



沪江无线持续集成的解决方案





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- 移动测试研发
- 13年从事测试工作
- 14年至今就职于沪江教育科技有限公司
- 负责移动端测试技术落地
- Testerhome核心成员



沪江

无线业务

- 无线业务增长快
- 核心App个数多达20几款
- 项目迭代周期短
- 过亿注册用户，超过60%是移动端



.....and more



沪江 无线业务

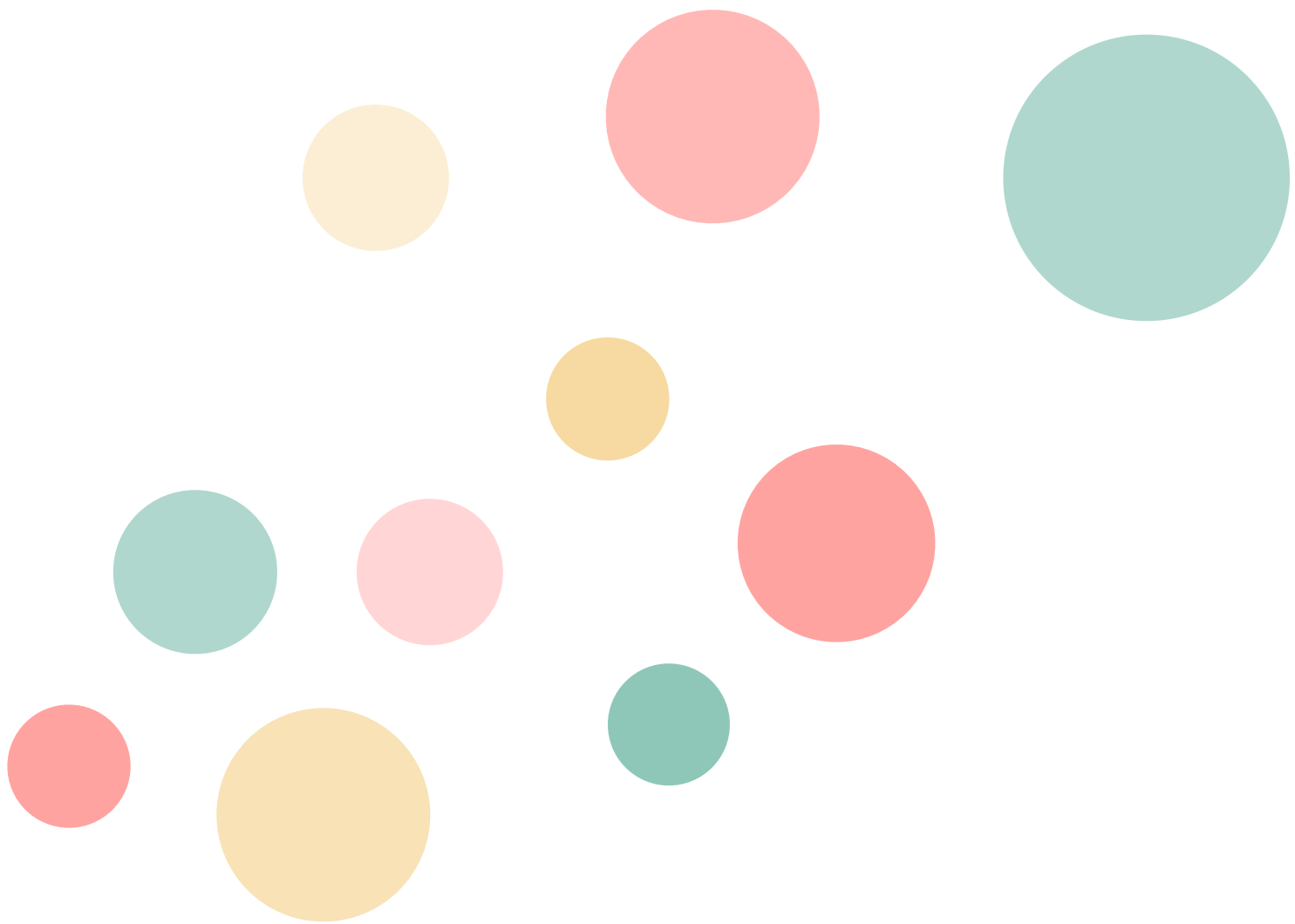
线上崩溃率：1.1%~2%

提测打回率：30%

测试回归时间占比：60%

A large dark grey circle with a thin orange and yellow border contains the text "持续集成" (Continuous Integration). To its upper left is a smaller dark grey circle containing a white left square bracket "[".

