

# THE ART OF DEBUGGING

WHAT IS A  
BUG??



NOT WORKING AS  
INTENDED

ne: Shutting down VM  
ne: FATAL EXCEPTION: main  
Process: com.electricobjects.client.debug, PID: 8284  
java.lang.RuntimeException: Unable to start activity ComponentInfo{com.electricobjects.client.debug/com.electricobjects.client.playlist.PlaylistDetailActivity}  
at android.app.ActivityThread.performLaunchActivity(ActivityThread.java:2416)  
at android.app.ActivityThread.handleLaunchActivity(ActivityThread.java:2476)  
at android.app.ActivityThread.-wrap11(ActivityThread.java)  
at android.app.ActivityThread\$H.handleMessage(ActivityThread.java:1344)  
at android.os.Handler.dispatchMessage(Handler.java:102)  
at android.os.Looper.loop(Looper.java:148)  
at android.app.ActivityThread.main(ActivityThread.java:5417) <1 internal calls>  
at com.android.internal.os.ZygoteInit\$MethodAndArgsCaller.run(ZygoteInit.java:726)  
at com.android.internal.os.ZygoteInit.main(ZygoteInit.java:616)  
Caused by: java.lang.NullPointerException: Attempt to invoke virtual method 'boolean com.electricobjects.client.util.ProgressRecyclerAdapter.isCompleted()' on a null object reference  
at com.electricobjects.client.main.ArtworkListContainer.onLoadingStarted(ArtworkListContainer.java:115)  
at com.electricobjects.client.playlist.PlaylistDetailActivity.onCreateLoader(PlaylistDetailActivity.java:198)  
at android.app.LoaderManagerImpl.createLoader(LoaderManager.java:546)  
at android.app.LoaderManagerImpl.createAndInstallLoader(LoaderManager.java:555)  
at android.app.LoaderManagerImpl.initLoader(LoaderManager.java:609)  
at com.electricobjects.client.SuperActivity.setUpLoaders(SuperActivity.java:122)  
at com.electricobjects.client.playlist.PlaylistDetailActivity.onCreate(PlaylistDetailActivity.java:69)  
at android.app.Activity.performCreate(Activity.java:6251)  
at android.app.Instrumentation.callActivityOnCreate(Instrumentation.java:1107)  
at android.app.ActivityThread.performLaunchActivity(ActivityThread.java:2369)  
at android.app.ActivityThread.handleLaunchActivity(ActivityThread.java:2476)  
at android.app.ActivityThread.-wrap11(ActivityThread.java)  
at android.app.ActivityThread\$H.handleMessage(ActivityThread.java:1344)  
at android.os.Handler.dispatchMessage(Handler.java:102)  
at android.os.Looper.loop(Looper.java:148)

## Fatal Exception: java.lang.OutOfMemoryError

okio.Buffer.readByteArray (**SourceFile:643**)

okio.Buffer.readByteArray (**SourceFile:631**)

okio.RealBufferedSource.readByteArray (**SourceFile:93**)

com.squareup.okhttp.ResponseBody.bytes (**SourceFile:57**)

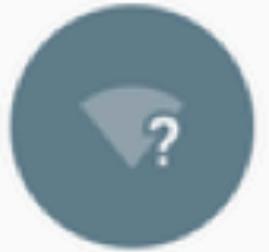
08:10

Friday, January 8



## Check Connection

Open your web browser to finish connecting to Wi..

