



# Непрерывное интеграционное тестирование мобильного SDK





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≈ 1 год в мире ручного тестирования web

≈ 3 года в мире автоматизации mobile

in/apesotskiy



@alter\_al

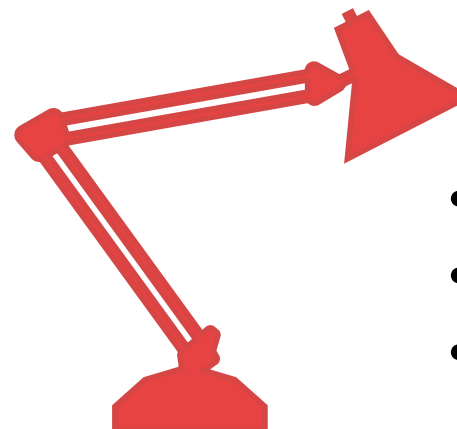




# my TRACKER

— это библиотека мобильной аналитики, которая:

- помогает строить эффективные рекламные кампании
- устанавливает качество трафика
- определяет пользовательский retention
- собирает системные события
- определяет аудиторию пользователей по возрасту/полу/локации
- рисует красивые отчеты



- iOS
- Android
- Unity

Системные события	
instal	Интеграция
launch	Android Добавляется как gradle-зависимость или jar-библиотека
pu	iOS Добавляется в виде фреймворка
login, registra	Unity Добавляется в виде Unity пакета
custom	

Почему мы тестируем интеграцию нашей библиотеки в сторонних приложениях?

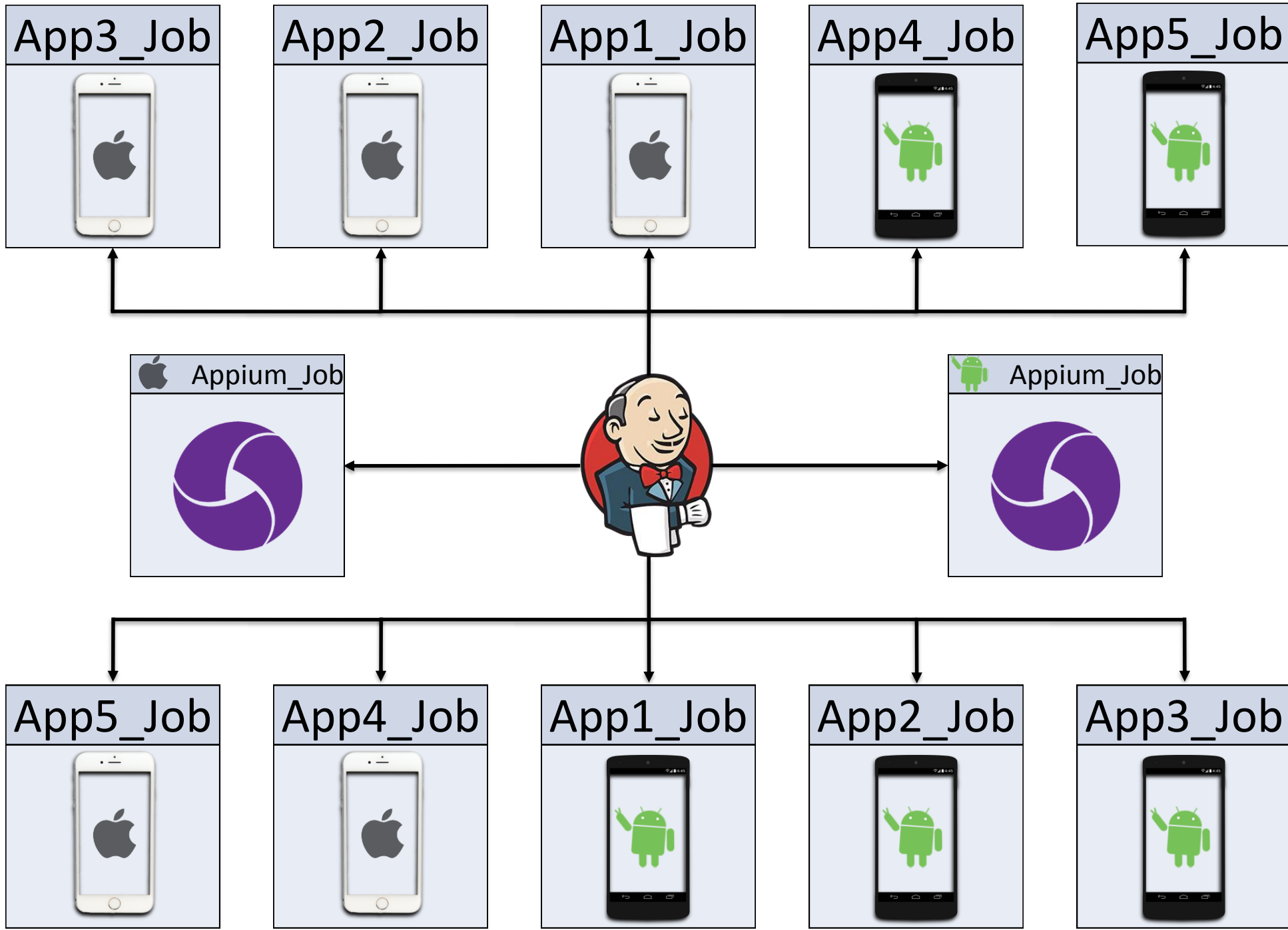
Потому что можем!

