

Android UI Tests Workshop

Evgenii Matsiuk & Sergei Iartsev

About



Evgenii Matsiuk

- Staff SWE at Careem (UAE, Dubai)
- Android GDE
- Kaspresso founder
- Speaker & Writer

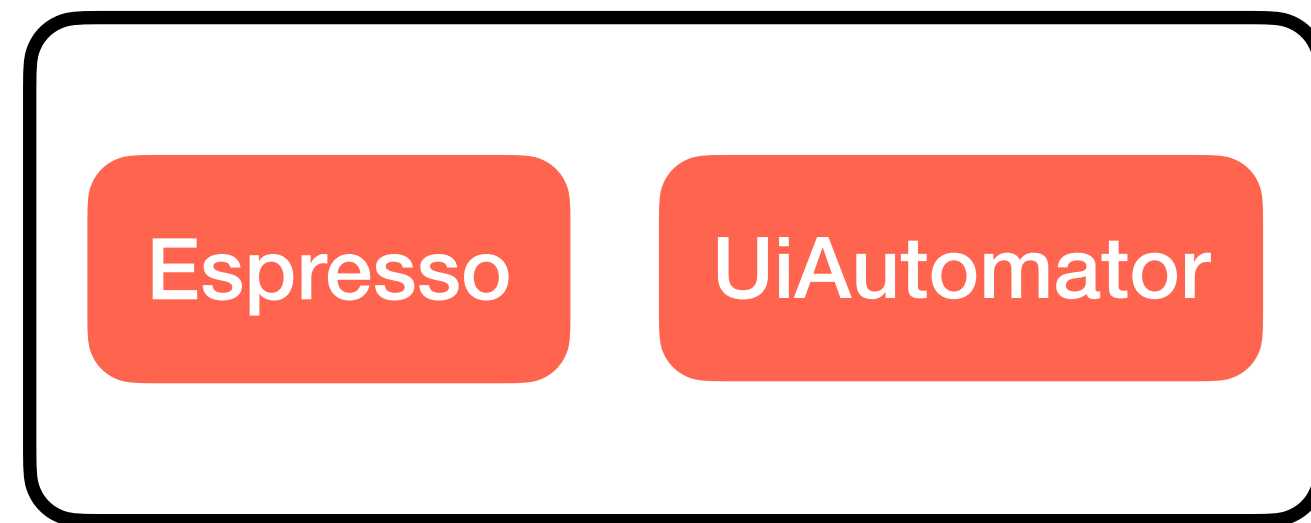


Sergei Iartsev

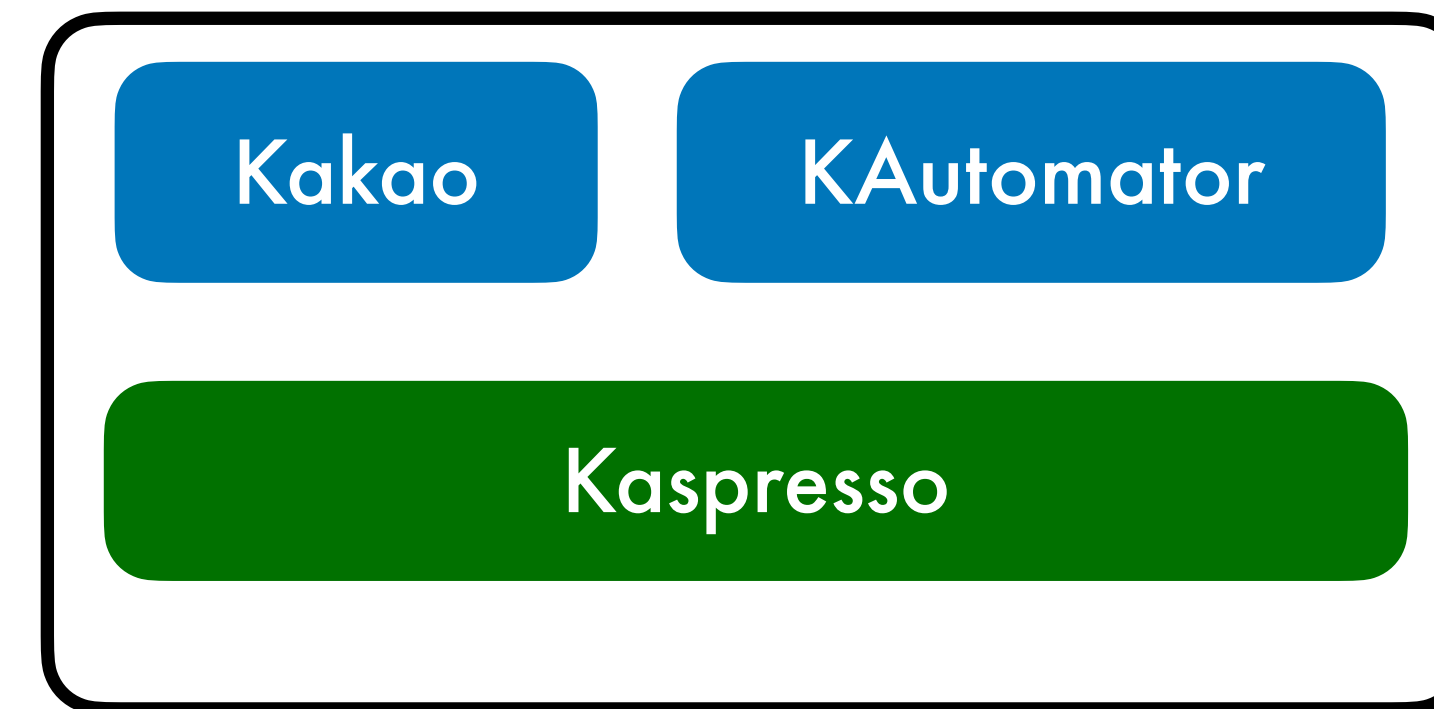
- CTO at HintEd

Общая картина

Writing



Google provided



Community

Running

AndroidJUnitRunner

Orchestrator

Google provided

Composer

Fork

Spoon

Flank

AvitoRunner

Marathon

Community

Writing

Espresso

