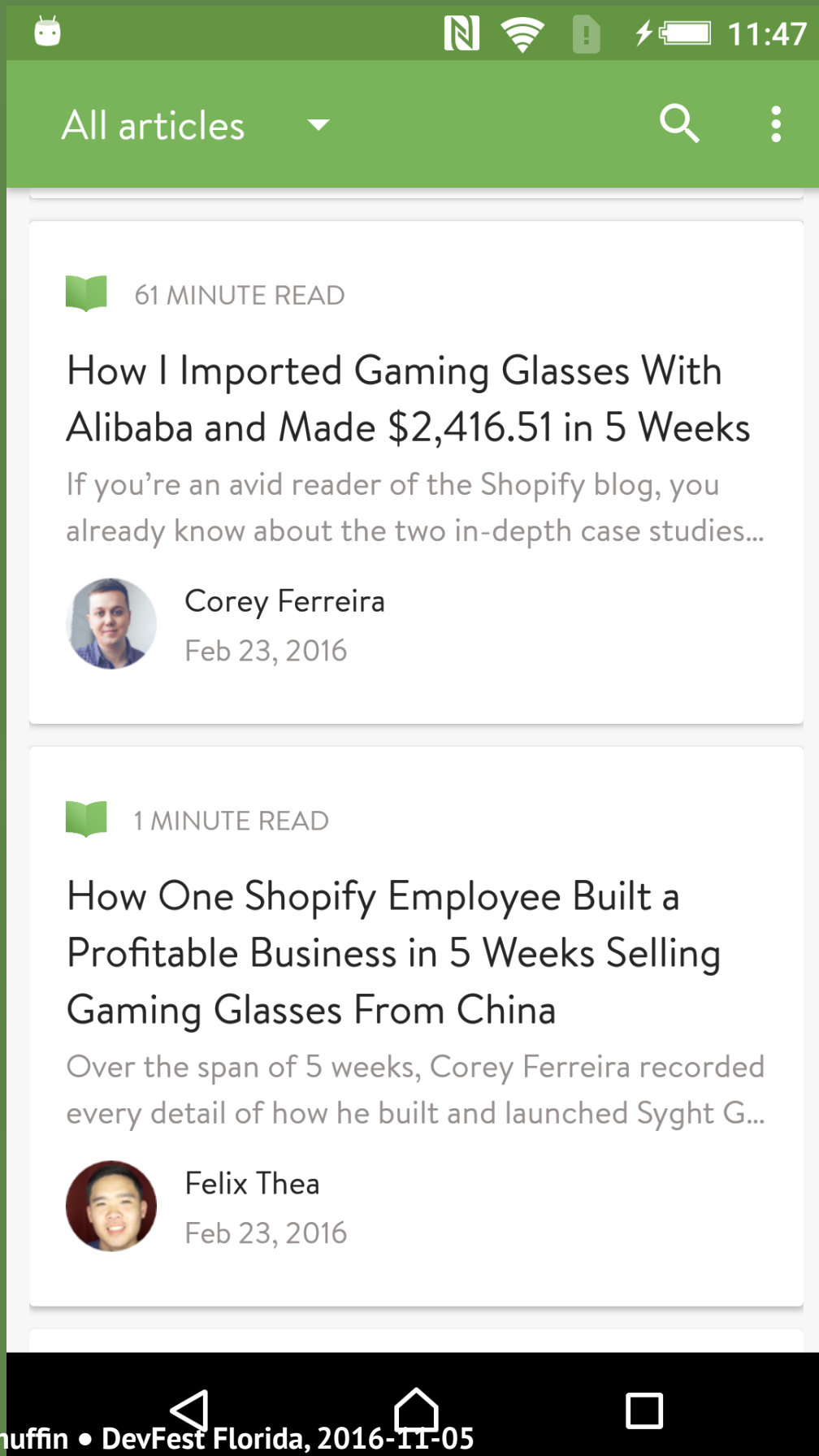
Feature Tour

Click website banner to install app



Feature Tour

Click website banner to install app



Feature Tour

Browse article summaries,
tap to read

Case Studies

How I Imported Gaming Glasses With Alibaba and Made \$2,416.51 in 5 Weeks

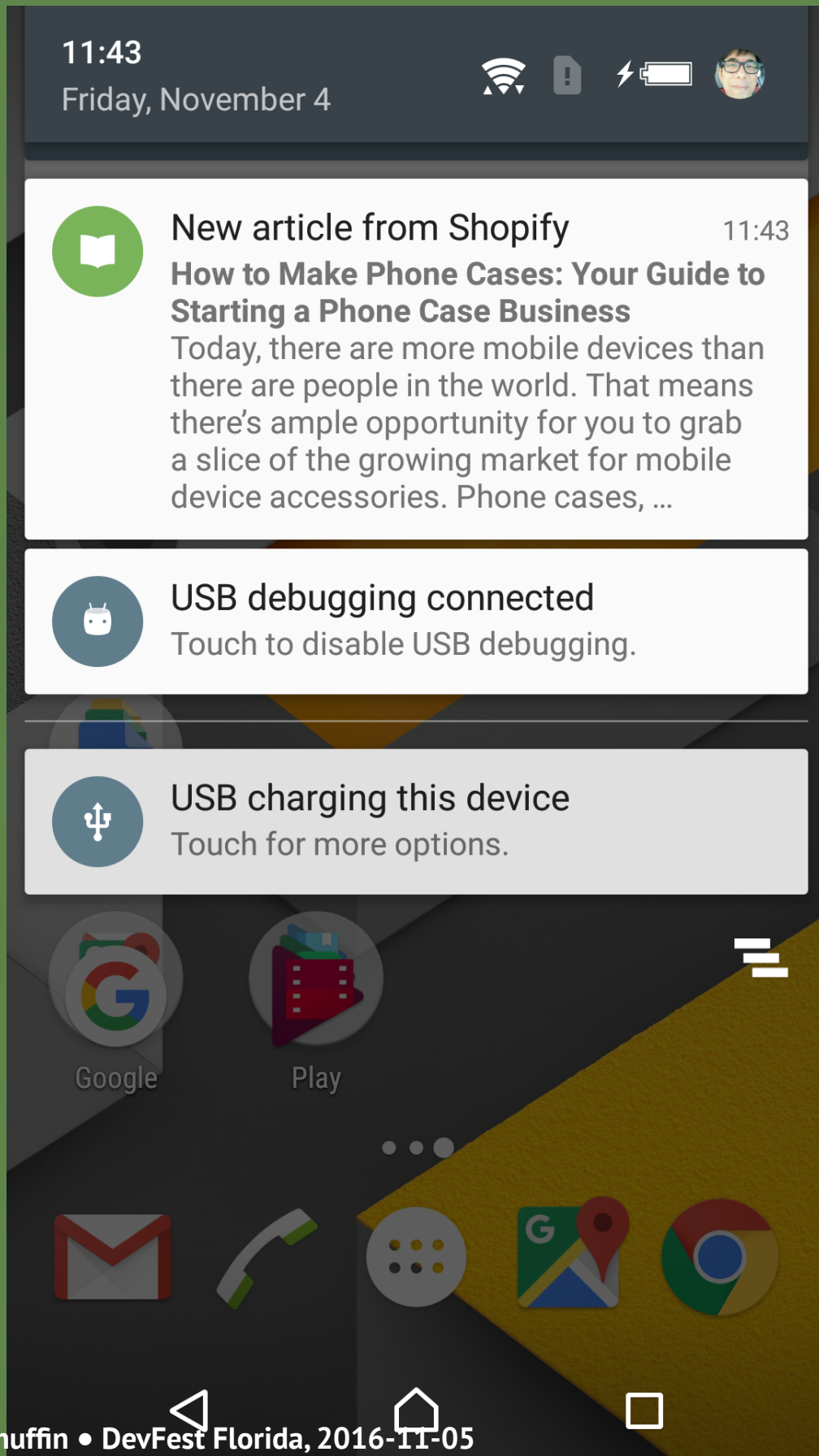
By Corey Ferreira • 47 minute read



We
this
econ
and
.