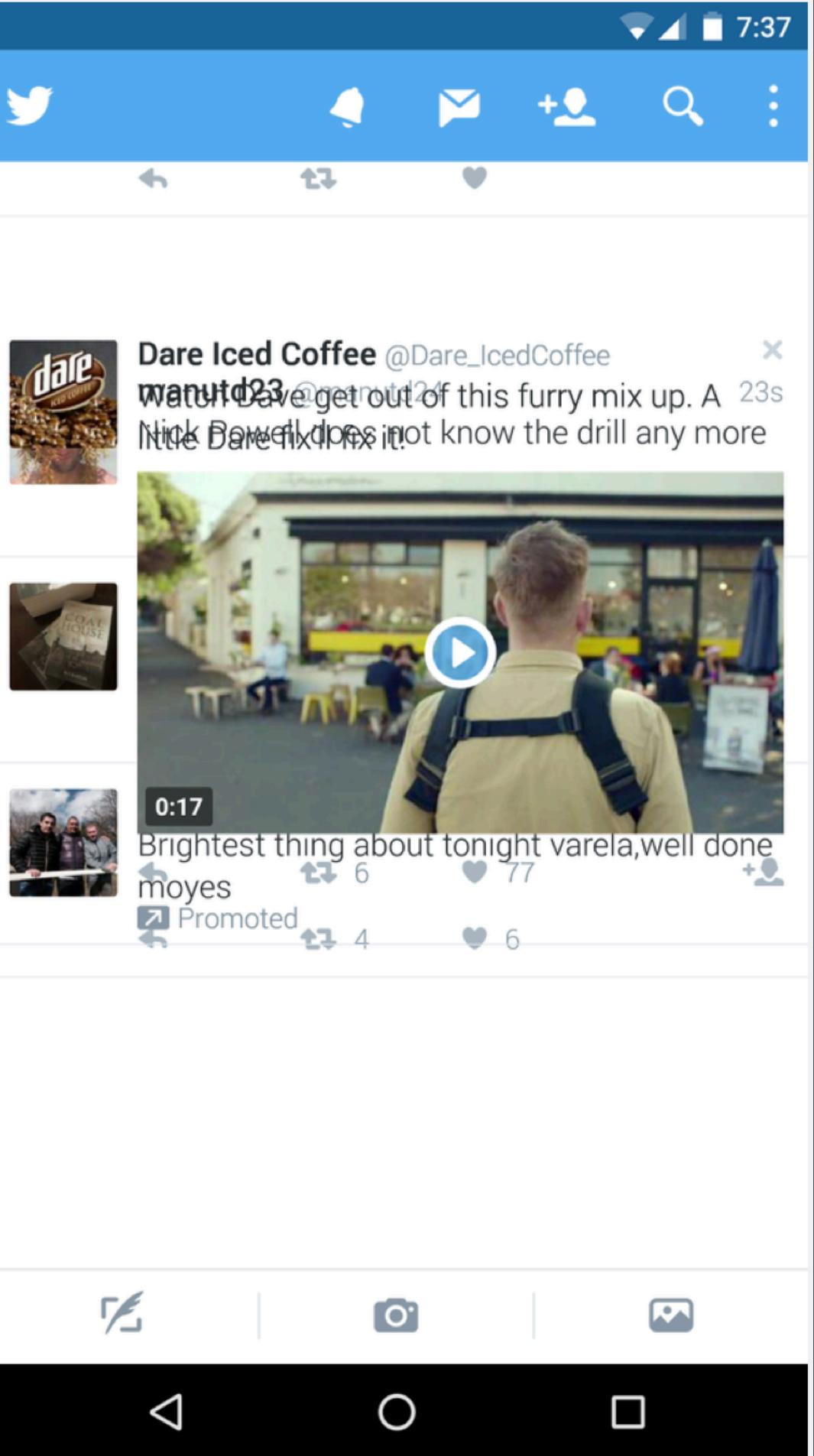


## Sign in to Wi-Fi network

"\*WIFI-AIRPORT"

Say "Ok Google"







Jesse Wilson 5:17 PM

Yeah

Yeah



Jake Wharton 5:18 PM

Idempotency: How does it work?

But cool. A yellow thumbs up emoji.

Search



## 46 Years of Friendship on Facebook

Sara, you and **Megan Dell** became friends on Facebook 46 years ago today. We thought you'd like to look back on some of the memories you've shared together.



