

One for all, all for one

The Journey to Android Monorepo at Uber

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Senior Software Engineer
Android Developer Experience

@kageiit

The Uber logo, consisting of the word "UBER" in white capital letters on a black rectangular background, is positioned in the lower-left corner of the image. The background image shows a woman with long brown hair leaning into the open rear door of a silver car, talking to a man with a beard who is sitting in the driver's seat. The scene is set on a city street with buildings in the background.

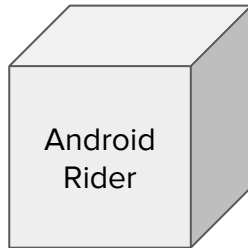
UBER

Your Codebase

Uber's Old Android Codebase

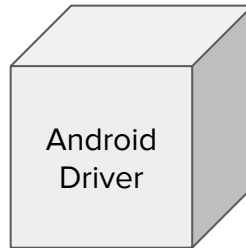
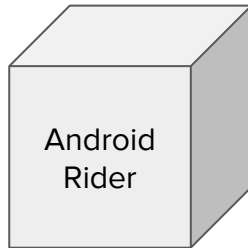
Uber's Old Android Codebase

First came Rider



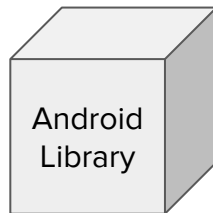
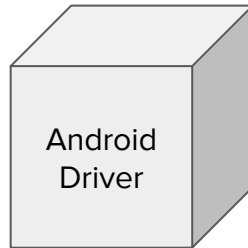
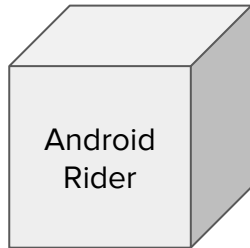
Uber's Old Android Codebase