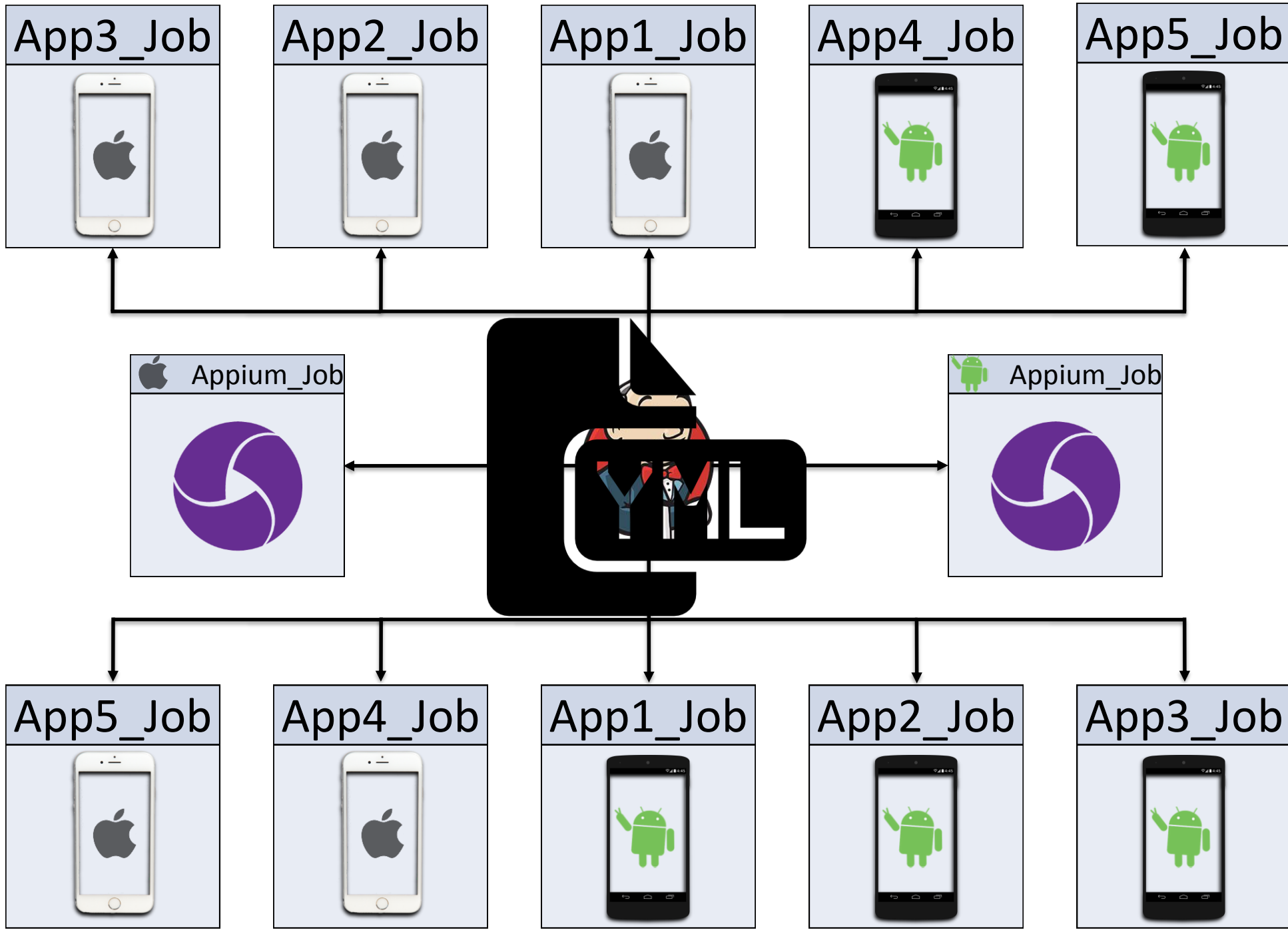


Кто если не мы?









```

1 - job:
2   name: 'Android_VK'
3   scm:
4     - git:
5       branches:
6         - '*/master'
7       credentials-id: bc71ced9-f7ca-4ec1-93f0-9c13d871b92b
8       url: git@gitlab.mail.ru:mytracker/myci.git
9   parameters:
10  - string:
11    name: hockey_build_id
12  wrappers:
13  - inject:
14    properties-content: |
15      hockey_host=https://rink.hockeyapp.net/api/2/apps
16      hockey_app_id=834384384123123242342
17      tracker_app_id=326328027538557155048
18      udid=85485458839239434
19      adId=4235-FRGRE3-SDEF23-43DSG4-3234
20  builders:
21  - shell: |-
22    curl "$JENKINS_URL/job/appium/build"
23
24    curl -s -o $APP_PATH \
25      -H "X-HockeyAppToken: $HOCKEY_TOKEN" \
26      -O -L "$hockey_host/$hockey_app_id/app_versions/$hockey_build_id?format=apk"
27
28    ./gradlew clean testme -Dos=Android \
29      -Dudid=$udid \
30      -DadId=$adId \
31      -DappId=$tracker_app_id
32  publishers:
33  - post-tasks:
34    script: |
35    curl "$JENKINS_URL/job/appium/lastBuild/stop"

```

// имя сборки

// git репозиторий

// параметры на входе

// исходные параметры сборки

// запуск appium

// скачивание билда из Hockey App

// запуск тестов

// послесборочное выключение appium

```
1 project:
2   name: android_template_tracker_apps_testing
3   jobs:
4     - '{android_tracker_app_name}':
5       android_tracker_app_name: Android_Horoscopes
6       udid: 0184333399927859
7       hockey_app_id: 1329282d1fd8e6d860862a649f195425
8       receiver: ru.mail.horo.android.InstallRefererReceiver
9       tracker_app_id: 11101025134043565114
10      node_name: "mars"
11     - '{android_tracker_app_name}':
12       android_tracker_app_name: Android_Dev-MYM
13       udid: 0184333399927859
14       hockey_app_id: db33ddb68ac6e9461dbdde13fd8687b0
15       receiver: ru.mail.mrgservice.MRGSBROADCASTReceiver
16       tracker_app_id: 15807859288836161790
17       node_name: "mars"
18     - '{android_tracker_app_name}':
19       android_tracker_app_name: Android_JuggernautWars
20       udid: 0184333399927859
21       hockey_app_id: a6fe4f0bd5bfc7c415ea5249b90966b3
22       receiver: ru.mail.mrgservice.MRGSBROADCASTReceiver
23       tracker_app_id: 12040654188323781285