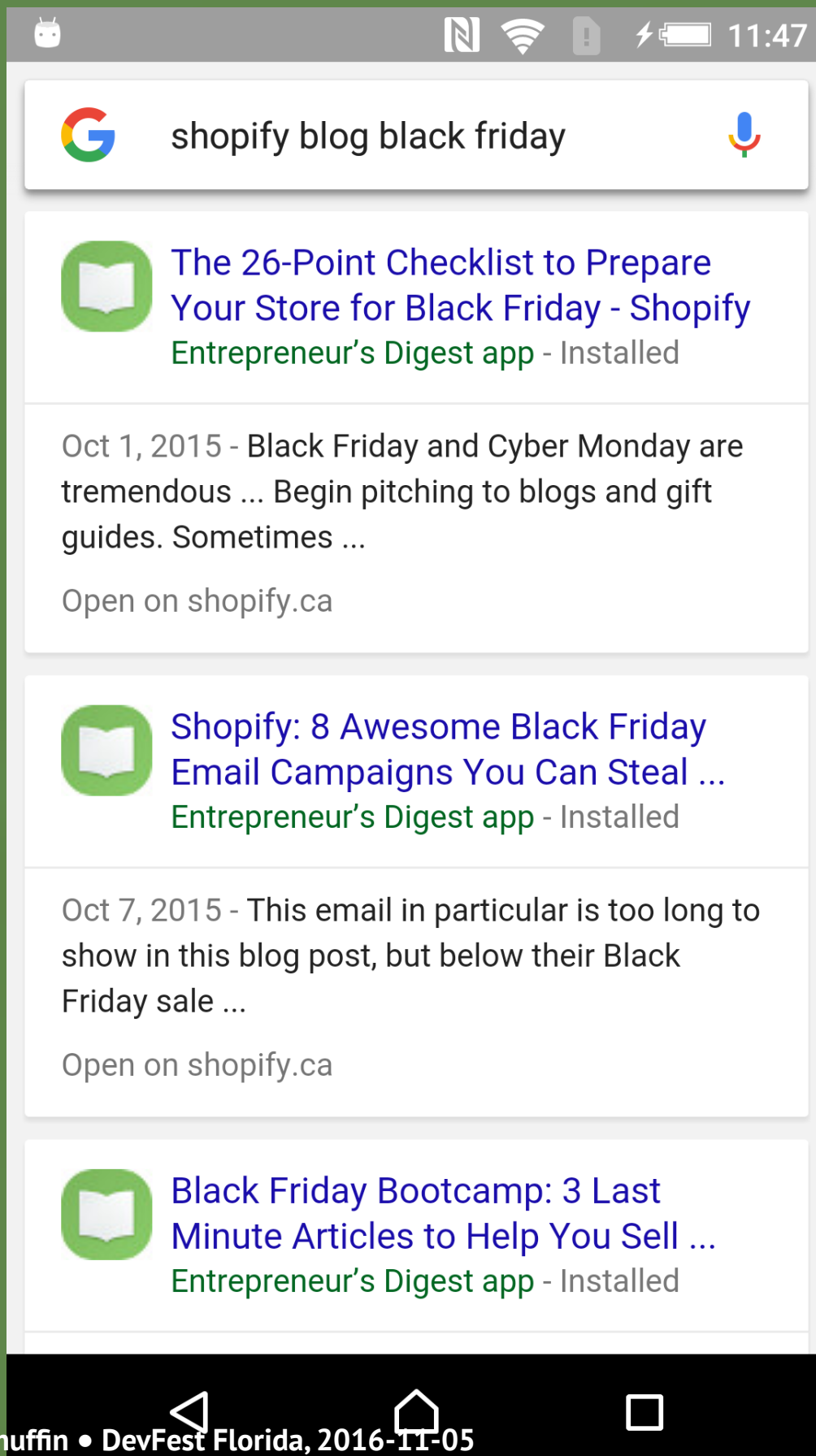
Feature Tour

Browse article summaries,
tap to read



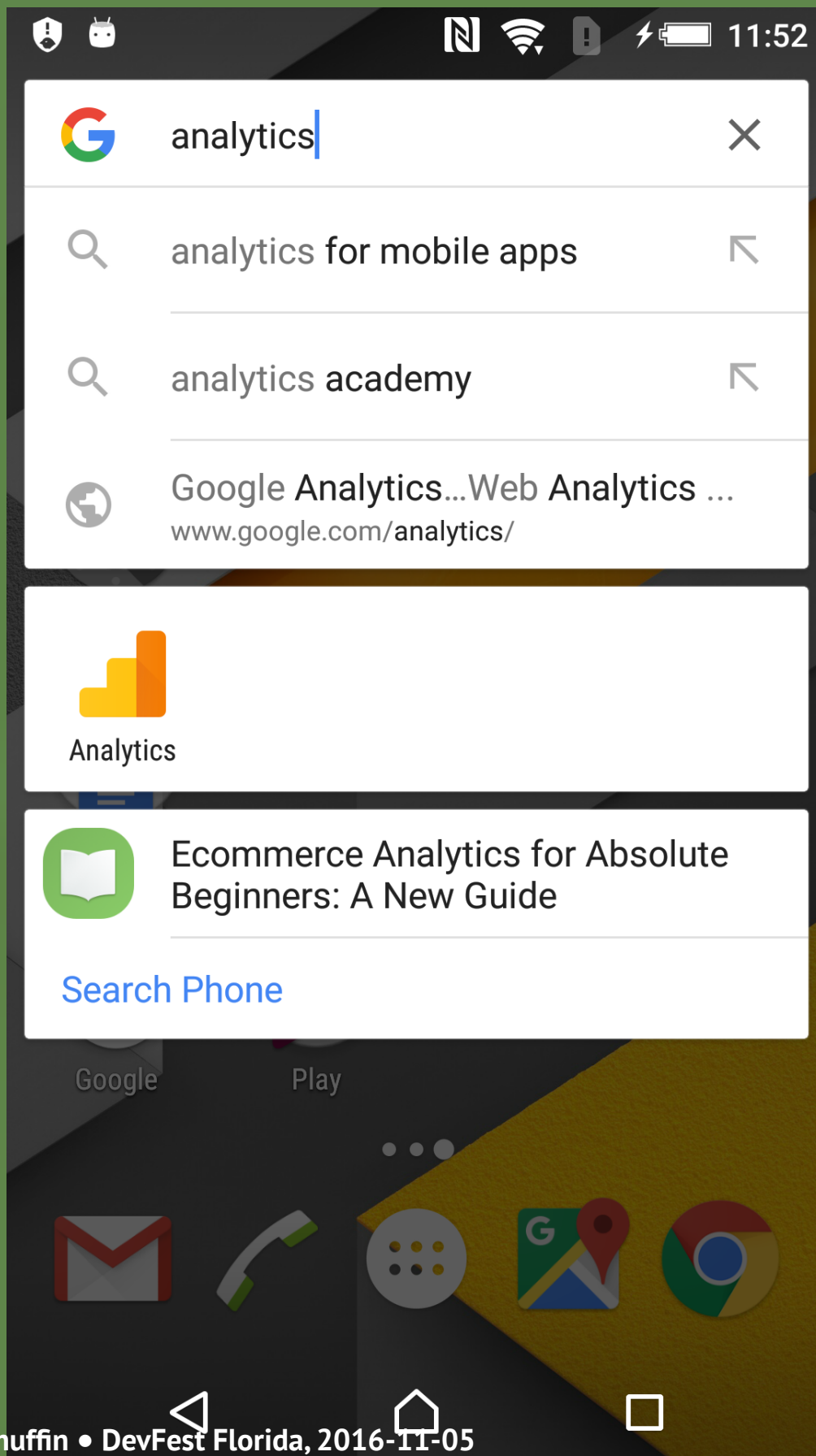
Feature Tour

Receive notification for new articles



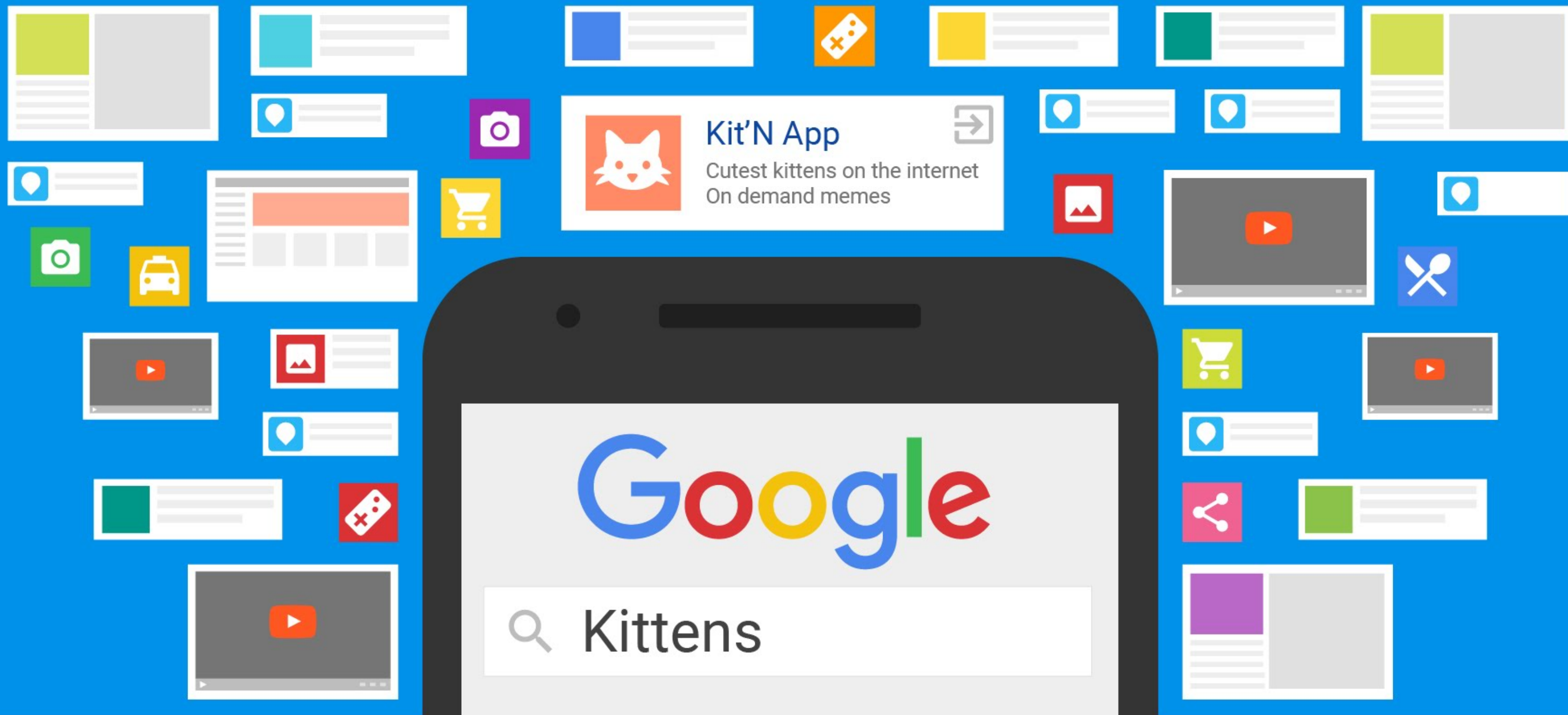
Feature Tour

Search results highlight app content, and link to app



Feature Tour

Previously viewed articles are suggested in search results

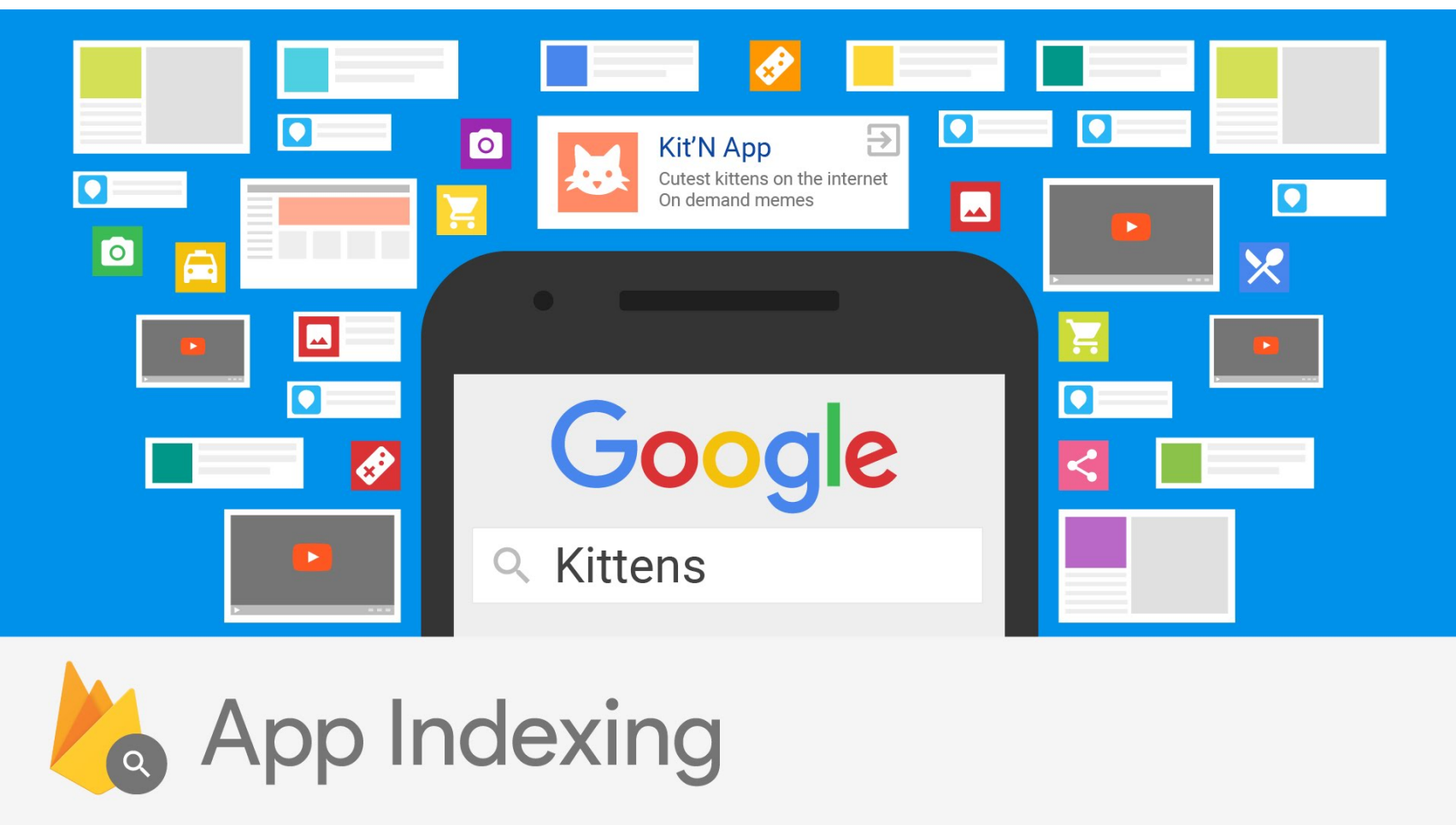


App Indexing

@gnufmuffin • DevFest Florida, 2016-11-05