# 3 BUG TYPES

BUG TYPE 1  
PROBLEMS YOU CAN SEE: OK

# BUG TYPE 2

## PROBLEMS YOU CANNOT SEE: HARD

BUG TYPE 3  
PROBLEMS YOU DO NOT KNOW EXIST:  
IMPOSSIBLE





**Greg Leppert**  
to me, Lori ▾

Begin forwarded message:

**From:** Lori Karns [REDACTED]  
**Subject:** Yikes  
**Date:** January 14, 2016 at 12:35:19 PM EST  
**To:** Greg Leppert <[REDACTED]>

That is from my 5 minutes of testing playlists.



Jan 3 – Feb 2

3.22 GB

3.2 GB  
warning

# STEP 1:





# STEP 0: HOW TO DEAL

embarrassed







TRUST



**STEP 1:  
GET AS MUCH INFORMATION AS  
POSSIBLE**

GET AS MUCH INFORMATION AS POSSIBLE

STACK TRACE

GET AS MUCH INFORMATION AS POSSIBLE

STACK TRACE  
VERSION OF ANDROID

# GET AS MUCH INFORMATION AS POSSIBLE

STACK TRACE  
VERSION OF ANDROID  
DEVICE MAKE & MODEL

# GET AS MUCH INFORMATION AS POSSIBLE

STACK TRACE  
VERSION OF ANDROID  
DEVICE MAKE & MODEL  
STEPS TO REPRODUCE

**STEP 2:  
SEE IF YOU CAN REPRODUCE IT**

**STEP 3:**  
**GOOGLE FOR KEYWORDS / SEARCH**  
**STACKOVERFLOW**

**STEP 4:  
RE-READ YOUR CODE**

# STEP 5: GATHER MORE INFORMATION

# CRASHLYTICS

## logException

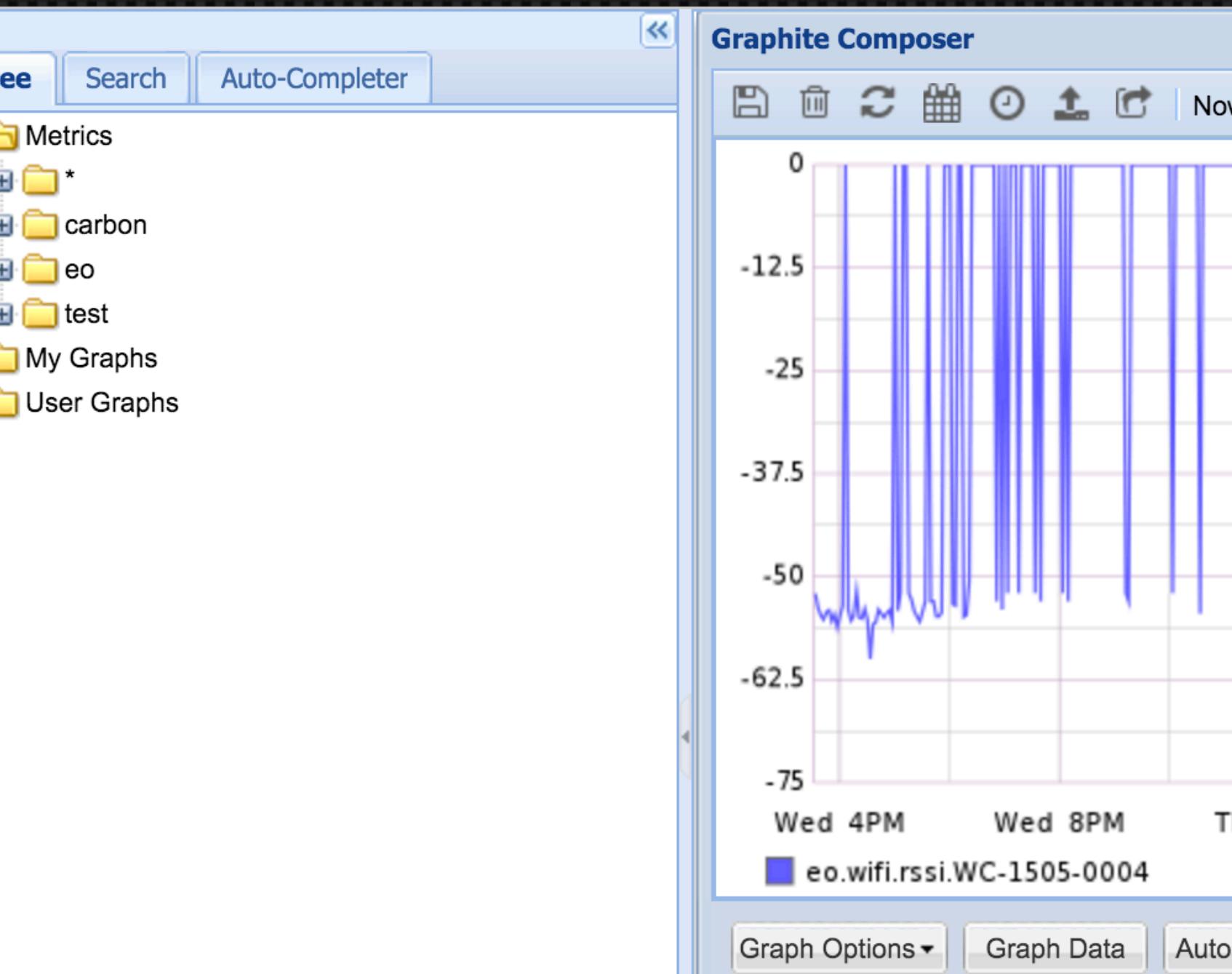
2.0.2 (2) ... 3.1.4 (2)	1376 NON-FATALS	66 USERS
2.0.2 (2) ... 3.1.3 (2)	1132 CRASHES	46 USERS
2.0.2 (2) ... 3.2.0 (2)	1025 NON-FATALS	133 USERS
2.0.2 (2) ... 3.2.0 (2)	951 NON-FATALS	237 USERS
1.0.3 (2)	872 NON-FATALS	169 USERS
2.0.2 (2) ... 3.2.0 (2)	869 NON-FATALS	189 USERS
2.0.2 (2) ... 3.1.4 (2)	812 NON-FATALS	252 USERS