UiAutomator

Google provided

Kakao

KAutomator

Kaspresso

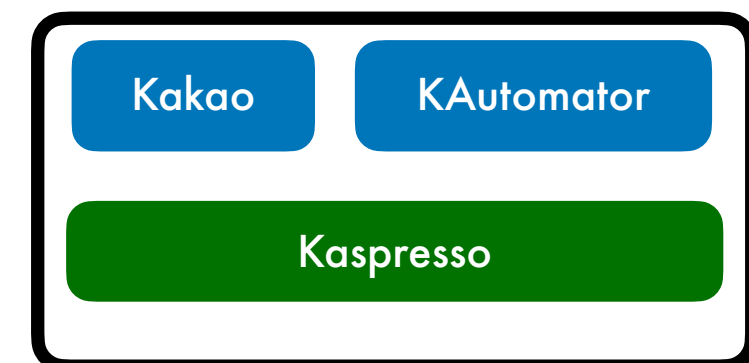
Community

Whereto run

Writing

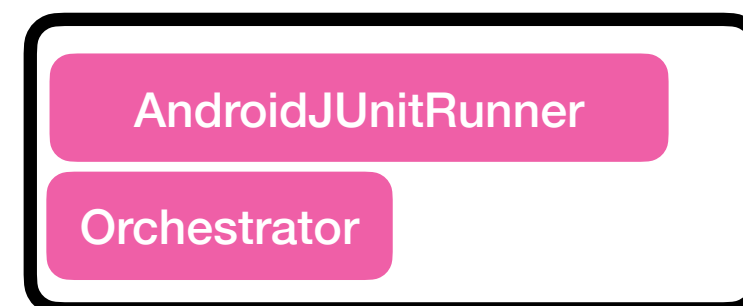


Google provided

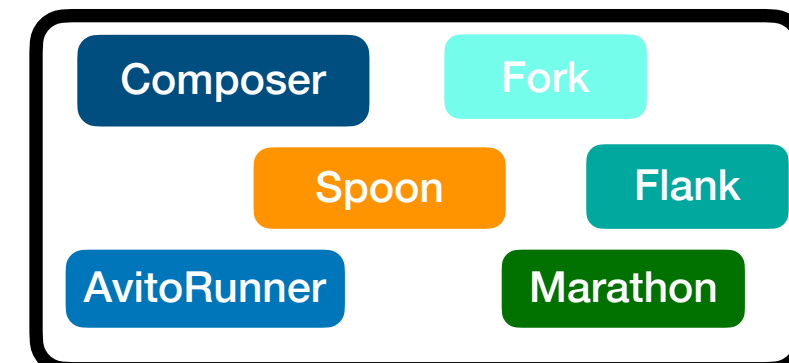


Community

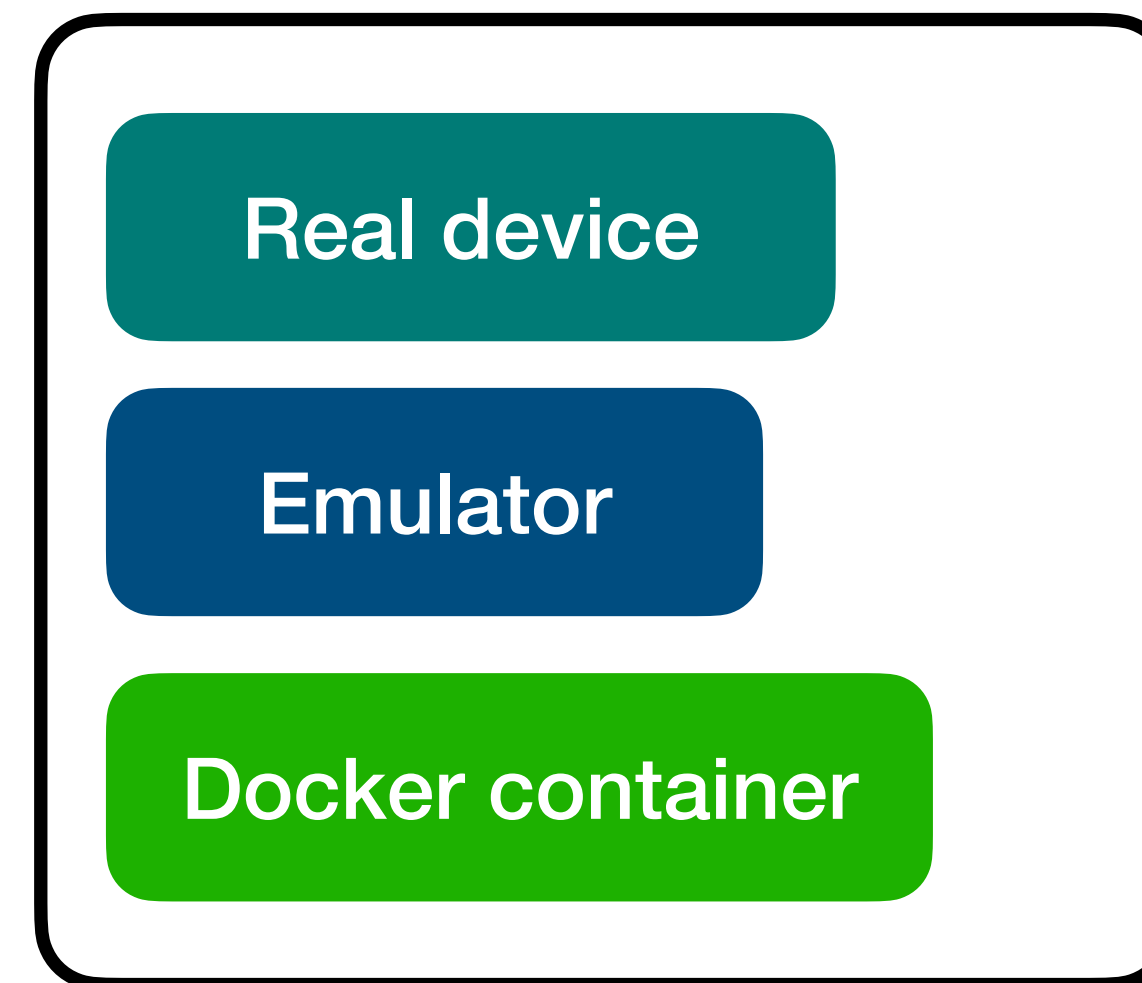
Running



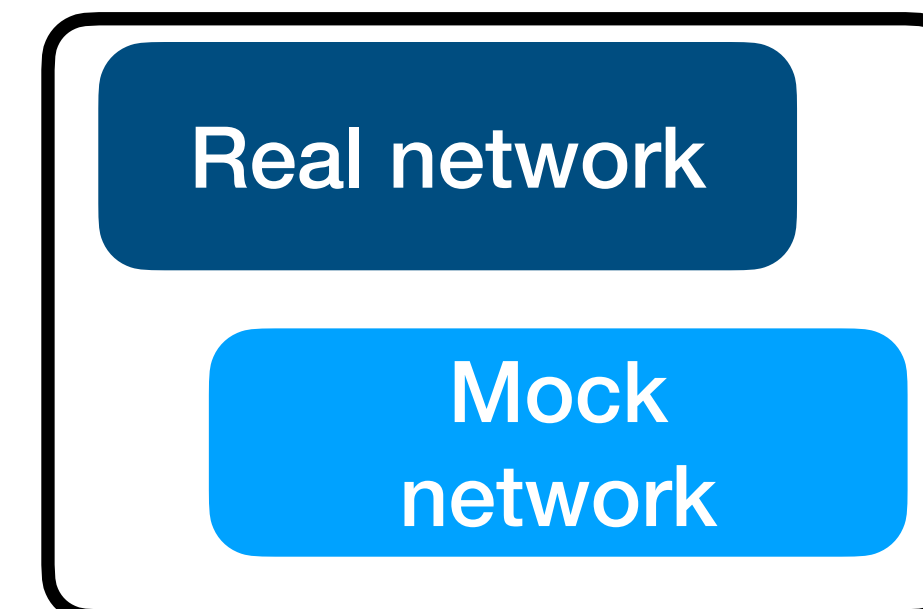
Google provided



Community



Device

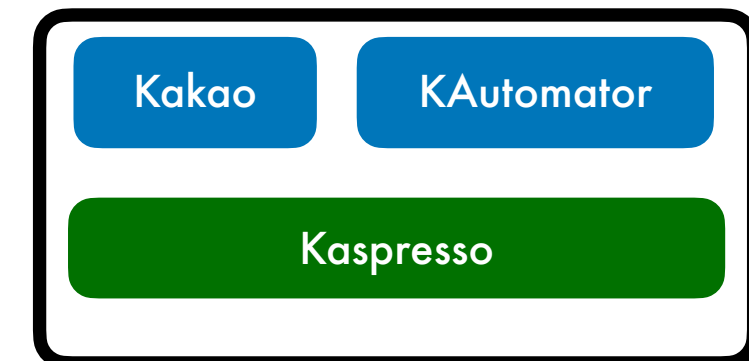


Device condition

Writing

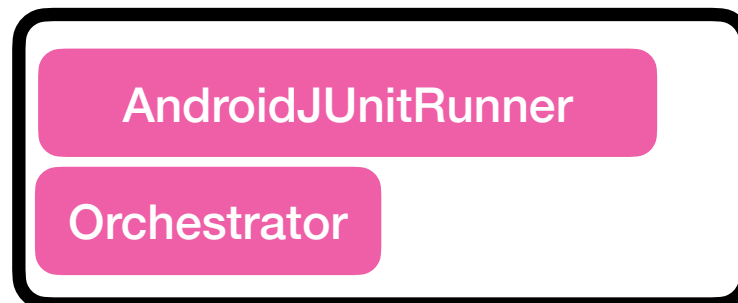