What is it?

Gets app into Google search results, and associates it with your website



What does it give you?

- **Install cards for users who don't have app**



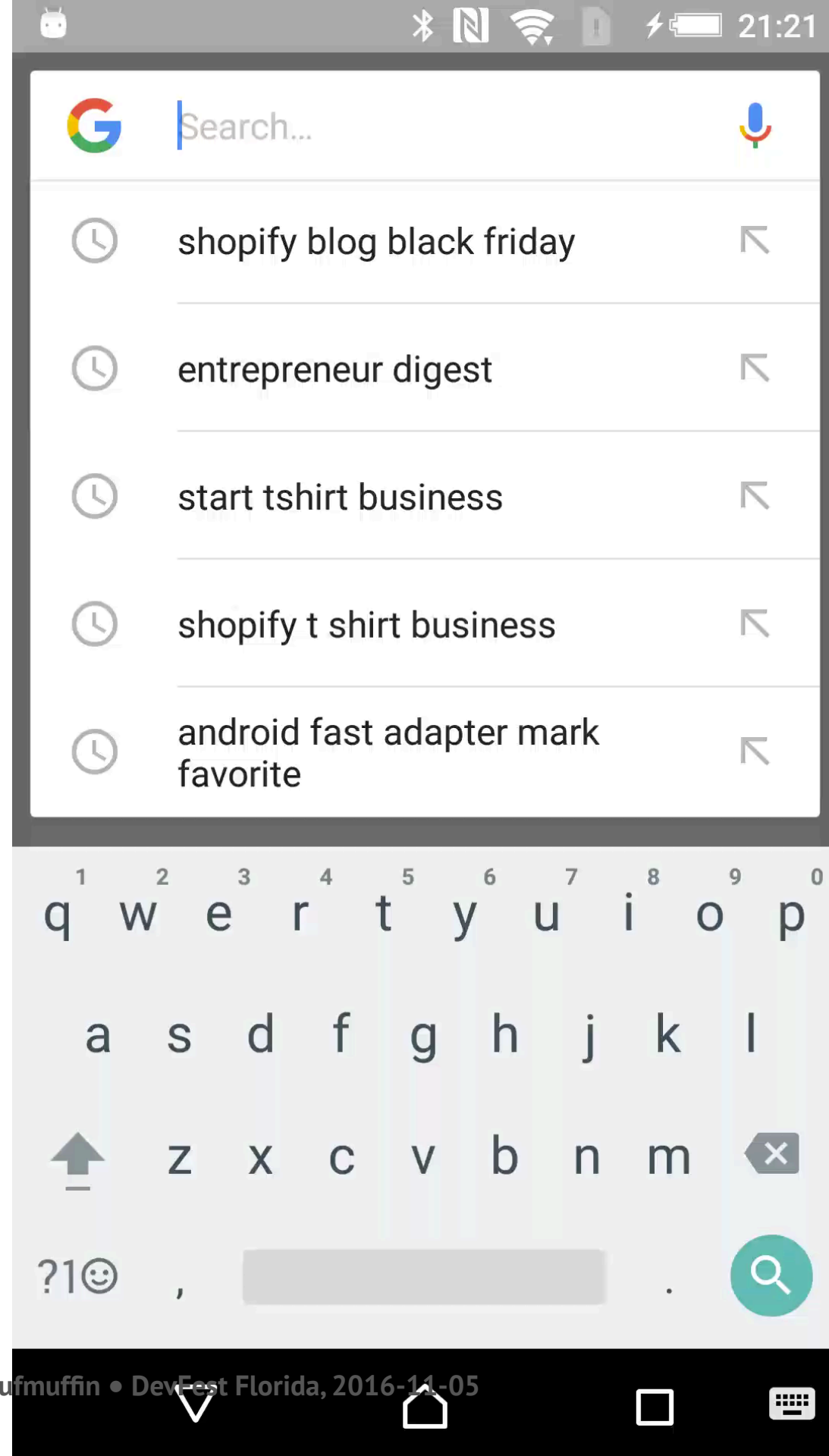
Entrepreneur's Digest

Google Play: 4.5 ★★★★★ (12)

Get actionable and in-depth content about entrepreneurship, commerce, marketing and running a business, and more.

Free

INSTALL

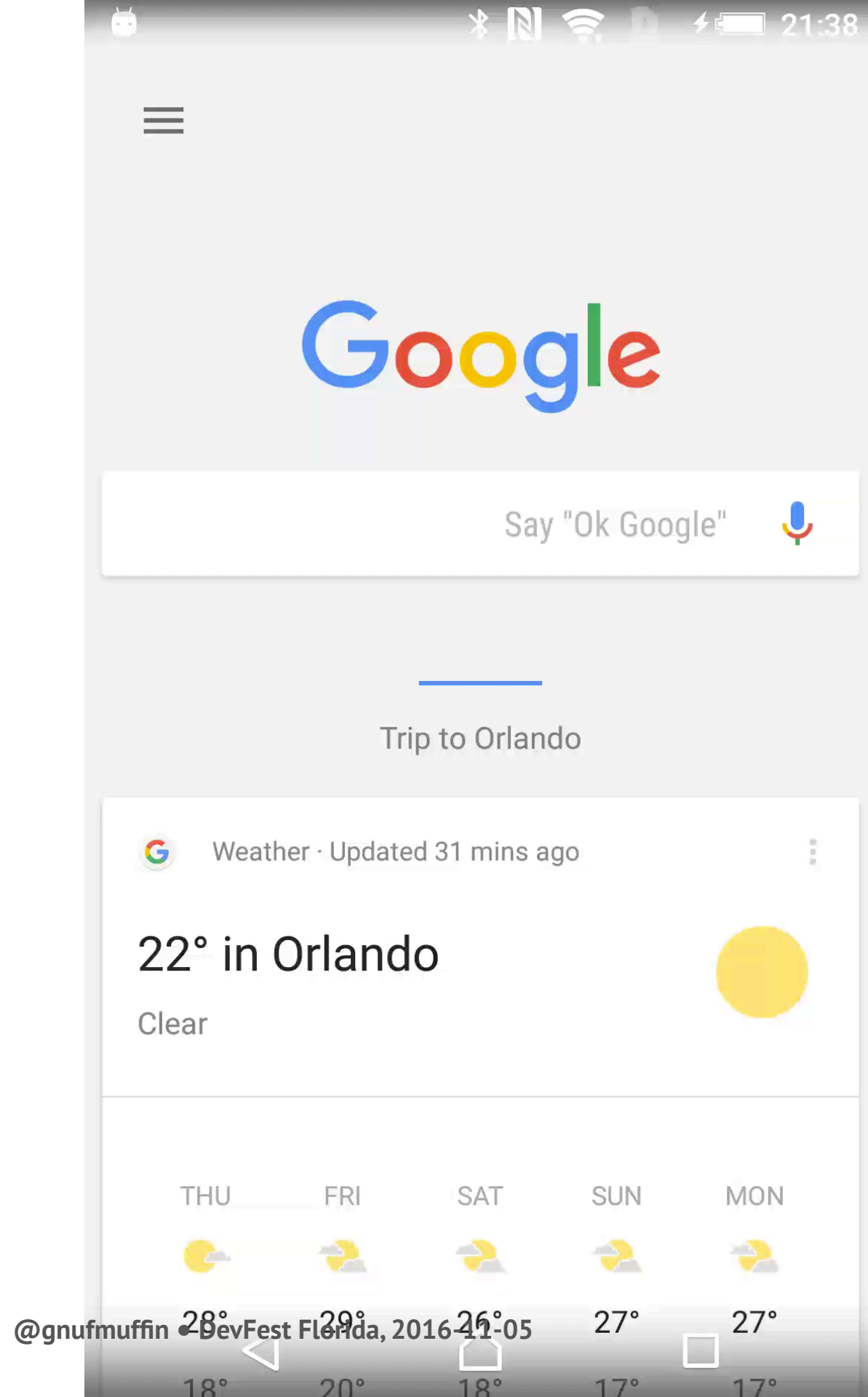


What does it give you?