# SERVERT SIDE LOGGING

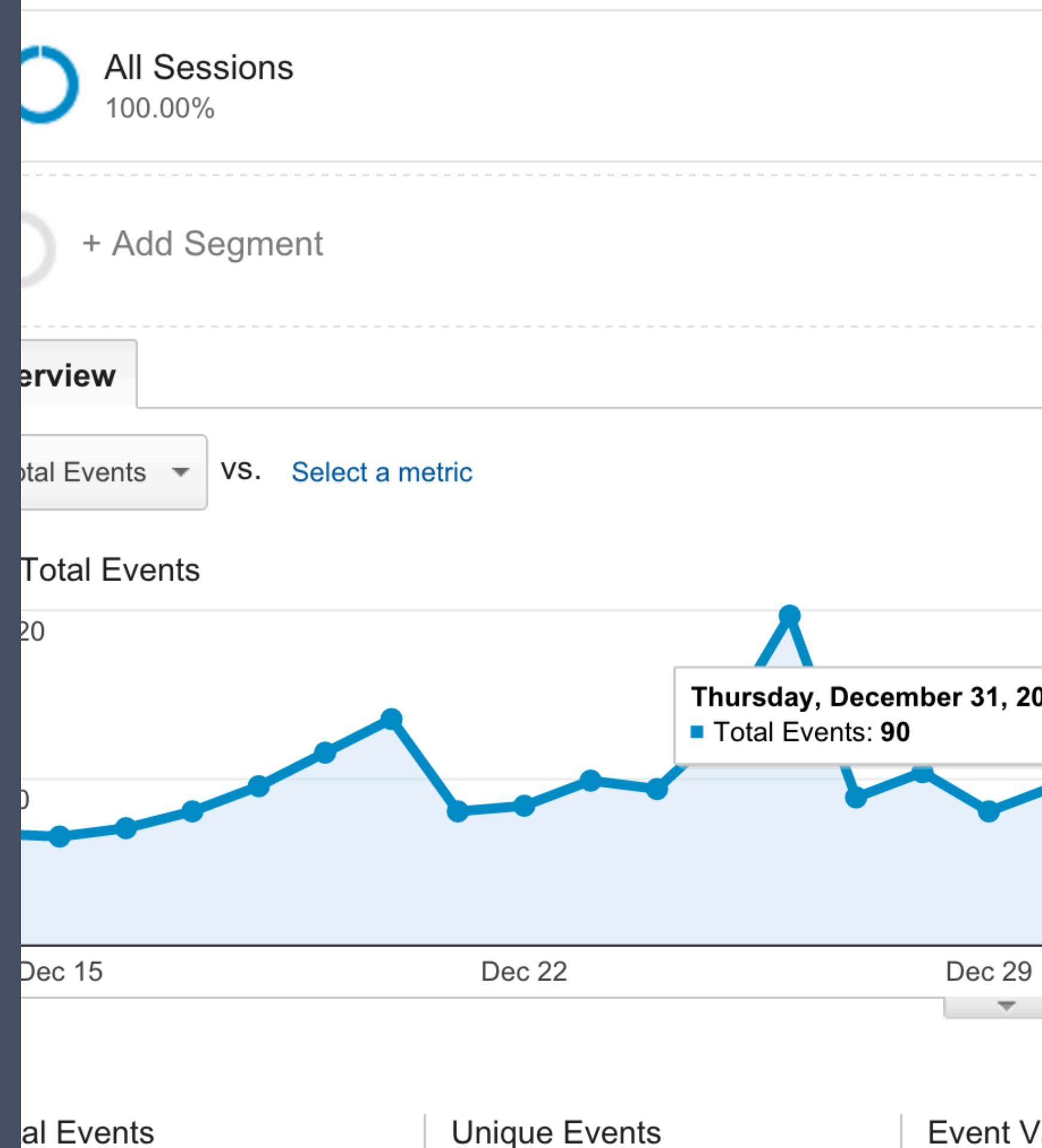
od

# EVENT GRAPHING

Graphite



# GOOGLE ANALYTICS EVENTS



# DEBUGGING INTERLUDE

**KEY THINGS TO  
REMEMBER:**

# KEY THINGS TO REMEMBER:

- > CONCURRENCY: ARE YOUR CLASSES THREAD SAFE?