Google provided

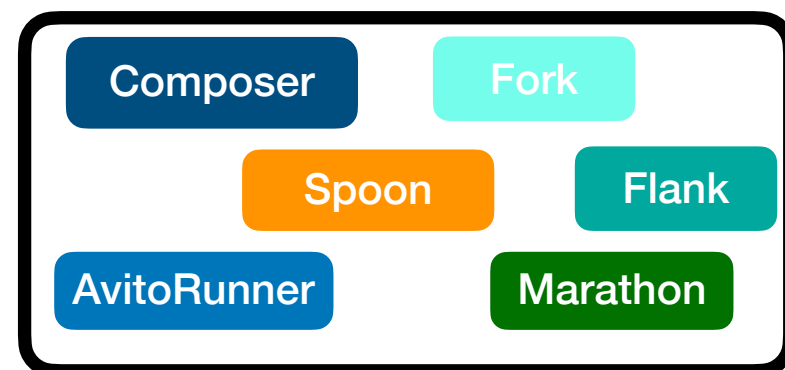


Community

Running

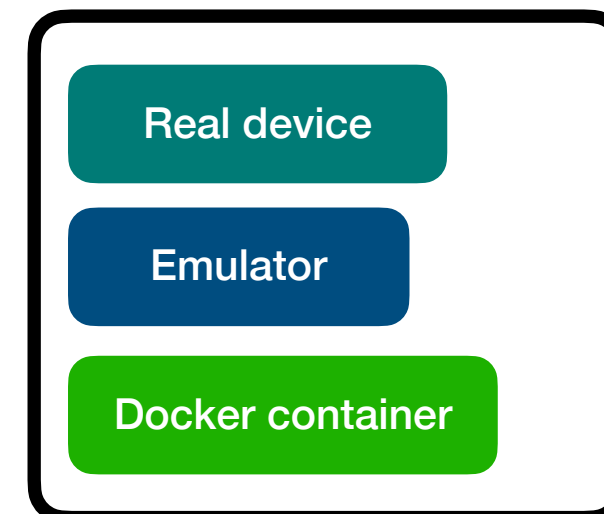


Google provided

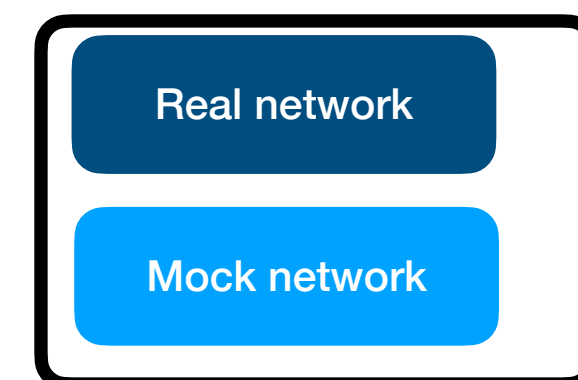


Community

Where to run

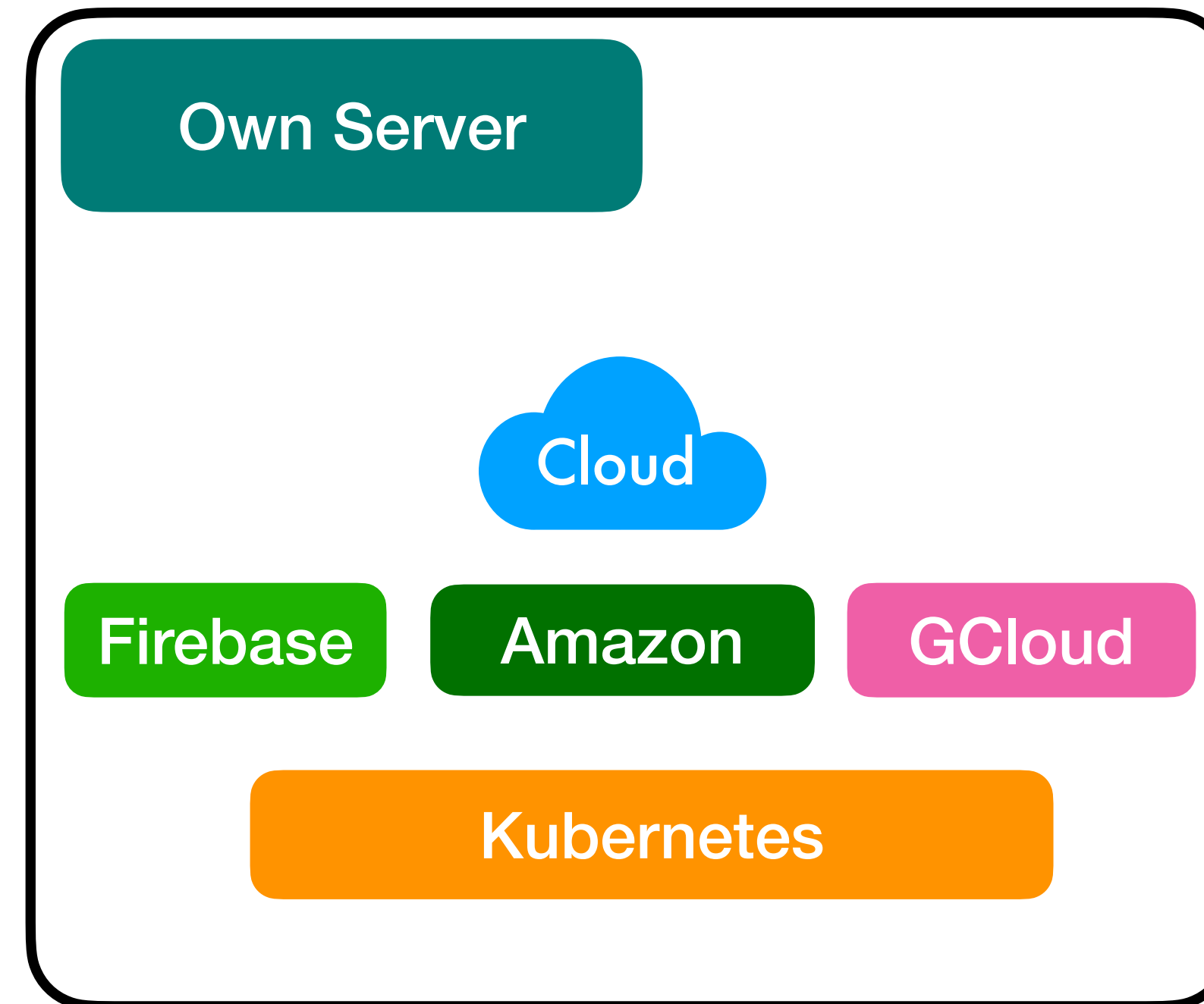


Device



Device condition

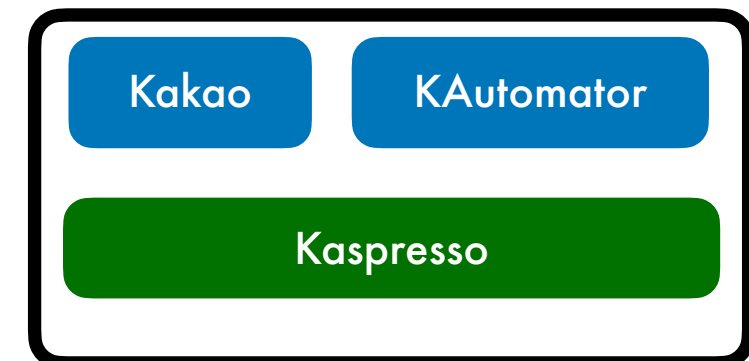
Infrastructure



Writing

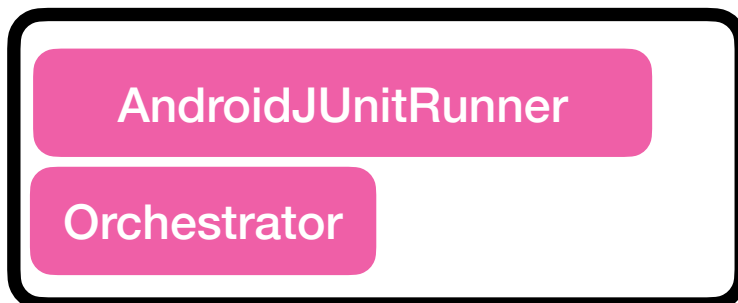


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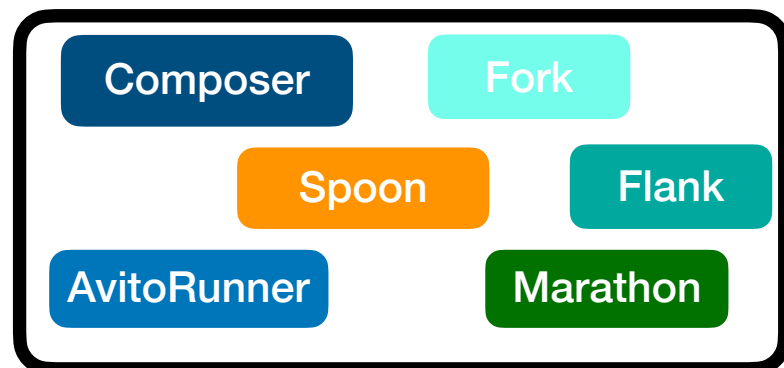


