

Mobile Application Development

Produced
by

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Waterford Institute of Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE





Android & Firebase Part 4

Firebase Integration





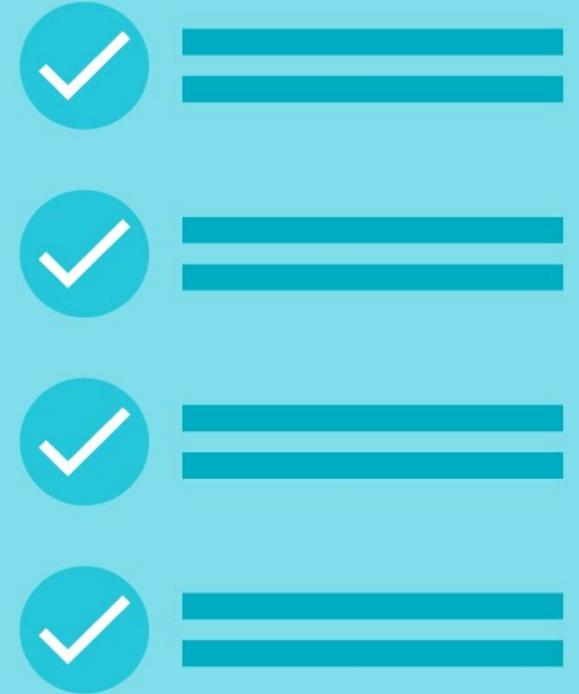
Agenda

- ❑ Firebase history
- ❑ The all new Firebase
- ❑ Real-time database
- ❑ Authentication
- ❑ Storage
- ❑ Remote config
- ❑ Hosting
- ❑ Crash reporting
- ❑ Test lab
- ❑ Firebase cloud messaging
- ❑ Dynamic links
- ❑ App indexing
- ❑ Analytics
- ❑ CoffeeMate Highlights & Demos along the way...



Agenda

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Test Lab for Android

Test virtually on
popular REAL
devices



Firebase test lab for android

- ❑ Cloud based infrastructure for testing android apps.
- ❑ Test across variety of devices and device configurations.
- ❑ Test results include logs, videos and screenshots.
- ❑ Integrate with android studio and CI systems easily.



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Test Lab for Android

TESTS TEMPLATES



Test your Android apps against a wide range of devices

[Learn more](#) [View the docs](#)

RUN YOUR FIRST TEST

Overview Analytics

DEVELOP

- Authentication
- Database
- Storage
- Hosting
- Functions
- Test Lab**
- Crash Reporting
- Performance

GROW

- Notifications
- Remote Config
- Dynamic Links

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Test Lab

Run a test

Choose test type

- Robo test**
The [Robo test](#) automatically explores your app on a wide array of devices to find defects and report any crashes that occur. Robo test doesn't require you to write app tests.
- Instrumentation test**
Run the [Espresso](#), [Robotium](#) or [UIAutomator 2.0](#) test that you have written to test your app on a wide array of devices.
- Game Loop**
A [Game Loop](#) runs specific activities that receive a custom intent.

i **Robo test is compatible with apps that use elements from the Android UI framework**
If your app uses other UI frameworks (like Unity), the test may only explore your app's first screen.

[LEARN MORE](#)

CONTINUE

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Run a Robo test

1 Configure test 2 Select dimensions

Upload your app's APK, then select the dimensions that you want to test.

App APK

app-debug.apk BROWSE

CONTINUE

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1 Configure test **2** Select dimensions

Select the devices, API levels, orientations and locales that you want to run your test on. You must select at least one of each dimension.

i You have a daily quota of 5 physical and 10 virtual device test executions that is refreshed at (12.00 a.m. PST) **UPGRADE**

Physical devices

Nexus 7 (2013) ASUS

19 21

Pixel Google

25 26

HTC One (M8) HTC

19

Nexus 9 HTC

21

Huawei Mate 9 HUAWEI

24

LG G3 LG

19

LG G4 LG



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Nexus 4 LG
 19 21 22

Nexus 5 LG
 19 21 22 23

Nexus 5X LG
 23 24 25 26

Nexus 6 Motorola
 21 22 23 24 25

Nexus 10 Samsung
 19 21 22

Orientation
 Landscape
 Portrait

Locales
English, Ireland (en_IE) X
Add a locale

Advanced options

Save template 5 devices, 1 orientation, 1 locale

START 5 TESTS



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Test Lab for Android

TESTS | TEMPLATES

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CoffeeMateFBI [RUN A TEST](#)

Test matrix	Test type	Started	Total executions	Issues
✓ Matrix No.564145	Robo	10 minutes ago	1	—
⚠ Matrix No.721474	Robo	27 minutes ago	3	3 executions crashed
⚠ Matrix No.560501	Robo	2 days ago	2	2 executions crashed
⚠ Matrix No.738507	Robo	2 days ago	5	1 execution crashed

