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# 安卓自动化测试利器：uiautomator2

- 最新版本: v2.0
- 更新时间: 20210330

## 简介

总结安卓设备自动化测试领域好用的库uiautomator2，包括简介；如何搭建环境；有哪些核心功能，比如监听、用xpath等查找元素、以及常见的操作元素，比如点击元素、输入内容等、如何获取当前屏幕的截图和xml源码；以及与u2相关的内容，比如辅助调试的weditor、adb、android-uiautomator-server、uiautomator；以及常见问题和经验，比如文字输入、NAF、long\_click不工作、后台服务被杀掉等；以及一些源码分析；和通用代码段，包括工具类函数、adb相关、设备相关等；最后给出参考资料和文档。以及额外加上了很多实际案例，比如常见的确定类弹框按钮、自动关闭各大应用市场的广告类弹框、Vivo自动安装app、Vivo自动登录账号、奇虎360的自动登录账号。以及其他一些常见逻辑。

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本书的各种源码、在线浏览地址、多种格式文件下载如下：

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- [crifan/android\\_automation\\_uiautomator2: 安卓自动化测试利器：uiautomator2](#)

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- [安卓自动化测试利器：uiautomator2 book.crifan.com](#)
- [安卓自动化测试利器：uiautomator2 crifan.github.io](#)

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## 鸣谢

感谢我的老婆陈雪的包容理解和悉心照料，才使得我 `crifan` 有更多精力去专注技术专研和整理归纳出这些电子书和技术教程，特此鸣谢。

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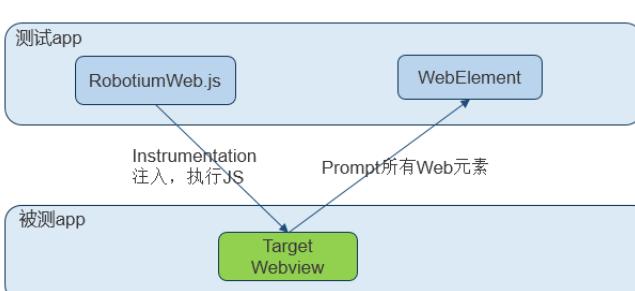
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## uiautomator2简介

- uiAutomator2
  - 简称: u2
  - 是什么: 使用Python对Android设备进行UI自动化的库
  - 作用: 自动化操作安卓设备, 用于测试或抓包等
  - 语言: Python
  - 主页
    - [openatx/uiAutomator2: Android UiAutomator2 Python Wrapper](#)
    - 其中 openatx 中的
      - ATX = AutomatorX
  - 竞品=其他安卓自动化测试框架
    - Robotium
    - Selendroid
    - Espresso

## 基本原理

- 背景
  - Android内置的支持测试的框架
    - Android 4.2+: UiAutomator
    - Android 2.3 ~ 4.1: Instrumentation
- uiAutomator2的原理
  - 图
  - 文字
    - 采用 Instrumentation 注入被测app后, 执行 js 脚本, 提取并封装成拥有 Web 元素的文本信息、 id 或 class 等属性、坐标信息等等的WebElement 对象
    - 通过 js 注入的方式, 可以获取网页中的包括文字、 tag标签、属性、坐标等等信息。
    - Android

- `WebChromeClient` 类在 `Android` 中，主要用于辅助 `WebView` 处理 `js` 的对话框、提示框等等

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## 环境搭建

下面介绍如何搭建uiautomator2的开发环境，去测试安卓设备。

### 准备工作：安卓手机

#### 确保手机中开启了USB安装

安卓手机中开启 开发者选项 -> USB调试 -> USB安装



## 安装

```
pip3 install -U uiautomator2
```

- 如果包管理器是 pipenv，则用：  
◦ pipenv install uiautomator2

再去安装相关依赖的东西：

```
python3 -m uiautomator2 init
```

## 测试连接

再去测试连接：

```
import uiautomator2 as u2
d = u2.connect() # connect to device
print(d.info)
```

其中：

u2.connect()可以换成wifi或usb：

- wifi
  - d = u2.connect('10.0.0.1')
- usb
  - d = u2.connect('8c8a4d4d')
    - 其中 8c8a4d4d 是 adb devices 列出的当前（用USB数据线连接到Mac中的）安卓设备的ID
      - ~ adb devices  
List of devices attached  
8c8a4d4d device