Community

Running

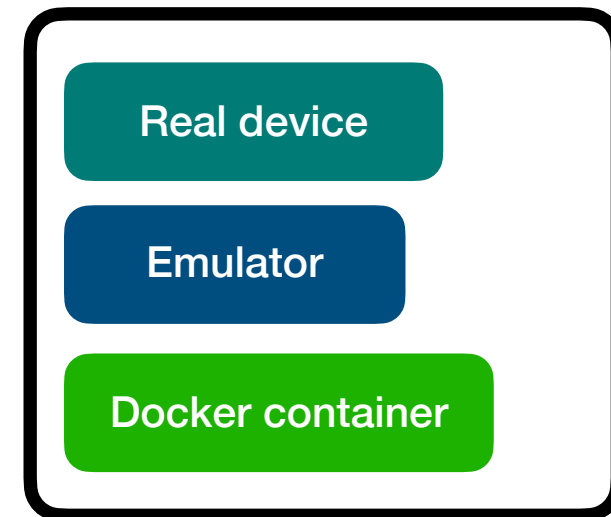


Google provided

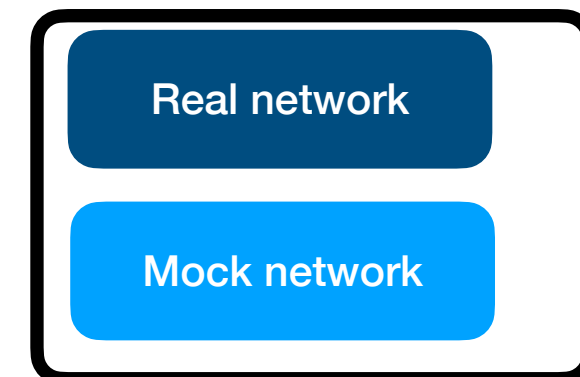


Community

Where to run

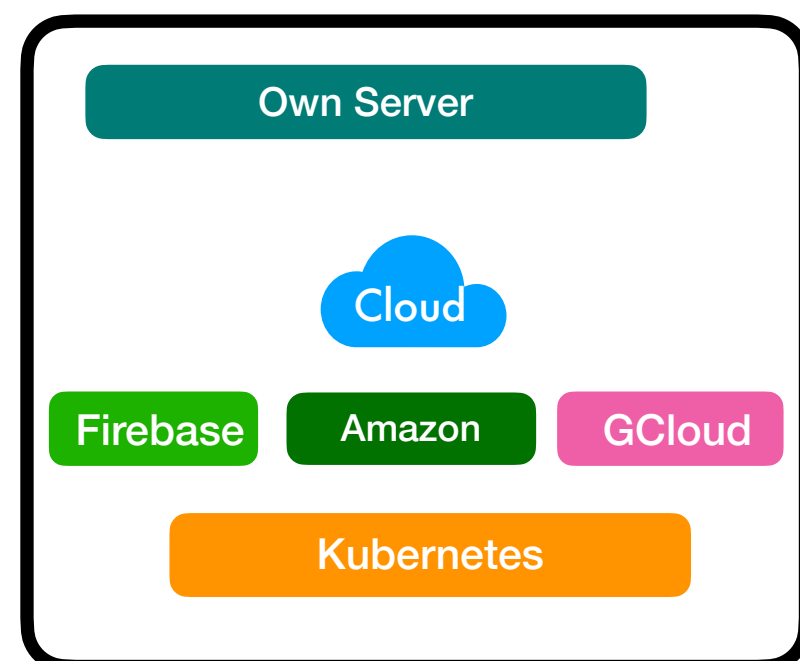


Device

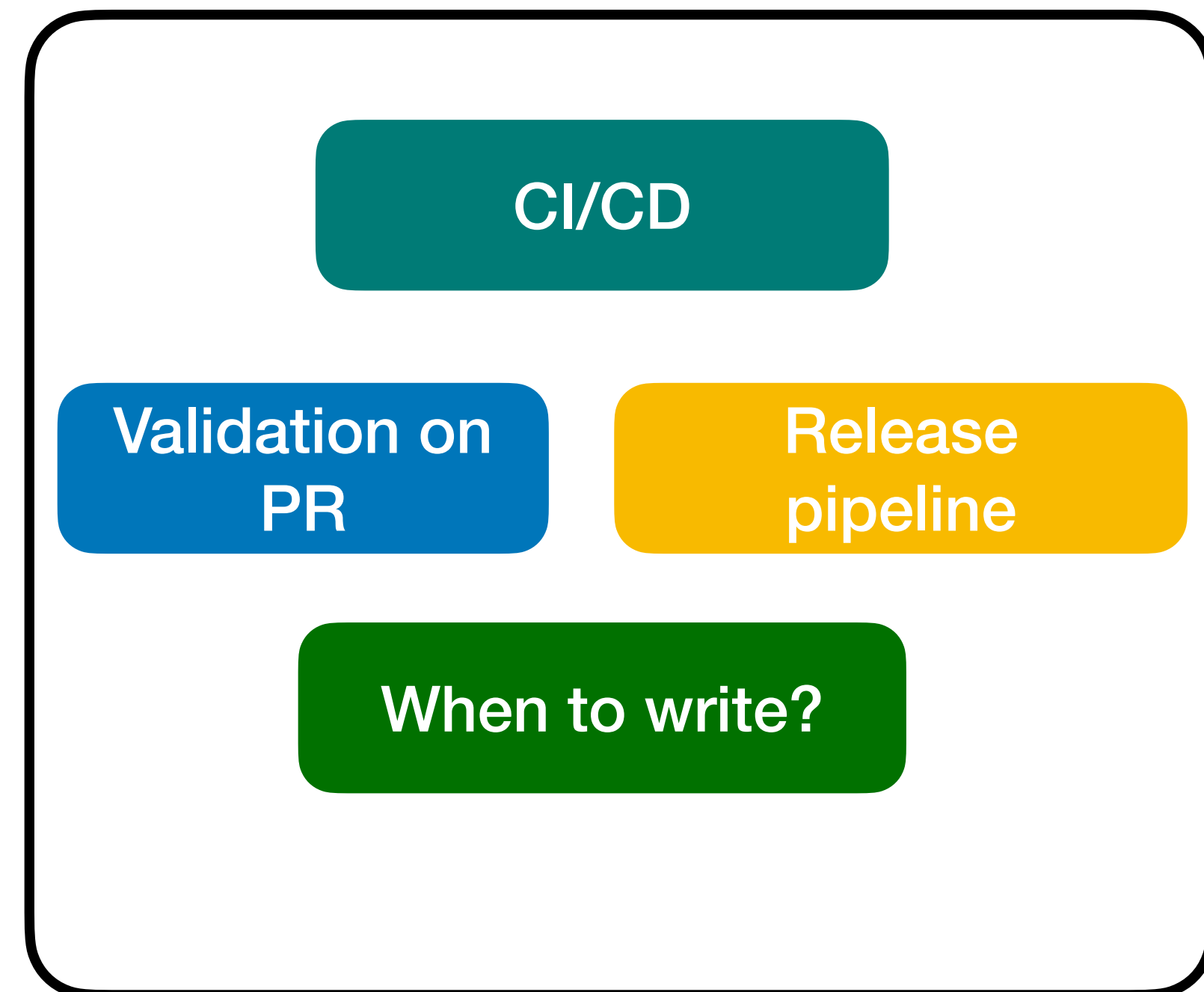


Device condition

Infrastructure



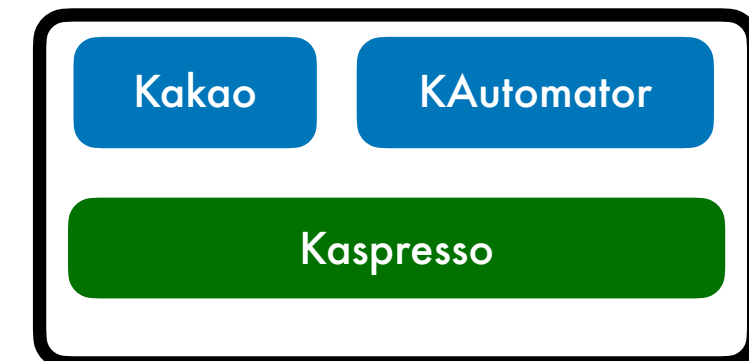
Processes



Writing

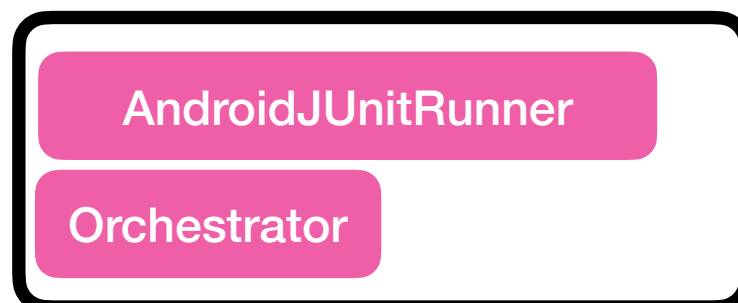


Google provided

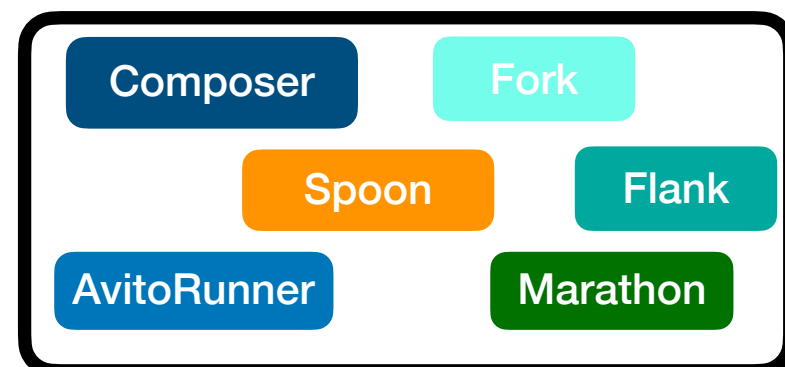


Community

Running

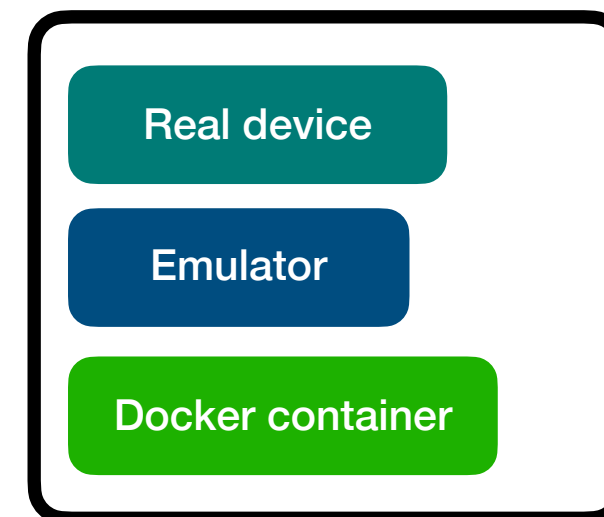


Google provided

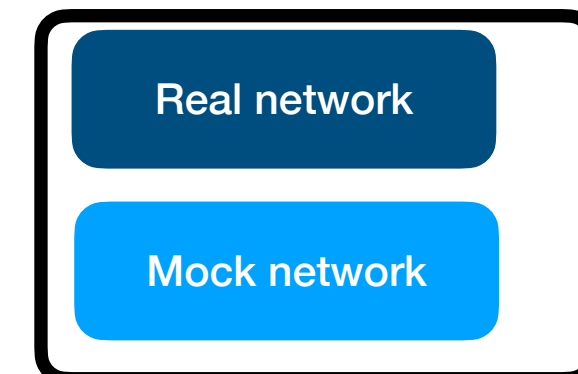


Community

Whereto run

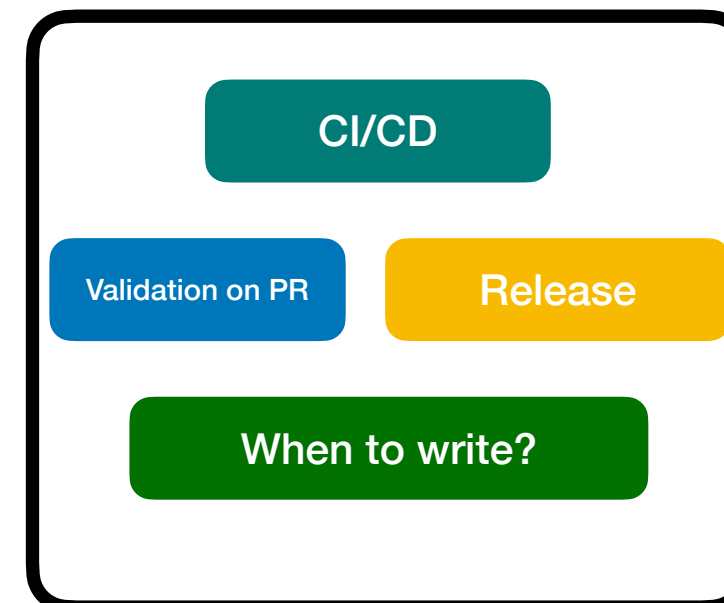


Device

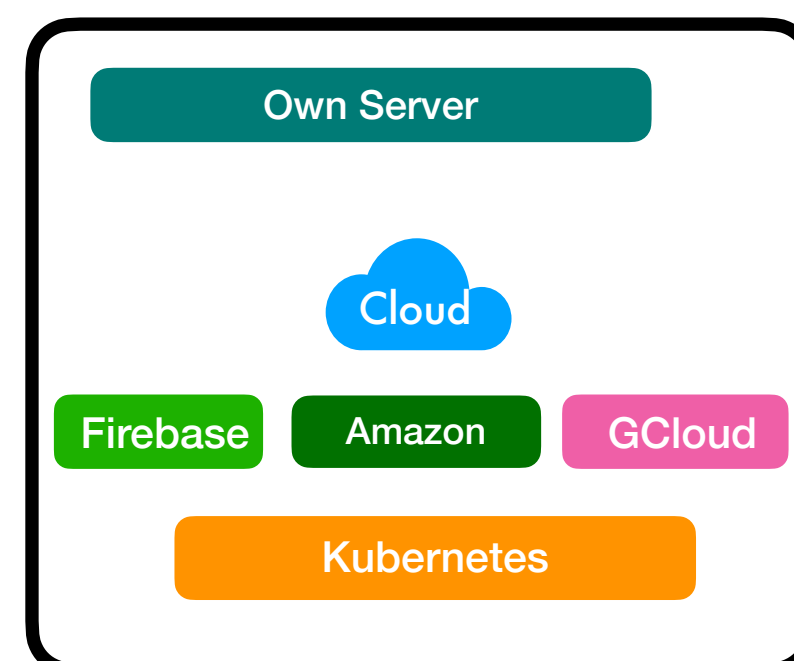


Device condition

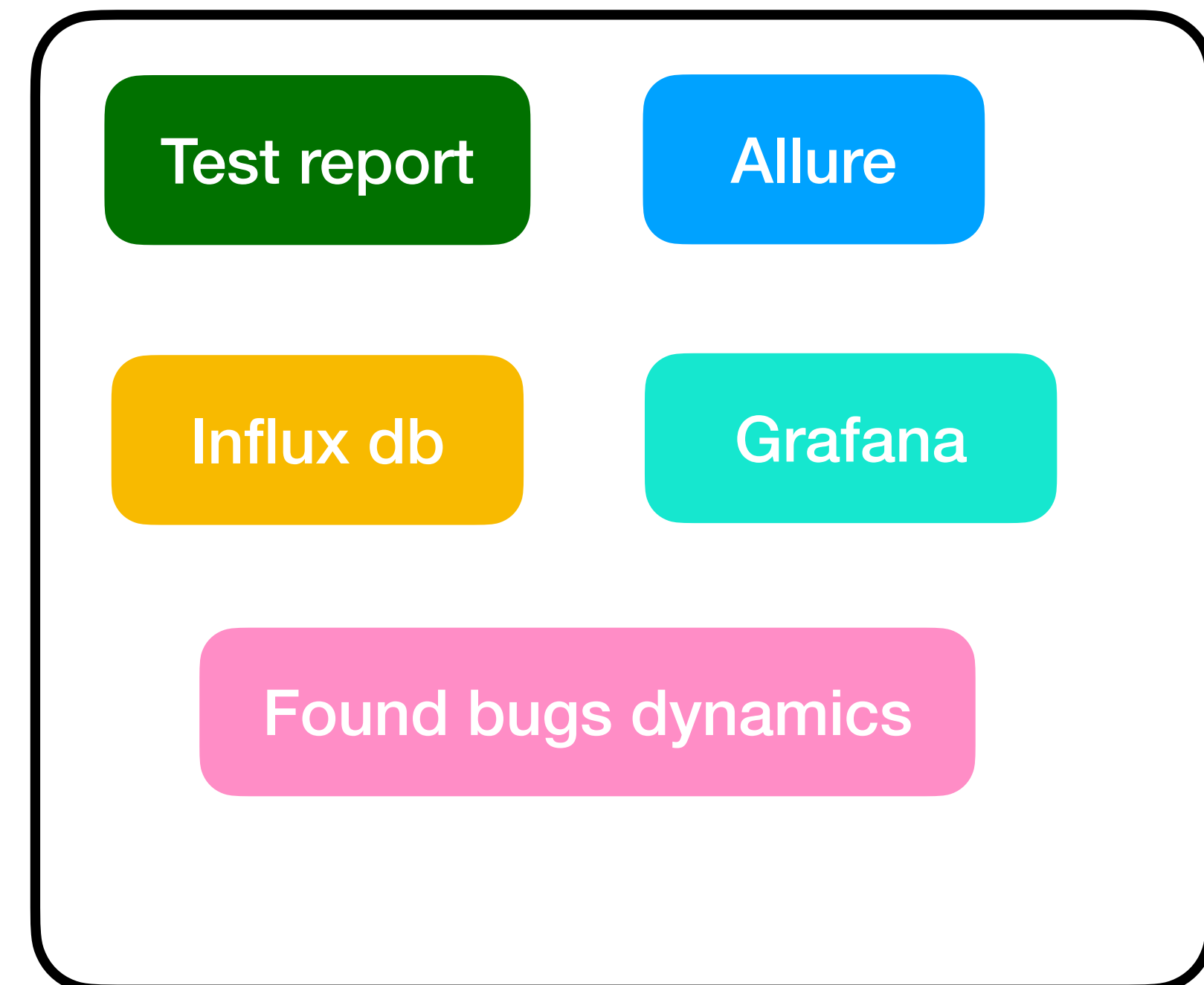
Processes



Infrastructure