- Install cards for users who don't have app
- **Deep links launch app from search results**

What does it give you?

- Install cards for users who don't have app
- Deep links launch app from search results
- **Viewed content appears in search autocompletion**



App Indexing: How To Implement

1. Identify website URL structure

`http://www.shopify.com/blog/really-informative-article`
`http://www.shopify.ca/blog/topics/`
`http://www.shopify.in/blog/topics/informative`

App Indexing: How To Implement

1. Identify website URL structure

`http://www.shopify.com/blog/<title-slug-of-article>`

`http://www.shopify.ca/blog/topics/`

`http://www.shopify.in/blog/topics/<subject>`

🔥 Watch out for shared prefix in paths!

App Indexing: How To Implement

2. Associate website with app

On Android 6.0+, create a Digital Asset Link

— Upload to `/.well-known/assetlinks.json`

App Indexing: How To Implement

2. Associate website with app

Example `assetlinks.json`

```
[
  {
    "relation": [
      "delegate_permission/common.handle_all_urls"
    ],
    "target": {
      "namespace": "android_app",
      "package_name": "com.shopify.blog",
      "sha256_cert_fingerprints": [
        "00:01:02:03..."
      ]
    }
  }
]
```


App Indexing: How To Implement

2. Associate website with app

On Android < 6.0, associate in Search Console

- Add Android app as a new property
- Link webpages to app by adding markup on page
- Get Google to crawl your site

App Indexing: How To Implement

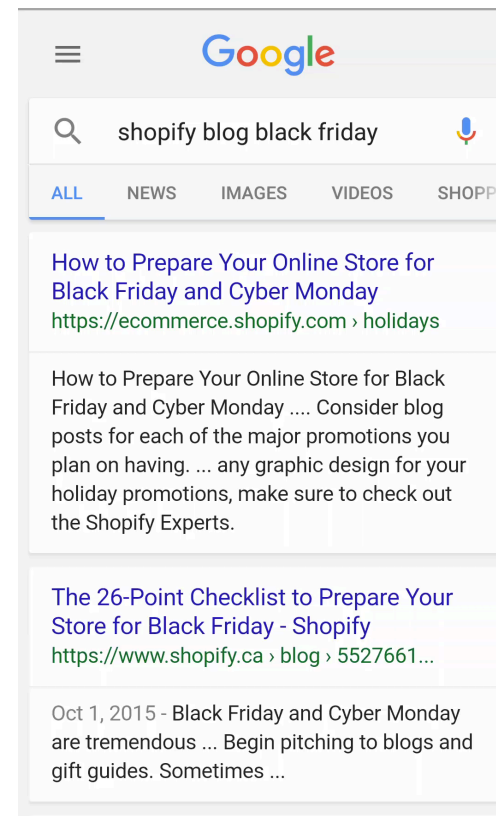
2. Associate website with app

Example markup for
`/blog/really-informative-article`

```
<link rel="alternate"  
      href="android-app://com.shopify.blog/https/↵  
          www.shopify.com/blog/really-informative-article" />
```

App Indexing: How To Implement

2. Associate website with app



🔥 Without linkage, user sees chooser

App Indexing: How To Implement

3. Add intent filters to Android manifest

```
<intent-filter>
```

```
...
```

```
<data android:scheme="https" ↵  
      android:host="www.example.com" ↵  
      android:path="/recipes">
```

```
...
```

- For each Activity, define one or more handled inbound URLs

App Indexing: How To Implement

3. Add intent filters to Android manifest

```
<intent-filter>
```

```
...
```

```
<data android:scheme="http" />
```

```
<data android:scheme="https" />
```

```
<data android:pathPrefix="/blog" />
```

```
<data android:host="www.shopify.com" />
```

```
<data android:host="www.shopify.ca" />
```

```
<data android:host="www.shopify.in" />
```

```
...
```



All data elements contribute to filter

App Indexing: How To Implement

3. Add intent filters to Android manifest

`http://www.shopify.com/blog/<title-slug-of-article>`
`http://www.shopify.com/blog/topics/<subject>`

— What if I want different activities to handle URLs with same prefix?

App Indexing: How To Implement

3. Add intent filters to Android manifest

```
@Override
protected void onCreate(Bundle savedInstanceState) {
    Uri uri = getIntent().getData();
    String uriPath = uri.getPath();
    if (uriPath.startsWith("/blog/topics")) {
        // launch Activity for handling topics
    } else {
        // launch Activity for handling articles
    }
}
```



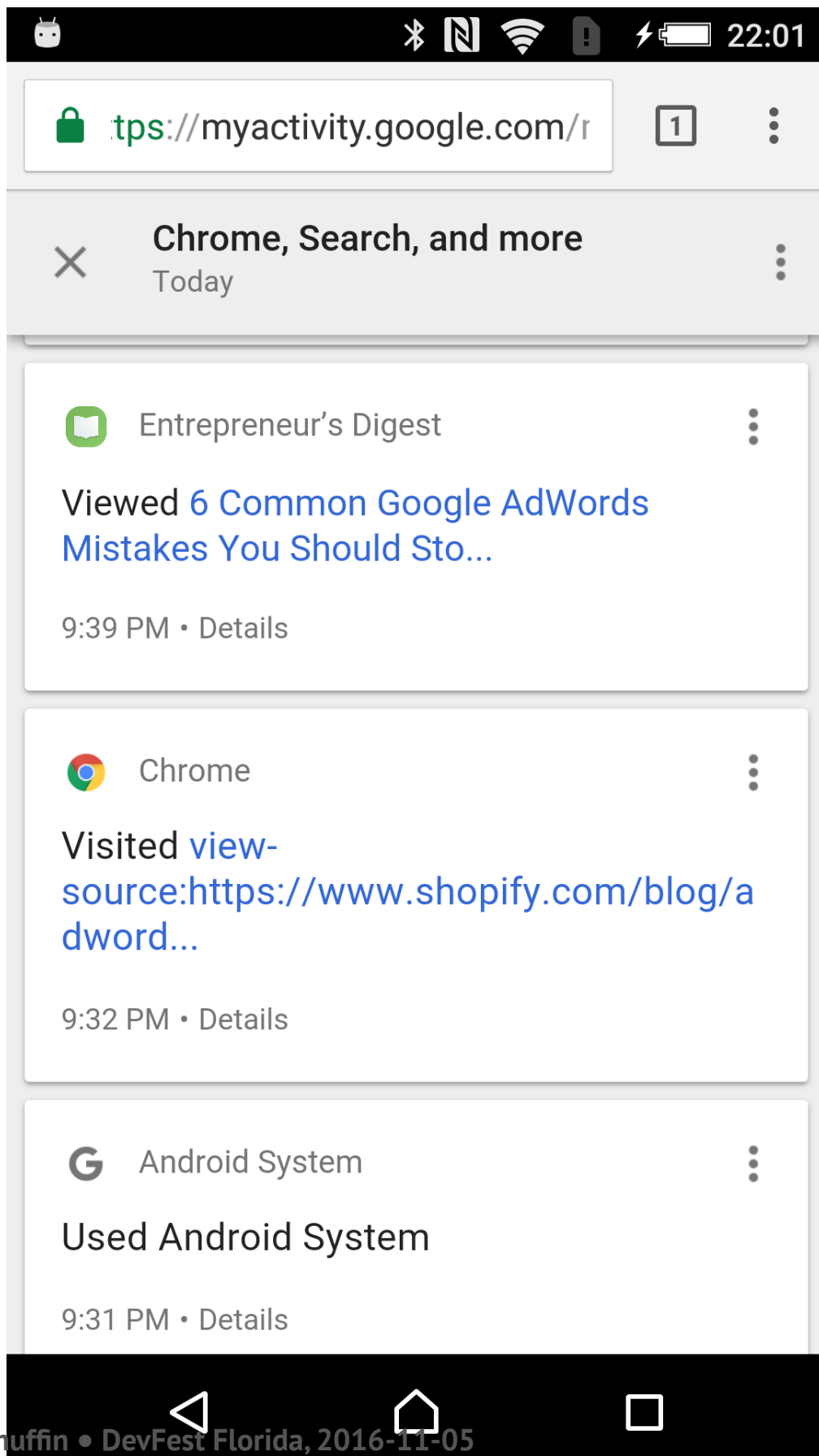
Use a router Activity

App Indexing: How To Implement

4. Index user action

To get user action indexed (for search autocomplete):

- Include App Indexing library dependency
- Create Thing for Action
- Call `AppIndex.AppIndexApi.start()` and `stop()`



