appium

mobile automation made awesome

Chinese Mobile Testing Summit • Beijing, CN
11 July 2015

Jonathan Lipps • Director of Ecosystem & Integrations • Sauce Labs

@AppiumDevs • @jlipps • @saucelabs

Appium: Open Source Mobile Automation

Director of Engineering, Ecosystems

Project Lead & Architect

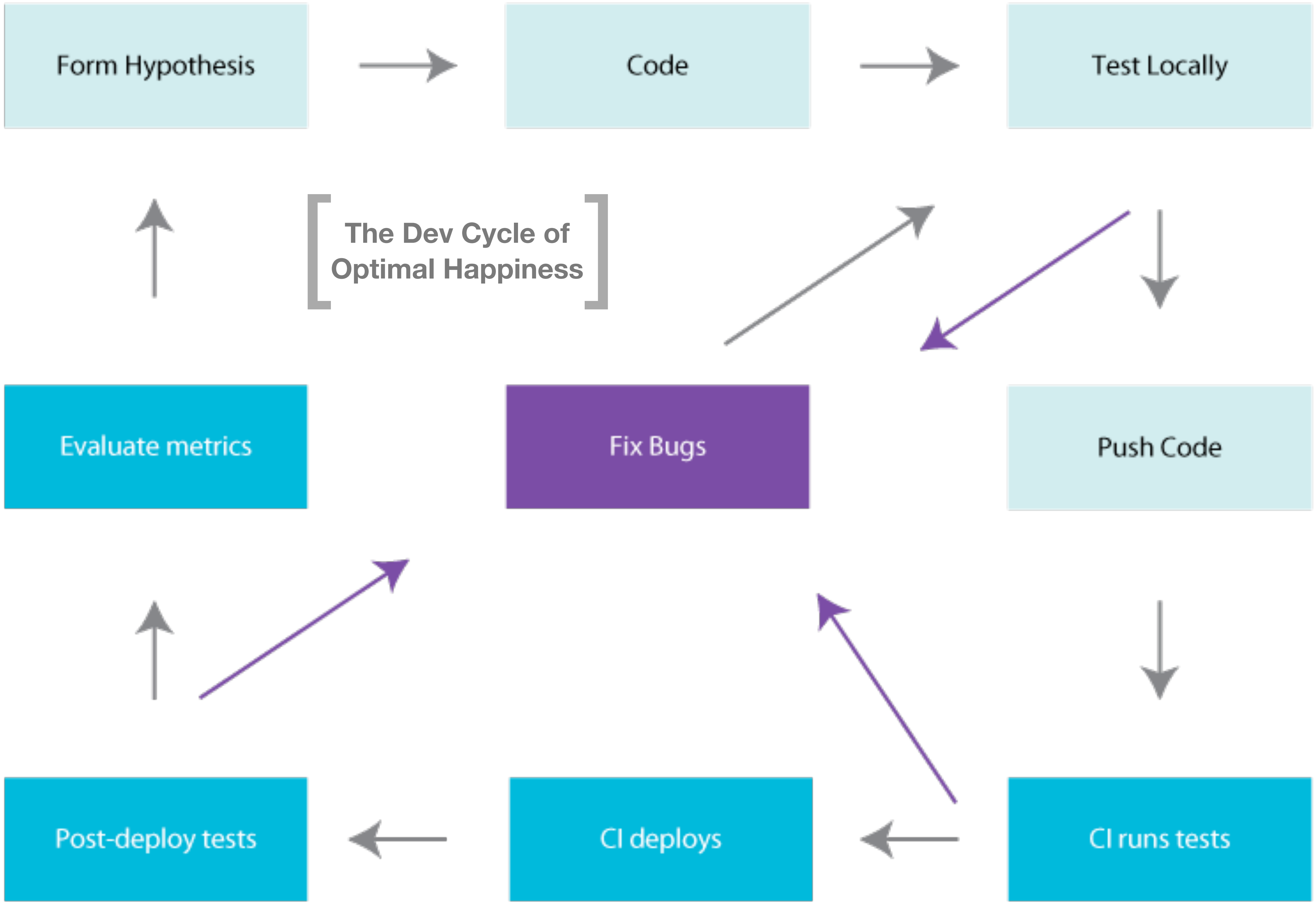
Jonathan Lipps • Director of Ecosystem & Integrations • Sauce Labs

@AppiumDevs • @jlipps • @saucelabs

appium introduction

Mobile is here to stay. So how do we **scale mobile quality**?

Automated testing is the solution for a fast dev cycle that maintains high quality


Form Hypothesis
Code
Test Locally
The Dev Cycle of Optimal Happiness
Evaluate metrics
Fix Bugs
Push Code
Post-deploy tests
CI deploys
CI runs tests

appium is the cross-platform solution for native and hybrid mobile automation

appium raison d’être

The appium philosophy

R1. Test the same app you submit to the marketplace

R2. Write your tests in any language, using any framework

R3. Use a standard automation specification and API

R4. Build a large and thriving open-source community effort

Platform Support

Real devices	🍎	🤖
Simulators	🍎	🤖
Native apps	🍎	🤖
Hybrid apps	🍎	🤖
Mobile web	🍎	🤖

Over **65** releases

Over **5,600** commits

3,000 issues closed

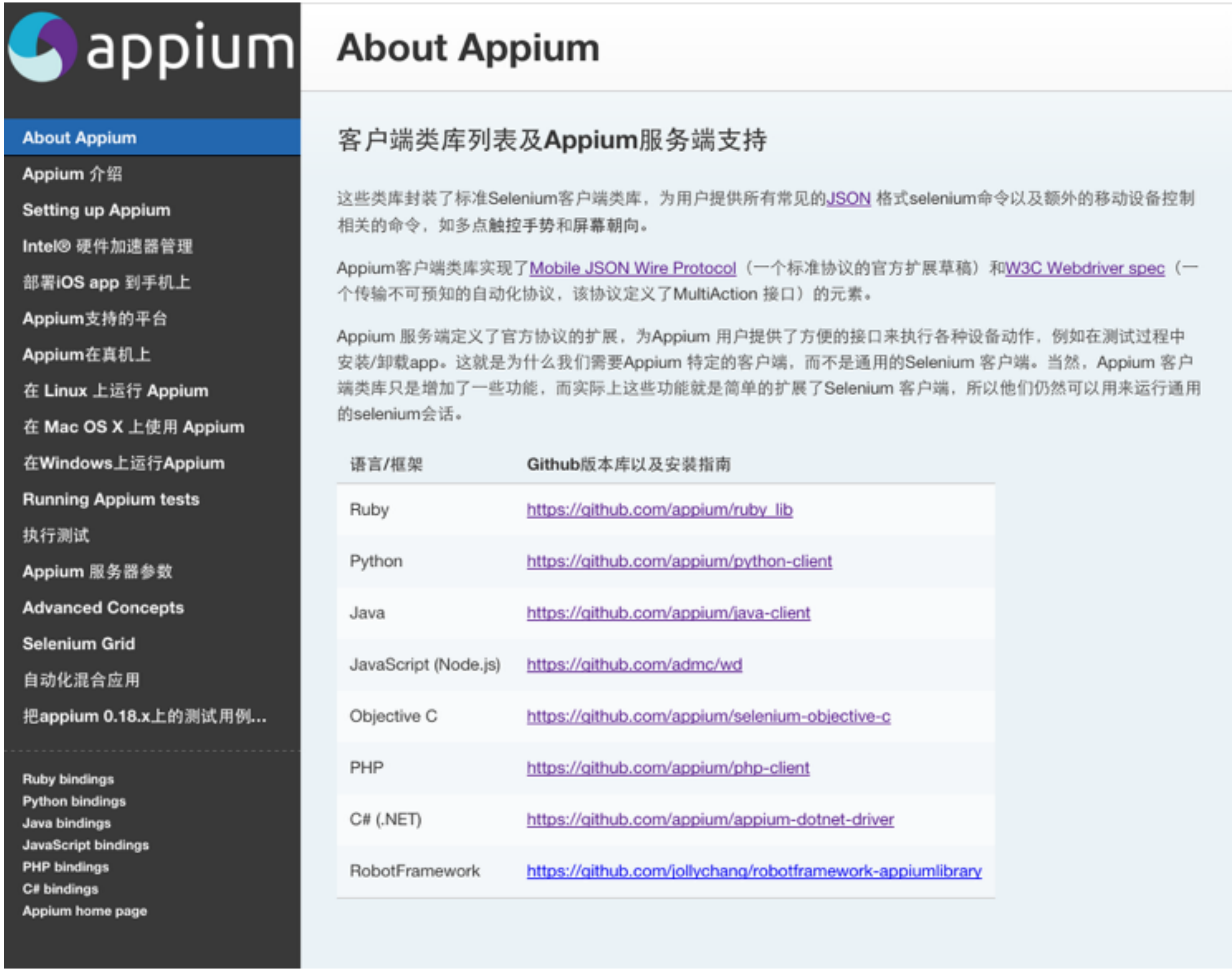
1,900 pull requests merged

2,400 stars

1,600 forks

Over **160** contributors

OSS Rookie of the Year, **Bossie** award



About Appium

客户端类库列表及Appium服务端支持

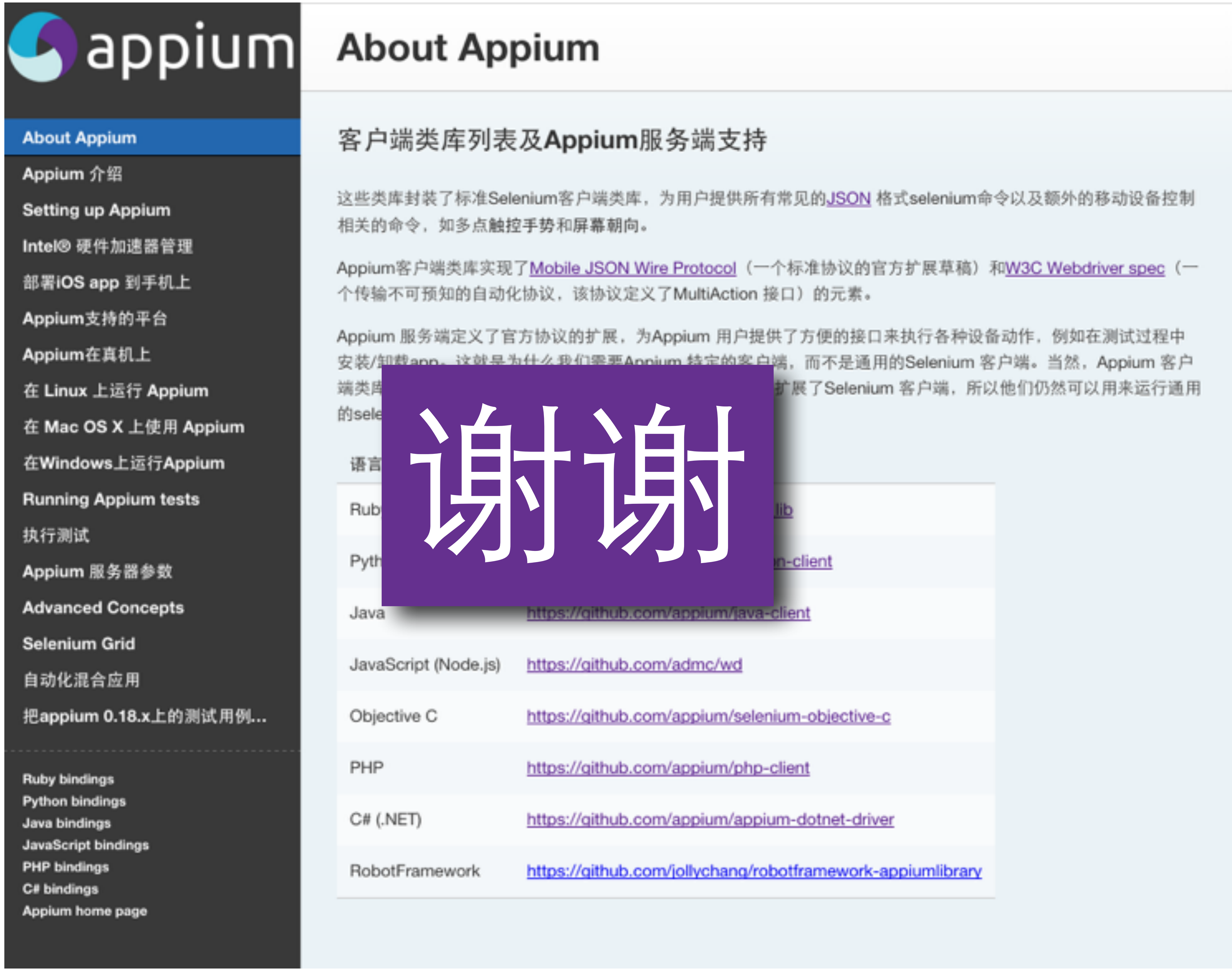
这些类库封装了标准Selenium客户端类库，为用户提供所有常见的JSON 格式selenium命令以及额外的移动设备控制相关的命令，如多点触控手势和屏幕朝向。

Appium客户端类库实现了Mobile JSON Wire Protocol（一个标准协议的官方扩展草稿）和W3C Webdriver spec（一个传输不可预知的自动化协议，该协议定义了MultiAction 接口）的元素。

Appium 服务端定义了官方协议的扩展，为Appium 用户提供了方便的接口来执行各种设备动作，例如在测试过程中安装/卸载app。这就是为什么我们需要Appium 特定的客户端，而不是通用的Selenium 客户端。当然，Appium 客户端类库只是增加了一些功能，而实际上这些功能就是简单的扩展了Selenium 客户端，所以他们仍然可以用来运行通用的selenium会话。

语言/框架	Github版本库以及安装指南
Ruby	https://github.com/appium/ruby_lib
Python	https://github.com/appium/python-client
Java	https://github.com/appium/java-client
JavaScript (Node.js)	https://github.com/admc/wd
Objective C	https://github.com/appium/selenium-objective-c
PHP	https://github.com/appium/php-client
C# (.NET)	https://github.com/appium/appium-dotnet-driver
RobotFramework	https://github.com/jollychang/robotframework-appiumlibrary