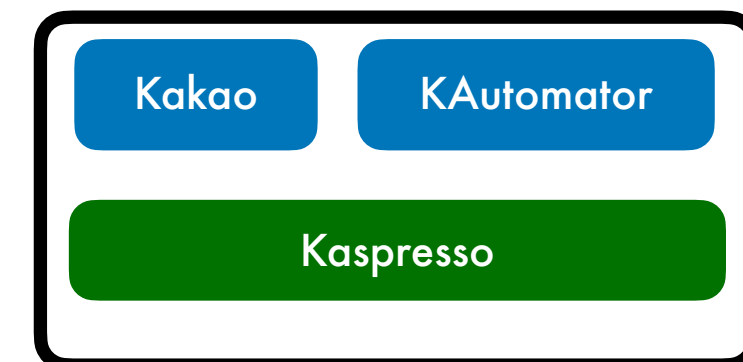
Analytics



Writing

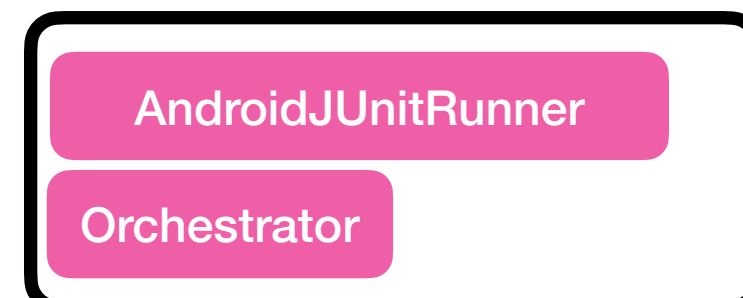


Google provided

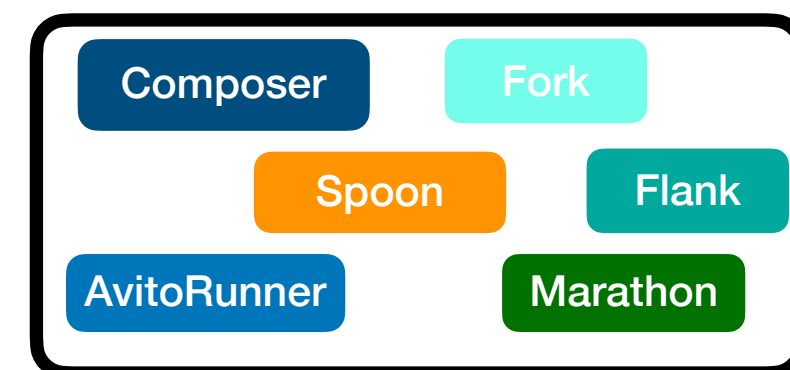


Community

Running

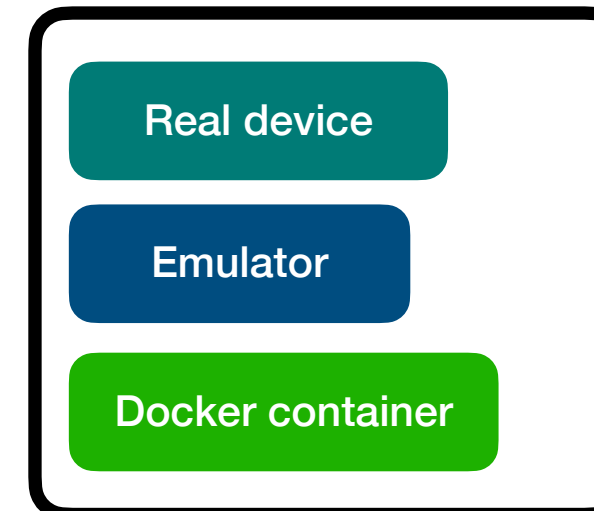


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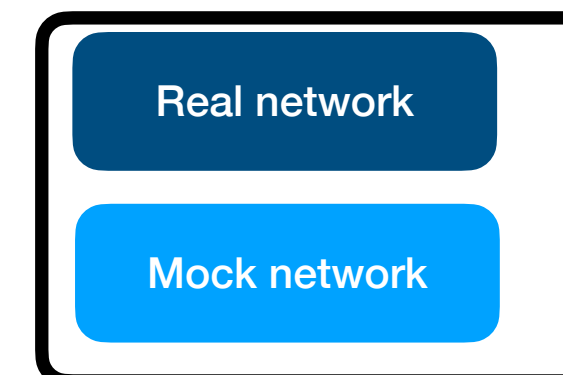


Community

Where to run

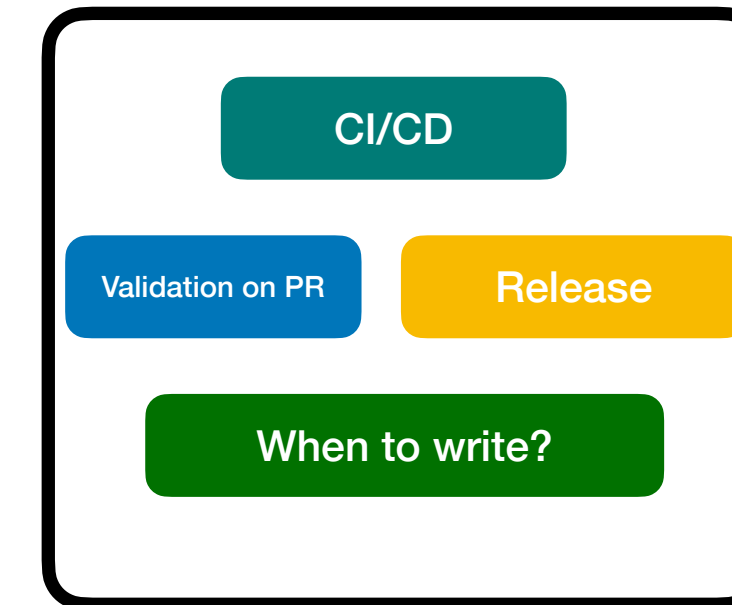


Device

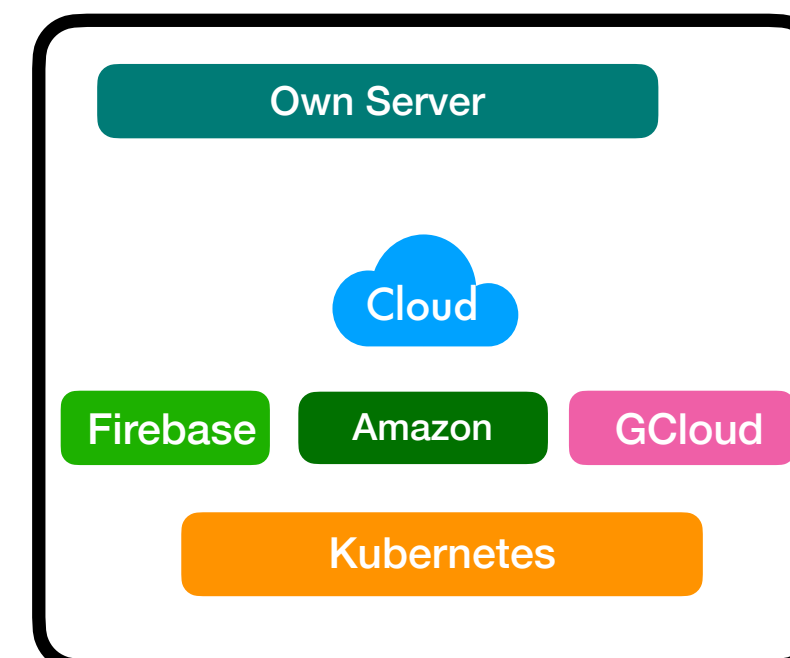


Device condition

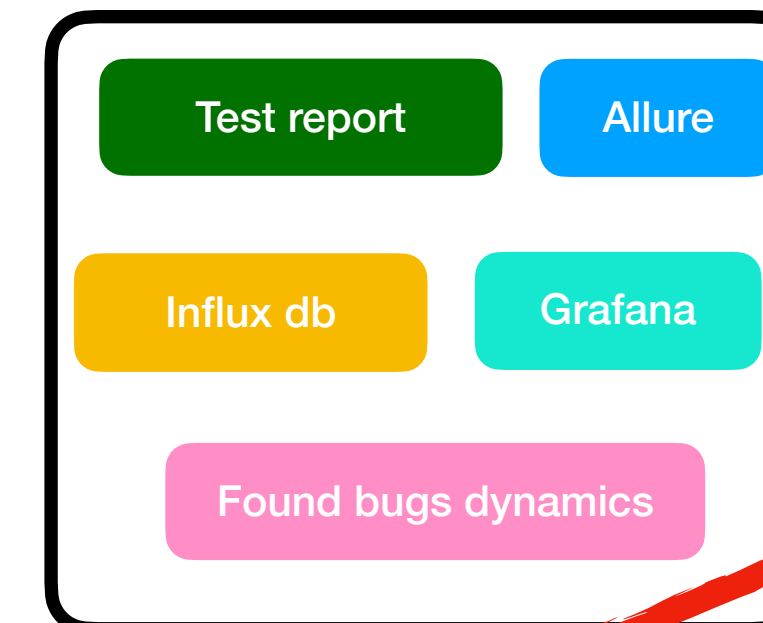
Processes



Infrastructure



Analytics



Should work fine

Writing

Espresso

UiAutomator

Google provided

Kakao

KAutomator

Kaspresso

Community

Where to run

Real device

Emulator

Docker container

Device

Real network

Network

Device condition

Processes