Then Driver



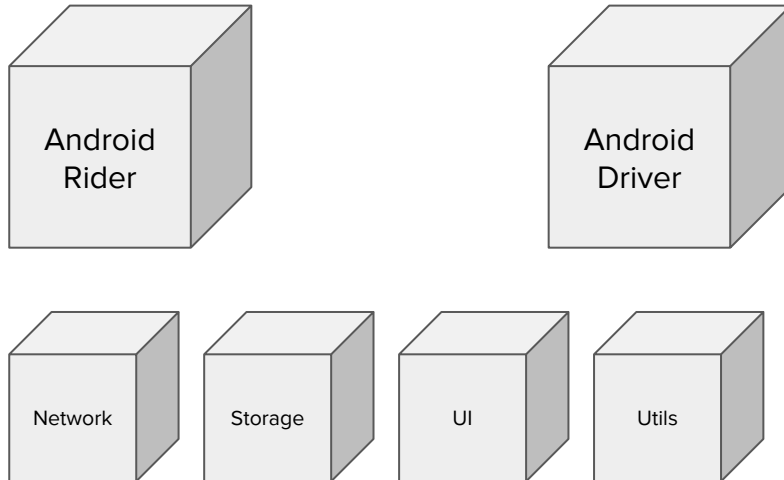
Uber's Old Android Codebase

Shared Library



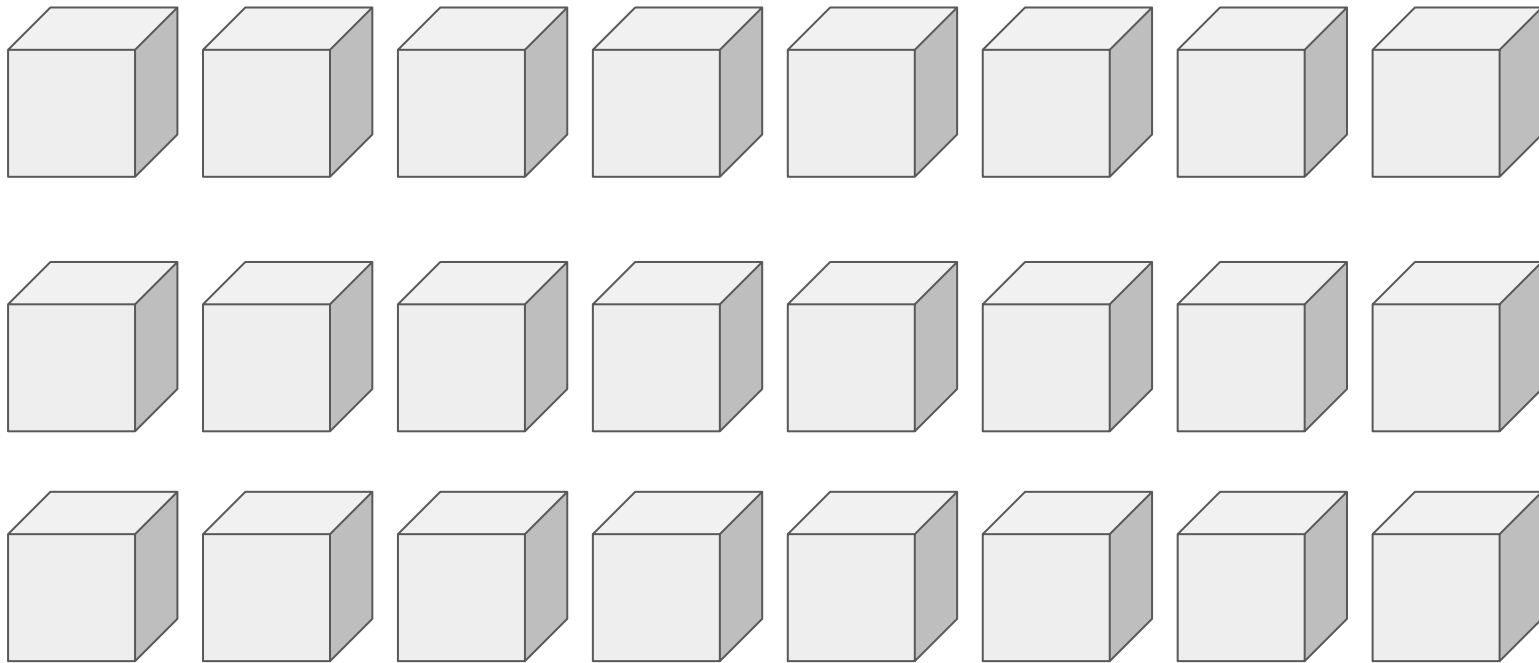
Uber's Old Android Codebase

Core Architectural Components



Uber's Old Android Codebase

Proliferation of Repositories



Uber's Old Android Codebase

The Good

Clear Ownership

Uber's Old Android Codebase

The Good

Clear Ownership

Less Toe Stepping

Uber's Old Android Codebase

The Good

Clear Ownership

Less Toe Stepping

Better Performance

Uber's Old Android Codebase

The Bad

Architectural Silos

Uber's Old Android Codebase

The Bad

Architectural Silos

Duplication Of Effort

Uber's Old Android Codebase

The Bad

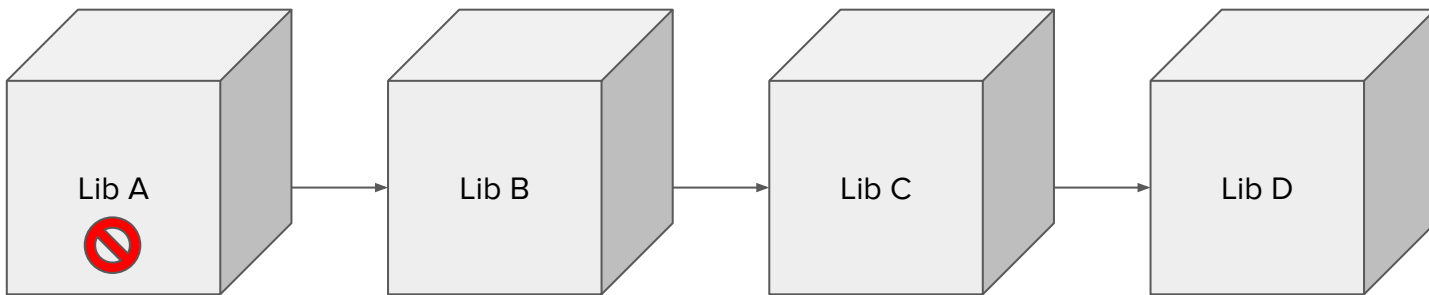
Architectural Silos

Duplication Of Effort

Never up-to-date

Uber's Old Android Codebase

Non Atomic Breaking Changes



Uber's Old Android Codebase

Dealing with Dependency Hell

Build has FAILED

Omega check failed on:

[mobile/android-contactpicker](#)

[mobile/android-presidio](#)

[mobile/android-signature](#)

See <http://t.uber.com/omega> for how to fix common errors



Developer Efficiency Decreased

Evolution into Monorepo

One for all, all for one

Alexandre Dumas

One for all, all for one

One for all, all for one

Monorepo in the Wild



Uber
Android

CONGRATS! YOUR MULTIREPO
EVOLVED INTO A MONOREPO

ONE DOES NOT SIMPLY



MONOREPO

Will ____? Scale?