24       node_name: "mars"
25     - '{android_tracker_app_name}':
26       android_tracker_app_name: Android_Hawk
27       udid: 0184333399927859
28       hockey_app_id: f5bd4c05160b49159783b013d77c6eab
29       receiver: com.my.tracker.campaign.CampaignReceiver
30       tracker_app_id: 67064709953629362569
31       node_name: "mars"
32     - '{android_tracker_app_name}':
33       android_tracker_app_name: Android_VK_Live
34       udid: 0184333399927859
35       hockey_app_id: 9f9a1f2aa6b046a799661eed973785f9
36       receiver: com.my.tracker.campaign.CampaignReceiver
37       node_name: "mars"
38     - '{android_tracker_app_name}':
39       android_tracker_app_name: Android_News
40       udid: 0184333399927859
41       hockey_app_id: 606e6d690da0876fdb72ce2d2a759a34
42       receiver: ru.mail.mailnews.CustomCampaignTrackingReceiver
43       tracker_app_id: 06906500589285095554
44       node_name: "mars"
45     - '{android_tracker_app_name}':
46       android_tracker_app_name: Android_Artisto
47       udid: 0184333399927859
48       hockey_app_id: 26259cfd3b7c438cb6634873f3a647d5
49       receiver: com.my.tracker.campaign.CampaignReceiver
50       tracker_app_id: 81839671394550224296
51       node_name: "mars"
52     - '{android_tracker_app_name}':
53       android_tracker_app_name: Android_RideShare
54       udid: 0184333399927859
55       hockey_app_id: 790c300a48744ec3ab70891dda95a4ba
56       receiver: com.my.tracker.campaign.CampaignReceiver
57       tracker_app_id: 75571494297757604525
58       node_name: "mars"
59     - '{android_tracker_app_name}':
60       android_tracker_app_name: Android_Vesna
61       udid: 0184333399927859
62       hockey_app_id: ea8b5c5bf2ac434d9dc644dea2386a4c
63       receiver: com.my.tracker.campaign.CampaignReceiver
64       node_name: "mars"
65     - '{android_tracker_app_name}':
66       android_tracker_app_name: Android_myMail
67       udid: 0184333399927859
68       hockey_app_id: 8646b252f46bc287d6edd717b43ae65b
69       receiver: com.my.tracker.campaign.CampaignReceiver
70       tracker_app_id: 01867715168847660983
71       node_name: "mars"
72     - '{android_tracker_app_name}':
73       android_tracker_app_name: Android_MapsMe
74       udid: 0184333399927859
```