CI/CD

Validation on PR

Release

When to write?

Running

AndroidJUnitRunner

Orchestrator

Google provided

Composer

Fork

Spoon

Flank

AvitoRunner

Marathon

Community

Infrastructure

Own Server

Cloud

Firebase

Amazon

GCloud

Kubernetes

Analytics

Test report

Allure

Influx db

Grafana

Found bugs dynamics

Цель воркшопа

Построение процесса автотестирования на Android
от А до Я в теории и на практике

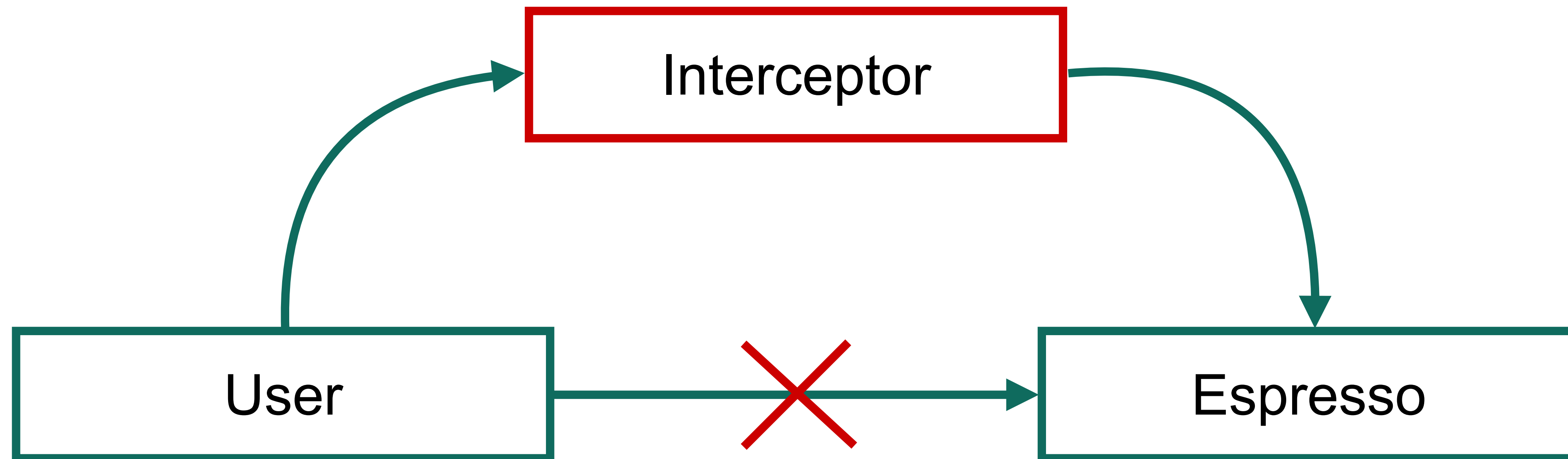
Heisenbug app



Почему Kaspreso

- Универсальный механизм интерсепторов
- Читаемый и понятный DSL + большое количество удобного API
- Стабильность
- Ускорение работы (Kautomator)
- Дополнительные логи по действиям тестов
- Возможность вызовы ADB команд
- Скриншотилка
- Поддержка Jetpack Compose, Robolectric, Allure