谢谢



About Appium

客户端类库列表及Appium服务端支持

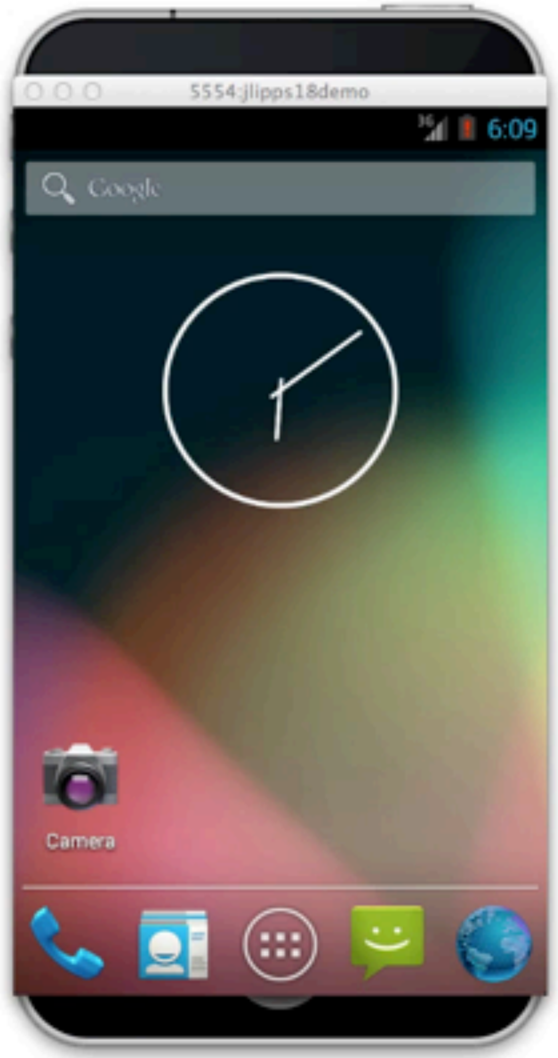
这些类库封装了标准Selenium客户端类库，为用户提供所有常见的JSON 格式selenium命令以及额外的移动设备控制相关的命令，如多点触控手势和屏幕朝向。

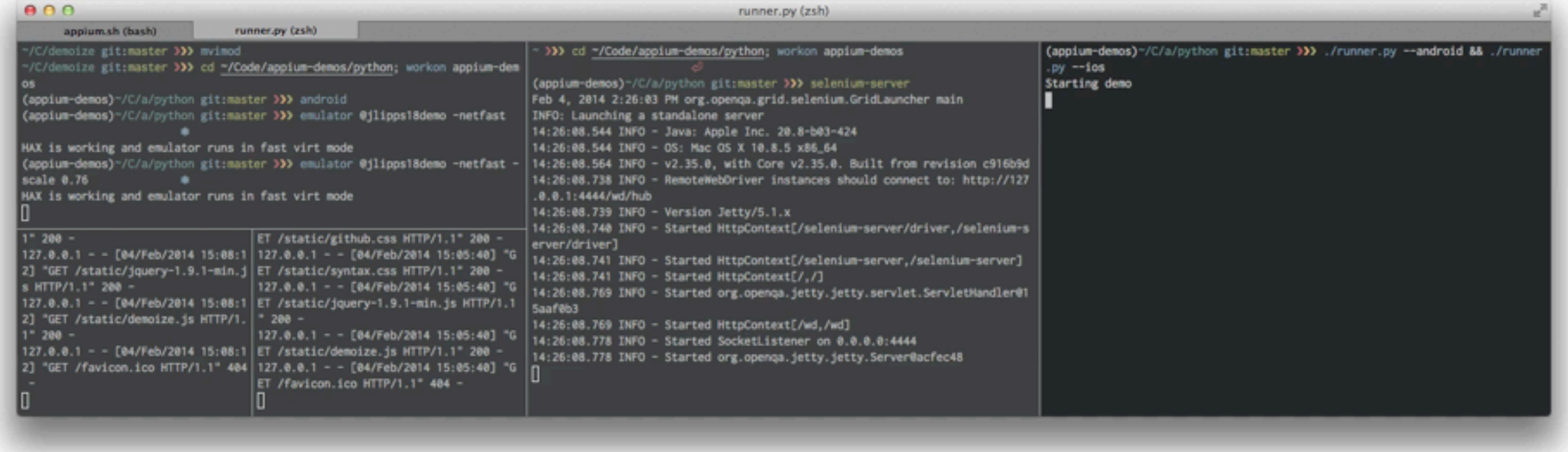
Appium客户端类库实现了Mobile JSON Wire Protocol（一个标准协议的官方扩展草稿）和W3C Webdriver spec（一个传输不可预知的自动化协议，该协议定义了MultiAction 接口）的元素。

Appium 服务端定义了官方协议的扩展，为Appium 用户提供了方便的接口来执行各种设备动作，例如在测试过程中安装/卸载app。这就是为什么我们需要Appium 特定的客户端，而不是通用的Selenium 客户端。当然，Appium 客户端类库 扩展了Selenium 客户端，所以他们仍然可以用来运行通用的sele

语言	
Rub	lib
Pyth	n-client
Java	https://github.com/appium/java-client
JavaScript (Node.js)	https://github.com/admc/wd
Objective C	https://github.com/appium/selenium-objective-c
PHP	https://github.com/appium/php-client
C# (.NET)	https://github.com/appium/appium-dotnet-driver
RobotFramework	https://github.com/jollychang/robotframework-appiumlibrary

Demos





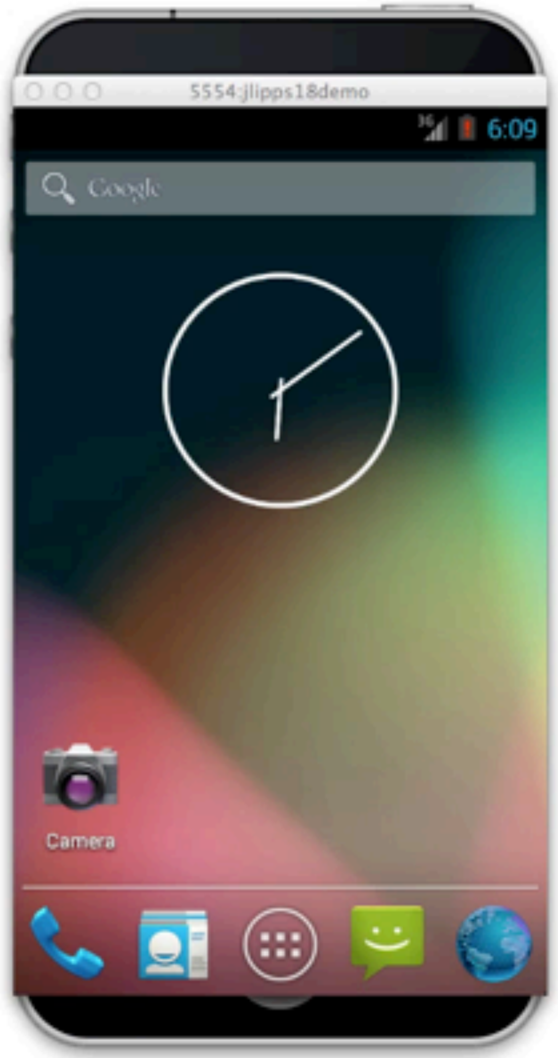
```
~/C/demoize git:master >>> mvimod
~/C/demoize git:master >>> cd ~/Code/appium-demos/python; workon appium-dem
os
(appium-demos)~/C/a/python git:master >>> android
(appium-demos)~/C/a/python git:master >>> emulator @jlipps18demo -netfast

HAX is working and emulator runs in fast virt mode
(appium-demos)~/C/a/python git:master >>> emulator @jlipps18demo -netfast -
scale 0.76
HAX is working and emulator runs in fast virt mode
```

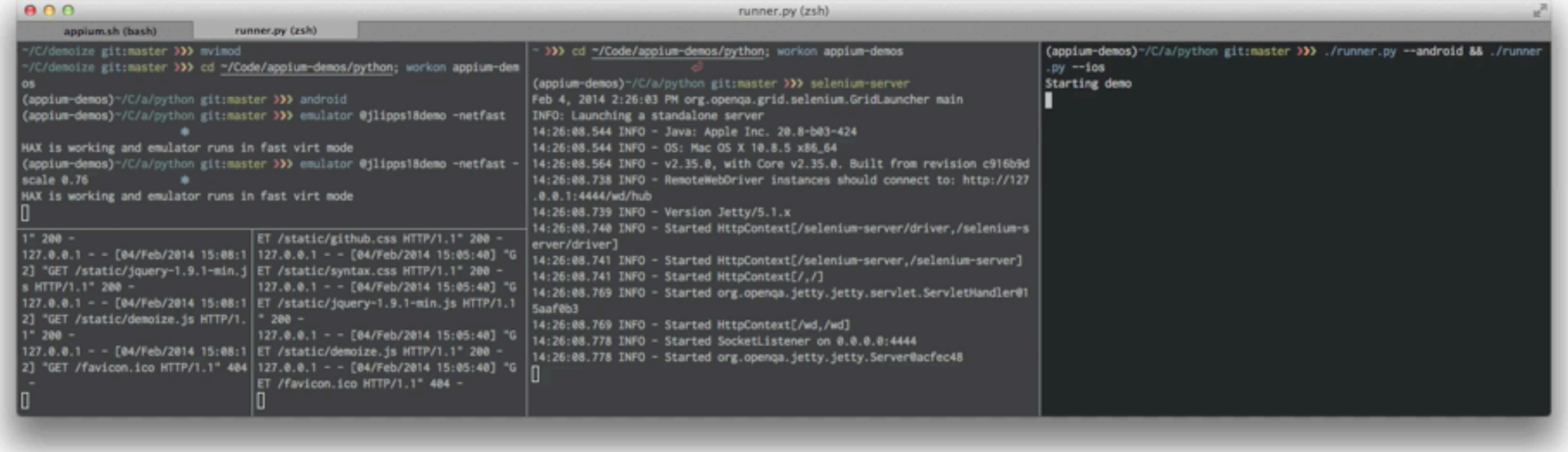
```
1" 200 -
127.0.0.1 - - [04/Feb/2014 15:08:1
2] "GET /static/jquery-1.9.1-min.j
s HTTP/1.1" 200 -
127.0.0.1 - - [04/Feb/2014 15:08:1
2] "GET /static/demoize.js HTTP/1.
1" 200 -
127.0.0.1 - - [04/Feb/2014 15:08:1
2] "GET /favicon.ico HTTP/1.1" 404
 -
```

```
ET /static/github.css HTTP/1.1" 200 -
127.0.0.1 - - [04/Feb/2014 15:05:40] "G
ET /static/syntax.css HTTP/1.1" 200 -
127.0.0.1 - - [04/Feb/2014 15:05:40] "G
ET /static/jquery-1.9.1-min.js HTTP/1.1
" 200 -
127.0.0.1 - - [04/Feb/2014 15:05:40] "G
ET /static/demoize.js HTTP/1.1" 200 -
127.0.0.1 - - [04/Feb/2014 15:05:40] "G
ET /favicon.ico HTTP/1.1" 404 -
```

```
~ >>> cd ~/Code/appium-demos/python; workon appium-demos

(appium-demos)~/C/a/python git:master >>> selenium-server
Feb 4, 2014 2:26:03 PM org.openqa.grid.selenium.GridLauncher main
INFO: Launching a standalone server
14:26:08.544 INFO - Java: Apple Inc. 20.8-b03-424
14:26:08.544 INFO - OS: Mac OS X 10.8.5 x86_64
14:26:08.564 INFO - v2.35.0, with Core v2.35.0. Built from revision c916b9d
14:26:08.738 INFO - RemoteWebDriver instances should connect to: http://127
.0.0.1:4444/wd/hub
14:26:08.739 INFO - Version Jetty/5.1.x
14:26:08.740 INFO - Started HttpContext[/selenium-server/driver,/selenium-s
erver/driver]
14:26:08.741 INFO - Started HttpContext[/selenium-server,/selenium-server]
14:26:08.741 INFO - Started HttpContext[/,/]
14:26:08.769 INFO - Started org.openqa.jetty.jetty.servlet.ServletHandler@1
5aaf0b3
14:26:08.769 INFO - Started HttpContext[/wd,/wd]
14:26:08.778 INFO - Started SocketListener on 0.0.0.0:4444
14:26:08.778 INFO - Started org.openqa.jetty.jetty.Server@acfec48
```

```
(appium-demos)~/C/a/python git:master >>> ./runner.py --android && ./runner
.py --ios
Starting demo
```





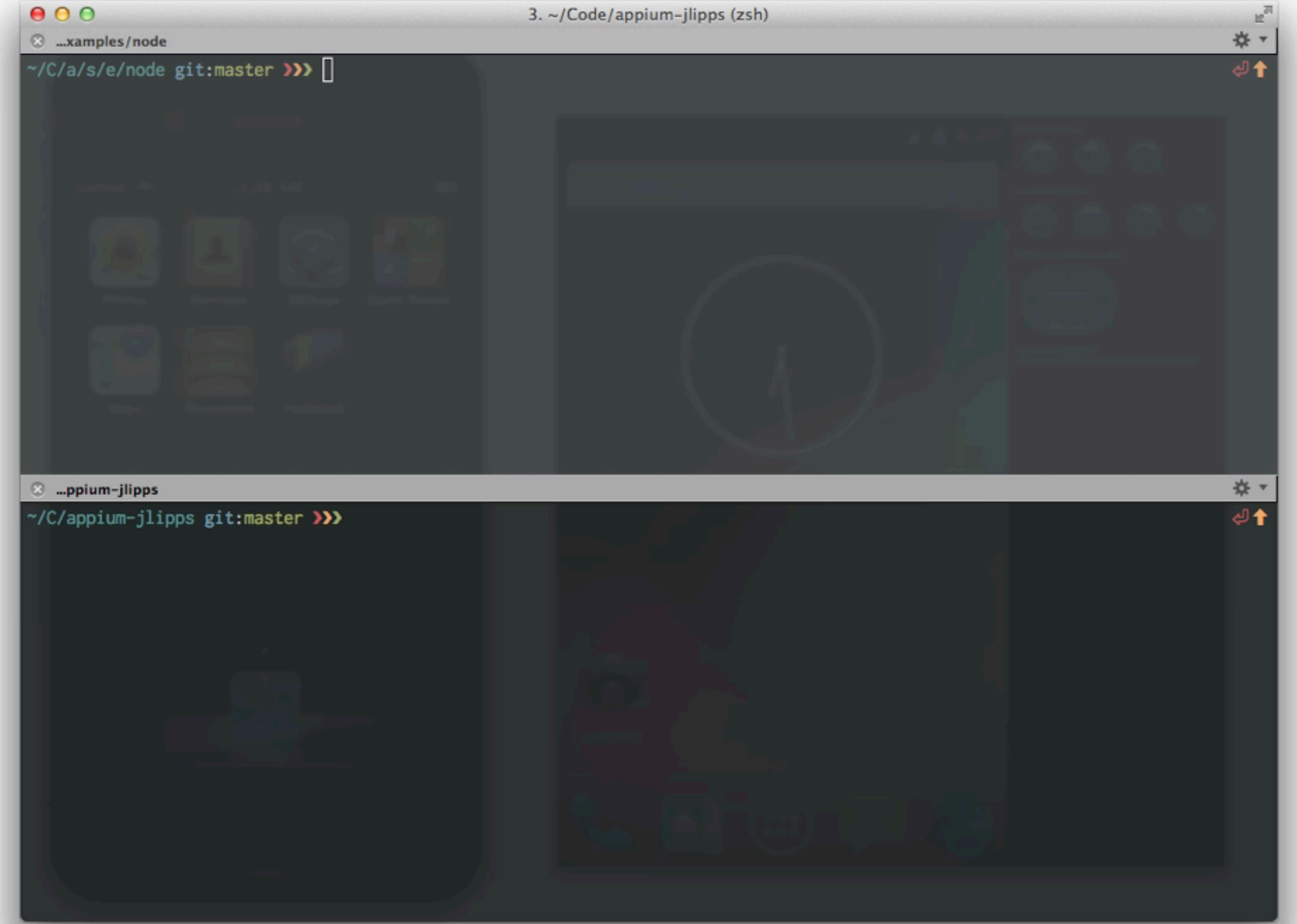
```
~/C/demoize git:master ››› mvimod
~/C/demoize git:master ››› cd ~/Code/appium-demos/python; workon appium-dem
os
(appium-demos)~/C/a/python git:master ››› android
(appium-demos)~/C/a/python git:master ››› emulator @jlipps18demo -netfast

HAX is working and emulator runs in fast virt mode
(appium-demos)~/C/a/python git:master ››› emulator @jlipps18demo -netfast -
scale 0.76
HAX is working and emulator runs in fast virt mode
```

```
1" 200 -
127.0.0.1 - - [04/Feb/2014 15:08:1
2] "GET /static/jquery-1.9.1-min.j
s HTTP/1.1" 200 -
127.0.0.1 - - [04/Feb/2014 15:08:1
2] "GET /static/demoize.js HTTP/1.
1" 200 -
127.0.0.1 - - [04/Feb/2014 15:08:1
2] "GET /favicon.ico HTTP/1.1" 404
 -
```

```
ET /static/github.css HTTP/1.1" 200 -
127.0.0.1 - - [04/Feb/2014 15:05:40] "G
ET /static/syntax.css HTTP/1.1" 200 -
127.0.0.1 - - [04/Feb/2014 15:05:40] "G
ET /static/jquery-1.9.1-min.js HTTP/1.1
" 200 -
127.0.0.1 - - [04/Feb/2014 15:05:40] "G
ET /static/demoize.js HTTP/1.1" 200 -
127.0.0.1 - - [04/Feb/2014 15:05:40] "G
ET /favicon.ico HTTP/1.1" 404 -
```