- // имя Jenkins Job Builder шаблона
- // параметры приложения N
- // параметры приложения N+1
- // параметры приложения N+2
- // параметры приложения N+3
- // параметры приложения N+4
- // параметры приложения N+5
- // параметры приложения N+6
- // параметры приложения N+7
- // параметры приложения N+8
- // параметры приложения N+9

Изи изи



Тестируемые платформы	<ul style="list-style-type: none"> <li>• iOS</li> <li>• Android</li> </ul>
Масштаб	<ul style="list-style-type: none"> <li>• &gt; 70 приложений</li> <li>• ≈ +1 приложение в месяц</li> </ul>
Скачивание нового билда	<ul style="list-style-type: none"> <li>• curl</li> <li>• gp-download</li> </ul>
Тесты	<ul style="list-style-type: none"> <li>• Appium::Java</li> </ul>
Отчет	<ul style="list-style-type: none"> <li>• Slack</li> <li>• Jenkins::Allure</li> </ul>
Время прохождения одной сборки	<ul style="list-style-type: none"> <li>• 5 - 10 минут</li> </ul>



Dashboard

Apps

Feedback

Statistics

Distribution Groups

Timeline

New App



All Apps

All Platforms

All Roles

All Organizations

Search Apps



Agent 3 Beta  
iOS | beta



Agent Beta  
Android | beta



am.ru And...  
Android | staging



am.ru iOS  
iOS | mytracker



Android - ...  
Android | beta



Android m...  
Android | beta



Android m...  
Android | store



Android Go...  
Android | alpha



Android Go...  
Android | beta



Android H...  
Android | beta



Android H...  
Android | beta



Android H...  
Android | alpha



Android П...  
Android | beta



Android П...  
Android | store



AWM Alph...  
Android | alpha



AWM Alph...  
iOS | enterprise



AWM ART  
iOS | enterprise



AWM DEV  
iOS | alpha



AWM DEV  
iOS | alpha



AWM FF  
Android | enterp



AWM GD ...  
iOS | alpha



AWM QA ...  
Android | alpha



AWM QA ...  
iOS | alpha



BeepCar A...  
Android | alpha



BeepCar i...  
iOS | alpha



BeepCar L...  
iOS | store



Chinese J...  
iOS | enterprise



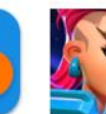
Chinese J...  
iOS | store



Cloud And...  
Android | alpha



Cloud iOS ...  
iOS | beta



Dev MYM  
Android | alpha



Dev MYM  
iOS | alpha



DonationAl...  
Android | alpha



EFFECTUM  
Android | beta



FreeU  
Android | beta



Heroes of ...  
Android | enterp



Heroes of ...  
iOS | enterprise



Hustle Cas...  
Android | beta



ICQ 3 Beta  
iOS | beta



ICQ Beta  
Android | beta



IFLY (Stable)  
Android | beta



IFLY (Stable)  
iOS | beta



iOS - Artist...  
iOS | store



iOS myMai...  
iOS | beta



iOS myMai...  
iOS | store



iOS Гopoc...  
iPhone | beta



iOS Новoc...  
iOS | betacorp



iOS Пoчтa...  
iOS | beta



iOS Пoчтa...  
iOS | store



Iron Desert  
Android | beta



Iron Desert  
iOS | beta



Juggernaut...  
Android | enterp



Juggernaut...  
iOS | enterprise



Juggernaut...  
Android | enterp



Juggernaut...  
Android | store



Juggernaut...  
Android | store



Juggernaut...  
iOS | enterprise



Jungle Heat  
Android | beta



Jungle Heat  
iOS | beta



JW Test  
Android | beta



JW Test  
iOS | beta



Maps.Me ...  
Android | beta



Maps.Me ...  
iOS | beta



Modern Ta...  
iOS | store



Neon  
iPhone | beta



O! Beta  
iPhone | beta



OK Beta  
iOS | beta



OK Live  
Android | beta



OK Live  
iPhone | alpha



OK Messa...  
Android | enterp



Pandao  
Android | beta



Pandao  
Android | store



Pandao  
iOS | enterprise



Pandao  
iOS | store



Pandao  