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Overview

Test Lab > CoffeeMateFBI

Matrix No.721474

Robo test, 28 minutes ago

Failed	Passed	Skipped	Inconclusive
3	0	0	0

Test execution	Duration	Locale	Orientation	Issues
⚠ Nexus 9, Virtual, API Level 25	14 sec	English, Ireland	Portrait	Crashed
⚠ Pixel, API Level 26	1 min 36 sec	English, Ireland	Portrait	Crashed
⚠ Nexus 6P, Virtual, API Level 26	21 sec	English, Ireland	Portrait	Crashed

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Firestore Analytics

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Test Lab > CoffeeMateFBI > Matrix No.721474

← Robo test, Nexus 9, Virtual, API Level 25

App crashed during testing

Failed 21/09/2017, 08:13 14 sec English, Ireland Portrait VIEW SOURCE FILES

TEST ISSUES LOGS SCREENSHOTS ACTIVITY MAP VIDEOS PERFORMANCE

```
java.lang.RuntimeException: Unable to instantiate application ie.cmfbf.main.CoffeeMateApp: java.lang.ClassNotFoundException: Didn't find class "ie.cmfbf.main.CoffeeMateApp" on path: DexPathList[[zip file "/data/app/ie.cmfbf-1/base.apk"],nativeLibraryDirectories= [/data/app/ie.cmfbf-1/lib/x86, /system/lib, /vendor/lib]]
```

```
FATAL EXCEPTION: main
Process: ie.cmfbf, PID: 7486
java.lang.RuntimeException: Unable to instantiate application ie.cmfbf.main.CoffeeMateApp:
java.lang.ClassNotFoundException: Didn't find class "ie.cmfbf.main.CoffeeMateApp" on path: DexPathList[[zip
file "/data/app/ie.cmfbf-1/base.apk"],nativeLibraryDirectories= [/data/app/ie.cmfbf-1/lib/x86, /system/lib,
/vendor/lib]]
    at android.app.LoadedApk.makeApplication(LoadedApk.java:802)
    at android.app.ActivityThread.handleBindApplication(ActivityThread.java:5377)
    at android.app.ActivityThread.-wrap2(ActivityThread.java)
    at android.app.ActivityThread$H.handleMessage(ActivityThread.java:1545)
    at android.os.Handler.dispatchMessage(Handler.java:102)
    at android.os.Looper.loop(Looper.java:154)
    at android.app.ActivityThread.main(ActivityThread.java:6119)
    at java.lang.reflect.Method.invoke(Native Method)
    at com.android.internal.os.ZygoteInit$MethodAndArgsCaller.run(ZygoteInit.java:886)
    at com.android.internal.os.ZygoteInit.main(ZygoteInit.java:776)
Caused by: java.lang.ClassNotFoundException: Didn't find class "ie.cmfbf.main.CoffeeMateApp" on path:
```



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← Robo test, Nexus 9, Virtual, API Level 25

App crashed during testing

Failed 21/09/2017, 08:13 14 sec English, Ireland Portrait VIEW SOURCE FILES

TEST ISSUES LOGS SCREENSHOTS ACTIVITY MAP VIDEOS PERFORMANCE

Warning and higher Styled

E	03:16:35.504	memtrack	Couldn't load memtrack module (No such file or directory)
E	03:16:35.504	android.os.Debug	failed to load memtrack module: -2
W	03:16:35.624	dex2oat	Mismatch between dex2oat instruction set features (ISA: X86 Feature string: smp,ssse3,sse4.1,sse4.2,-avx,-avx2,lock_add,popcnt) and those of dex2oat executable (ISA: X86 Feature string: smp,ssse3,sse4.1,sse4.2,-avx,-avx2,-lock_add,popcnt) for the command line: /system/bin/dex2oat --zip-fd=6 --zip-location=base.apk --oat-fd=7 --oat-location=/data/app/vmd11711355130.tmp/oat/x86/base.odex --instruction-set=x86 --instruction-set-variant=silvermont --instruction-set-features=default --runtime-arg -Xms64m --runtime-arg -Xmx512m --compiler-filter=interpret-only --swap-fd=8
E	03:16:35.625	cutils-trace	Error opening trace file: Permission denied (13)
W	03:16:35.799	PackageManager	Not granting permission android.permission.SET_ANIMATION_SCALE to package com.google.android.apps.mtaas.tools (protectionLevel=50 flags=0x3808be44)



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← Robo test, Nexus 9, Virtual, API Level 25