Will VCS Scale?

Will Build Times Scale?

<https://buckbuild.com>

<https://github.com/uber/okbuck>

Will Development Scale?

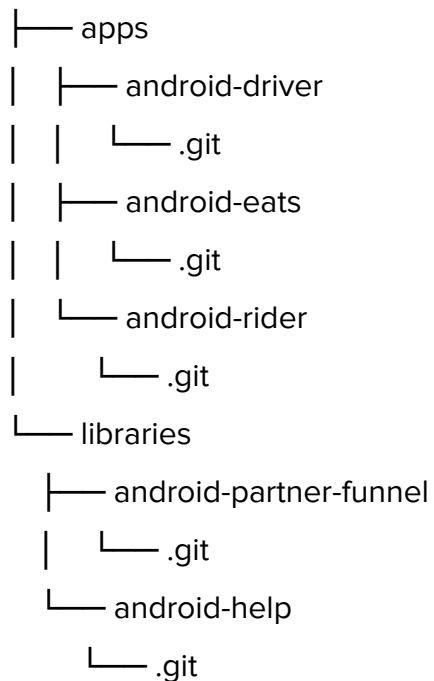
Uber's iOS Monorepo

<https://eng.uber.com/ios-monorepo>

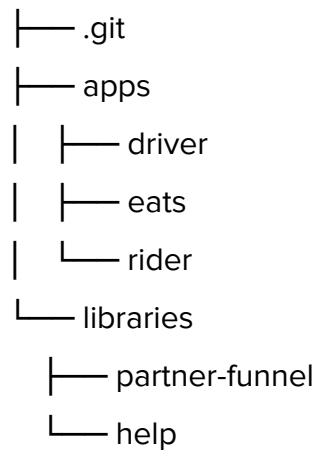
Mini Monorepo

Never Rewrite History

~/Uber/android



~/Uber/android



<https://github.com/unravelin/tomono>

Evolution into Monorepo

Staging the Monolith

Snapshot Regularly

Evolution into Monorepo

Staging the Monolith

Snapshot Regularly

Build/Test/Fix

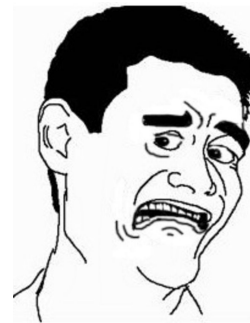
Evolution into Monorepo

Staging the Monolith

Snapshot Regularly


Build/Test/Commit

Fix Breaking API Changes





Evolution into Monorepo

Breaking API Changes



jenkins added a comment.

Tue, Apr 11, 11:41 AM



Build is green

Breaking Api changes may affect Android monorepo. cc @gkorlam @ravi @ryanson

```
Comparing binary compatibility of /Users/mobileci/jenkins/workspace/build-differential-gradle/experiment/build/intermediates/bundles/release/classes.jar against
/Users/mobileci/jenkins/workspace/build-differential-gradle/experiment/build/old/oldclasses.jar
***! MODIFIED CLASS: PUBLIC com.ubercab.experiment.log.TreatmentLogger (not serializable)
    ---! REMOVED METHOD: PUBLIC(-) void
logTreatmentEvent(com.ubercab.experiment.analytics.ExperimentName, com.ubercab.experiment.model.Experiment,
boolean)
    ---! REMOVED METHOD: PUBLIC(-) void
logTreatmentEventWithOverrideFlag(com.ubercab.experiment.analytics.ExperimentName,
com.ubercab.experiment.model.Experiment, boolean, boolean)
***! MODIFIED INTERFACE: PUBLIC ABSTRACT com.ubercab.experiment.log.TreatmentSender (not serializable)
    ---! REMOVED METHOD: PUBLIC(-) ABSTRACT(-) void
sendTreatmentEvent(com.ubercab.experiment.analytics.ExperimentName, com.ubercab.exper
https://ci-android-mobile.uberinternal.com/job/build-differential-gradle/9119/ for more details.
```