iOS | store



Panomatic...  
iOS | alpha



Panomatic...  
iOS | beta



Ramadan ...  
Android | beta



Ramadan ...  
iOS | beta



TIP Alpha  
Android | alpha



TIP Alpha  
iOS | alpha



vesna  
iPhone | beta



Vesna App  
Android | beta



VK Dev  
iPhone | enterpri



VK Live  
Android | beta



VKontakte  
Android | beta



ZakaZaka-...  
Android | beta



ZakaZaka-...  
iPhone | beta



Мой Мир  
Android | store



Мой Мир (β)  
iOS | beta



Мой мир  
iOS | store



OK  
Android | beta



OK Live  
Android | store



OK Live  
Android | store





- Установки
- Удаления
- Запуски
- Клики



- Отправка запросов



- Перехват запросов
- Сохранение запросов



- Поиск уникальных идентификаторов
- Поиск системных событий
- Проверка таймштампов
- Проверка минимальной версии SDK
- Проверка наличия локации и окружения, в зависимости от permissions
- Валидация запросов по json схеме



- Установки
- Удаления
- Запуски
- Клики



- Отправка запросов

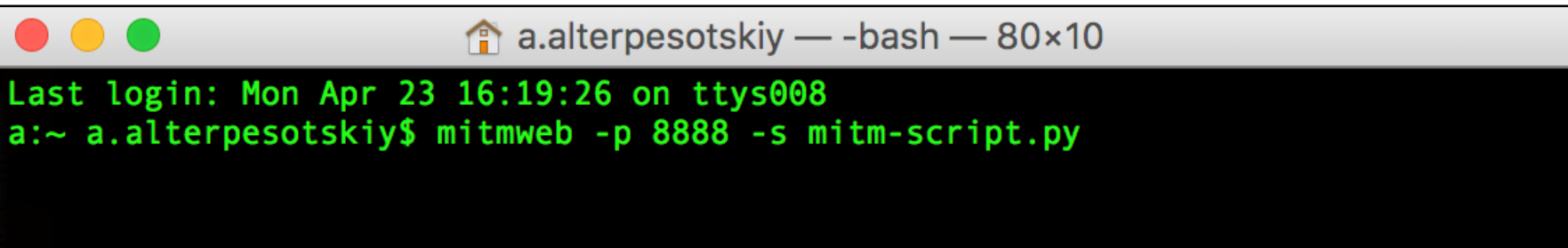


- Перехват запросов
- Сохранение запросов



- Поиск уникальных идентификаторов
- Поиск системных событий
- Проверка таймштампов
- Проверка минимальной версии SDK
- Проверка наличия локации и окружения, в зависимости от permissions
- Валидация запросов по json схеме

```
1 from mitmproxy import http
2 from random import randint
3 from pathlib import Path
4 import time
5 import json
6
7 sniffing_hosts = [ "tracker-api.my.com" ]
8 save_requests_path = str(Path.home()) + "/requests/"
9
10 def save_requests(request):
11     request.decode
12     try:
13         adid = json.loads(request.text)['device']['advertising_id']
14     except:
15         adid = json.loads(request.text)['device']['idfa']
16     request_folder = save_requests_path + adid
17     os.makedirs(request_folder, exist_ok=True)
18     file = request_folder + "/request_" + str(int(time.time())) + ".json"
19     with open(file, 'w') as f:
20         f.write(request.text)
21
22 def request(flow: http.HTTPFlow) -> None:
23     request = flow.request
24     if any(host in request.pretty_host for host in sniffing_hosts):
25         save_requests(request)
26
```



A terminal window with a title bar containing a home icon, the user name 'a.alterpesotskiy', and the shell '-bash' with window dimensions '80x10'. The terminal output shows the last login time and the execution of the 'mitmweb' command with specific options.

```
a.alterpesotskiy — -bash — 80x10
Last login: Mon Apr 23 16:19:26 on ttys008
a:~ a.alterpesotskiy$ mitmweb -p 8888 -s mitm-script.py
```

```
1 from mitmproxy import http
2 from random import randint
3 from pathlib import Path
4 import time
5 import json
6
7 sniffing_hosts = [ "tracker-api.my.com" ]
8 save_requests_path = str(Path.home()) + "/requests/"
9
10 def save_requests(request):
11     request.decode
12     try:
13         adid = json.loads(request.text)['device']['advertising_id']
14     except:
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16     request_folder = save_requests_path + adid
17     os.makedirs(request_folder, exist_ok=True)
18     file = request_folder + "/request_" + str(int(time.time())) + ".json"
19     with open(file, 'w') as f:
20         f.write(request.text)
21
22 def request(flow: http.HTTPFlow) -> None:
23     request = flow.request
24     if any(host in request.pretty_host for host in sniffing_hosts):
25         save_requests(request)
26
```