# KEY THINGS TO REMEMBER:

- > NETWORK CONDITIONS

# KEY THINGS TO REMEMBER:

- > ANDROID HAS BUGS

# KEY THINGS TO REMEMBER:

- > BUT SAMSUNG IS BUGGIER

# KEY THINGS TO REMEMBER:

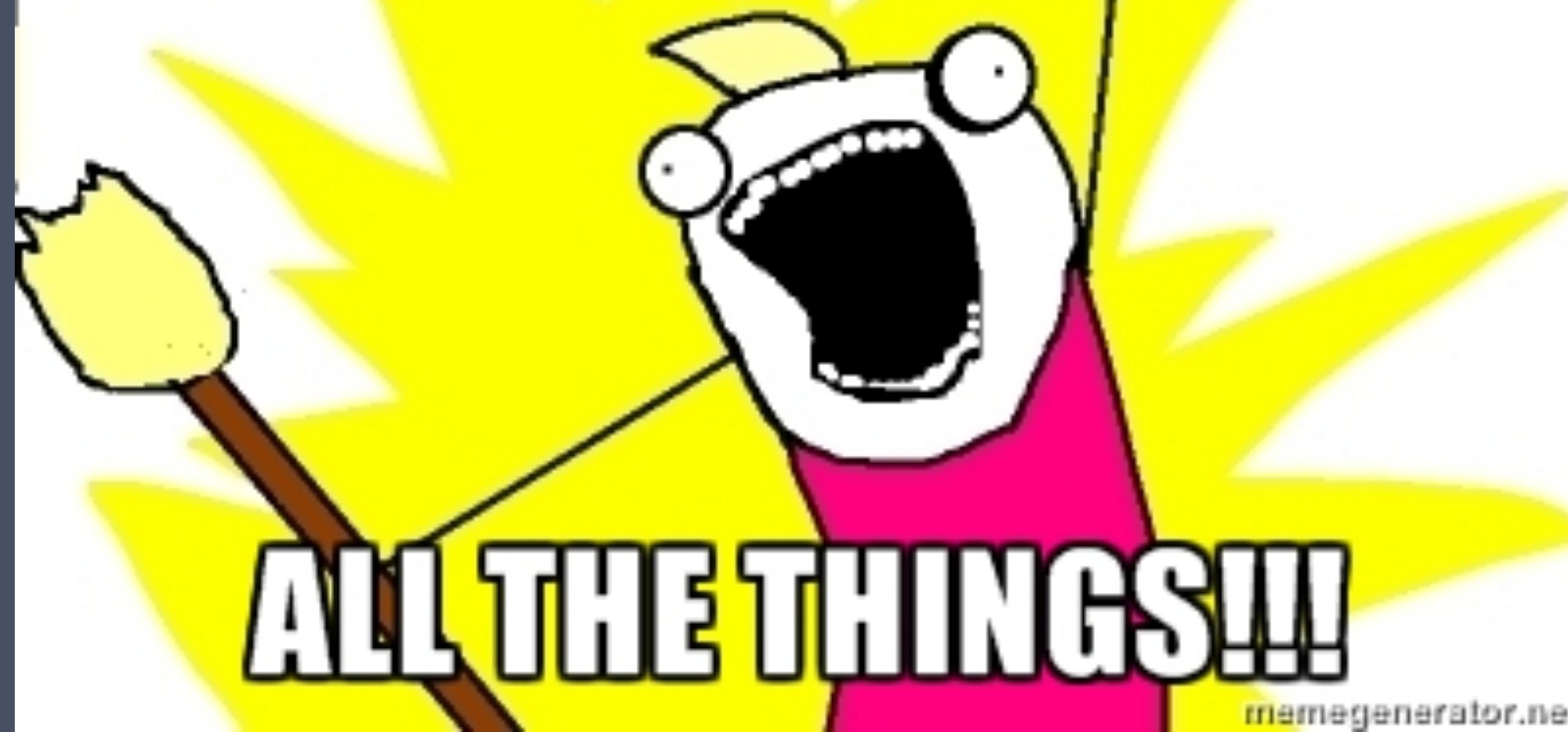
- > CHECK YOUR ASSUMPTIONS

# KEY THINGS TO REMEMBER:

> CHECK YOUR ASSUMPTIONS  
(AKA) YOUR BACKEND DEV MAY BE LYING (UNINTENTIONALLY)

# PREVENTING BUGS

# TEST



## ALL THE THINGS!!!!

# WRITE A CHECKLIST

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- > IF THE NETWORK IS NOT AVAILABLE
- > IF THE SERVER HAS AN ERROR
- > IF IT RETURNS CORRECTLY
- > IF SOMETHING ELSE GOES HORRIBLY WRONG
- > IF THE USER IS UNAUTHENTICATED