App Indexing: How To Implement

4. *Index user action*

Action also appears in
<https://history.google.com/>



Dynamic Links

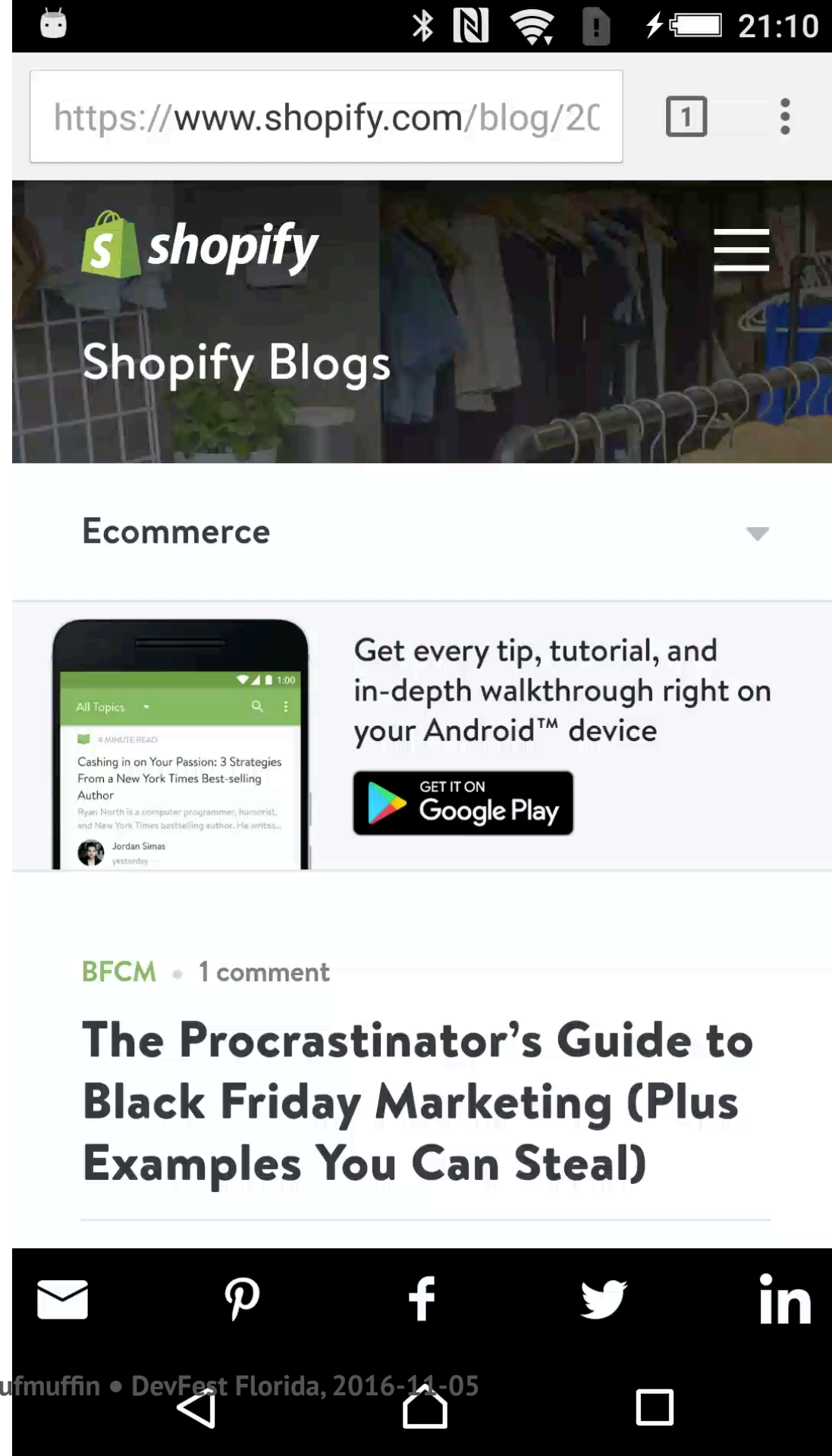
@gnufmurfen • DevFest Florida, 2016-11-05

What is it?

Cross-platform deep linking that survives app installs, and drives app installation from mobile web users



Dynamic Links



What does it give you?

- Deep link into app, triggers upgrade or install if necessary

What does it give you?

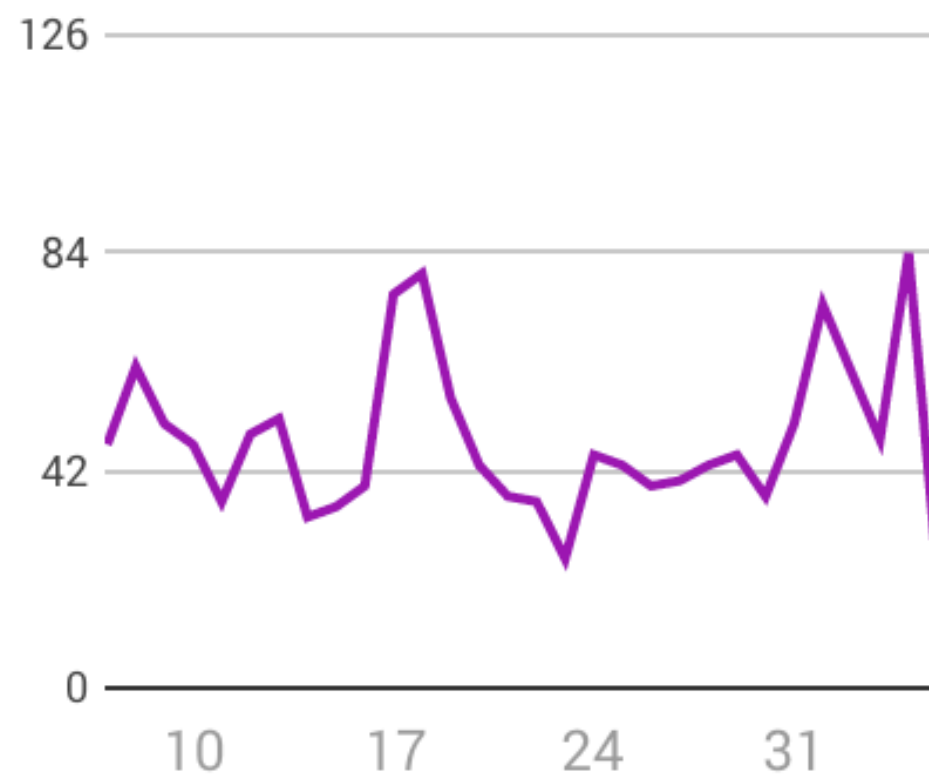
- Deep link into app, triggers upgrade or install if necessary
- **Short links**

Short Dynamic Link

<https://c9skp.app.goo.gl/jTpt>

What does it give you?

- Deep link into app, triggers upgrade or install if necessary
- Short links
- **Analytics**



Clicks

1437

https://c9skp.app.goo.gl/ ?

☒ Generate Dynamic Link ☐ Shorten an existing Dynamic Link ?

Link name (required) ?

My Search Ad for widgets

Link URL (required) ?

https://www.example.com/product/widgets

Android app

Select Android app ▼

Advanced options ▼

To add custom parameters to Dynamic Links,
you can create links manually. [Learn more](#)



CREATE LINK

Dynamic Links: How To Implement

1. Create the links

- Enter basic details in console
- Creates a short link

Dynamic Links: How To Implement

1. Create the links

- Can also construct long links programmatically

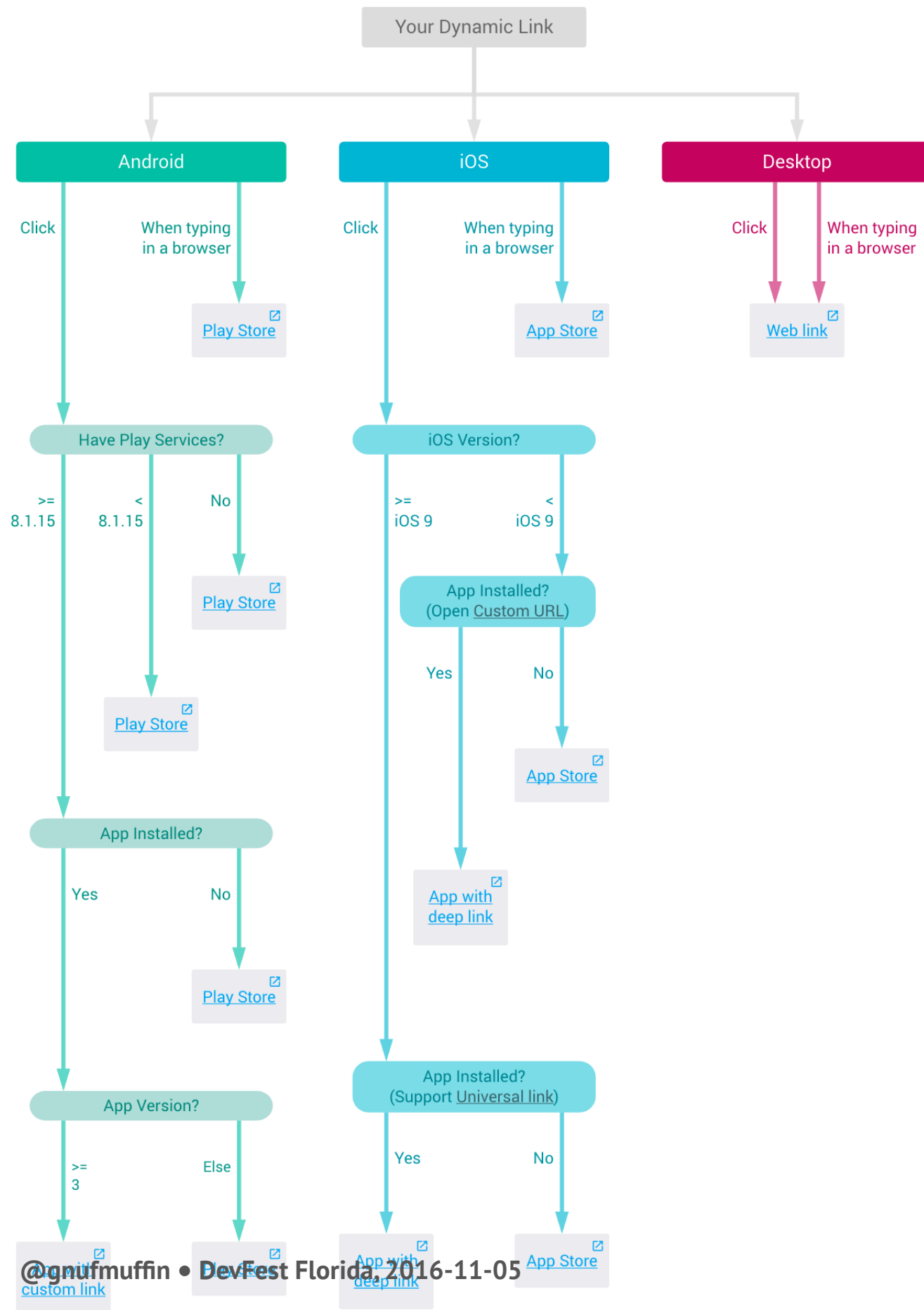
```
https://domain?link=your_deep_link&apn=package_name[&amv=minimum_version][&a
```