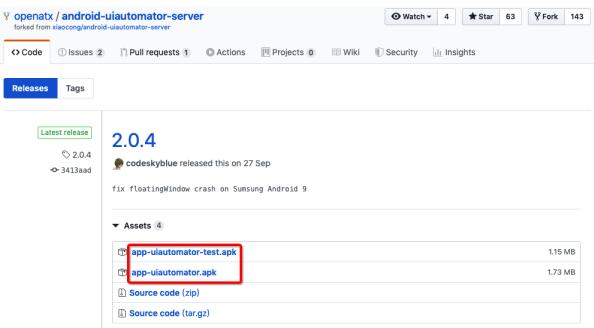
输出举例：

```
→ autoTestAndroidGameHappyBigBattle python
Python 3.7.3 (default, May 22 2019, 10:55:14)
[Clang 10.0.1 (clang-1001.0.46.4)] on darwin
Type "help", "copyright", "credits" or "license" for more :
>>> import uiautomator2 as u2
>>> d = u2.connect('8c8a4d4d')
conn=<urllib3.connection.HTTPConnection object at 0x1077f4c
```

## 说明：安装细节

### 安装内容

上述命令会安装相关工具到你安卓手机中：

- uiautomator-server
  - 作用：包含http rpc服务的apk
    - 2个apk
      - 图解
 
      - 框架要求2个apk，缺一不可
        - app-uiautomator-test.apk：测试程序
          - uiautomator这个框架允许我们测试第三方应用
          - 包名：com.github.uiautomator.test
        - app-uiautomator.apk：被测应用
          - 基本就是个傀儡
            - 只要别轻易的死掉，就算是一个合格的应用了
            - 包名：com.github.uiautomator
    - 地址：<https://github.com/openatx/android-uiautomator-server/releases>
  - atx-agent
    - 地址：<https://github.com/openatx/atx-agent>
  - openstf/minicap
    - 地址：<https://github.com/openstf/minicap>
  - openstf/minitouch
    - 地址：<https://github.com/openstf/minitouch>

### 安装log日志

期间如果开启了uiautomator2的debug后，可以看到更详细的信息。

比如安装路径（小米9中安装期间显示安装的东西有）：

- minicap、minitouch
  - [https://tool.appetizer.io/openatx/stf-binaries/raw/master/node\\_modules/minitouch-](https://tool.appetizer.io/openatx/stf-binaries/raw/master/node_modules/minitouch-)

prebuilt/prebuilt/arm64-v8a/bin/minitouch

- com.github.uiautomator, com.github.uiautomator.test 2.0.3
  - <https://tool.appetizer.io/openatx/android-uiautomator-jsonrpcserver/releases/download/v0.1.6/bundle.jar>
  - <https://tool.appetizer.io/openatx/android-uiautomator-jsonrpcserver/releases/download/v0.1.6/uiautomator-stub.jar>
  - <https://tool.appetizer.io/openatx/android-uiautomator-server/releases/download/2.0.3/app-uiautomator.apk>
  - <https://tool.appetizer.io/openatx/android-uiautomator-server/releases/download/2.0.3/app-uiautomator-test.apk>

安卓6的 华为畅享6S , 重新初始化的log是:

```
[200218 13:55:44] [DevicesMethods.py 11 ] start init driver
[I 200218 13:55:45 init:132] uiautomator2 version: 2.5.3
[I 200218 13:55:45 init:317] Install minicap, minitouch
[I 200218 13:55:45 init:330] Install com.github.uiautomator
[I 200218 13:56:02 init:300] - app-uiautomator.apk installed
[I 200218 13:56:14 init:300] - app-uiautomator-test.apk installed
[I 200218 13:56:14 init:308] Install atx-agent 0.8.2
[I 200218 13:56:19 init:342] Check atx-agent version
Successfully init AdbDevice(serial=DWH9X17124W03779)
```

安卓9的 红米Note8Pro 的初始化log是:

```
[200217 14:45:33] [DevicesMethods.py 11 ] start init driver
[I 200217 14:45:37 init:132] uiautomator2 version: 2.5.3
[I 200217 14:45:37 init:317] Install minicap, minitouch
minicap.so |=====| 67.1K/67.1K
[I 200217 14:45:37 init:330] Install com.github.uiautomator
[I 200217 14:45:38 init:300] - app-uiautomator.apk installed
[I 200217 14:45:38 init:300] - app-uiautomator-test.apk installed
[I 200217 14:45:38 init:308] Install atx-agent 0.8.2
[I 200217 14:45:39 init:342] Check atx-agent version
Successfully init AdbDevice(serial=hmucae175ptk7szs)
```