[持续集成



持续集成 解决什么

什么持续

高频率地去获取反馈、
响应反馈

集成什么

编译，
单元测试，
打包，
自动化测试



持续集成 解决什么

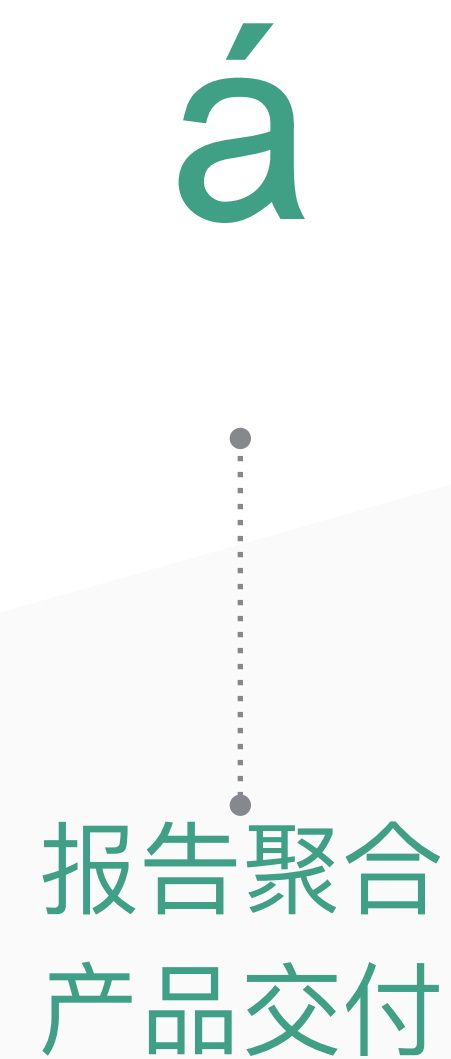
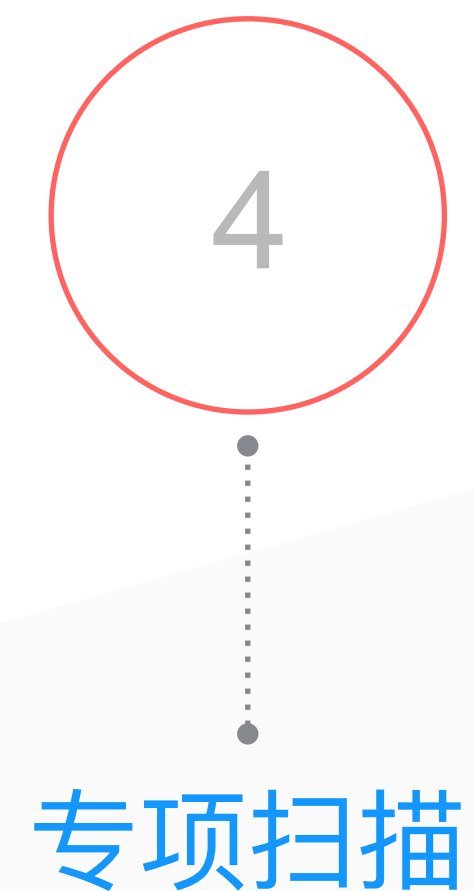
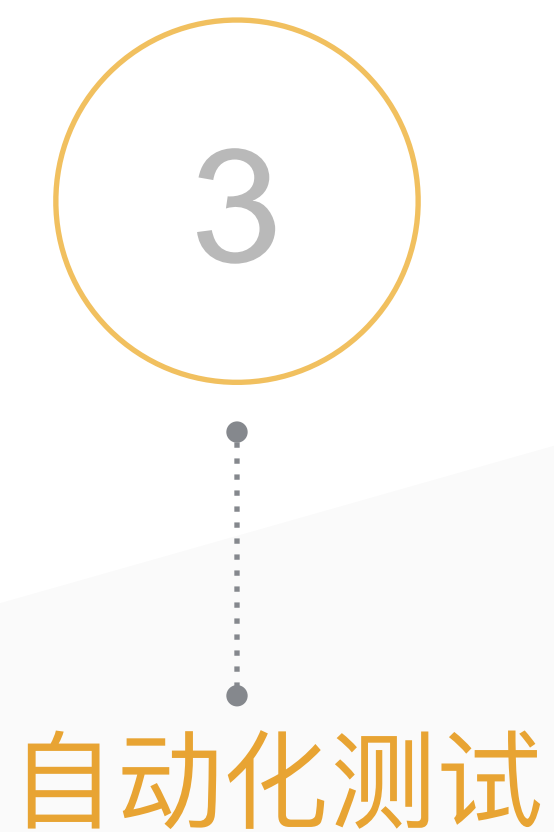
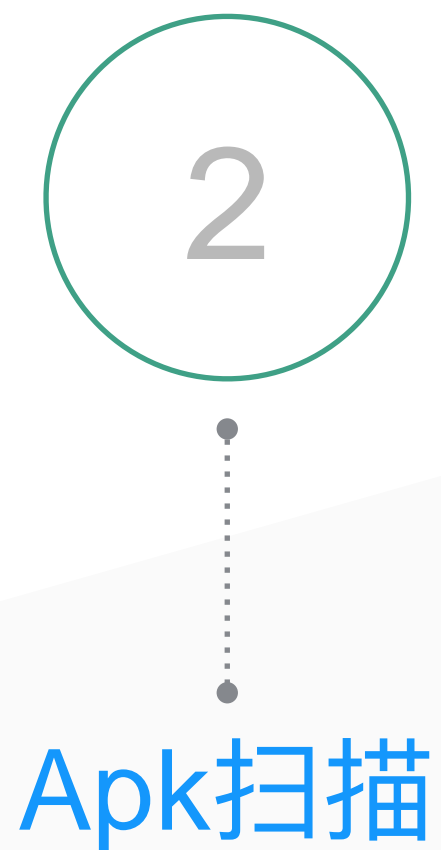
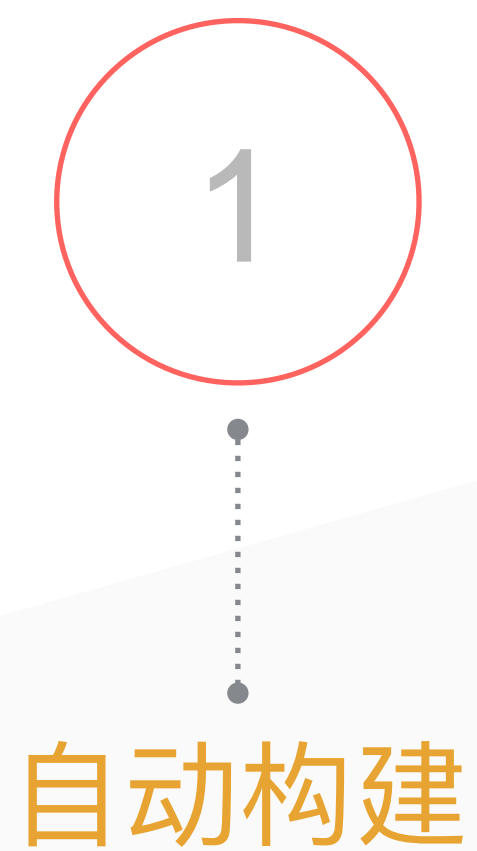
发现问题

- 1、编译问题
- 2、安装问题
- 3、App页面可达性
- 4、专项指标

提高效率

- 1、产线过多 (10~20个核心App)
- 2、迭代速度快
- 3、测试时间被压缩

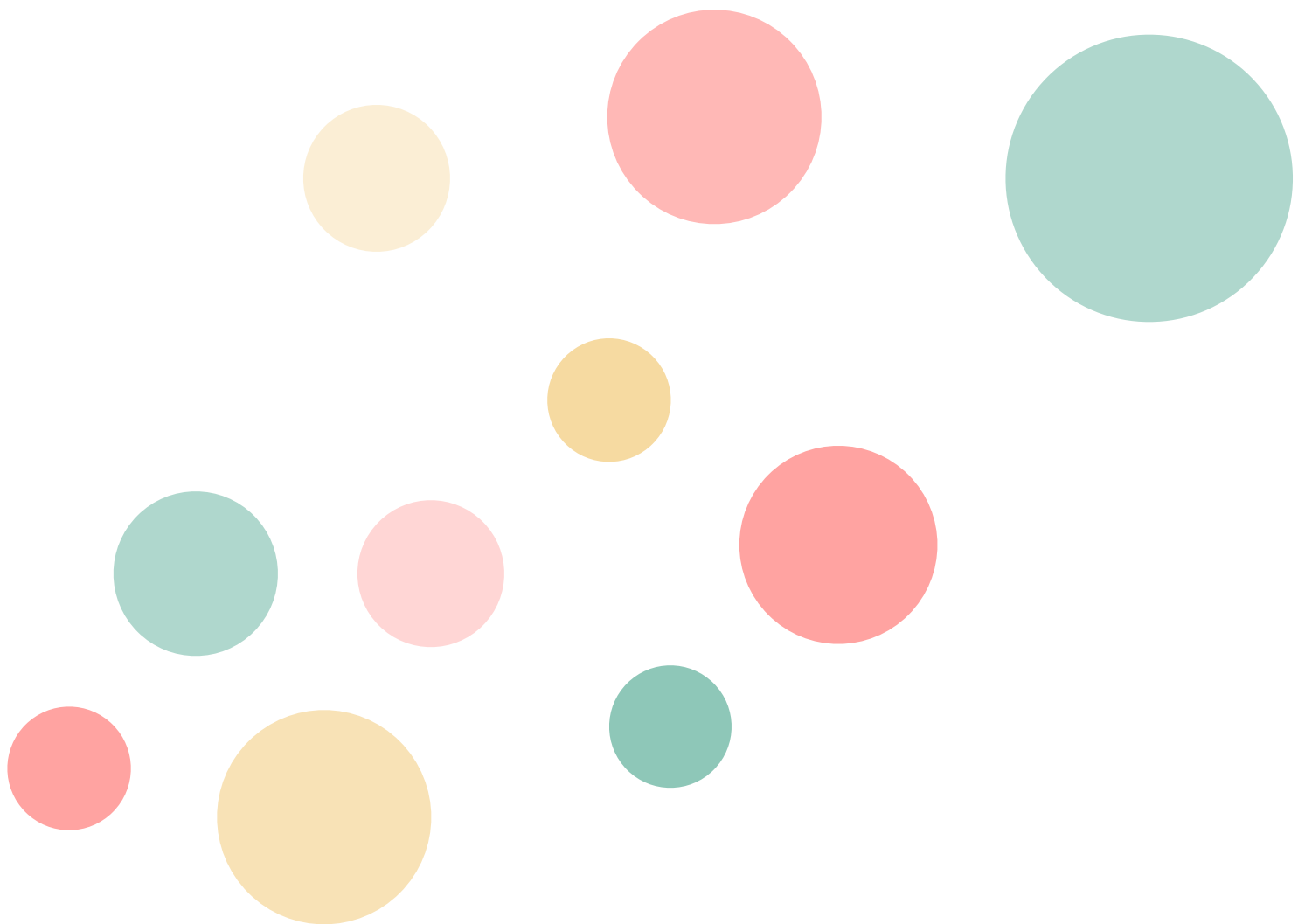
持续集成流程



A large dark grey circle with a thin orange and yellow border contains the Chinese characters "解决方案" (Solution). To its upper left is a smaller dark grey circle containing a white left square bracket "[".