-  No analytics
- Can create short links programmatically via REST API
 - From existing long links or from parameters

Dynamic Links: How To Implement

1. Create the links

- Pass **d=1** when creating long link programmatically



Dynamic Links: How To Implement

1. Create the links

🔥 Cannot delete Dynamic Links at the moment

Dynamic Links: How To Implement

2. Receive links in app

- Include Dynamic Link library dependency
 - 🔥 Called `firebase-invites`
- In every activity that could be launched, call `AppInvite.AppInviteApi.getInvitation()`
 - MAIN launch activity (if app was just installed)
 - Any activities with intent filter matching link

Dynamic Links: How To Implement

2. Receive links in app

- Analytics events automatically generated

dynamic_link_first_open

dynamic_link_app_open

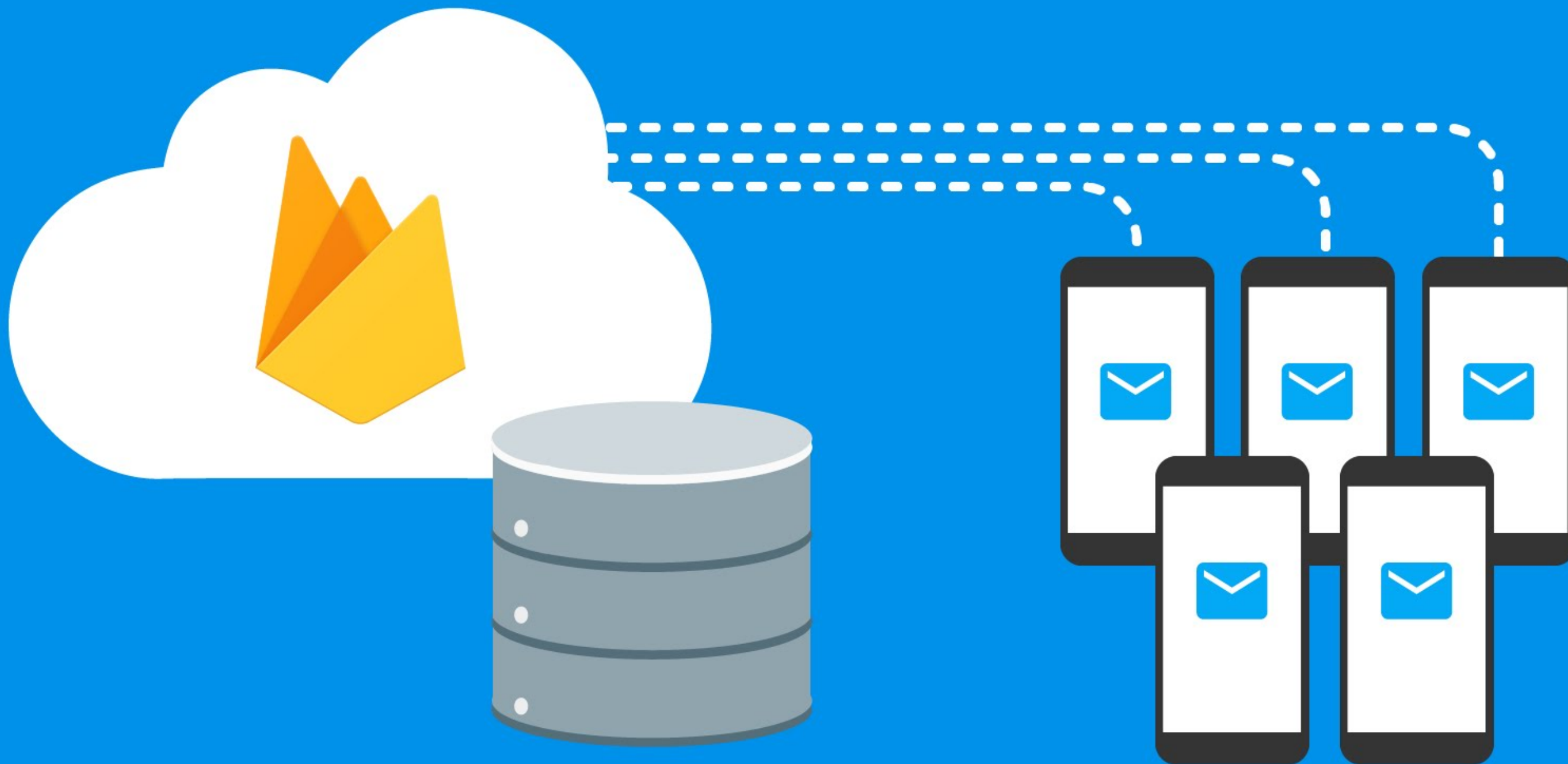
dynamic_link_app_update

Dynamic Links: How To Implement

2. Receive links in app

You *must* consume the invitation

— 🔥 If you don't, no analytic events will be generated



Cloud Messaging

@gnufmuffin • DevFest Florida, 2016-11-05

What is it?

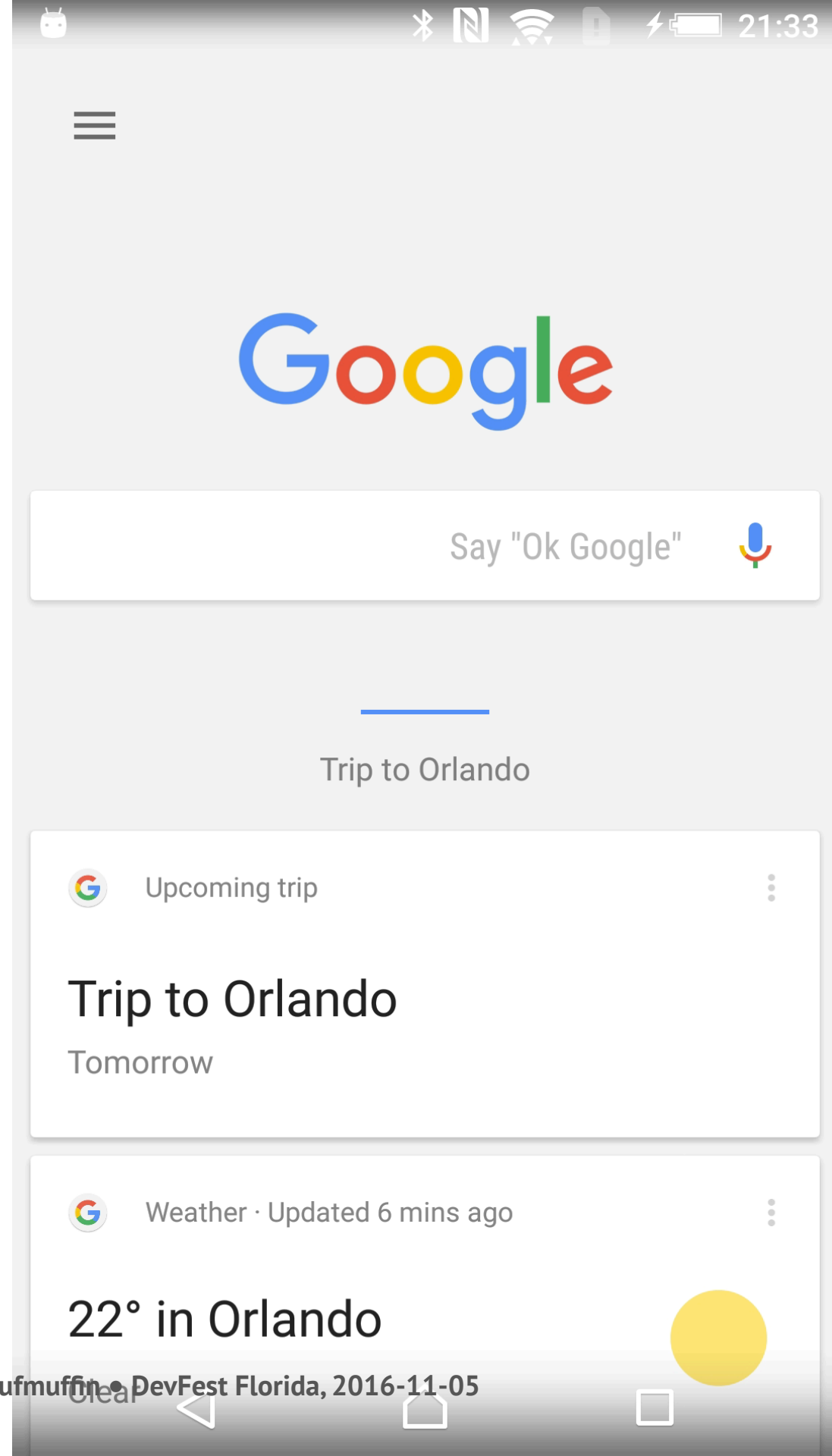
Cross-platform messaging service for reliable delivery of messages



What does it give you?