⬤ ⬤ ⬤ a.alterpesotskiy — -bash — 80×10

Last login: Mon Apr 23 16:19:26 on ttys008

a:~ a.alterpesotskiy\$ mitmweb -p 8888 -s mitm-script.py

Replay
 Duplicate
 Revert
 Delete
 Download
 Resume
 Abort

Flow Modification      Export      Interception








Path	Method	Status	Size	Time
https://tracker-api.my.com/v2/	POST	204	736b	3s

Request    Response    Details

POST https://tracker-api.my.com/v2/ HTTP/1.1

connection	close
Content-Type	application/json
Content-Encoding	gzip
User-Agent	Dalvik/2.1.0 (Linux; U; Android 6.0.1; Nexus 5 Build/M4B30Z)
Host	tracker-api.my.com
Accept-Encoding	gzip
Content-Length	736


```
{
  "app": {
    "app": "com.my.trackerdemo.initbutt",
    "app_lang": "ru",
    "appbuild": "727",
    "appver": "1.0"
  },
  "app_id": "00202000140707100040",
  "custom_events": [],
  "device": {
    "advertising_id": "41a02140-4d0f-4e00-0017-0a071000045a",
    "advertising_tracking_enabled": 1,
    "android_id": "00a7000107200200",
    "density": 3,
    "device": "hammerhead",
    "device_id": "0021000010070007",
    "dpi": 480,
    "euname": "Nexus 5",
    "h": 1920,
    "lang": "ru",
    "mac": "00:7a:11:00:00:10:10",
    "manufacture": "LGE",
    "mrgs_device_id": "00002017000400004010100000000000",
    "os": "Android",
    "osver": "6.0.1",
    "rooted": false,
    "timezone": "GMT+03:00 Europe/Moscow",
    "w": 1080,
    "xdpi": 442.451,
    "ydpi": 443.345
  }
}
```

Replay Duplicate Revert Delete Download Resume Abort








Flow Modification Export Interception


Path	Method	Status	Size	Time	Request	Response	Details
------	--------	--------	------	------	---------	----------	---------

 https://tracker-api.my.com/v2/	POST	204	736b	385ms			
--	------	-----	------	-------	--	--	--

HTTP/1.1 204 No Content	
Server	nginx
Date	Mon, 23 Apr 2018 13:56:43 GMT
Connection	close

Response content missing.

        
 Replay Duplicate Revert Delete Download Resume Abort  
 Flow Modification Export Interception