[

解决方案

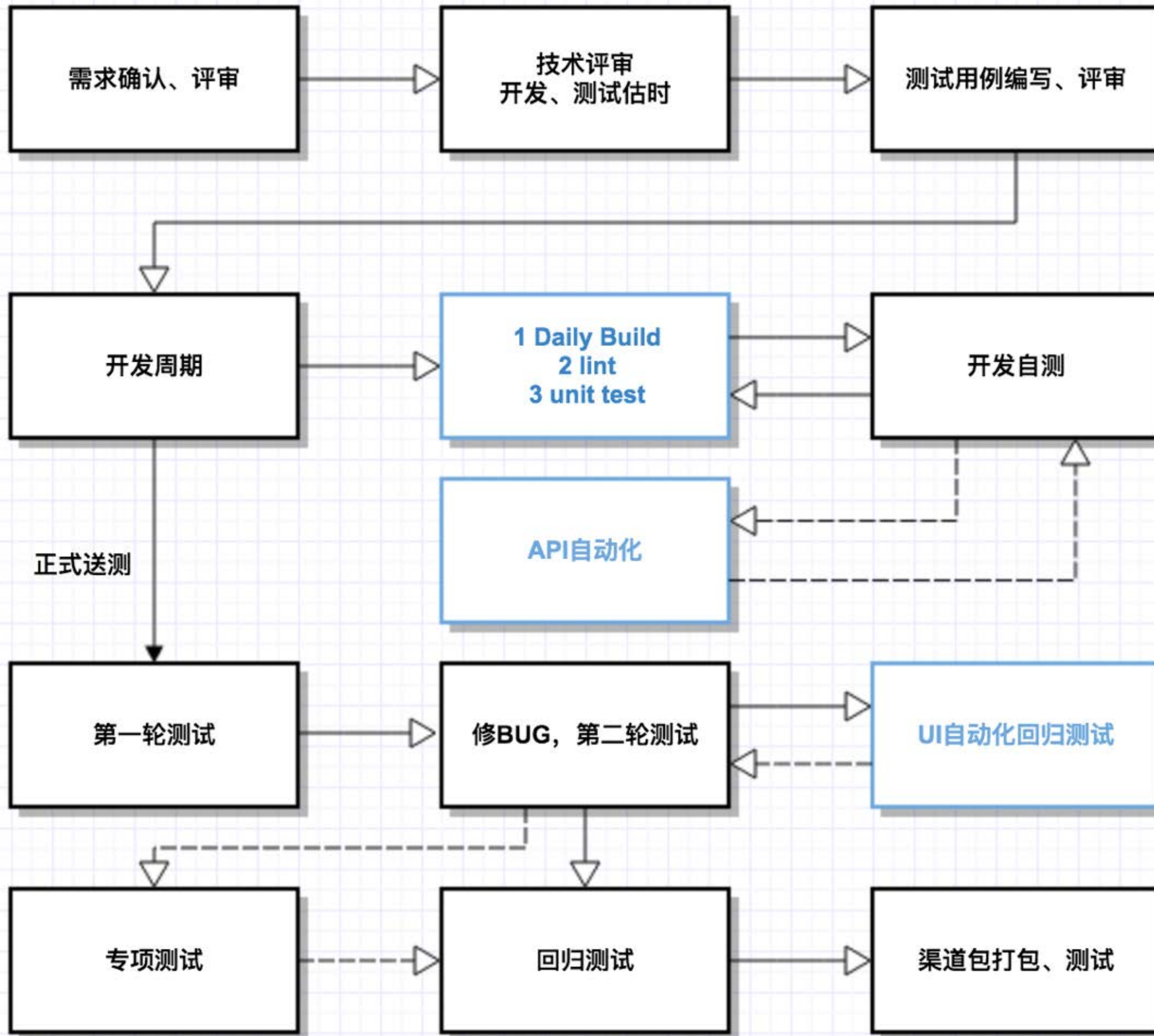


移动端

常见测试流程

痛点

- 1、App构建失败
- 2、App冒烟测试不通过
- 3、接口没自动化
- 4、专项报告





持续集成 打包

打包方式: Gradle
包依赖管理: Maven
产出: Debug-apk、Release-apk

START

Android



自动构建

iOS

打包方式: Xctools
包依赖管理: Cocoapods
产出: Debug-ipa、Release-ipa
Debug-app



持续集成 Apk扫描

START

反编译、字符串扫描

静态扫描



包大小检查

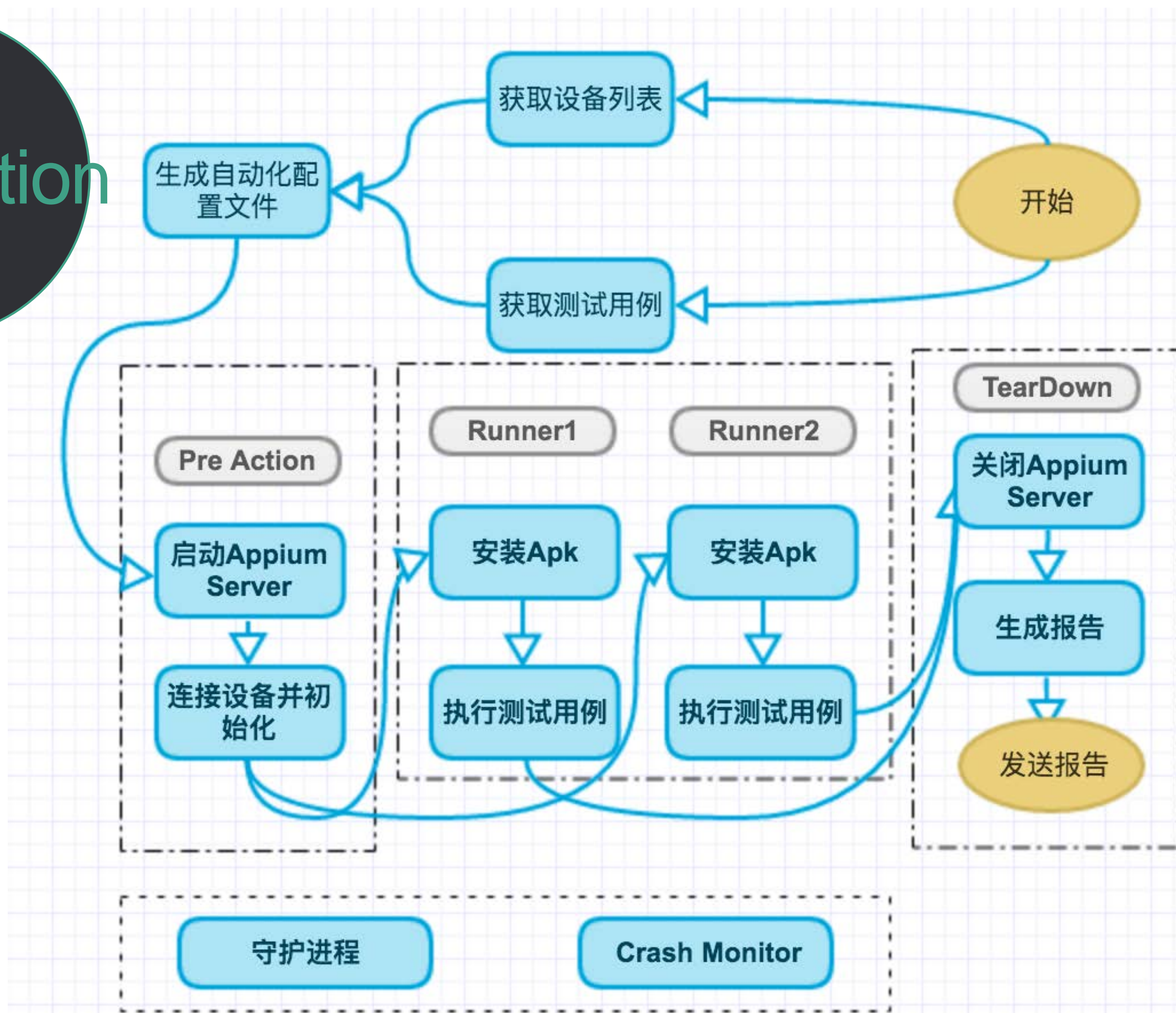
包大小信息、历史包大小对比、其他产品包大小对比

Automation

自动化框架特性

M

- 1、兼容多类App
- 2、兼容多类设备
- 3、支持并发测试



NJSD

中国（南京）软件开发者大会
China (Nanjing) Software Developers Conference

2016

持续集成

专项测试 指标

CI中的专项测试

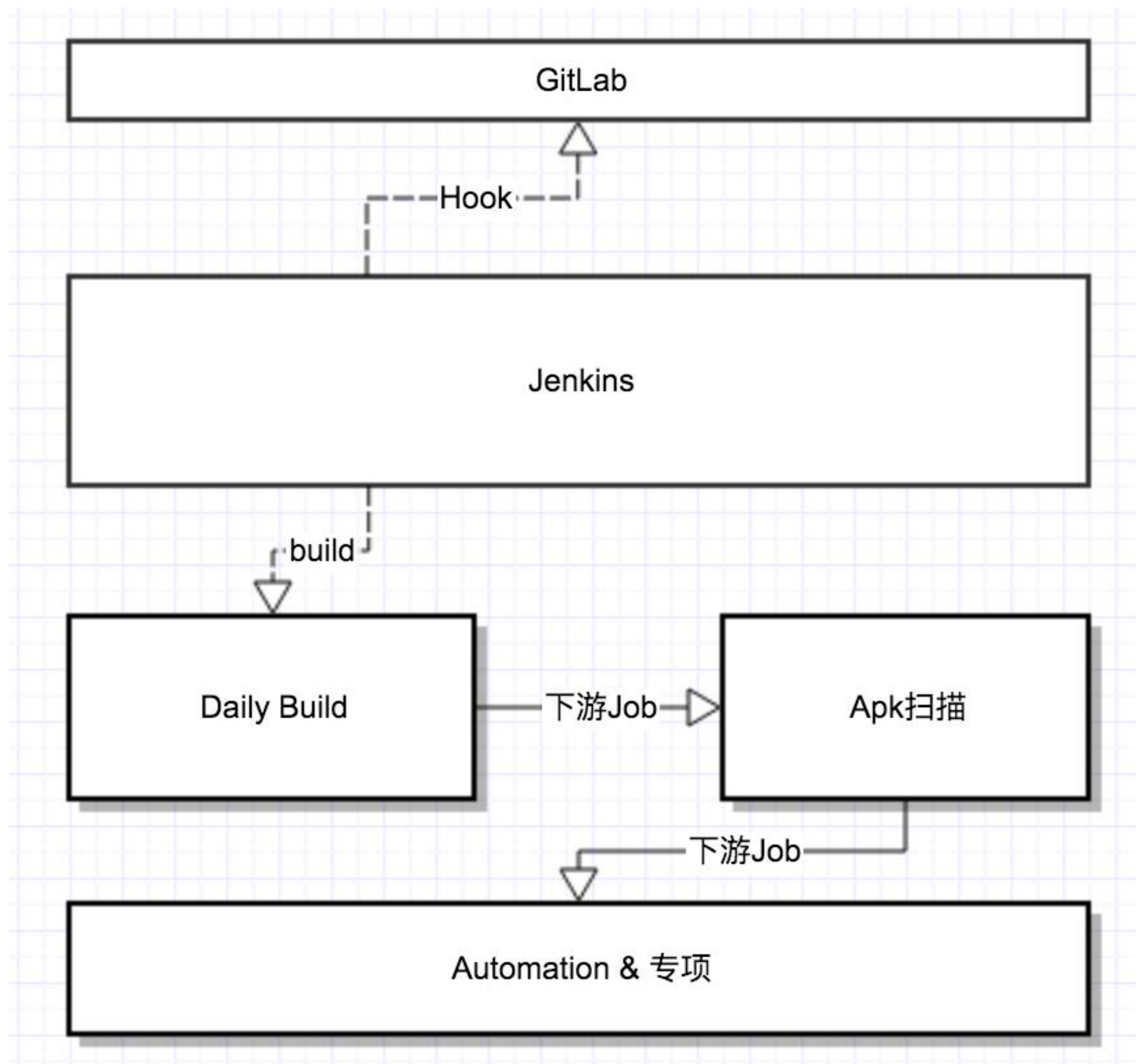
START

- 1、Apk包大小检测
- 2、启动时间
- 3、稳定性测试
- 4、产品对比

性能埋点

通过AOP的技术实现，程序内部完成性能数据收集，并随BI数据一起上报。平台通过拉取BI数据，进行性能数据分析。

持续集成 实现机制





提交新的测试

选择apk



选择已上传文件

- documents/2016/03/29/cctalk_tiyantuan_6.0.5.229.141314.apk
- documents/2016/04/01/A208.apk








或选择一个apk文件:

No file chosen
文件100MB以内, 以apk结尾

选择用例

-  CCTalk
-  沪江网校


☑ 设备选择

-  HM NOTE 1S
-  HM 1S
-  m1 note
-  SM-G9008V
-  SM-N9008
-  ALE-TL00
-  MX5




运行结果List


Dashboard




9