App crashed during testing

Failed 21/09/2017, 08:13 14 sec English, Ireland Portrait VIEW SOURCE FILES

TEST ISSUES LOGS **SCREENSHOTS** ACTIVITY MAP VIDEOS PERFORMANCE

Device Details

Manufacturer	unknown
Brand	generic
Model	GCE x86_phone
Device	gce_x86
Release version	7.1.1
SDK version	25
Play Services Version Code	11302470

CoffeeMateFBI has stopped

Open app again

7641e57f.png 08:17



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Test Lab > CoffeeMateFBI

Matrix No.564145

Robo test, Just now

Failed	Passed	Skipped	Inconclusive
0	1	0	0

Test execution	Duration	Locale	Orientation	Issues
✓ Nexus 9, Virtual, API Level 25	-	English, Ireland	Portrait	-



console.firebase.google.com/project/coffeematefbi/testlab/histories/bh

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Test Lab > CoffeeMateFBI > Matrix No.564145

← Robo test, Nexus 9, Virtual, API Level 25

Passed 21/09/2017, 08:30 1 min 20 sec English, Ireland Portrait VIEW SOURCE FILES

LOGS **SCREENSHOTS** ACTIVITY MAP VIDEOS PERFORMANCE



e957e61e.png 4c262b7c.png 8b687b10.png



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W	03:34:02.983 (9)	Finsky(4672): [1] c...	android.provider.Settings.Global.
W	03:34:02.989	Finsky(4672): [1] c...	No account configured on this device.
W	03:34:02.990 (4)	Finsky(4672): [1] c...	No account configured on this device.
W	03:34:02.999	System	ClassLoader referenced unknown path: /system/priv-app/DownloadProvider/lib/x86
W	03:34:03.005		ClassLoader referenced unknown path: /system/priv-app/MediaProvider/lib/x86
W	03:34:03.006 (2)	Finsky(4672): [292]...	No account configured on this device.
E	03:34:03.027	Finsky(4672): [1] c...	onConnectionFailed: ConnectionResult{statusCode=API_UNAVAILABLE, resolution=null, message=null}
W	03:34:03.041	dex2oat	Mismatch between dex2oat instruction set features (ISA: X86 Feature string: smp,ssse3,sse4.1,sse4.2,-avx,-avx2,lock_add,popcnt) and those of dex2oat executable (ISA: X86 Feature string: smp,ssse3,sse4.1,sse4.2,-avx,-avx2,-lock_add,popcnt) for the command line: /system/bin/dex2oat --zip-fd=6 --zip-location=base.apk --oat-fd=7 --oat-location=/data/app/vmdl11010021910.tmp/oat/x86/base.odex --instruction-set=x86 --instruction-set-variant=silvermont --instruction-set-features=default --runtime-arg -Xms64m --runtime-arg -Xmx512m --compiler-filter=interpret-only --swap-fd=8
W	03:34:03.041	dex2oat	
E	03:34:03.041	cutils-trace	Error opening trace file: Permission denied (13)
W	03:34:03.047 (2)	Finsky(4672): [1] c...	No account configured on this device.
W	03:34:03.054 (4)	...	No account configured on this device.
W	03:34:03.214	PackageManager	Not granting permission android.permission.SET_ANIMATION_SCALE to package com.google.android.apps.mtaas.tools (protectionLevel=50 flags=0x3808be44)



Test Lab



Quick DEMO... (Video)

Pricing



	SPARK Free	FLAME \$25 per month	BLAZE Pay as you go	
	Generous limits for hobbyists	Predictable pricing for growing apps	Commodity pricing for apps at scale	
Included Free Analytics, App Indexing, Authentication, Cloud Messaging, Crash Reporting, Dynamic Links, Invites, Notifications & Remote Config	✓	✓	✓	
Test Lab	Daily quota or hourly rate	15 tests per day ³	15 tests per day ³	hourly, per device ⁴



Thanks!

A simple line drawing of a smiling person with their arms raised in a celebratory gesture. The person has a round face with a wide smile, two dots for eyes, and a few strands of hair. Their arms are raised, and they appear to be jumping or dancing. A small '©' symbol is visible at the bottom right of the drawing.



Some important points though....

- ❑ Do not think RDBMS, think JSON. How data should be structured is very important.
- ❑ Firebase has a recycler view, that integrates with real time database smoothly without any listeners.
- ❑ Test lab which is available in paid plan (Blaze), is an amazing feature for testing your app on different real and virtual devices.
- ❑ Set developer mode to true when testing remote config.



References & Links

- ❑ [Presentation by Kaushal Dhruw & Shakti Moyal 2016](#)
- ❑ <https://firebase.google.com>
- ❑ Demo app available at <https://goo.gl/WBP5fR>



Questions?