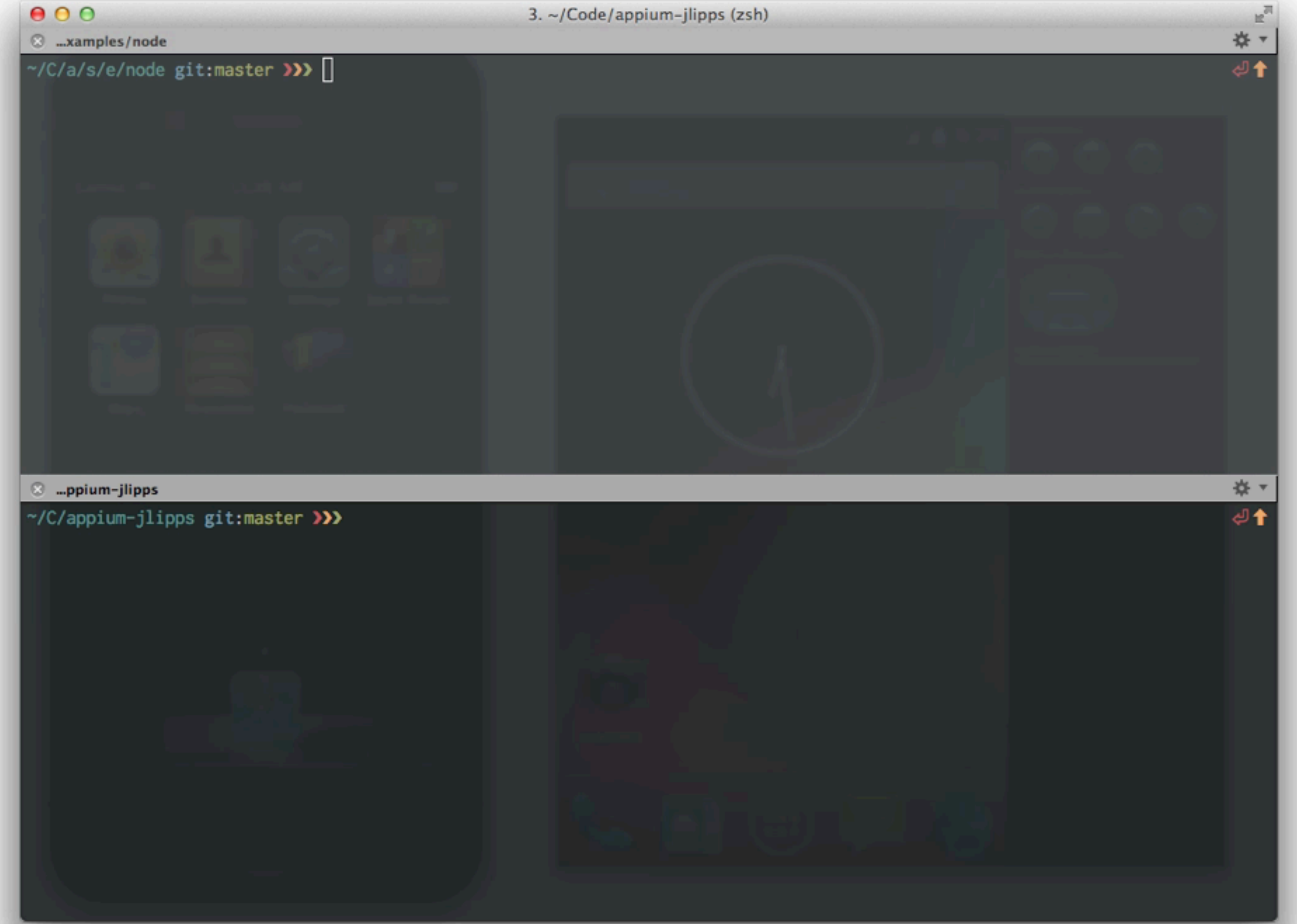
```
~ ››› cd ~/Code/appium-demos/python; workon appium-demos

(appium-demos)~/C/a/python git:master ››› selenium-server
Feb 4, 2014 2:26:03 PM org.openqa.grid.selenium.GridLauncher main
INFO: Launching a standalone server
14:26:08.544 INFO - Java: Apple Inc. 20.8-b03-424
14:26:08.544 INFO - OS: Mac OS X 10.8.5 x86_64
14:26:08.564 INFO - v2.35.0, with Core v2.35.0. Built from revision c916b9d
14:26:08.738 INFO - RemoteWebDriver instances should connect to: http://127
.0.0.1:4444/wd/hub
14:26:08.739 INFO - Version Jetty/5.1.x
14:26:08.740 INFO - Started HttpContext[/selenium-server/driver,/selenium-s
erver/driver]
14:26:08.741 INFO - Started HttpContext[/selenium-server,/selenium-server]
14:26:08.741 INFO - Started HttpContext[/,/]
14:26:08.769 INFO - Started org.openqa.jetty.jetty.servlet.ServletHandler@1
5aaf0b3
14:26:08.769 INFO - Started HttpContext[/wd,/wd]
14:26:08.778 INFO - Started SocketListener on 0.0.0.0:4444
14:26:08.778 INFO - Started org.openqa.jetty.jetty.Server@acfec48
```

```
(appium-demos)~/C/a/python git:master ››› ./runner.py --android && ./runner
.py --ios
Starting demo
```



```
~/C/a/s/e/node git:master ❯❯❯
```

```
~/C/appium-jlipps git:master ❯❯❯
```



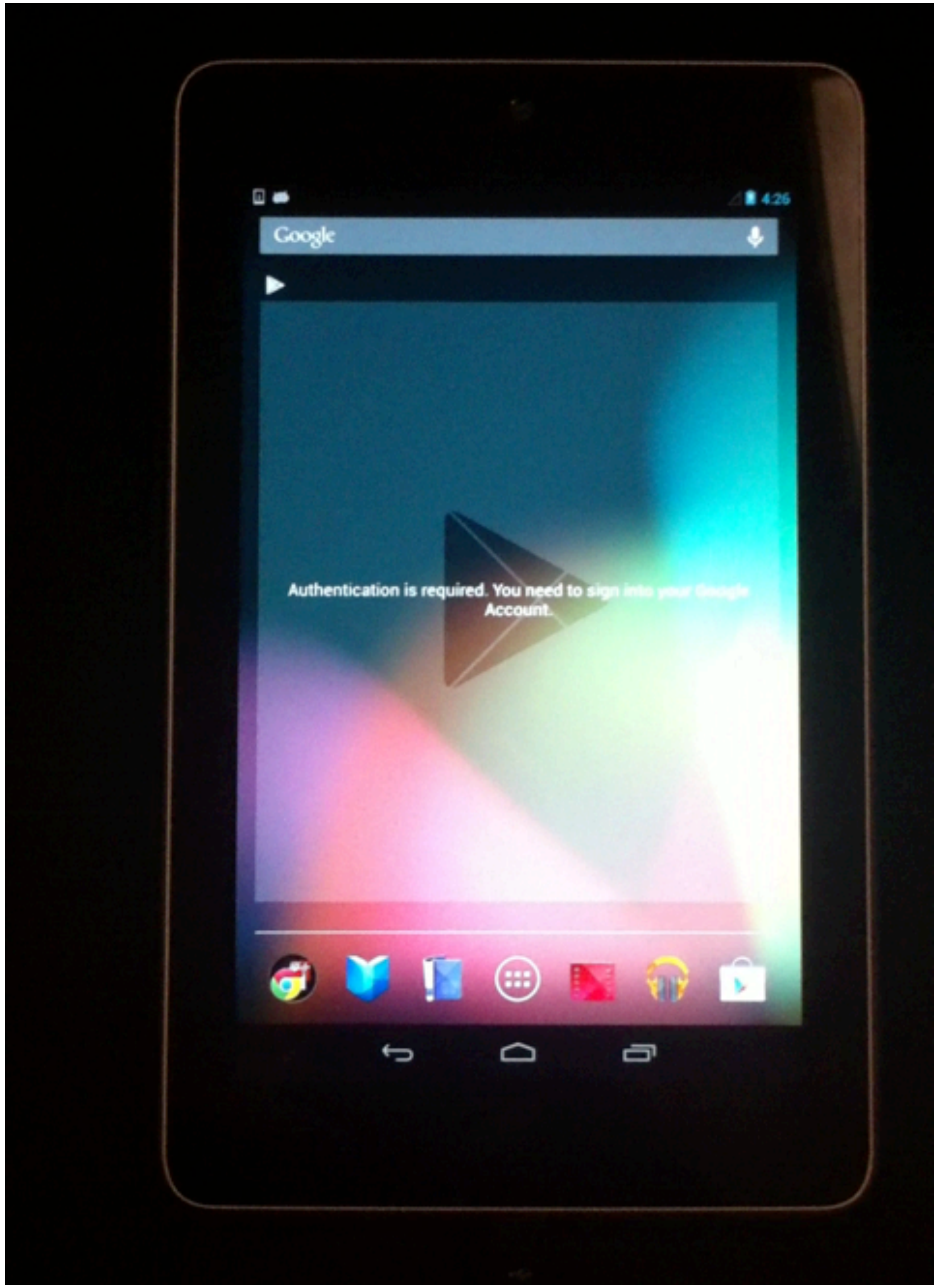
3. ~/Code/appium-jlipps (zsh)

...xamples/node

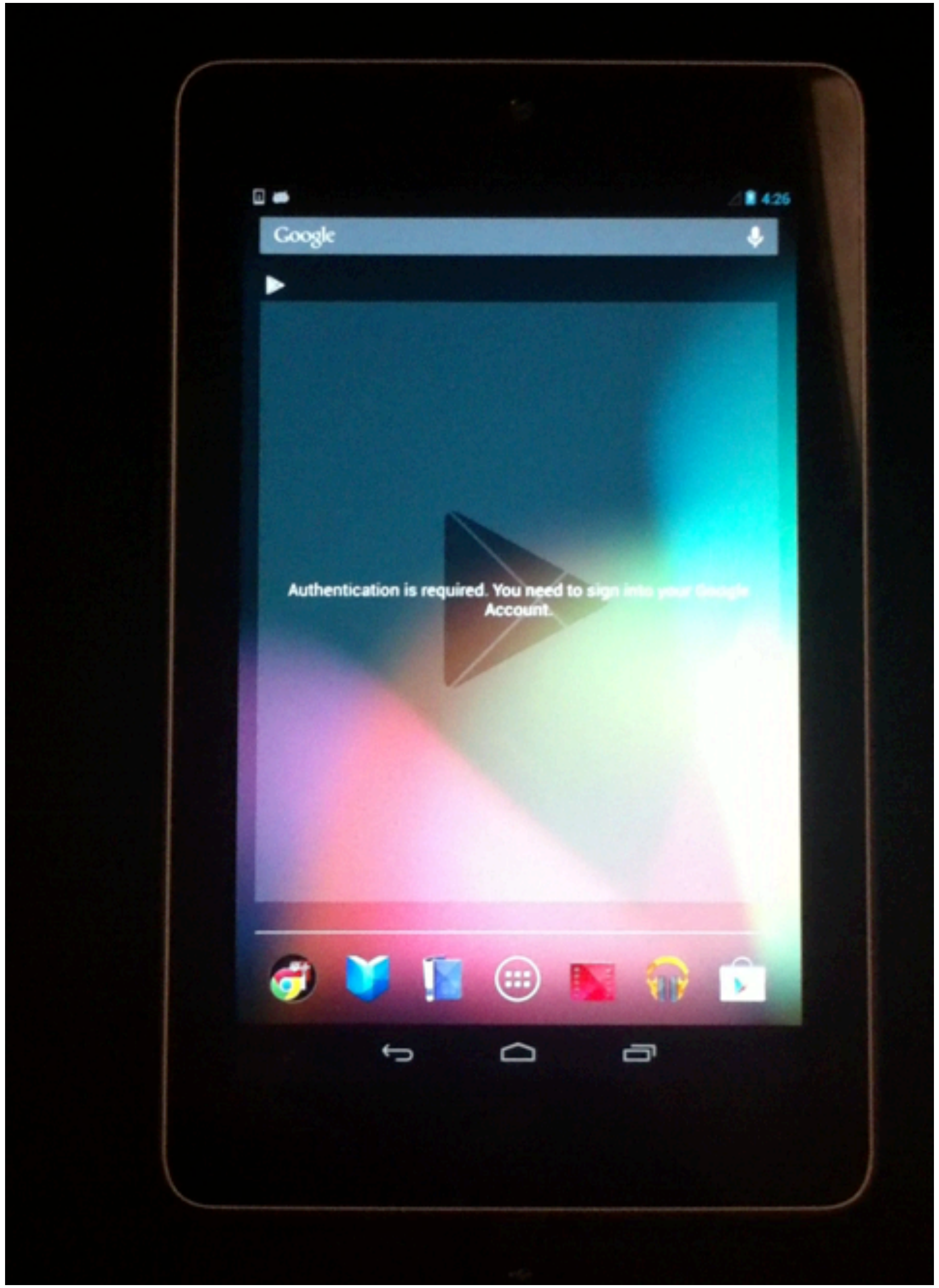
```
~/C/a/s/e/node git:master ›››
```

...ppium-jlipps

```
~/C/appium-jlipps git:master ›››
```



Authentication is required. You need to sign into your Google Account.