Job个数



52
今日构建



23
本周版本发布



3
本周质量事件

移动UI自动化运行结果

全部 失败用例 持续构建自动化

| Report ID | 产线 | 开始时间 | 手机型号 | 用例总数 | 通过 | 失败 | 崩溃数 | 脚本报错 | 执行者 |
|-----------|--------|---------------------|-------------|------|----|----|-----|------|----------|
| 448 | cctalk | 2016-04-07 10:20:33 | [SM-G9008V] | 3 | 3 | 0 | 0 | 0 | hjqa |
| 447 | cctalk | 2016-04-06 17:58:51 | [MX5] | 3 | 3 | 0 | 0 | 0 | robin.xu |
| 416 | cctalk | 2016-04-05 18:14:35 | [SM-N9008] | 1 | 0 | 0 | 0 | 1 | robin.xu |
| 407 | cctalk | 2016-04-05 14:58:18 | [MX5] | 3 | 0 | 0 | 0 | 3 | hjqa |
| 406 | cctalk | 2016-04-05 14:50:18 | [SM-G9008V] | 3 | 3 | 0 | 0 | 0 | hjqa |
| 397 | cctalk | 2016-04-04 17:50:43 | [MI 4W] | 1 | 1 | 0 | 0 | 0 | hekuan |
| 396 | cctalk | 2016-04-04 15:02:19 | [SM-N9108V] | 1 | 0 | 0 | 0 | 1 | hekuan |
| 395 | cctalk | 2016-04-04 14:00:20 | [SM-N9108V] | 3 | 0 | 1 | 0 | 2 | hekuan |
| 394 | cctalk | 2016-04-04 12:15:43 | [SM-N9108V] | 1 | 0 | 0 | 0 | 1 | hekuan |
| 393 | cctalk | 2016-04-01 11:29:02 | [ALE-TL00] | 3 | 0 | 2 | 0 | 1 | hjqa |