Path	Method	Status	Size	Time
 https://tracker-api.my.com/v2/	POST	204	736b	385ms

Request Response Details

### Client Connection

Address: ::ffff:100.100.121.206:51197:0:0  
 TLS SNI: tracker-api.my.com

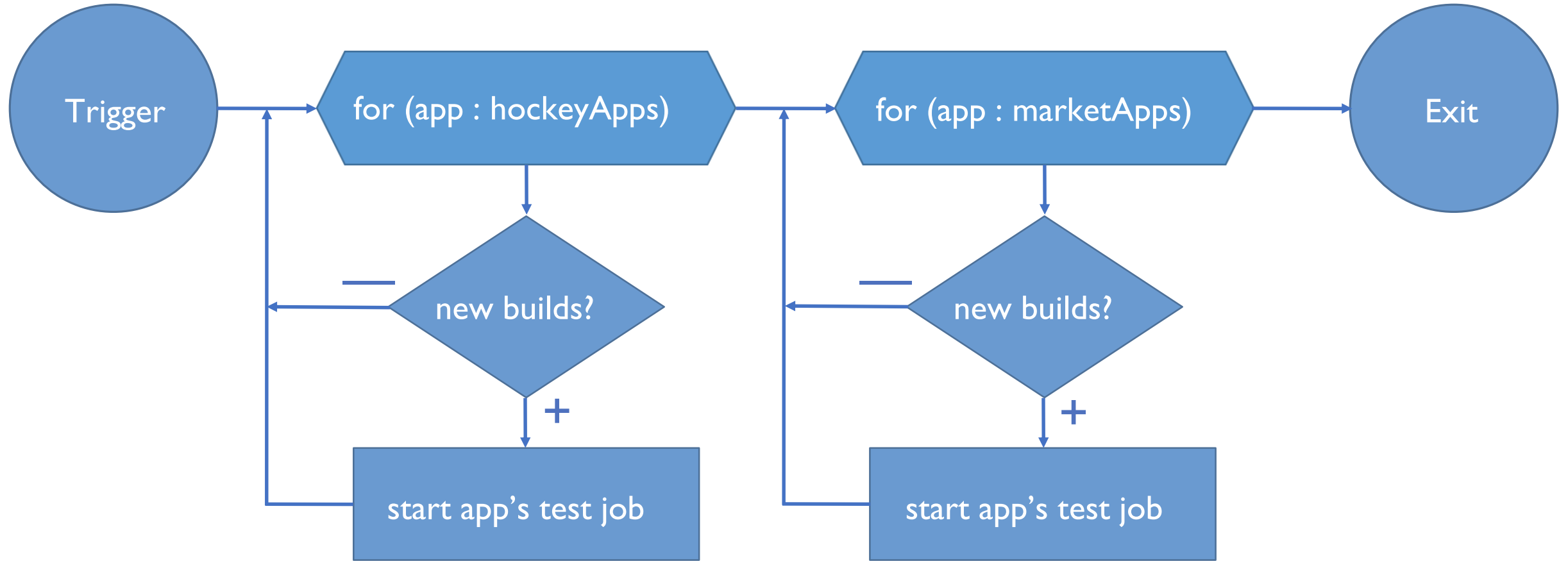
### Server Connection

Address: tracker-api.my.com:443  
 TLS SNI: tracker-api.my.com

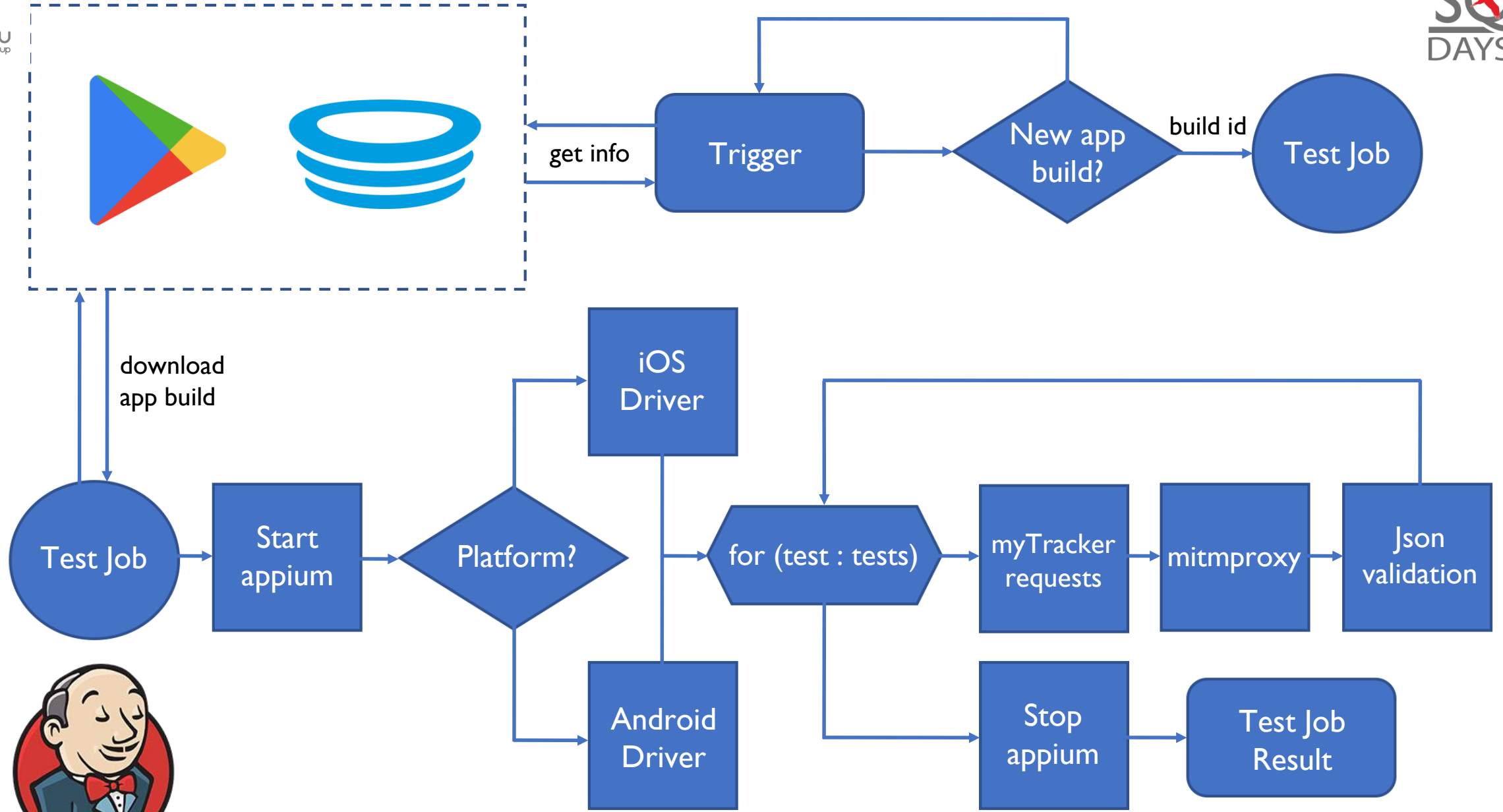
### Timing

Server conn. initiated: 2018-04-23 13:56:42.740(-220ms)  
 Server conn. TCP handshake: 2018-04-23 13:56:42.795(-165ms)  
 Client conn. established: 2018-04-23 13:56:42.694(-266ms)  
 First request byte: 2018-04-23 13:56:42.960  
 Request complete: 2018-04-23 13:56:42.966(6ms)  
 First response byte: 2018-04-23 13:56:43.122(162ms)  
 Response complete: 2018-04-23 13:56:43.125(165ms)





Подробнее о триггере	
Реализация	Jenkins Job
Частота запуска	0 */1 * * *
Время выполнения	2.5 мин
Призвание	Запуск тестовых сборок



my.com

@mail.ru  
group

SQA<sup>®</sup>  
DAYS#23



iOS Update

Apple checks

iOS apps signing

Android sniffing traffic

Google updates

```
1 from mitmproxy import http
2
3 block_hosts = [
4     "appldnld.apple.com",
5     "mesu.apple.com"
6 ]
7
8 def request(flow: http.HTTPFlow) -> None:
9     if any(host in flow.request.pretty_host for host in block_hosts):
10        flow.kill()
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
```

## Software Update

iOS 9.1 is available for your iPhone and is ready to install.

Install Now

Later

Details

iOS Update

Apple checks

iOS apps signing

Android sniffing traffic

Google updates



```
a:~ a.alterpesotskiy$ mitmweb -p 8888 --ignore-hosts \  
'^(?:?!tracker-api.my.com|mytracker.mycdn.me|appldnld.apple.com|mesu.apple.com).)*$'
```

### Unable to Verify App

An Internet connection is required to verify trust of the developer "iPhone Distribution: Mail.Ru LLC". This app will not be available until verified.