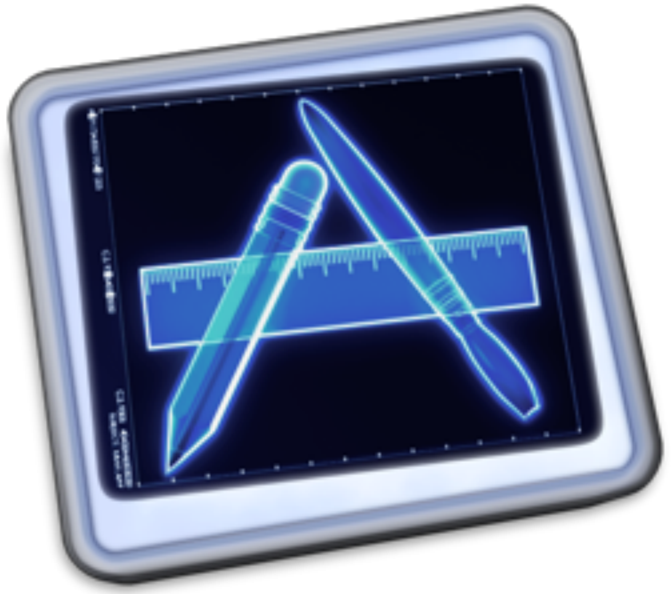


Authentication is required. You need to sign into your Google Account.

appium architecture

Automation Orchestra

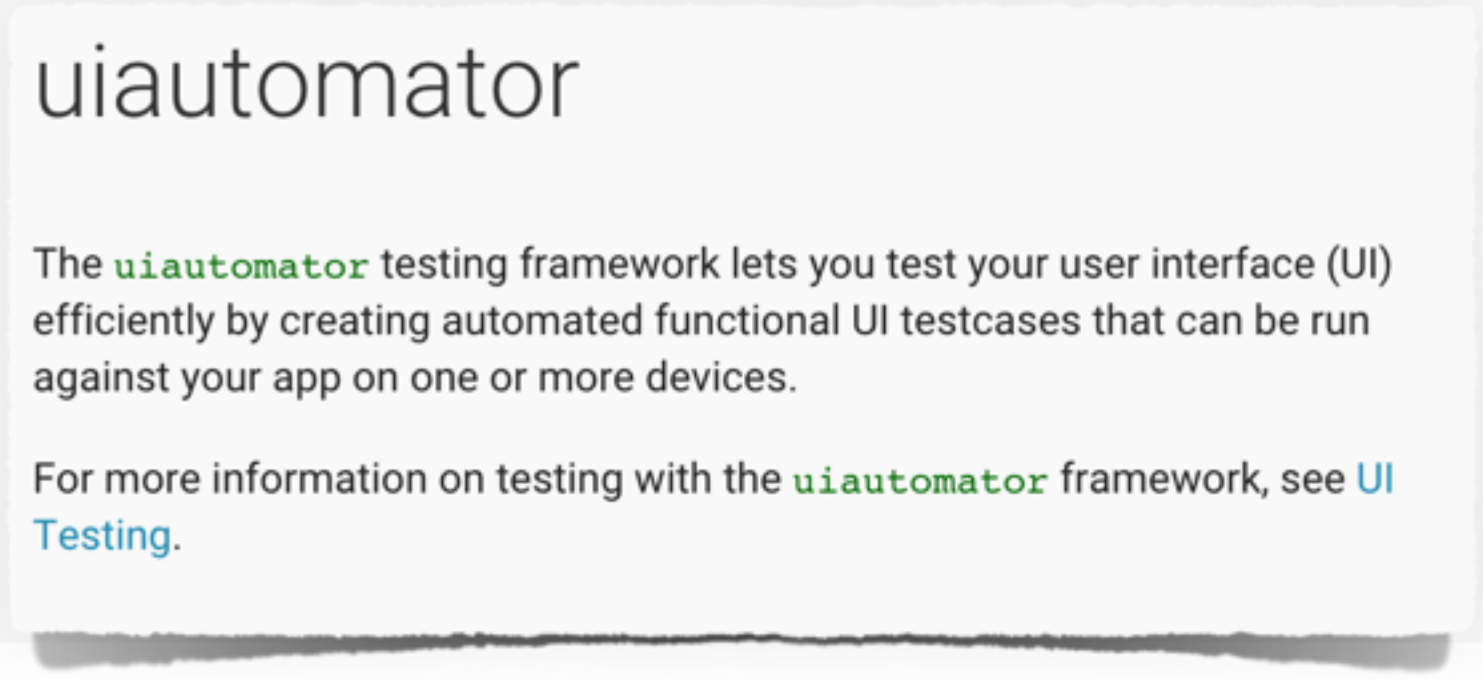
Apple **Instruments** & **UIAutomation** for iOS



Automation Orchestra

Apple **Instruments** & **UIAutomation** for iOS

Google **UiAutomator** for Android (4.2.1 up)



uiautomator

The uiautomator testing framework lets you test your user interface (UI) efficiently by creating automated functional UI testcases that can be run against your app on one or more devices.

For more information on testing with the uiautomator framework, see UI Testing.

Automation Orchestra

Apple **Instruments** & **UIAutomation** for iOS

Google **UiAutomator** for Android (4.2.1 up)

Google **Instrumentation** for older Android & hybrid

(via **Selendroid**)

Automation Orchestra

Apple **Instruments** & **UIAutomation** for iOS

Google **UiAutomator** for Android (4.2.1 up)

Google **Instrumentation** for older Android & hybrid (via **Selendroid**)

Coming Soon Google **DroidDriver** for all Android versions

Automation Orchestra

Apple **Instruments** & **UIAutomation** for iOS

Google **UiAutomator** for Android (4.2.1 up)

Google **Instrumentation** for older Android & hybrid (via **Selendroid**)

Coming Soon Google **DroidDriver** for all Android versions

Coming Soon Apple **XCUITest** for iOS 9+

Selenium WebDriver

is the globally-recognized standard
for browser automation

Selenium WebDriver

is a HTTP API

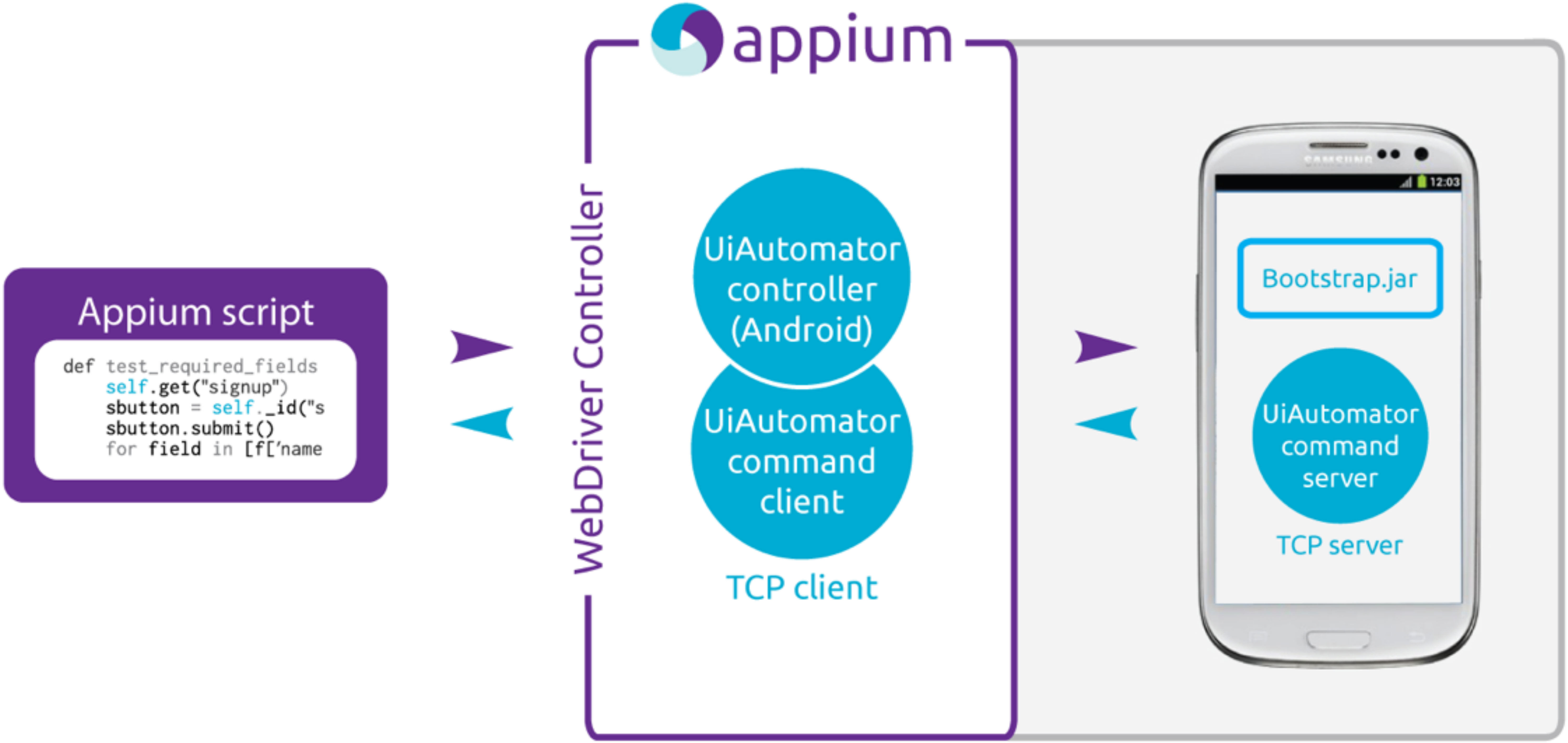
```
POST /session
POST /session/element
GET /session/element/:id/:attr
```

Selenium WebDriver
is a W3C working draft

appium is a Node.js HTTP server that creates and handles **WebDriver sessions** appium extends the WebDriver protocol with **mobile-specific** behaviors appium is working with the Selenium project so we can **standardize** these extensions

appium clients give access to these extensions in many languages

Java : JS : Python : Ruby : PHP : C# : ObjC : Perl appium can run on your computer, in your network, or on a cloud service like **Sauce Labs**



Appium script

```
def test_required_fields
    self.get("signup")
    sbutton = self._id("s
    sbutton.submit()
    for field in [f['name
```

appium

WebDriver Controller

UiAutomator controller (Android)

UiAutomator command client

TCP client

Bootstrap.jar

UiAutomator command server

TCP server

appium setup

Requirements

Basically the same as dev toolkits for iOS, Android

```
Xcode + iOS SDK
Android SDK + Java
```

Install: Option One

Clone from GitHub

```
REPO=”appium/appium.git”
git clone https://github.com/$REPO
cd appium && ./reset.sh
node .
```