Showing 1 to 10 of 172 rows 10 records per page



测试结果详情

产线 cctalk

| | |
|------|---------------------|
| 设备 | [SM-G9008V] |
| 开始时间 | 2016-04-07 10:04:14 |
| 用例数 | 3 |
| 成功 | 3 |
| 失败 | 0 |
| 错误 | 0 |

概况图

- 失败
- 错误
- 通过

报告详情




| 序号 | 类名 | 耗时 | 结果 | 操作步骤 | 详情 |
|----|------------------------|---------|------|--|----------------------|
| 1 | testClass01main | 58.272秒 | Pass | <ul style="list-style-type: none"> ○ 跳过引导 ○ 进入我的页面 ○ 登录帐号 ○ 进入CCTalk页 | 查看详情 |
| 2 | testClass02find | 31.296秒 | Pass | <ul style="list-style-type: none"> ○ 进入发现页面 ○ 精彩课程 ○ 英语课程 | 查看详情 |
| 3 | testClass03addresslist | 30.266秒 | Pass | <ul style="list-style-type: none"> ○ 进入通讯录页面 ○ 新的朋友 ○ 群 ○ 讨论组 ○ 学习号 | 查看详情 |

Showing 1 to 3 of 3 rows
10 records per page

<<
<
1
>
>>



详细出错信息

| | | |
|---|--|---|
|  testClass02find |  Fail |  26.602秒 |
|---|--|---|

日志信息

```
selenium.webdriver.remote.remote_connection: DEBUG: POST http://127.0.0.1:4892/wd/hub/session {"desiredCapabilities": {"unicodeKeyboard": *True*, *deviceName*: *testDevice*, *automationName*: *Appium*, *app*: *D:\jenkins\workspace\sync_appium_server\hujiang\work\cctalk\cctalk_tiyantuan_6.0.5.229.141314.apk*, *appActivity*: *.LoadingActivity*, *resetKeyboard*: *True*, *platformVersion*: *4.4*, *appPackage*: *com.hujiang.cctalk*, *platformName*: *Android*, *appWaitActivity*: *.LoadingActivity*}}
hujiang.util.android.DaemAction: INFO: DaemAction : Start to get current hierarchy.
hujiang.util.android.DaemAction: INFO: DaemAction : Start to get current hierarchy.
hujiang.util.android.DaemAction: INFO: DaemAction : Start to get current hierarchy.
selenium.webdriver.remote.remote_connection: DEBUG: Finished Request
selenium.webdriver.remote.remote_connection: DEBUG: POST http://127.0.0.1:4892/wd/hub/session/b9b7b903-f432-46da-b87b-ad069e1b4301/timeouts/implicit_wait {"sessionId": *b9b7b903-f432-46da-b87b-ad069e1b4301*, *ms*: 10000.0}
selenium.webdriver.remote.remote_connection: DEBUG: Finished Request
hujiang.testcase.BaseTestCase: INFO: DeamAction : appiumServer start and send to DaemAction class.Driver is <appium.webdriver.webdriver.WebDriver object at 0x02E94DF0>
hujiang.util.commonBase: INFO: click 发现
```

程序信息

```
hujiang.util.android.CrashAnalyzer: ERROR: 04-01 11:26:23.430 E/AndroidRuntime(27309): *** FATAL EXCEPTION IN SYSTEM PROCESS: main

hujiang.util.android.CrashAnalyzer: ERROR: 04-01 11:26:23.430 E/AndroidRuntime(27309): java.lang.IllegalStateException: UiAutomationService android.accessibilityservice.IAccessibilityServiceClient$Stub$Proxy@53b8c2aa already registered!

hujiang.util.android.CrashAnalyzer: ERROR: 04-01 11:26:23.430 E/AndroidRuntime(27309):      at android.os.Parcel.readException(Parcel.java:1551)

hujiang.util.android.CrashAnalyzer: ERROR: 04-01 11:26:23.430 E/AndroidRuntime(27309):      at android.os.Parcel.readException(Parcel.java:1496)

hujiang.util.android.CrashAnalyzer: ERROR: 04-01 11:26:23.430 E/AndroidRuntime(27309):      at android.view.accessibility.IAccessibilityManager$Stub$Proxy.registerUiTestAutomationService(IAccessibilityManager.java:352)
```


沪江学习 性能收集测试情况:

设备: [XIAOMI][红米NOTE 1]

冷启动耗时: **250ms** (平均)

测试网络: WiFi

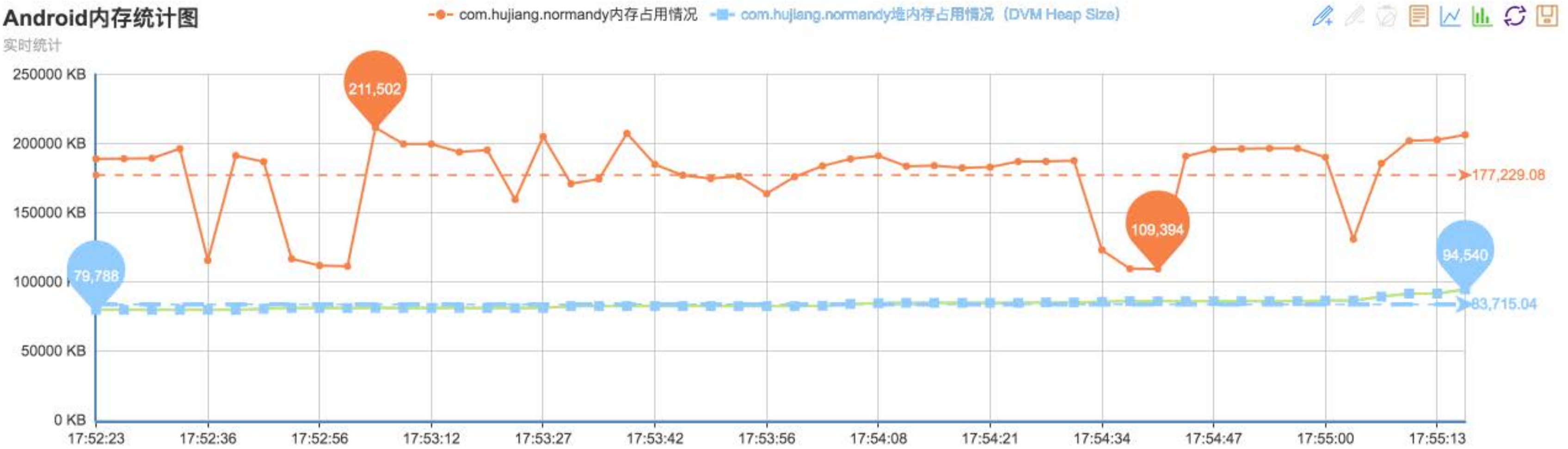
内存占用峰值: 211M

CPU占用峰值: 89%

整体情况: 沪江学习在使用过程中, 整体的CPU占用、内存占用都是偏高的 (比起CCtalk、沪江网校), 且dvm heap size是最接近OOM的数值的 (89M)。