Механизм Интерсепторов



Механизм Интерсепторов

FlakyBehaviourInterceptor

```
FlakyBehaviourInterceptor.intercept(action =
```

AutoscrollBehaviourInterceptor

```
AutoscrollBehaviourInterceptor.intercept(action =
```

SystemDialogBehaviourInterceptor

```
SystemDialogBehaviourInterceptor.intercept(action =
```

Espresso

```
interaction.perform(ViewAction)
```

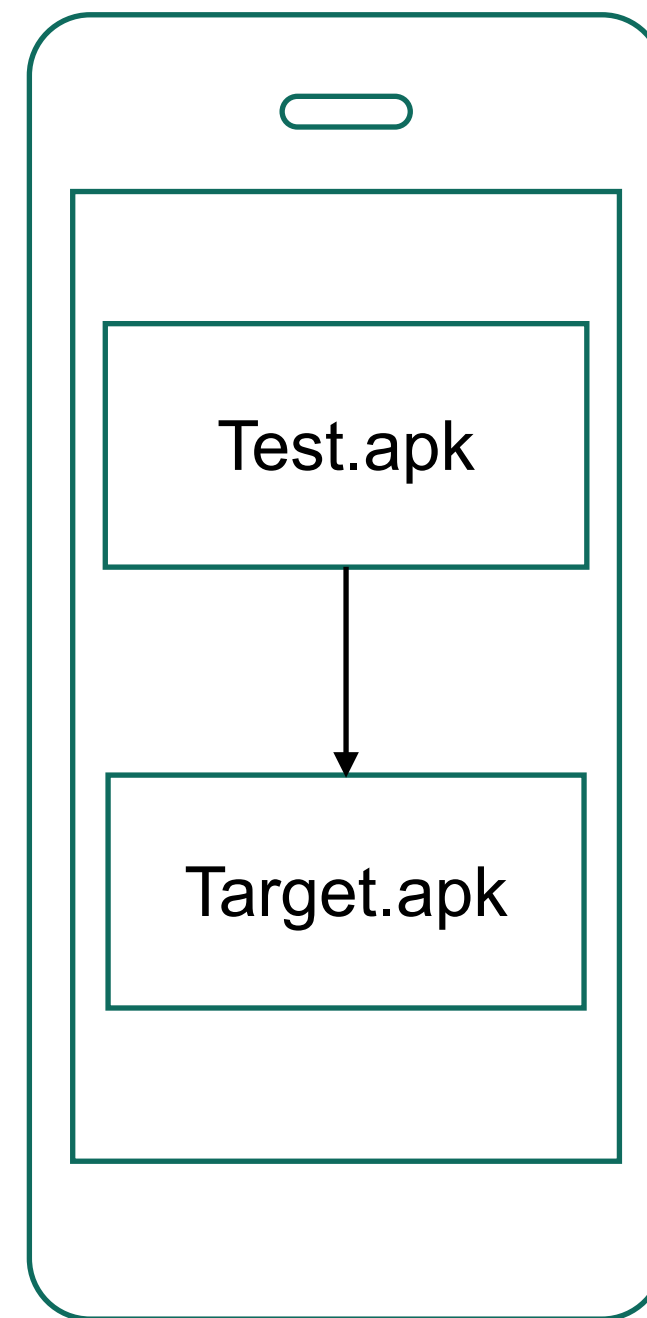

Механизм Интерсепторов

```
interaction.perform(ViewActionProxy (ViewAction) )
```

WatcherInterceptor

```
viewAction.perform (UIViewController, View)
```

Работа инструментальных тестов



Работа инструментальных тестов

Instrumentation is
the system - client
app interaction API

```
android.app.Instrumentation:
```

```
//...
```

```
static public Application newApplication(...) { ... }
```

```
public Application newApplication(...) { ... }
```

```
public void callApplicationOnCreate(...) { ... }
```

```
public Activity newActivity(...) { ... }
```

```
public Activity startActivitySync()
```

```
//...
```


Работа инструментальных тестов

AndroidJUnitRunner
starts JUnit tests
on the device

```
package android.app;

public class AndroidJUnitRunner extends Instrumentation { ... }

public class Instrumentation {

    public Application newApplication(ClassLoader cl,
                                     String className,
                                     Context context) {

        Application app =
            getFactory(context.getPackageName())
                .instantiateApplication(cl, className);

        app.attach(context);
        return app;
    }
}
```

Runners

Runner

JUnit4

AndroidJUnit4

AndroidJUnitRunner

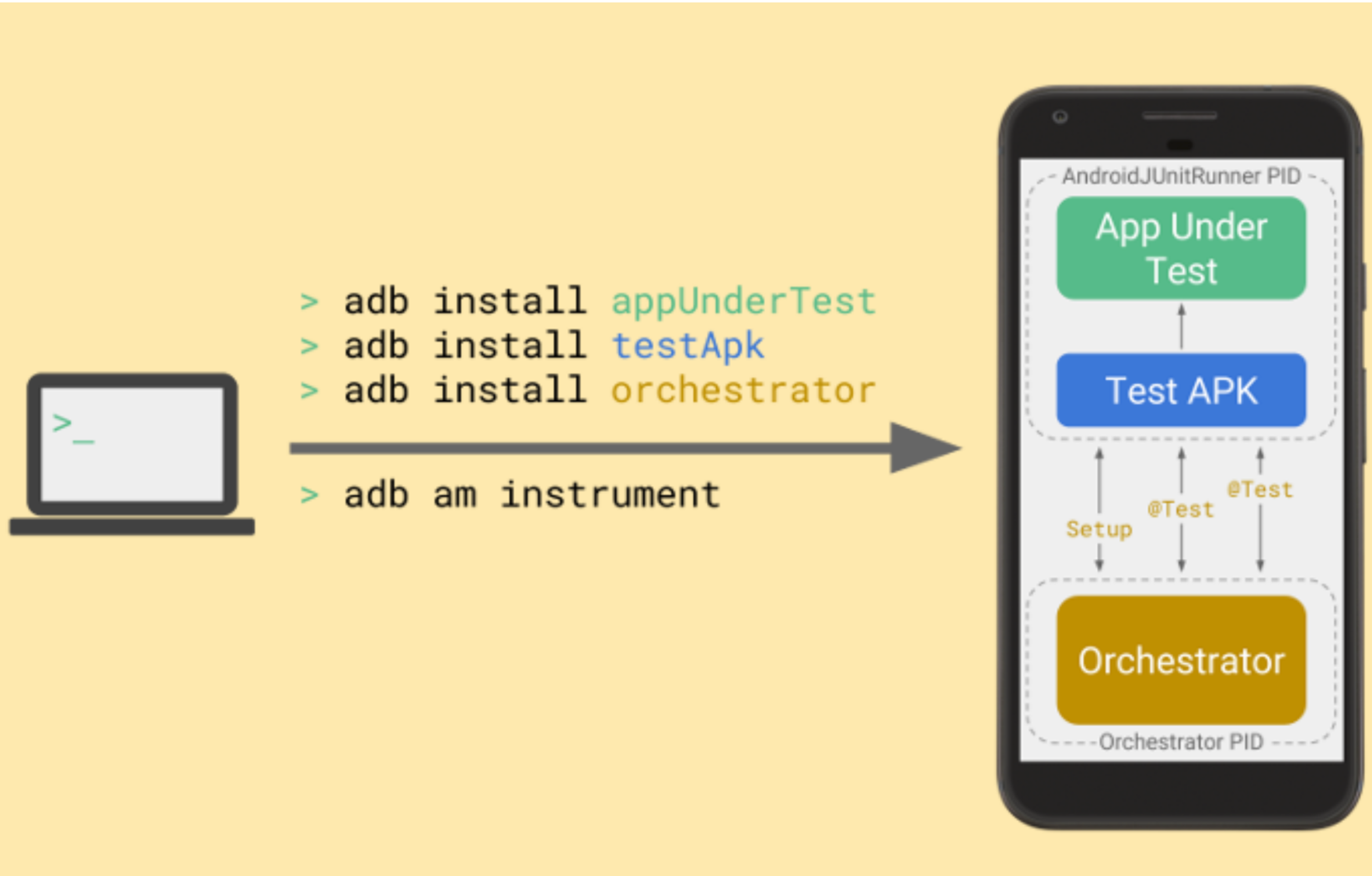
High Level Runner

Orchestrator

Marathon

Flank

Orchestrator



Почему Orchestrator не используется в продакшене?