Install: Option Two

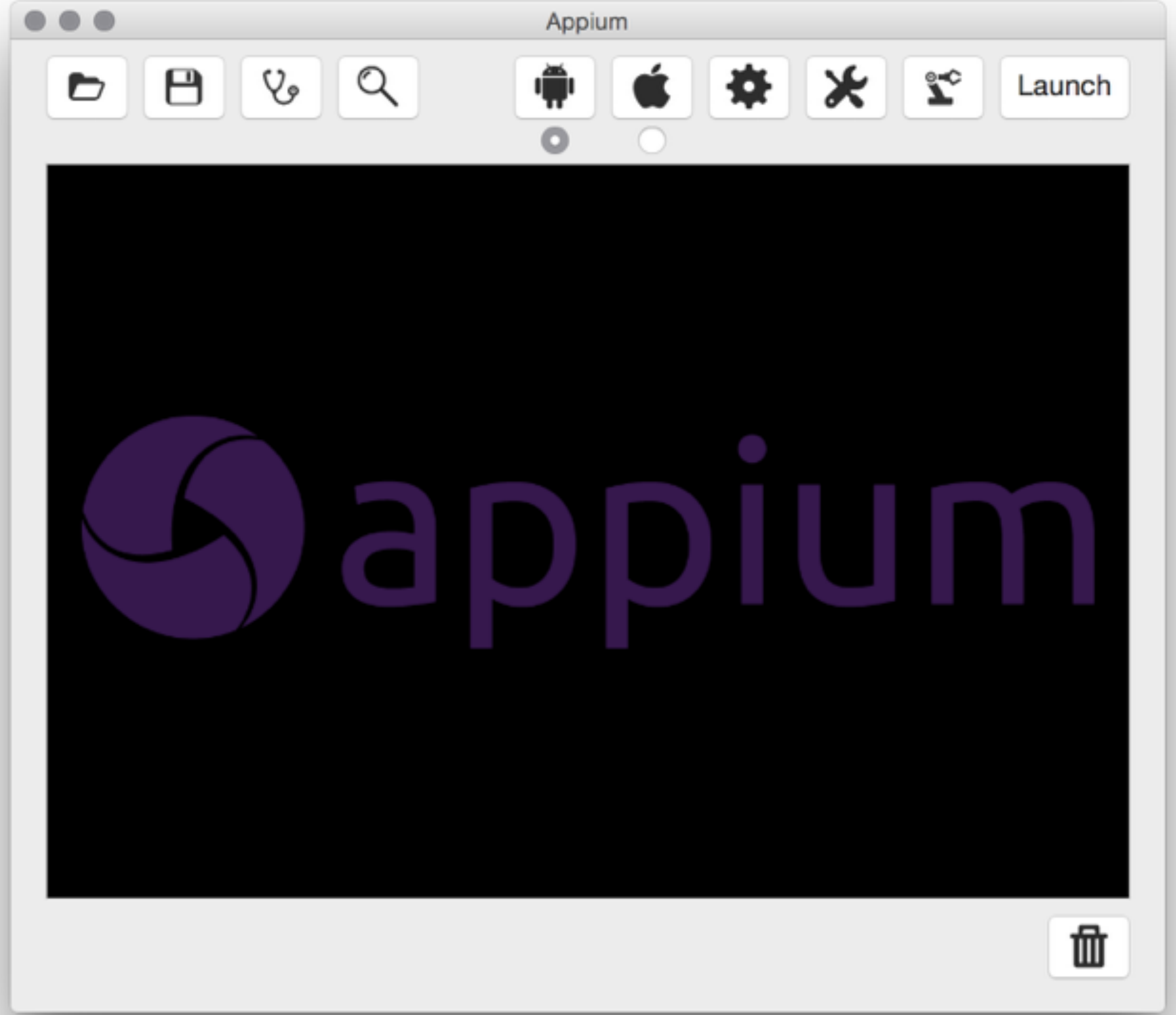
Install from NPM

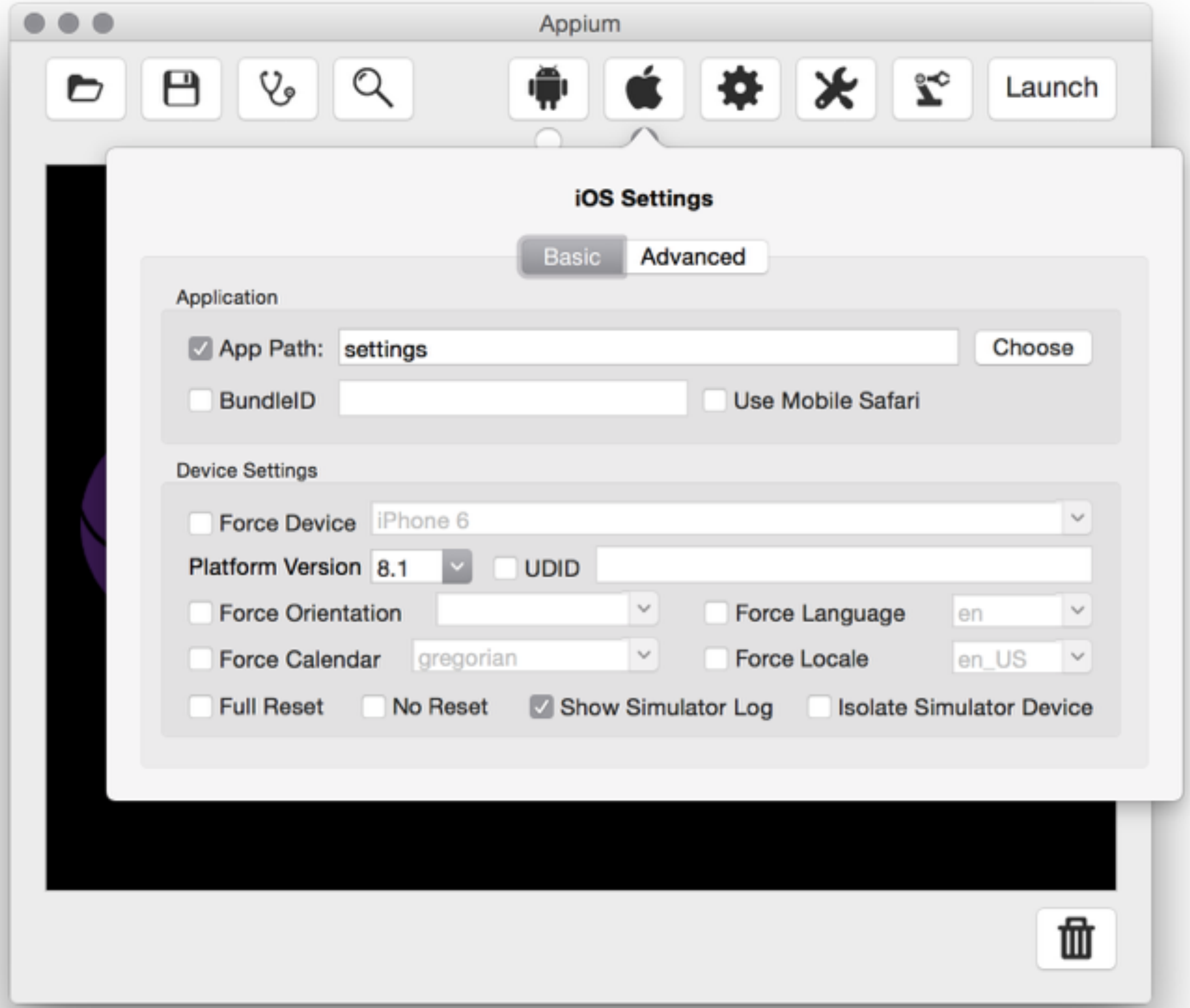
```
npm install -g appium
appium
```

Install: Option Three

Download the GUI app

```
# github.com/appium/appium/releases
open /Applications/Appium.app
```


Appium
Launch
appium



iOS Settings

Application

☑ App Path: settings   Choose

□ BundleID   □ Use Mobile Safari

Device Settings

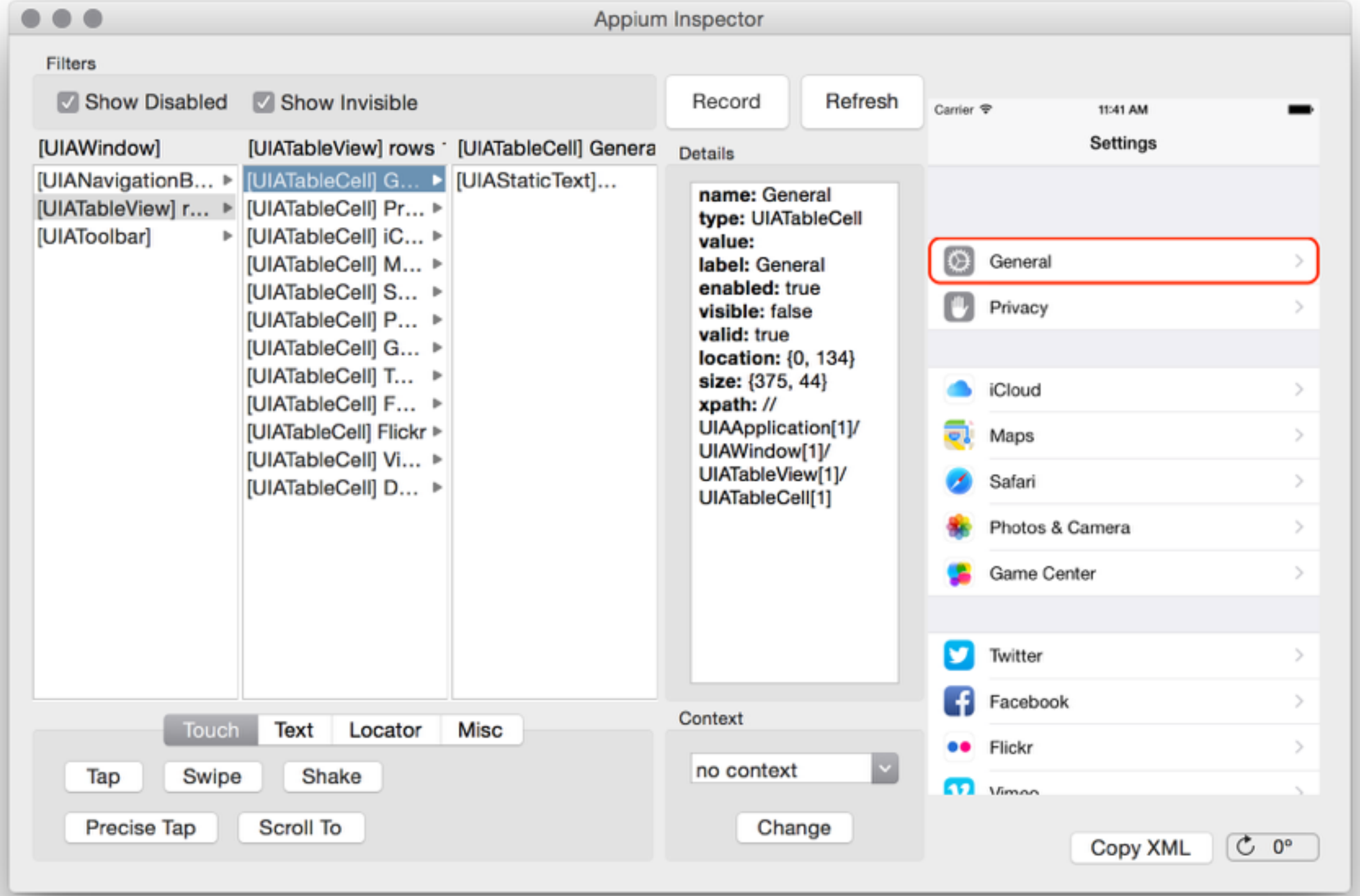
□ Force Device   iPhone 6

Platform Version   8.1   □ UDID

□ Force Orientation   □ Force Language   en

□ Force Calendar   gregorian   □ Force Locale   en_US

□ Full Reset   □ No Reset   ☑ Show Simulator Log   □ Isolate Simulator Device



☑ Show Disabled ☑ Show Invisible

name: General
type: UIATableCell
value:
label: General
enabled: true
visible: false
valid: true
location: {0, 134}
size: {375, 44}
xpath: //UIAApplication[1]/UIAWindow[1]/UIATableView[1]/UIATableCell[1]

Context: no context

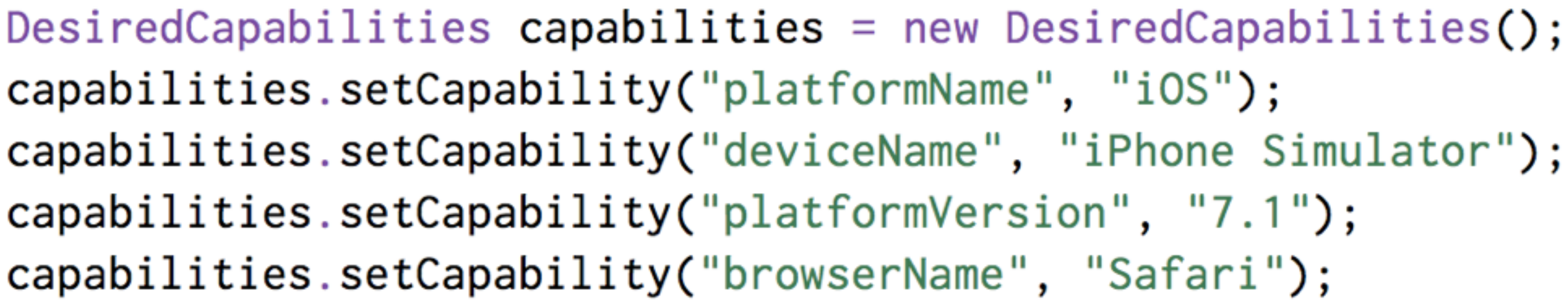
No Install

Use Sauce Labs

https://saucelabs.com/mobile

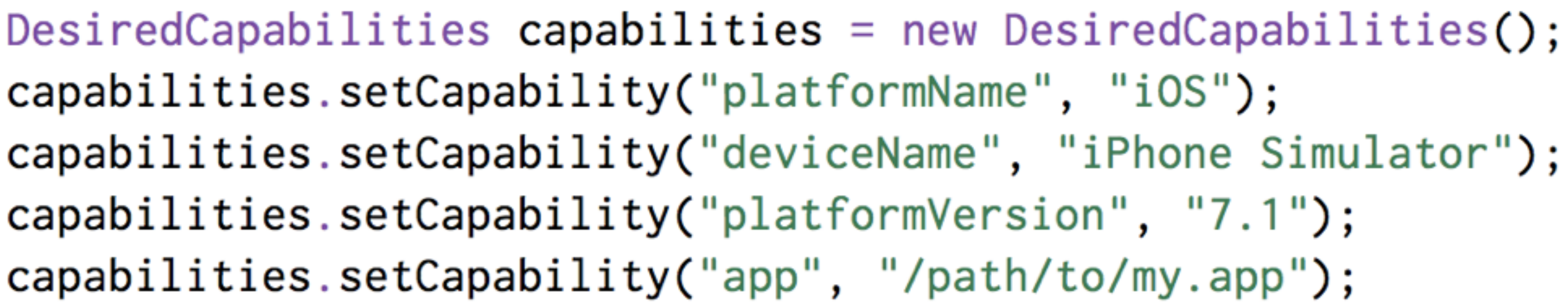
appium test model

Desired Capabilities



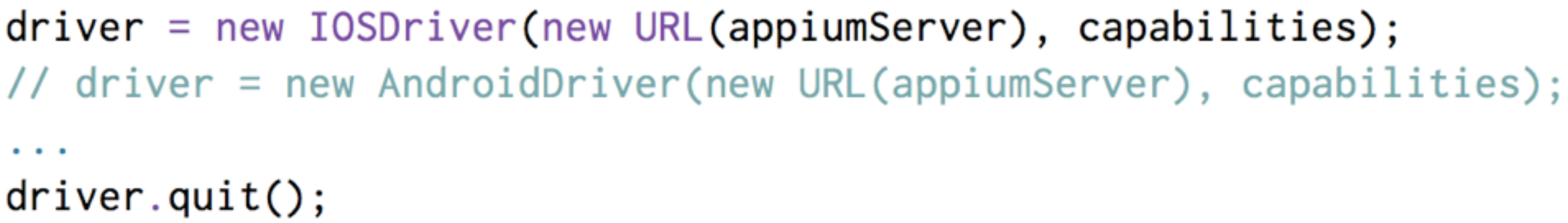
```
DesiredCapabilities capabilities = new DesiredCapabilities();
capabilities.setCapability("platformName", "iOS");
capabilities.setCapability("deviceName", "iPhone Simulator");
capabilities.setCapability("platformVersion", "7.1");
capabilities.setCapability("browserName", "Safari");
```