Android内存统计图

实时统计



Android CPU统计图

实时统计





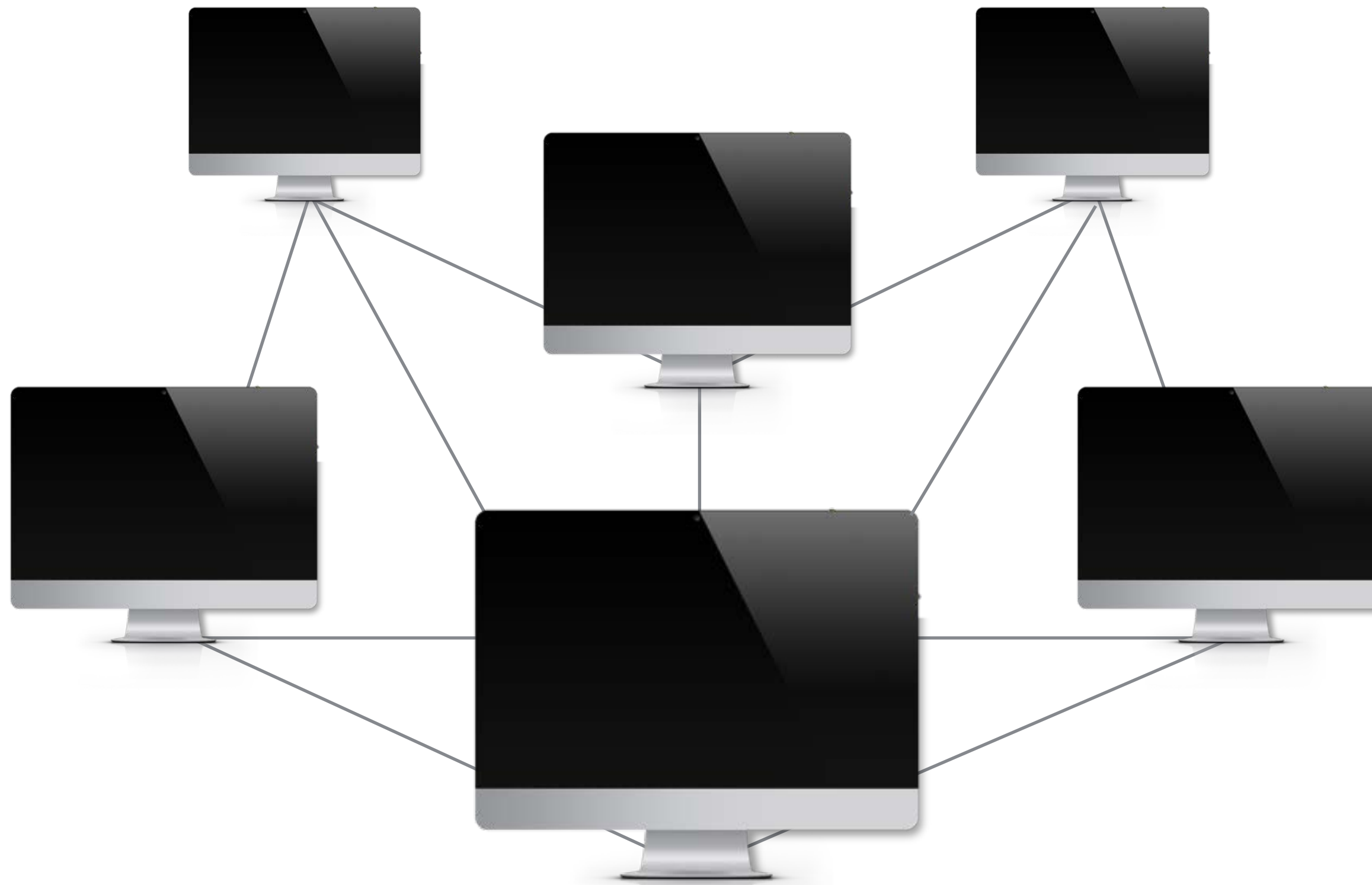
持续集成 CI



Jenkins Job分发调度
分布式 CI

多台Slave执行机

执行机各自挂靠多台设别



NJSD

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2016

设备管理平台



STF

基于开源框架

STF (Smart test farm)

二次开发

- 1、1PC机管理6~7台设备
- 2、实现远程调试
- 3、接入域LDAP单点登录
- 4、为自动化封装内部接口，方便调用

设备1拖多





STF UI

Control Devices Settings Help

TOTAL DEVICES: 11 USABLE DEVICES: 6 BUSY DEVICES: 1 黄伟东: 0

Devices Details Customize

| Status | Model | Serial | OS | Battery Level | Location | User |
|--------------|------------------|------------------|-------|---------------|-----------------------|-------|
| Use | ALE-TL00 | Z2XDU15731002956 | 5.0 | 100% | localhost.localdomain | |
| Use | HM NOTE 1S | 3190de0d | 4.4.4 | 100% | localhost.localdomain | |
| Use | SM-N9008 | 924ab214 | 5.0 | 100% | localhost.localdomain | |
| Use | MX5 | 850ABM7HCNMB | 5.0.1 | 99% | localhost.localdomain | |
| Use | m1 note | 71UBBLD235F7 | 4.4.4 | 100% | localhost.localdomain | |
| Use | HM 1S | 5a61872d | 4.4.4 | 100% | localhost.localdomain | |
| Busy | SM-G9008V | 32e3620c | 5.0 | 100% | localhost.localdomain | 徐磊-QA |
| Disconnected | 0123456789ABCDEF | 0123456789ABCDEF | | | localhost.localdomain | |
| Disconnected | MX4 | 75UBBLG226CC | 4.4.2 | 100% | localhost.localdomain | |
| Disconnected | MI NOTE LTE | 90cd2b80 | 4.4.4 | 100% | localhost.localdomain | |
| Disconnected | N2F4C16111015246 | N2F4C16111015246 | | | localhost.localdomain | |