- **Fast, free, and reliable message delivery**



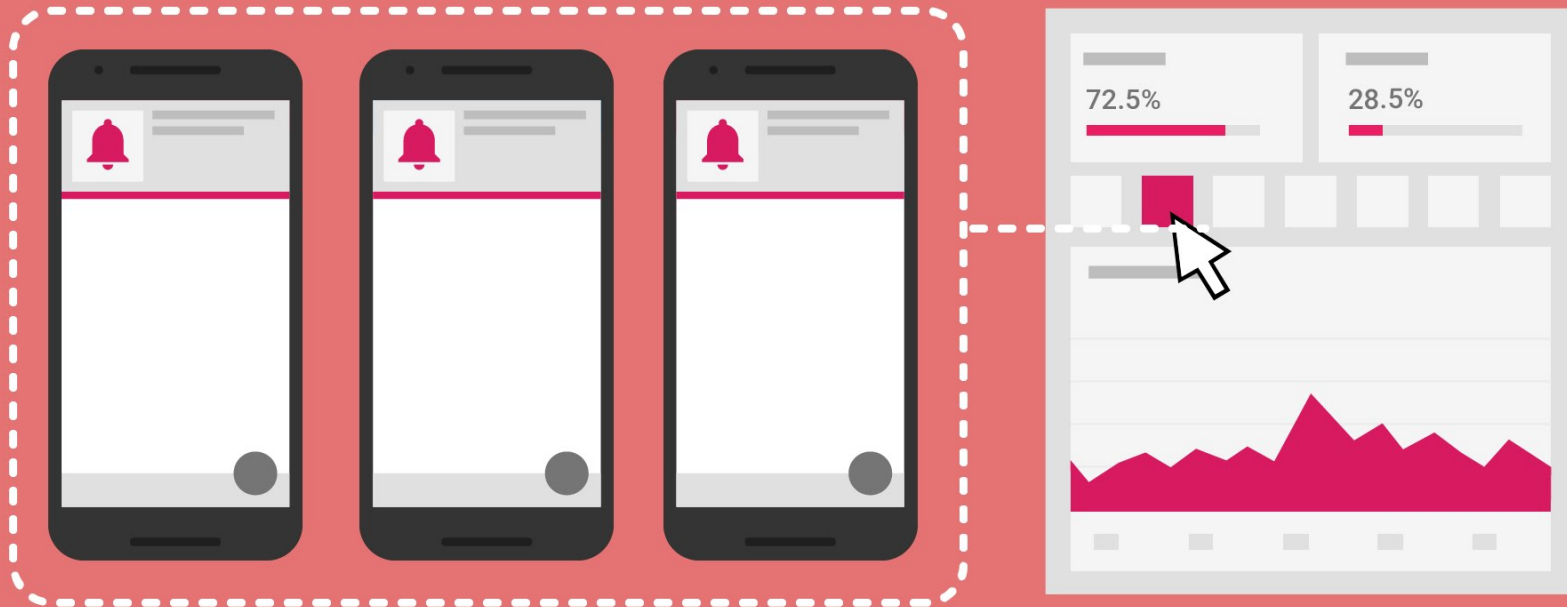


What does it give you?

- Fast, free, and reliable message delivery
- **Display notifications**

Comparison with Notifications

- Graphical console for re-engagement
- No coding required
- Built-in analytics



 Notifications

Which one?

- Notifications
 - Basic messages meant to be displayed
 - Open rate analytics

Which one?

- Notifications
 - Basic messages meant to be displayed
 - Open rate analytics
- Cloud Messaging
 - Everything else

Cloud Messaging: How To Implement

1. Add messaging service to app

- Include Cloud Messaging library dependency
- Declare messaging service

Cloud Messaging: How To Implement

1. Add messaging service to app

```
<service
    android:name=".notifications.MyFirebaseMessagingService"
    android:exported="false">
    <intent-filter>
        <action android:name="com.google.firebase.MESSAGING_EVENT" />
    </intent-filter>
</service>
```

Cloud Messaging: How To Implement

1. Add messaging service to app

MyFirebaseMessagingService.java

```
@Override
public void onMessageReceived(RemoteMessage remoteMessage) {
    Map<String, String> data = remoteMessage.getData();

    // React to message, e.g. create a Notification, or
    // schedule sync with server
}
```

Cloud Messaging: How To Implement

2. Subscribe to topics

- Some uses cases don't require dealing with registration IDs
-  Publish/subscribe model

```
firebase.subscribeToTopic("all_new_articles");
```

Cloud Messaging: How To Implement

3. Send message

- Send message to FCM connection server
 - From your application server
 - Manually (e.g. cURL)

Cloud Messaging: How To Implement

3. Send message

Example payload:

```
{  
  "data": {  
    "article_id": "123400",  
    "notif_type": "new_article"  
  },  
  "to" : "/topics/all_new_articles",  
  "restricted_package_name": "com.example"  
}
```

Cloud Messaging: How To Implement

3. Send message

Example cURL invocation:

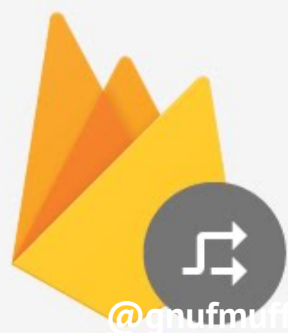
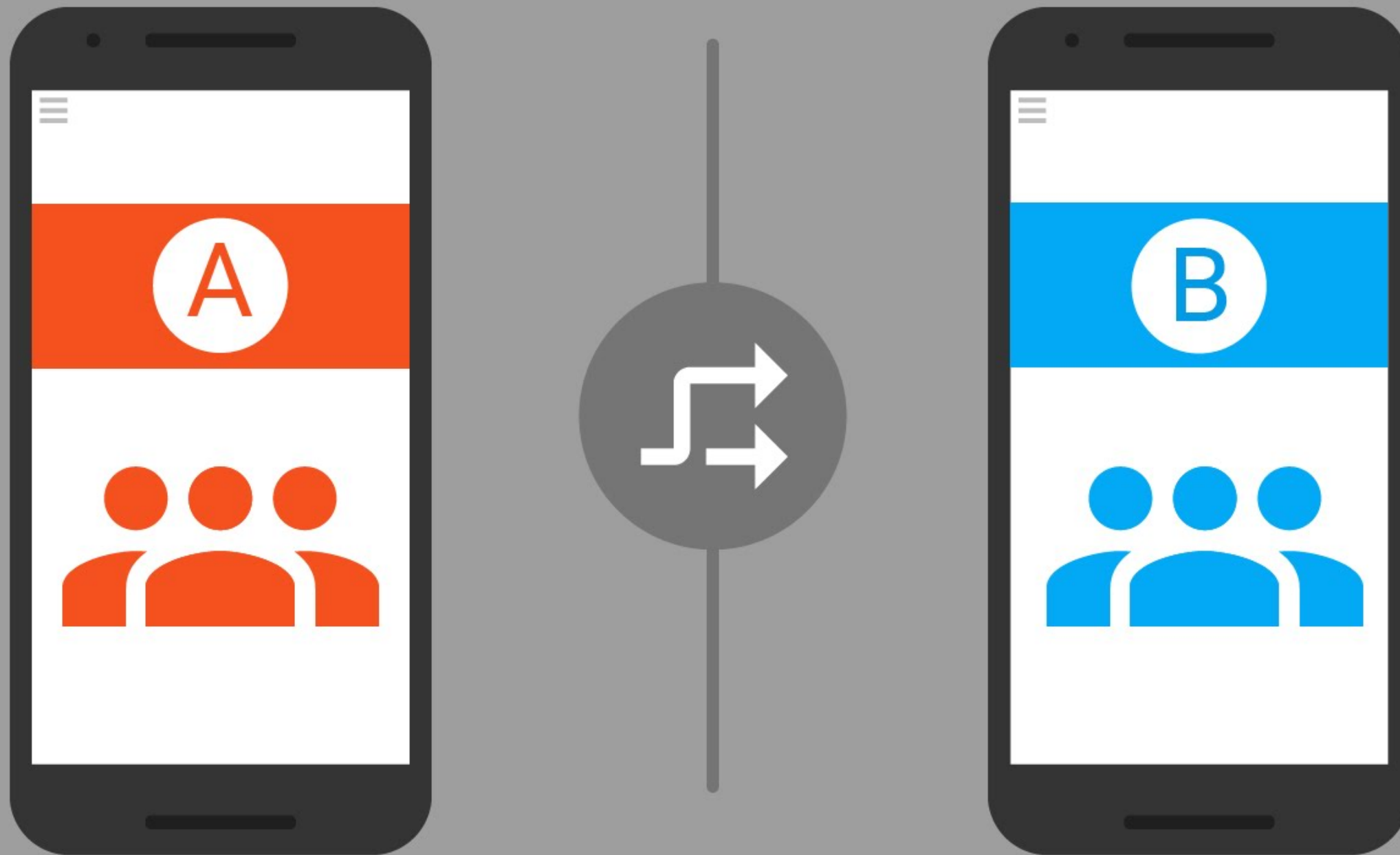
```
curl \
--header "Authorization: key=${FCM_SERVER_KEY}" \
--header "Content-Type: application/json" \
https://fcm.googleapis.com/fcm/send \
--data-ascii "${BODY}"
```


Cloud Messaging: How To Implement

3. *Send message*

- 🔥 Understand **data** vs **notification** messages
- Default behaviour may not be what you want

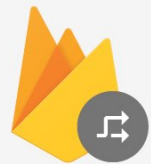
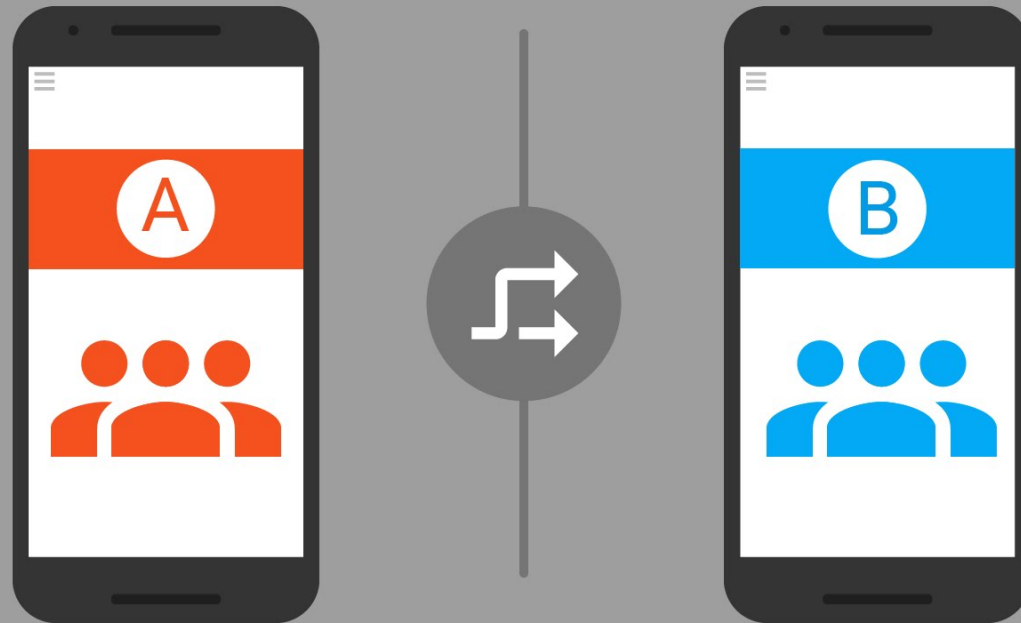
App state	Notification	Data	Both
Foreground	<code>onMessageReceived</code>	<code>onMessageReceived</code>	<code>onMessageReceived</code>
Background	System tray	<code>onMessageReceived</code>	Notification: system tray Data: in extras of the intent.