Desired Capabilities



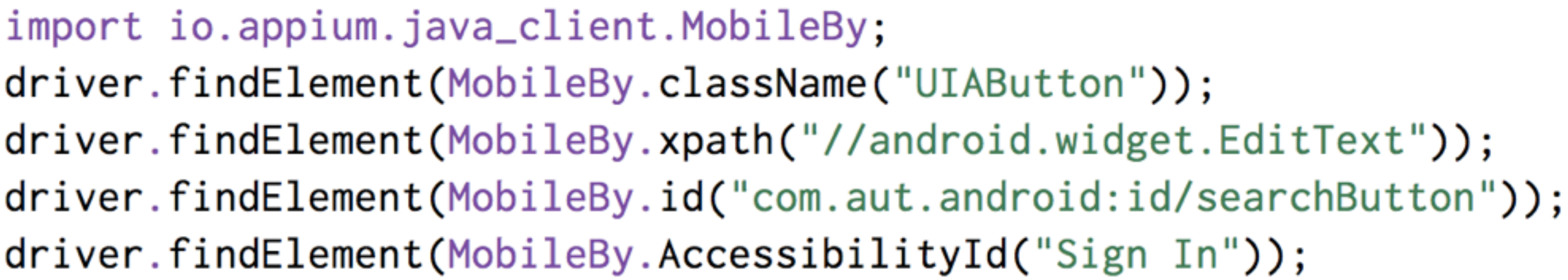
```
DesiredCapabilities capabilities = new DesiredCapabilities();
capabilities.setCapability("platformName", "iOS");
capabilities.setCapability("deviceName", "iPhone Simulator");
capabilities.setCapability("platformVersion", "7.1");
capabilities.setCapability("app", "/path/to/my.app");
```

Sessions



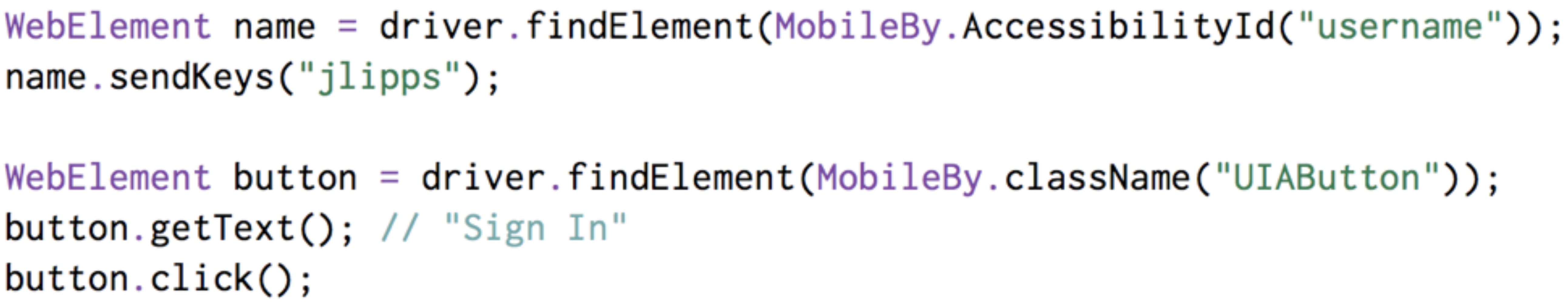
```
driver = new IOSDriver(new URL(appiumServer), capabilities);
// driver = new AndroidDriver(new URL(appiumServer), capabilities);
...
driver.quit();
```

Finding Elements



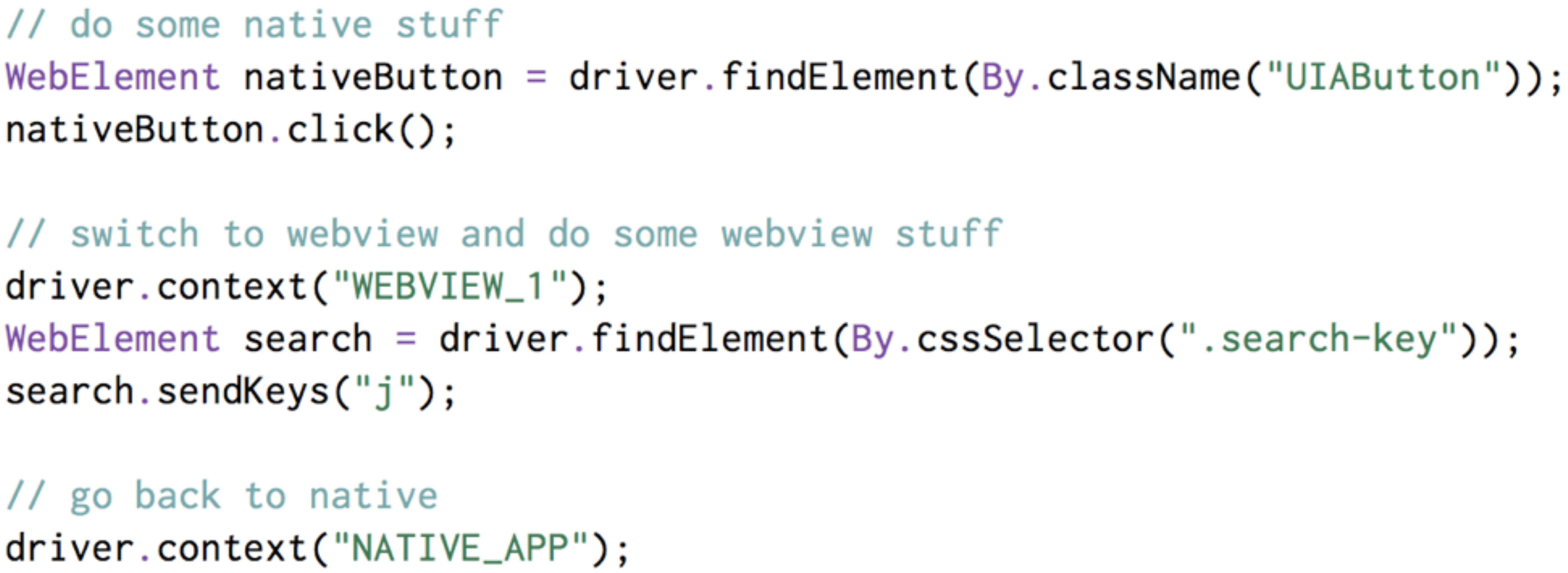
```java
import io.appium.java_client.MobileBy;
driver.findElement(MobileBy.className("UIAButton"));
driver.findElement(MobileBy.xpath("//android.widget.EditText"));
driver.findElement(MobileBy.id("com.aut.android:id/searchButton"));
driver.findElement(MobileBy.AccessibilityId("Sign In"));
```

Interacting with Elements



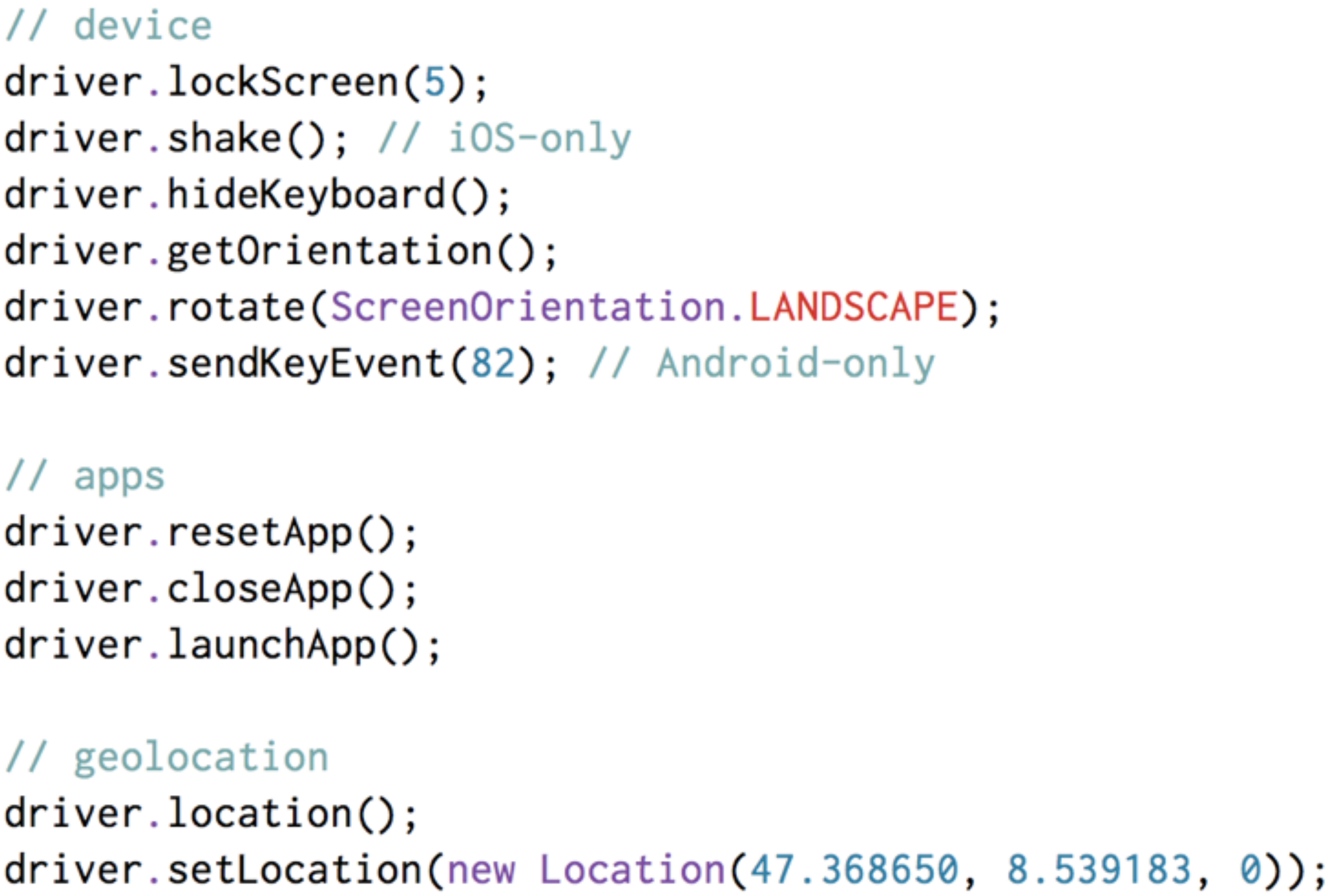
```
WebElement name = driver.findElement(MobileBy.AccessibilityId("username"));
name.sendKeys("jlipps");

WebElement button = driver.findElement(MobileBy.className("UIAButton"));
button.getText(); // "Sign In"
button.click();
```

Interacting with Webviews



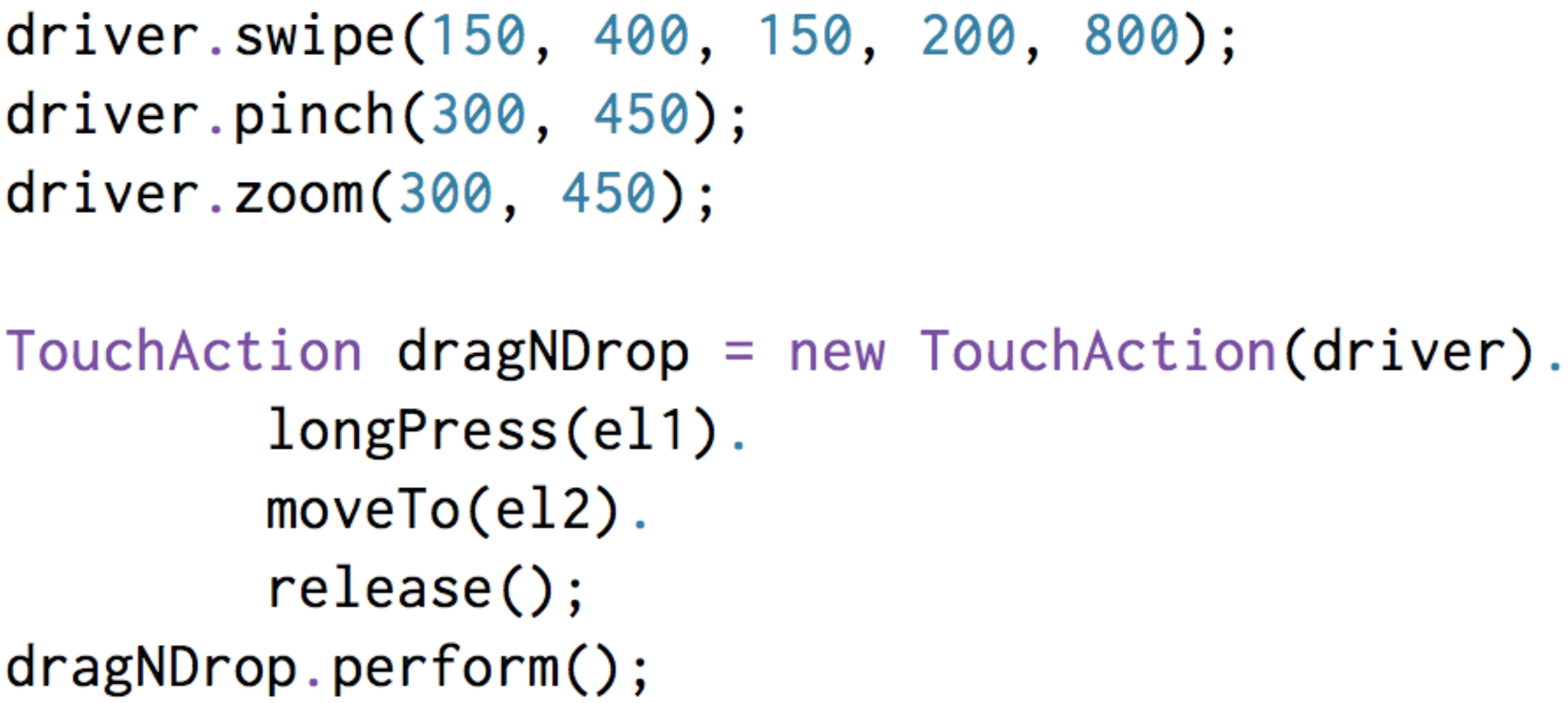
```
// do some native stuff
WebElement nativeButton = driver.findElement(By.className("UIAButton"));
nativeButton.click();

// switch to webview and do some webview stuff
driver.context("WEBVIEW_1");
WebElement search = driver.findElement(By.cssSelector(".search-key"));
search.sendKeys("j");

// go back to native
driver.context("NATIVE_APP");
```