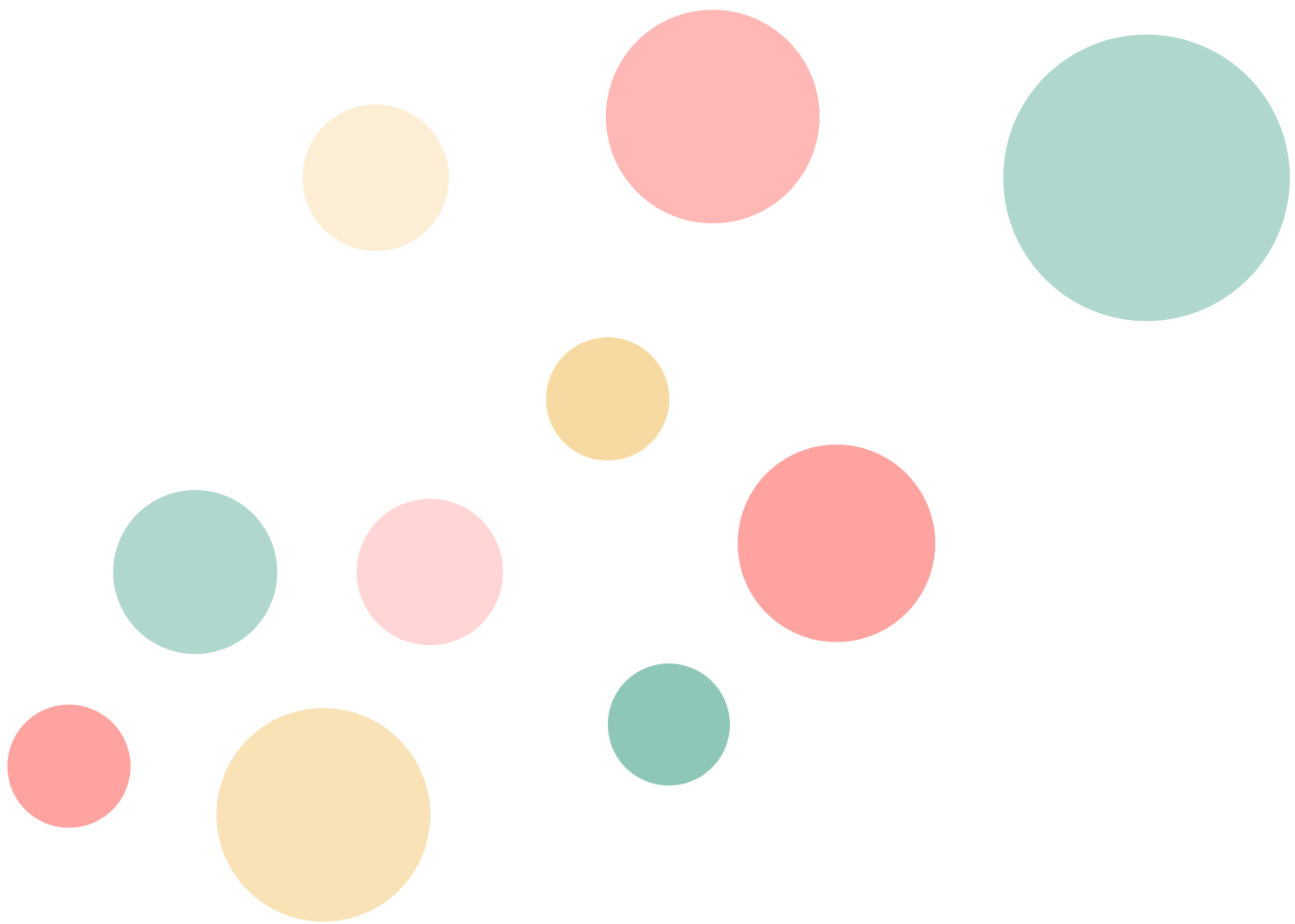
远程操作、 Debug调试

The image shows a screenshot of an Android emulator interface. On the left, a mobile application is displayed on a virtual device (SM-N9008). The app's screen features a cartoon girl with red hearts for eyes, surrounded by icons representing education, communication, and business. Below her, the text reads "没选择?" (No choice?) and "近千门课程任意选" (Choose from nearly a thousand courses). At the bottom of the app screen are two buttons: "直接登录" (Log in directly) and "稍后再说" (Remind me later). The emulator's status bar at the top shows various icons and the time 11:47. On the right side of the image, a development tool dashboard is visible. It includes a top navigation bar with "Web" and "Native" tabs. Below this, there are several panels: "Navigation" with a URL input field and "Open" button; "App Upload" with a "Drop file to upload" area; "Apps" with icons for "App Store", "Settings", "Developer", "Manage Apps", and "WiFi"; "Clipboard" with an input field and refresh button; "Shell" with an input field and "Clear" button; and "Remote debug" with a text input field containing the command "adb connect 192.168.154.30:7409". At the bottom of the dashboard, there is a "Logs" section with a table header including "Level", "Time", "PID", "TID", "Tag", and "Text", along with a "Clear" button.

1
困难

如何提高运行稳定性

投入多大的成本



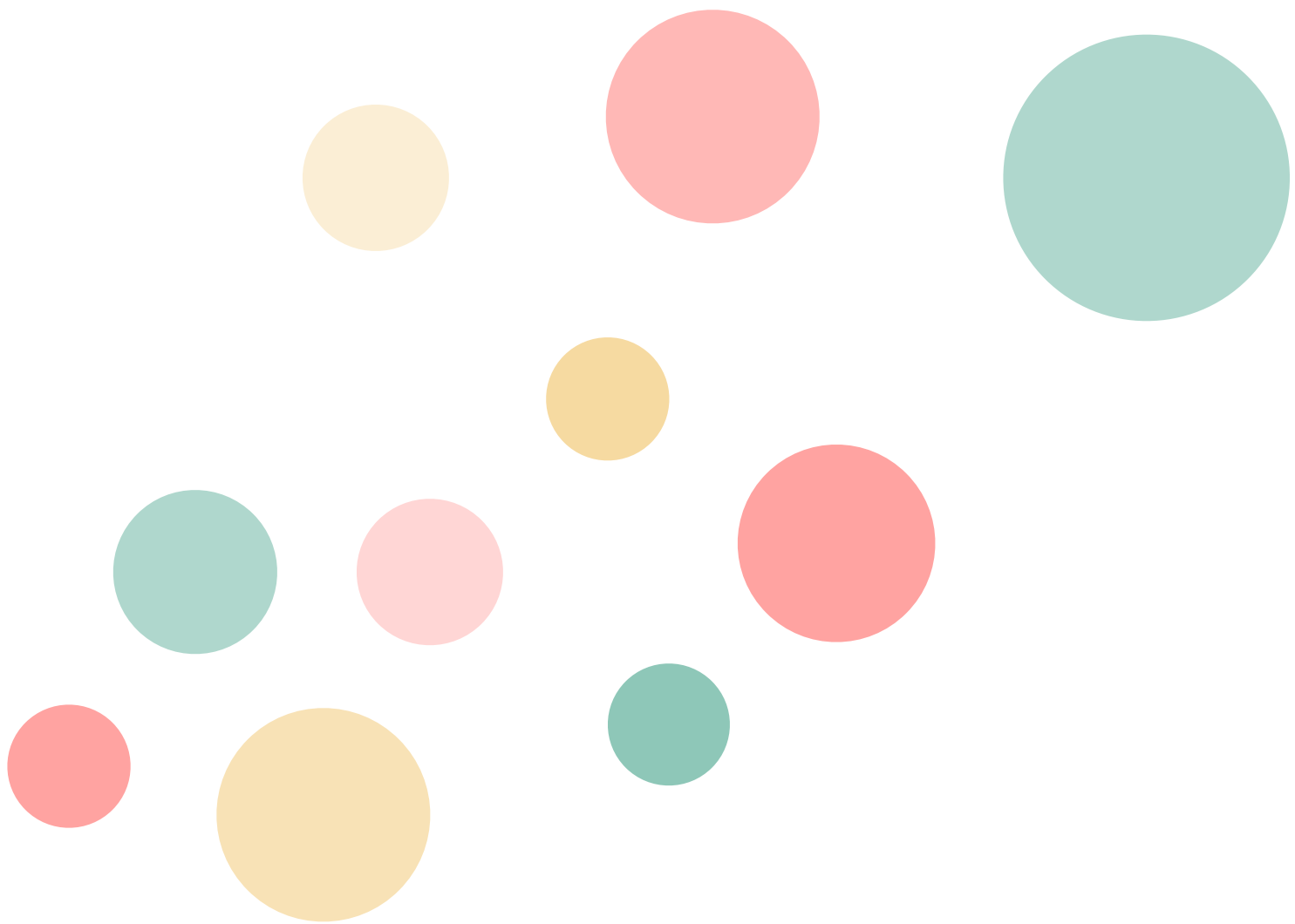
]