Remote Config

What is it?

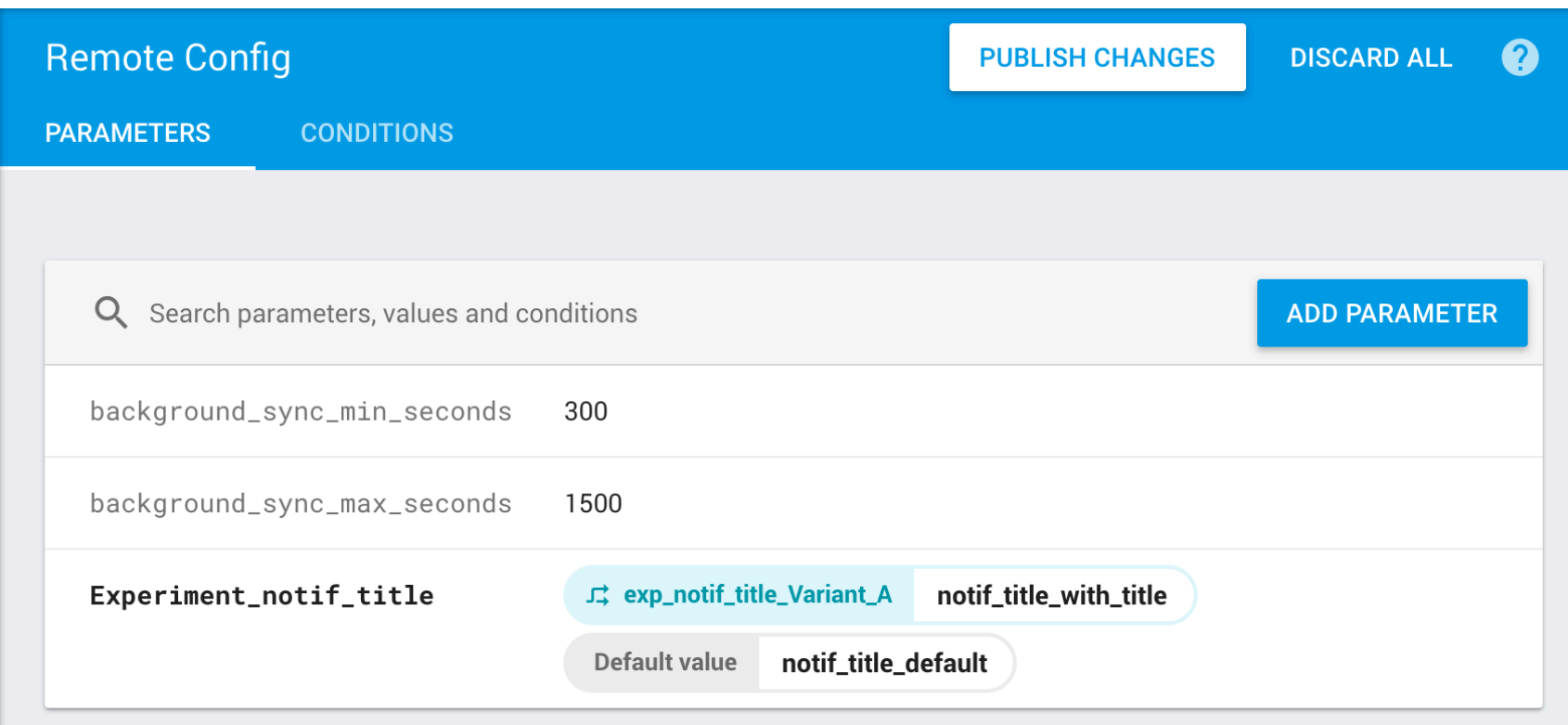
Change behaviour and appearance of app without needing a client update



Remote Config

What does it give you?

- Tune parameters in app
- Appearance
- Timing





New article from Shopify

22:08

6 Common Google AdWords Mistakes You Should Stop Paying For

AdWords can be a great way to target potential customers who are actively looking for what you're selling through the most popular search engine in the world. However, for all the power and potential ...



New: 6 Common Google AdWor.. 09:31

AdWords can be a great way to target potential customers who are actively looking for what you're selling through the most popular search engine in the world. However, for all the power and potential ...

What does it give you?

- Tune parameters in app
 - Appearance
 - Timing
- **Run experiments, A/B tests**

Remote Config Overview

- **Single access point for storing config data**

Remote Config Overview

- Single access point for storing config data
- **Client handles fetching, caching, and activating remote config**

Remote Config Overview

- Single access point for storing config data
- Client handles fetching, caching, and activating remote config
- **Use console to define parameters, with optional conditions**

Remote Config: How To Implement

1. Set up default values in app

- Include Remote Config library dependency
- Define parameter names and values in `defaults.xml`

Remote Config: How To Implement

1. Set up default values in app

```
<defaultsMap>
  <entry>
    <key>sync_min_seconds</key>
    <value>300</value>
  </entry>
  <entry>
    <key>sync_max_seconds</key>
    <value>1500</value>
  </entry>
  <entry>
    <key>Experiment_notif_title</key>
    <value>notif_title_default</value>
  </entry>
</defaultsMap>
```


Remote Config: How To Implement

1. Set up default values in app

— Apply defaults to Remote Config

```
remoteConfig.setDefaults(R.xml.defaults);
```

Remote Config: How To Implement

1. Set up default values in app

— Read from config in your app

```
long seconds = remoteConfig.getLong("sync_min_seconds");  
String variant = remoteConfig.getString("Experiment_notif_title");
```

Remote Config: How To Implement

2. Set up server values

Remote Config

PUBLISH CHANGES

DISCARD ALL

?

PARAMETERS

CONDITIONS

Search parameters, values and conditions

Parameter key ?

sync_min_seconds

Default value

600

Add value for condition ▼

CANCEL

ADD PARAMETER

Remote Config: How To Implement

2. Set up server values

Remote Config

PUBLISH CHANGES

DISCARD ALL

?

PARAMETERSCONDITIONS

Search parameters, values and conditions

Parameter key ?

sync_min_seconds

Default value

600

Add value for condition ▼

CANCEL

ADD PARAMETER

Remote Config: How To Implement

3. Set up experiments

Conditions are used to target groups of users

— User property, device property, audience, random percentile

Define a new condition

Use conditions to provide different parameter values if a condition is met

Name

Exp_A_Variant_1

Color

Applies if...

User in random percentile

A fractional percentile randomly and persistently assigned to each user on a per-project basis.

User in audience

Firebase Analytics audiences that include the user.

Device region/country

The inferred region or country for the user's device.

Device language

The user's chosen language and locale.

User property

Firebase Analytics user properties that user

AND

CANCEL

CREATE CONDITION

Remote Config: How To Implement

3. Set up experiments

e.g. A/B test with equal buckets

Edit a condition

Use conditions to provide different parameter values if a condition is met

Name

exp_notif_title_Variant_A

Color



Applies if...

User in random percentile ▾

<= ▾

50 %

DEF

AND



CANCEL

SAVE CONDITION

Remote Config: How To Implement

3. Set up experiments

Define parameter values for each condition

Parameter key ⓘ

Experiment_notif_title

Value for **exp_notif_title_Variant_A**

notif_title_with_title

DELETE

Add value for condition ▼

Default value

notif_title_default



CANCEL

UPDATE

Remote Config: How To Implement

4. Fetch remote config in app

```
remoteConfig.fetch(cacheExpiration)
    .addOnCompleteListener(new OnCompleteListener<Void>() {
        @Override
        public void onComplete(@NonNull Task<Void> task) {
            if (task.isSuccessful()) {
                remoteConfig.activateFetched();
                // or, activate whenever appropriate
            }
        }
    });
```


Remote Config: How To Implement

4. Fetch remote config in app

- Record variant as user property
- Use to define Analytics audience

```
analytics.setUserProperty("Experiment_notif_title_variant",  
    remoteConfig.getString("Experiment_notif_title"));
```

Review

- **App Indexing:** Gets app into Google search results
- **Dynamic Links:** Deep linking that survives app installs and drives re-engagement
- **Cloud Messaging:** Service for reliable delivery of messages
- **Remote Config:** Change behaviour and appearance of app after deploy

Further Reading

App Indexing

- <https://firebase.google.com/docs/app-indexing/>
- <https://developer.android.com/training/app-links/index.html>
- <https://realm.io/news/juan-gomez-android-app-indexing/>
- <https://moz.com/blog/how-to-get-your-app-content-indexed-by-google>

Further Reading

Dynamic Links

— <https://firebase.google.com/docs/dynamic-links/>

Cloud Messaging

— <https://firebase.google.com/docs/cloud-messaging/>

Further Reading

Remote Config

- <https://firebase.google.com/docs/remote-config/>
- <https://medium.com/@hitherejoe/exploring-firebase-on-android-ios-remote-config-3e1407b088f6#.46fwwr3s>
- <https://riggaroo.co.za/ab-test-app-firebase-remote-config/>

Additional Resources (1/2)

- Dev Summit: Nov 7 in Berlin: <https://events.withgoogle.com/firebase-dev-summit/>
- Status Dashboard: <https://status.firebase.google.com/>
- Google Group: <https://groups.google.com/forum/#!forum/firebase-talk>
- Slack: <https://firebase-community.appspot.com/>

Additional Resources (2/2)

- Blog: <https://firebase.googleblog.com/>
- YouTube channel: https://www.youtube.com/channel/UCP4bf6IHJJQehibu6ai_cg
- SDK Changelog: <https://firebase.google.com/support/releases>
- Quickstart samples: <https://github.com/firebase/quickstart-android>

Let's have some questions!

Email eric.fung@shopify.com

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Twitter [@gnufmuffin](https://twitter.com/gnufmuffin)

Slides speakerdeck.com/efung/

Blog code.gnufmuffin.com