<https://github.com/siom79/japicmp>

The Rollout

Code freeze



```
git rm -rf *
```

Lots and Lots of Documentation

A man with dark, curly hair and a beard, wearing a blue long-sleeved shirt, is shown from the chest up. He is holding a white corded telephone receiver to his ear with his right hand. He has a focused or slightly concerned expression. The background is a cluttered room. On the wall behind him are several posters, including one of a person's face and another with the text "PINK ST". There are also various objects on shelves and surfaces, including a green helmet, a small figurine, and some papers. The lighting is somewhat dim, and the overall tone is casual and candid.

**HELLO, ANDROID DEVX, HAVE YOU
TRIED BUILDING IT WITH BUCK?**

Migration Stats

No. of Files 75000

No. of Commits 44500

Diffs for Migration 800

Size of Repository 350 MB

No. of Modules

Today



Impact on Developer Productivity


One Repository

One Version

One Changeset

Faster Builds

Always up-to-date

A wooden picket fence runs diagonally across the frame, separating a dry, brown lawn on the left from a vibrant green lawn on the right. The fence is made of light-colored wooden pickets. The text "Master is always greener on the other side" is written in white on the green lawn.

Master is always
greener on the
other side

Questions? Find us at the [Mobile Developer Support uChat Room](#).

[ANDROID](#)[ANDROID-RELEASE](#)[IOS](#)[IOS-RELEASE](#)[SUBMITQUEUE](#)[DUMMY_REPO](#)[RTAPI](#)

History

Add camera click and help button to the camera view

[sagrawal](#)

SUCCEEDED

[D1188825](#)

🕒 7 minutes

📅 23 minutes ago

Add overlay mask for camera preview

[sagrawal](#)

SUCCEEDED

[D1185455](#)

🕒 8 minutes

📅 an hour ago

Update gradle to 4.2

[gkorlam](#)

SUCCEEDED

[D1201467](#)

🕒 25 minutes

📅 an hour ago

Remove libraries that are never consumed anywhere

[gkorlam](#)

SUCCEEDED

[D1201455](#)

🕒 8 minutes

📅 3 hours ago

Questions? Find us at the [Mobile Developer Support uChat Room](#).

[ANDROID](#)

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[IOS](#)

[IOS-RELEASE](#)

[SUBMITQUEUE](#)

[DUMMY_REPO](#)

[RTAPI](#)

Update gradle to 4.2

[gkorlam](#)

SUCCEEDED

[D1201467](#)

🕒 25 minutes

📅 an hour ago

Validation

PASSED



Run Tests

PASSED



Push Changes

PASSED

Downsides

The Journey is Not Over Yet

Tooling Improvements

The Journey is Not Over Yet

Tooling Improvements

Distributed builds

The Journey is Not Over Yet

Tooling Improvements

Distributed builds

Automatic dependency cleanup

The Journey is Not Over Yet

Tooling Improvements

Distributed builds

Automatic dependency cleanup

Duplicate/dead code detection

Do Try This at Home!

Thank you

Questions?

The Uber logo, consisting of the word "UBER" in a bold, black, sans-serif font, centered within a white square. The square is positioned in the bottom right corner of the slide, overlapping a teal background with a subtle geometric pattern of interlocking squares.

UBER



UBER

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- Slide 23 - <https://media.giphy.com/media/5H7pDI6uF7ZNm/giphy.gif>
- Slide 24 - <https://imgflip.com/memetemplate/One-Does-Not-Simply>
- Slide 35 - <http://replycandy.com/ew/yao-ming-scared-rage-face>
- Slide 38 - https://upload.wikimedia.org/wikipedia/commons/0/0e/Matanuska_Glacier_mouth.jpg
- Slide 41 - <https://giphy.com/gifs/wLOk1aJX9Mis0/>
- Slide 42 - <https://imgflip.com/memegenerator/1489292/Vegeta-over-9000>
- Slide 49 - https://az616578.vo.msecnd.net/files/2016/03/24/6359443246595527281092097913_grass_is_greener.jpg