成果

释放大部分
回归人力
约人*2~3h

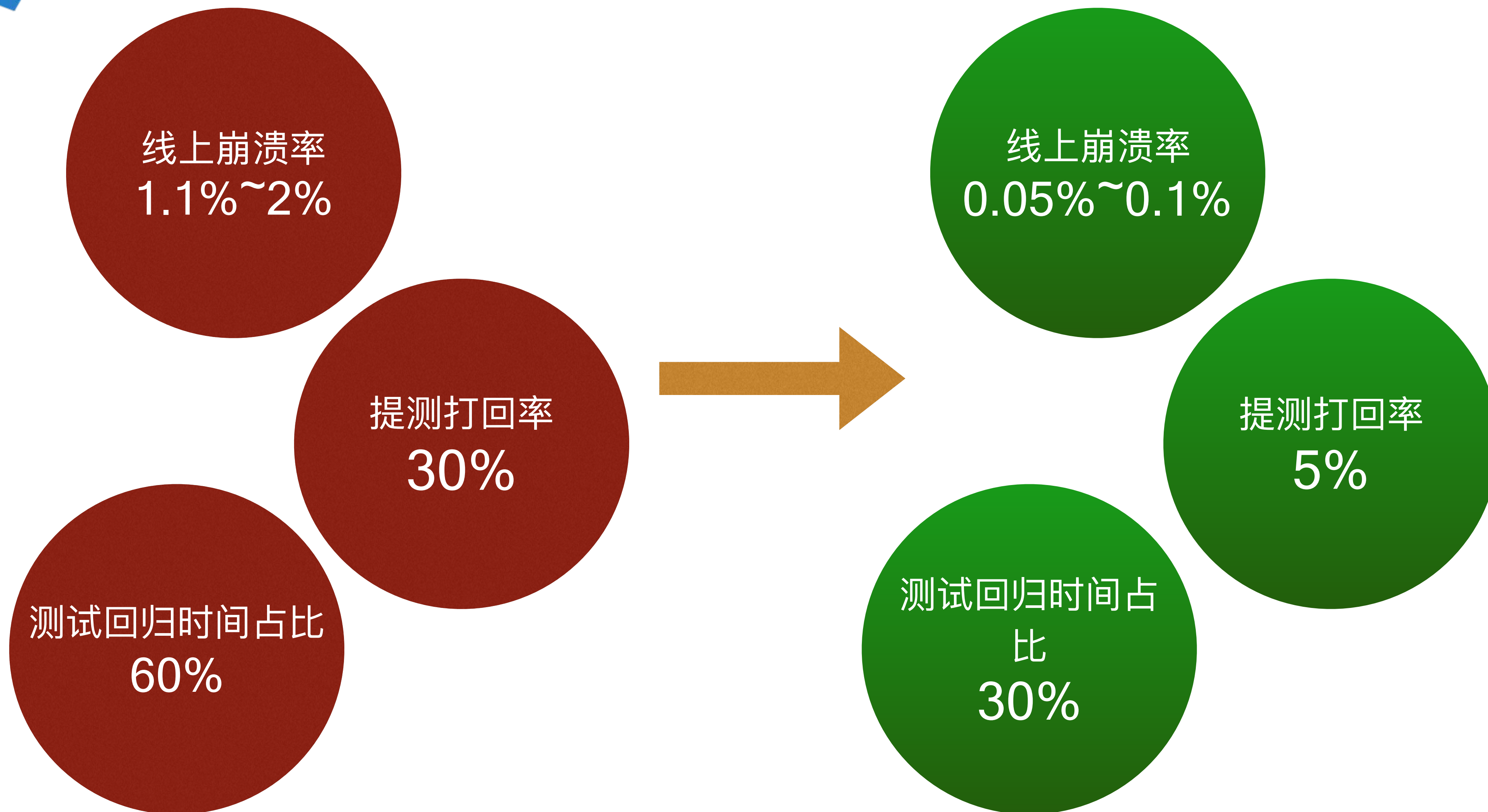
持续观察
App健康指
标

及时发现构建
问题
(在送测前)



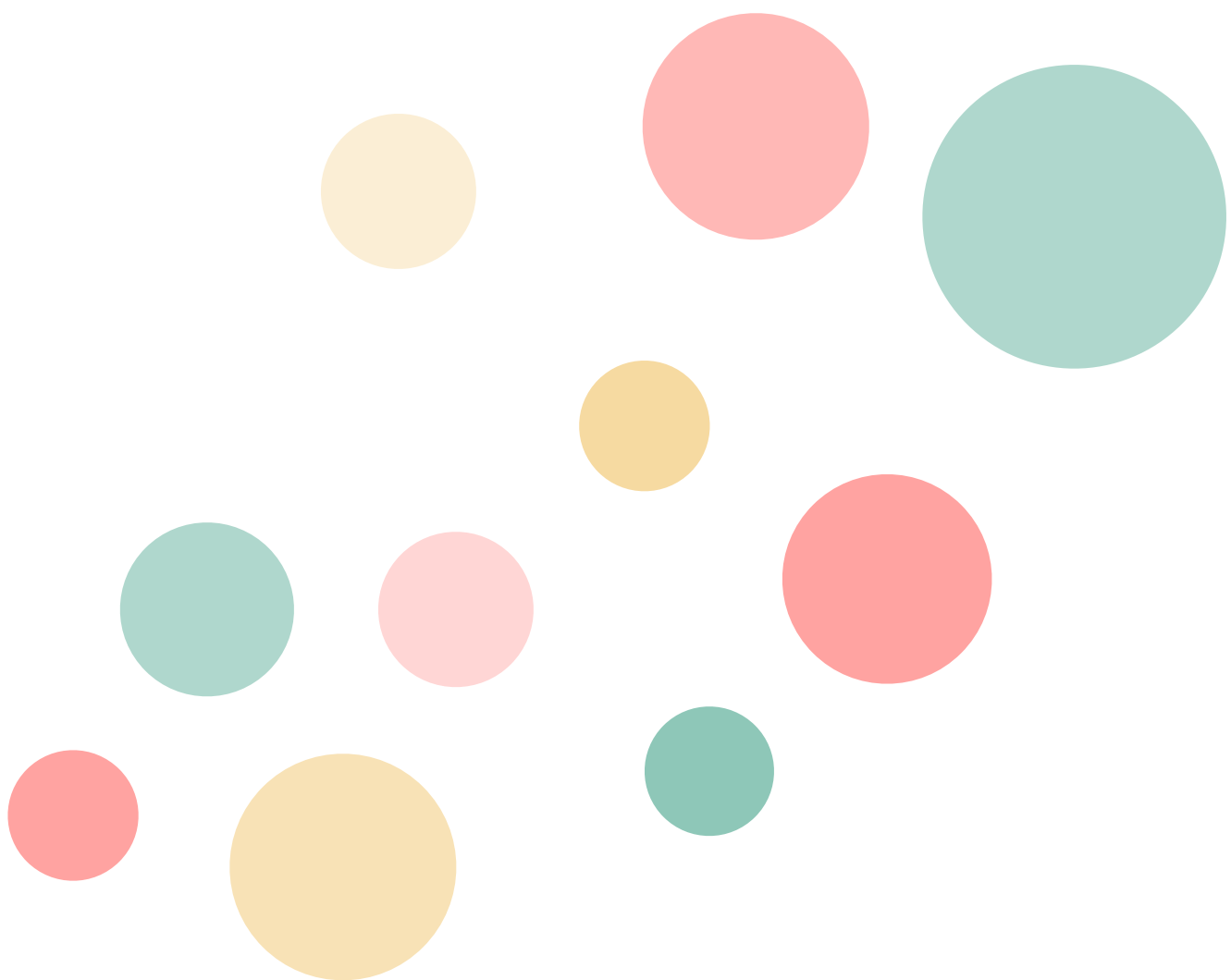


沪江 业务提升



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Q&A



嘿大东

上海 浦东新区

扫一扫上面的二维码图案，加我微信

A WeChat profile card for a user named '嘿大东' (Hey Dade) from Shanghai Pudong New Area. The profile picture is a cartoon fox. Below the name and location is a large QR code with a colorful bokeh background. At the bottom of the card, there is a text prompt: '扫一扫上面的二维码图案，加我微信' (Scan the QR code above to add me on WeChat).