# BETA TEST

MAKE THE TESTS  
AUTOMATIC

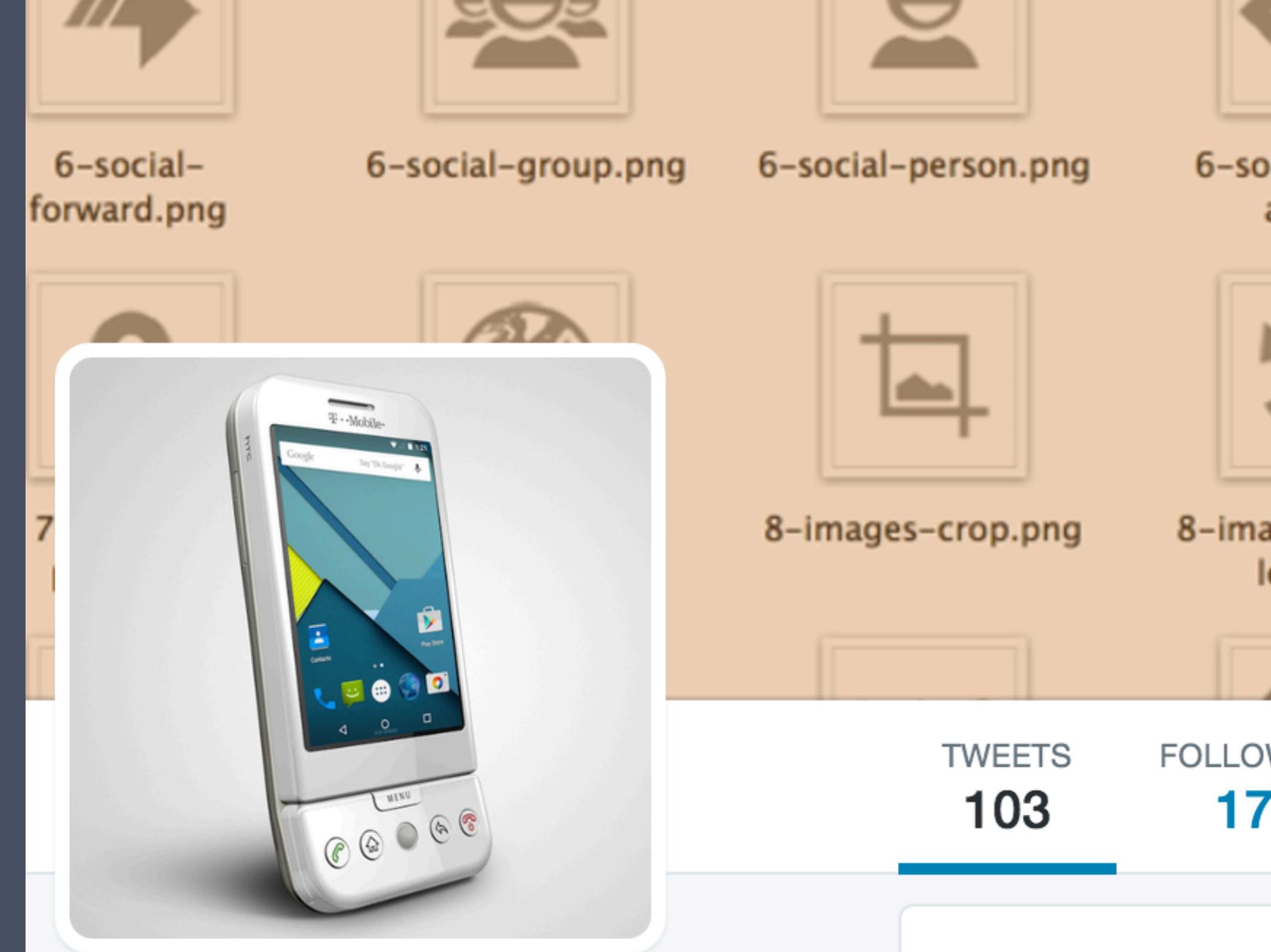
RUN THE AUTOMATIC  
TESTS

WHAT IS A  
BUG??

A BUG IS A FUTURE YOU  
DID NOT CONSIDER

# CURATED ANDROID FAILS

@VOLUMEDOWNPOWER



**volumedownpower**

@volumedownpower

Android Screenshots: some good, some  
bad, and lots of ugly

[🔗 developer.android.com/about/dashb...ar...](https://developer.android.com/about/dashb...)

SEND ME YOUR BUG STORIES.

@NIFTYNE