**Cancel**

### Sign In to iTunes Store

To continue, enter the password for your Apple ID " \_\_\_\_\_ " ."

**Cancel**      **Sign In**

iOS Update

Apple checks

iOS apps signing

Android sniffing traffic

Google updates

```
Desktop — -bash — 99x20
Last login: Wed Apr 11 17:27:53 on ttys002
[a:Desktop a.alterpesotskiy$ ideviceinstaller -i MyTargetTestApp.app/
Uploading MyTargetTestApp.app package contents... DONE.
Installing '(null)'
Install: CreatingStagingDirectory (5%)
Install: ExtractingPackage (15%)
Install: InspectingPackage (20%)
Install: TakingInstallLock (20%)
Install: PreflightingApplication (30%)
Install: InstallingEmbeddedProfile (30%)
Install: VerifyingApplication (40%)
ERROR: Install failed. Got error "APIInternalError".
a:Desktop a.alterpesotskiy$
```



```
1 fastlane sigh resign /path/to/your.ipa \  
2   --signing_identity "iPhone Developer: Алексей (RB5K2HDWHS)" \  
3   -p /path/to/your.mobileprovision  
4  
5  
6
```



iOS Update

Apple checks

iOS apps signing

Android sniffing traffic

Google updates

Сниффинг трафика	
KitKat	
Lollipop	
Marshmallow	
Nougat	
Oreo	

@xml/network\_security\_config

iOS Update

Apple checks

iOS apps signing

Android sniffing traffic

Google updates





- myTracker: <https://tracker.my.com>



- Appium: <https://appium.io>



- Mitmproxy: <https://mitmproxy.org>



- Jenkins Job Builder: <https://docs.openstack.org/infra/jenkins-job-builder>



- Hockey App: <https://hockeyapp.net>



- Fastlane: <https://fastlane.tools>



- Google Play CLI: <https://npmjs.com/package/google-play-cli>



- Network security config: <https://github.com/levyitay/AddSecurityExceptionAndroid>



- Sandbox [https://github.com/alter-al/continuous\\_integration\\_testing\\_mobile\\_sdk](https://github.com/alter-al/continuous_integration_testing_mobile_sdk)