Interacting with the Device



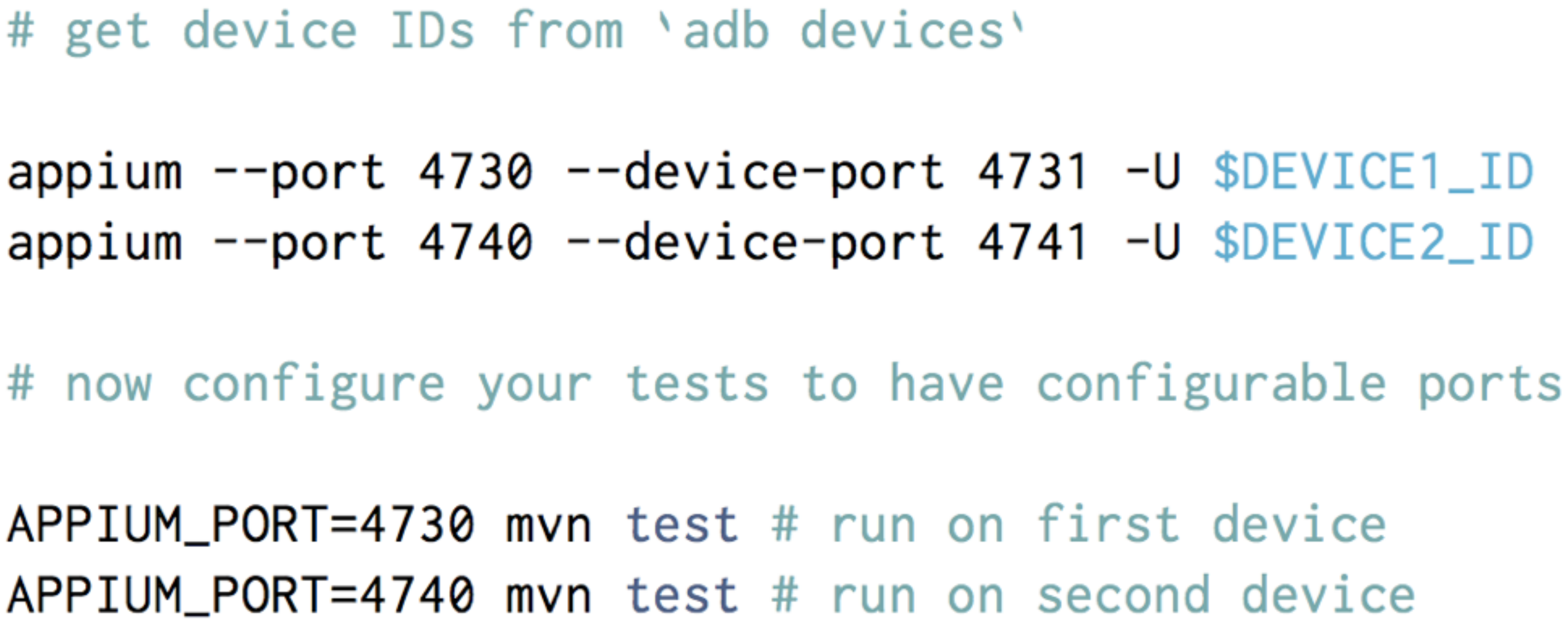
```
// device
driver.lockScreen(5);
driver.shake(); // iOS-only
driver.hideKeyboard();
driver.getOrientation();
driver.rotate(ScreenOrientation.LANDSCAPE);
driver.sendKeyEvent(82); // Android-only

// apps
driver.resetApp();
driver.closeApp();
driver.launchApp();

// geolocation
driver.location();
driver.setLocation(new Location(47.368650, 8.539183, 0));
```

Gestures



```
driver.swipe(150, 400, 150, 200, 800);
driver.pinch(300, 450);
driver.zoom(300, 450);

TouchAction dragNDrop = new TouchAction(driver).
        longPress(el1).
        moveTo(el2).
        release();
dragNDrop.perform();
```

Multiple devices (Android-only)

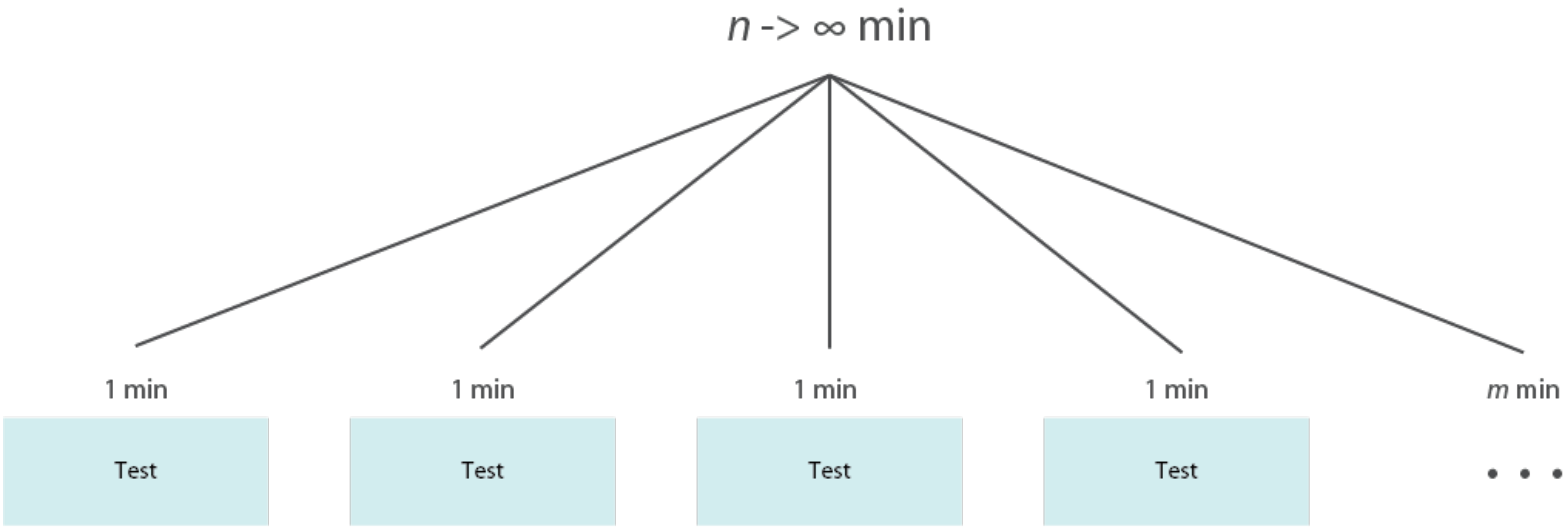


```
# get device IDs from `adb devices`

appium --port 4730 --device-port 4731 -U $DEVICE1_ID
appium --port 4740 --device-port 4741 -U $DEVICE2_ID

# now configure your tests to have configurable ports

APPIUM_PORT=4730 mvn test # run on first device
APPIUM_PORT=4740 mvn test # run on second device
```

appium scale

appium **is great for local** test development, but has limitations when scaling up for use in CI