- Отсутствие нормальных репортов
- Отсутствие нормального автомасштабирования
- Отсутствие ретраев
- Отсутствие предобработки флекающих тестов
- ADB заставляет страдать

Marathon

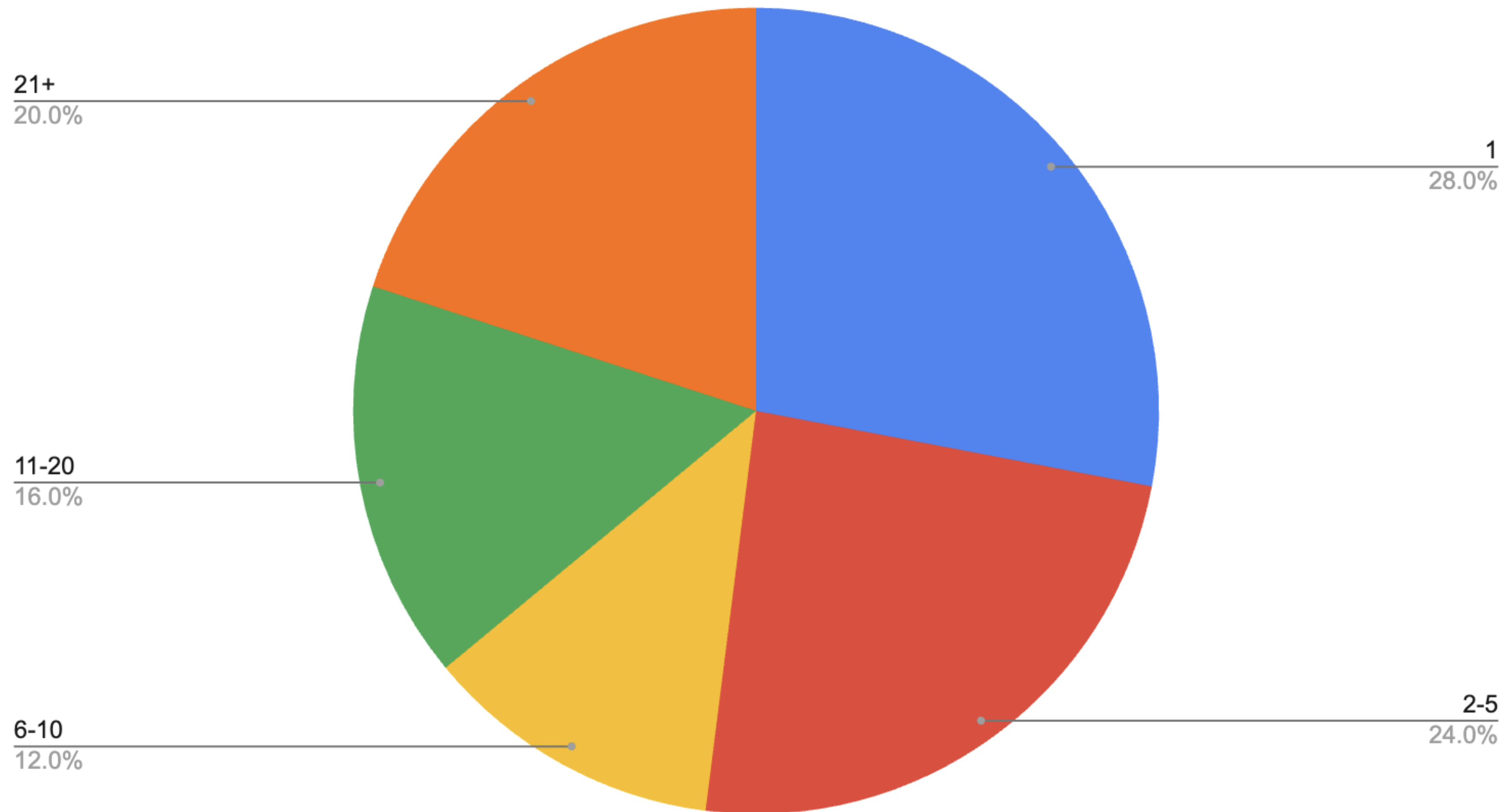
- Повторный запуск упавших тестов
- Flakiness стратегия
- Хорошие отчеты и поддержка Allure
- Изолированное окружение
- Замена ADB
- Cross Platform (iOS support)

На чем запускать тесты

- Настоящий девайс
 - +: он реальный
 - -: батарейка, вендоры, возраст
- Эмулятор
 - +: быстрый и простой
 - -: тяжело масштабируемый (внутреннее состояние)
- Docker container
 - +: масштабируемый, изолируемый, снэпшоты
 - -: только Linux

Инфраструктура

How many UI tests could be executed in parallel?



Инфраструктура

What infrastructure do you use for UI tests?

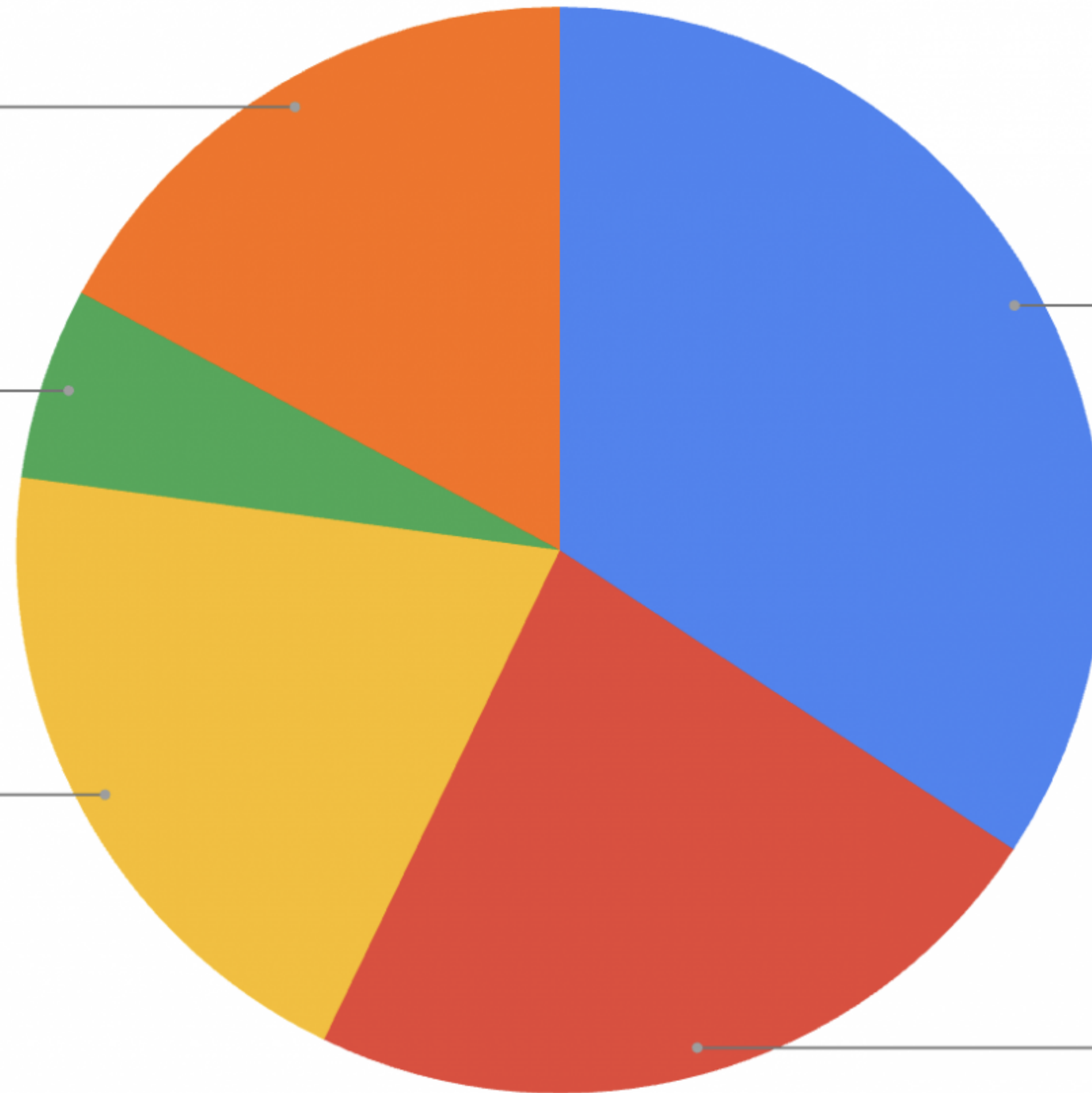
Others
17.1%

AWS
5.7%

Firebase TestLab
20.0%

Local Service
34.3%

One local machine
22.9%



Инфраструктура

- CI: GitLab CI
- Infrastructure:
 - Firebase Test Lab
 - TestWise



Let's Talk?

Telegram

Evgenii Matsiuk @eugene_matsyuk

Sergei Iartsev @syartsev