Sauce Labs is great for scale when you need to run a lot of appium tests



n -> ∞ min

1 min

Test

1 min

Test

1 min

Test

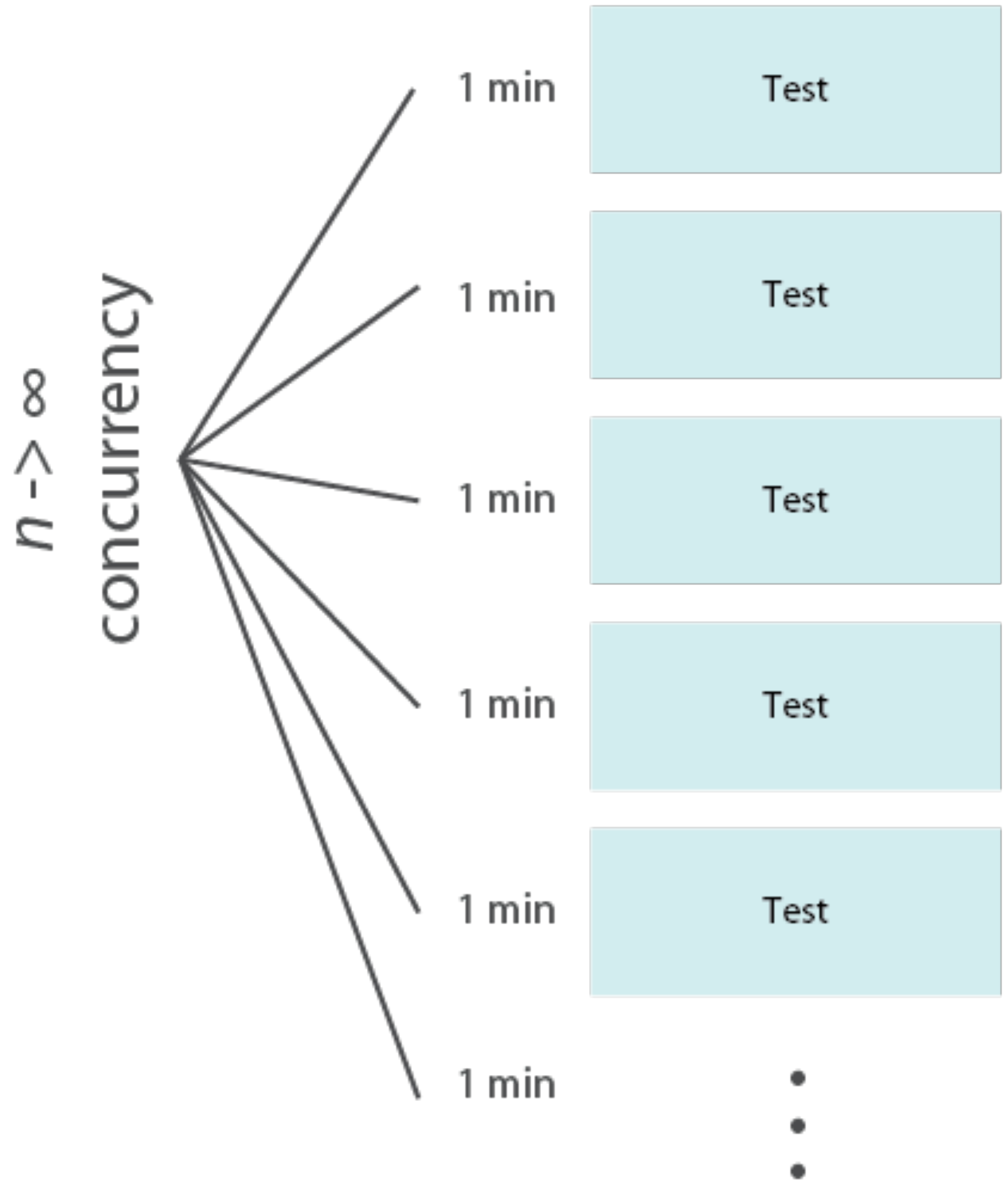
1 min

Test

m min

• • •

1 min



n -> ∞
concurrency

1 min
Test

1 min
Test

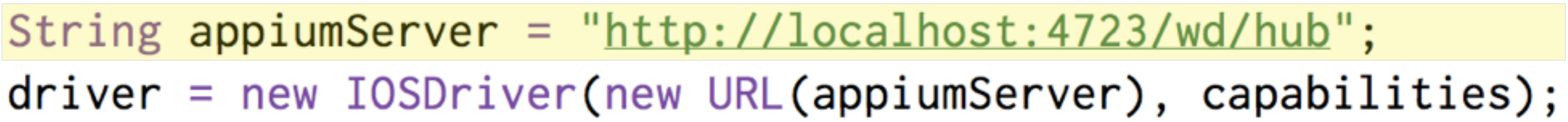
1 min
Test

1 min
Test

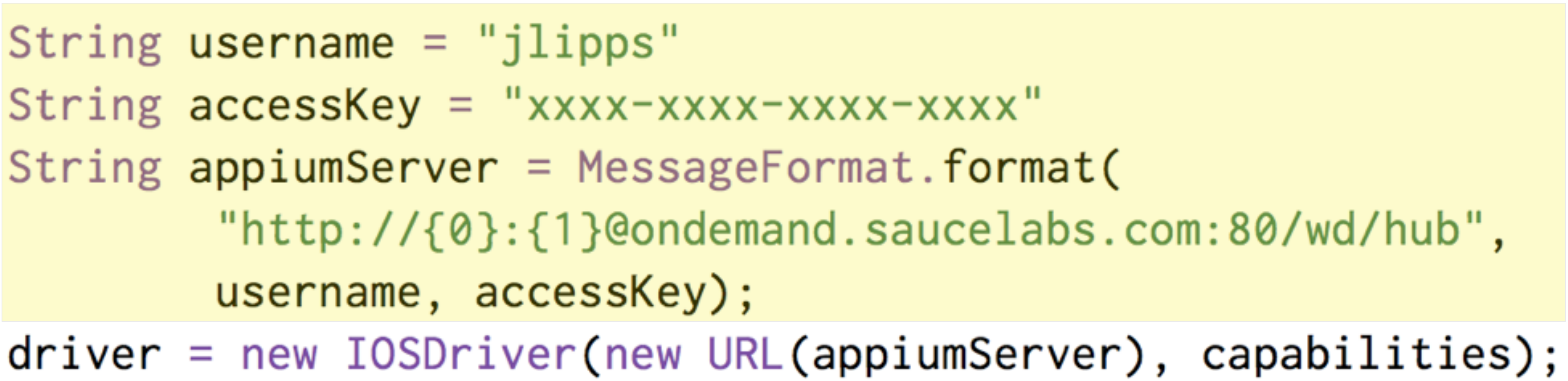
1 min
Test

1 min
⋮

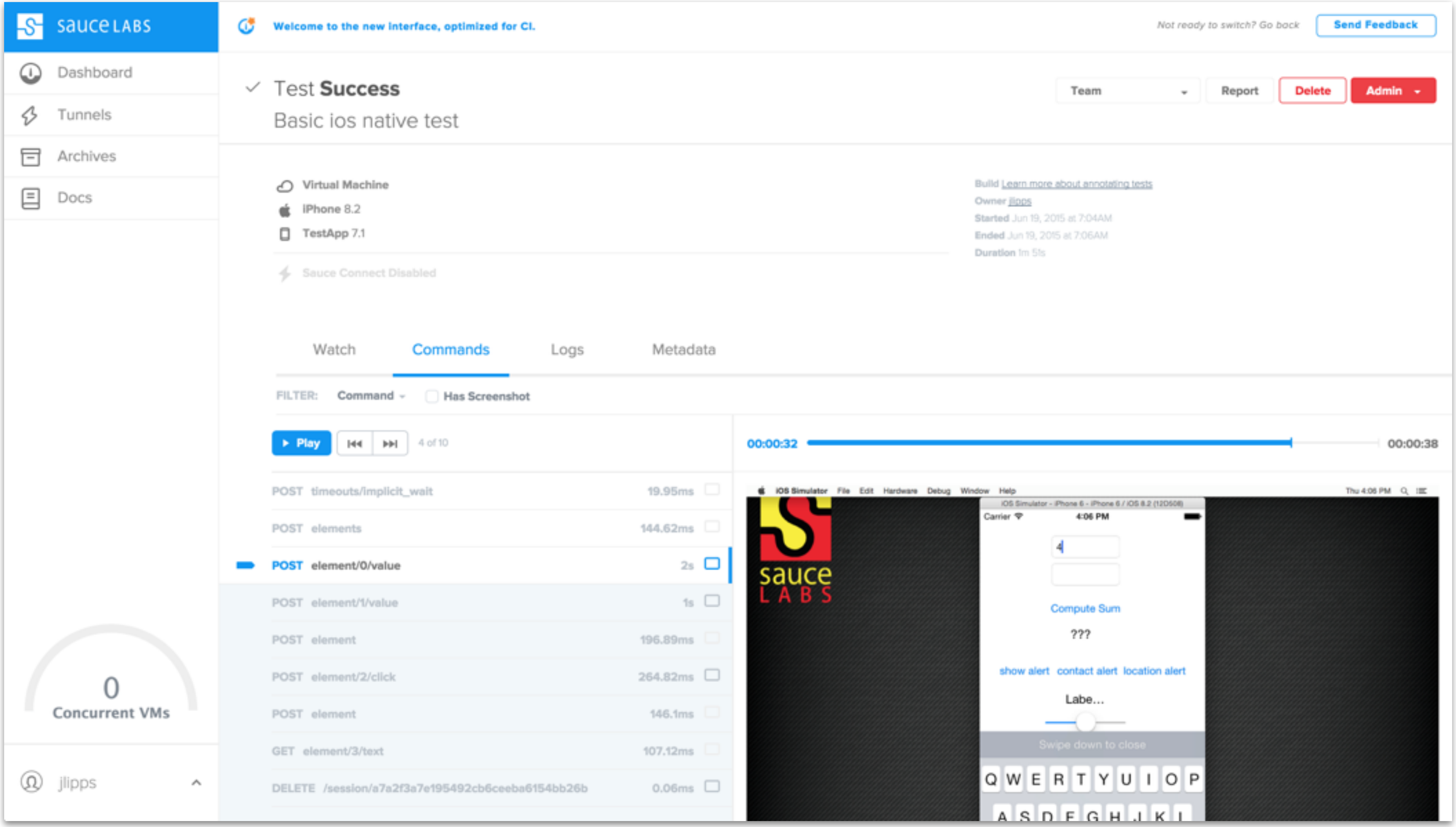
Running tests on Sauce



```
String appiumServer = "http://localhost:4723/wd/hub";
driver = new IOSDriver(new URL(appiumServer), capabilities);
```



```
String username = "jlipps"
String accessKey = "xxxx-xxxx-xxxx-xxxx"
String appiumServer = MessageFormat.format(
        "http://{0}:{1}@ondemand.saucelabs.com:80/wd/hub",
        username, accessKey);
driver = new IOSDriver(new URL(appiumServer), capabilities);
```



Welcome to the new interface, optimized for CI.

Not ready to switch? Go back

Test **Success**

Basic ios native test

Virtual Machine
iPhone 8.2
TestApp 7.1

Sauce Connect Disabled

Build Learn more about annotating tests
Owner jlipps
Started Jun 19, 2015 at 7:04AM
Ended Jun 19, 2015 at 7:06AM
Duration 1m 51s

FILTER: Command □ Has Screenshot

4 of 10

```
POST    timeouts/implicit_wait                          19.95ms
POST    elements                                        144.62ms
POST    element/0/value                                 2s
POST    element/1/value                                 1s
POST    element                                         196.89ms
POST    element/2/click                                 264.82ms
POST    element                                         146.1ms
GET     element/3/text                                  107.12ms
DELETE  /session/a7a2f3a7e195492cb6ceeba6154bb26b       0.06ms
```

00:00:32 00:00:38

iOS Simulator - iPhone 6 - iPhone 6 / iOS 8.2 (12D508)

Carrier 4:06 PM

4

???

Labe...

Swipe down to close

Sauce Labs simulator and emulator VMs are destroyed after each session

Sauce Connect allows your tests to run securely with all data transmitted through an encrypted private tunnel saucelabs.com

FREE FOR OPEN SOURCE

CMTS2015

PROMO CODE FOR FREE TESTING

Android Real Devices

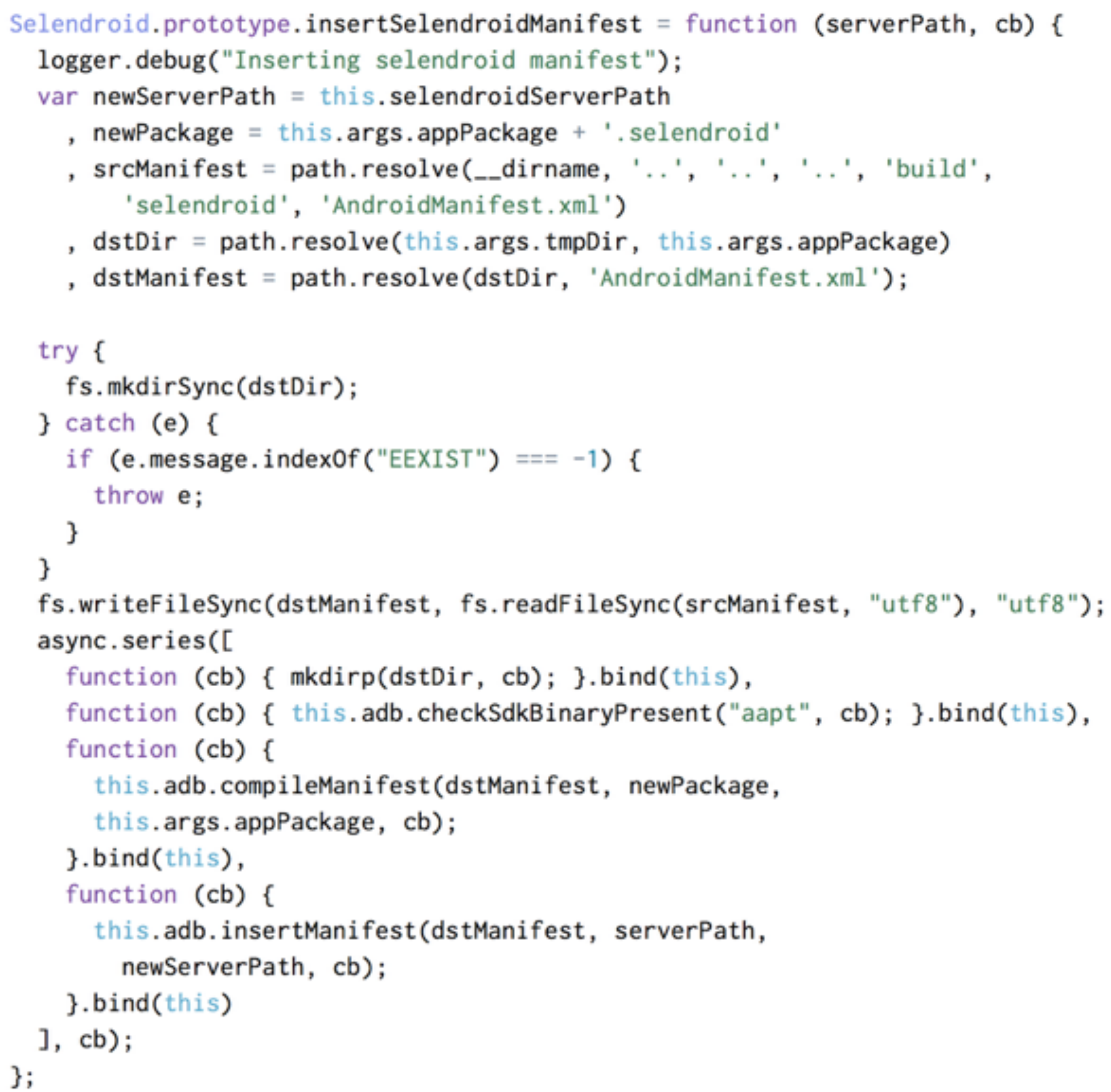
Android Real Devices

Publicly Available

...soon

appium future

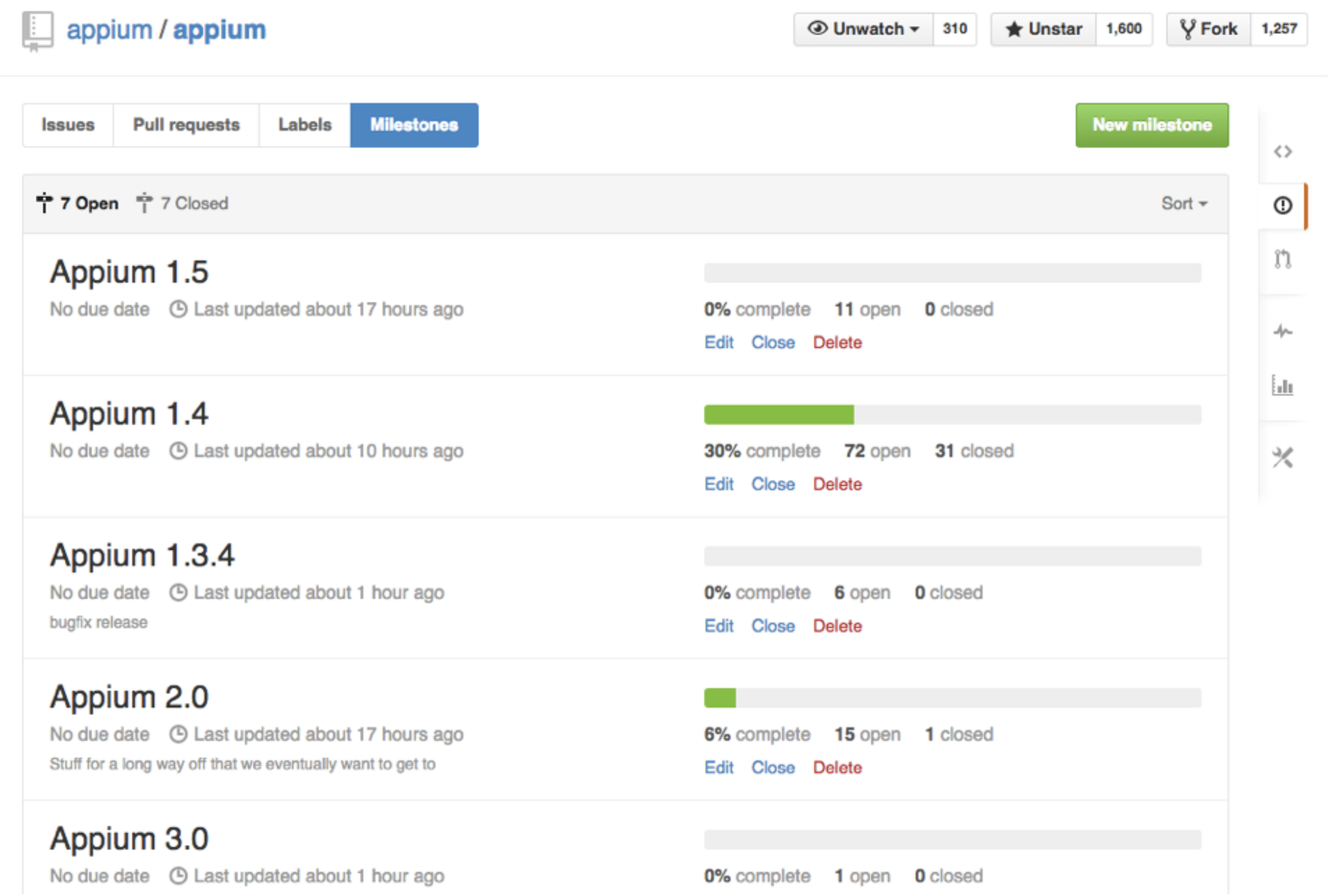
Appium 1.5



```
Selendroid.prototype.insertSelendroidManifest = function (serverPath, cb) {
  logger.debug("Inserting selendroid manifest");
  var newServerPath = this.selendroidServerPath
    , newPackage = this.args.appPackage + '.selendroid'
    , srcManifest = path.resolve(__dirname, '..', '..', '..', 'build',
        'selendroid', 'AndroidManifest.xml')
    , dstDir = path.resolve(this.args.tmpDir, this.args.appPackage)
    , dstManifest = path.resolve(dstDir, 'AndroidManifest.xml');

  try {
    fs.mkdirSync(dstDir);
  } catch (e) {
    if (e.message.indexOf("EEXIST") === -1) {
      throw e;
    }
  }
  fs.writeFileSync(dstManifest, fs.readFileSync(srcManifest, "utf8"), "utf8");
  async.series([
    function (cb) { mkdirp(dstDir, cb); }.bind(this),
    function (cb) { this.adb.checkSdkBinaryPresent("aapt", cb); }.bind(this),
    function (cb) {
      this.adb.compileManifest(dstManifest, newPackage,
      this.args.appPackage, cb);
    }.bind(this),
    function (cb) {
      this.adb.insertManifest(dstManifest, serverPath,
        newServerPath, cb);
    }.bind(this)
  ], cb);
};
```

```
async buildNewModServer () {
  logger.info(`Repackaging selendroid for ${this.appPackage}`);
  let packageTmpDir = path.resolve(this.tmpDir, this.appPackage);
  let newManifestPath = path.resolve(this.tmpDir, 'AndroidManifest.xml');
  logger.info(`Creating new manifest`);
  await util.mkdirp(packageTmpDir);
  await writeFile(newManifestPath, await readFile(SE_MANIFEST_PATH, "utf8"));
  await this.adb.initAapt(); // TODO this should be internal to adb
  await this.adb.compileManifest(newManifestPath, this.modServerPkg,
                                 this.appPackage);
  await this.adb.insertManifest(newManifestPath, SE_APK_PATH,
                                this.modServerPath);
  logger.info(`Repackaged selendroid ready at ${this.modServerPath}`);
}
```

http://github.com/appium/appium/milestones



7 Open 7 Closed

Appium 1.5
No due date Last updated about 17 hours ago
0% complete 11 open 0 closed
Edit Close Delete

Appium 1.4
No due date Last updated about 10 hours ago
30% complete 72 open 31 closed
Edit Close Delete

Appium 1.3.4
No due date Last updated about 1 hour ago
bugfix release
0% complete 6 open 0 closed
Edit Close Delete

Appium 2.0
No due date Last updated about 17 hours ago
Stuff for a long way off that we eventually want to get to
6% complete 15 open 1 closed
Edit Close Delete

Appium 3.0
No due date Last updated about 1 hour ago
0% complete 1 open 0 closed

The future is in your hands...

- Write code, be a committer
- Make our docs better
- Share your experiences
- Help with community support
- Let us know what to focus on
- Keep up the translations!

Questions?

http://appium.io

https://github.com/appium/appium

@AppiumDevs • @jlipps • @saucelabs

谢谢

Thanks!

http://appium.io

https://github.com/appium/appium

@AppiumDevs • @jlipps • @saucelabs