分别对应着去安装:

- minicap和minitouch
- com.github.uiautomator和com.github.uiautomator.test
  - 对应着: app-uiautomator.apk和app-uiautomator-test.apk
- atx-agent

## 安装后的app

不过, 实际上 (安卓10的小米9, 安卓9的小米Note8Pro) 只安装了, 最核心的2个:

xpath

- ATX

- 桌面图标



- 安装期间需要手动点击 继续安装



- com.github.uiautomator.test

- 桌面图片：无

- 安装期间，需要手动点击：继续安装

xpath



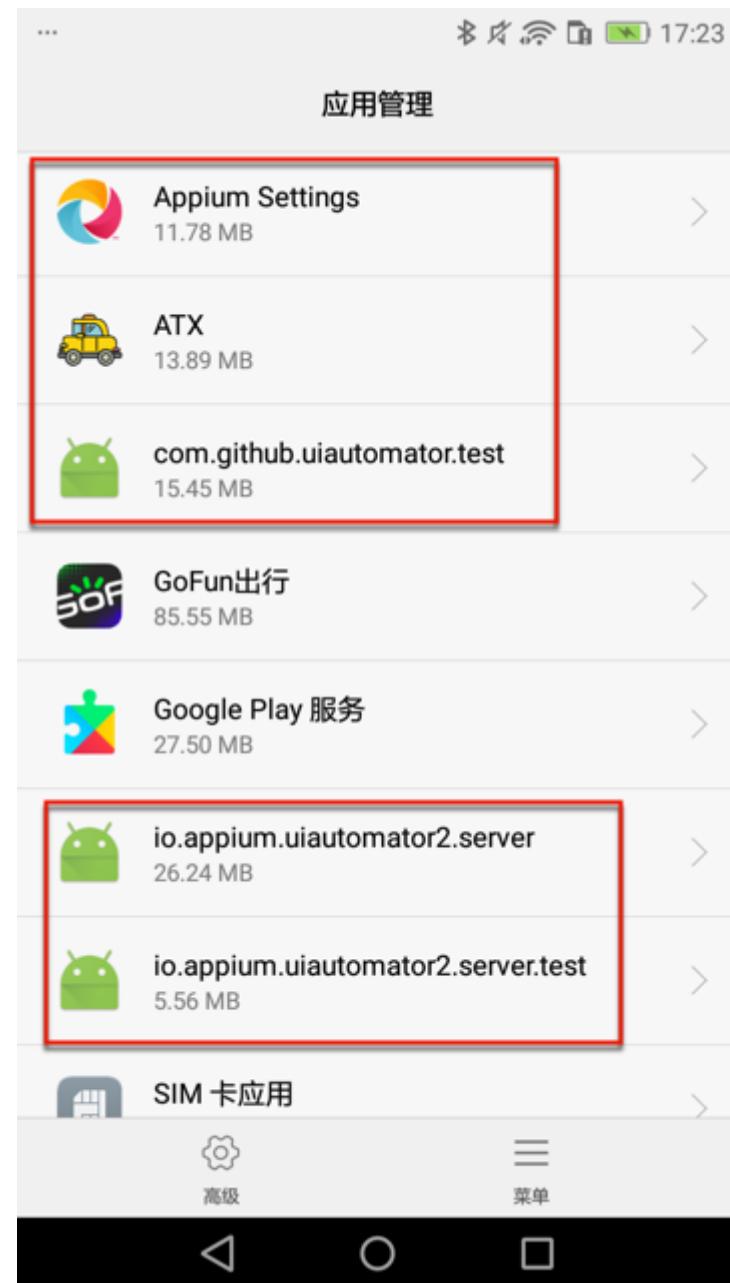
安装后，可以在应用管理中找到，刚才安装的2个应用：

- 红米Note8Pro 安卓9



xpath

- 华为畅享6S 安卓6



### ATX

关于ATX，启动后的主界面：

xpath



点击 `启动UIAUTOMATOR` 后，会显示： ATX: Uiautomator started

xpath



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## 核心功能

接着介绍uiautomator2的一些常用的核心的功能。

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## 监听

其中一个很常用的功能就是：监听

即，注册了要监听的条件，满足后，就会自动触发。

典型应用比如，希望界面中出现 好的、确定 等按钮，就自动点击。

比如：

- 大众点评安装期间的 安装



- 弹框中的 允许

xpath



- 普通安卓原生的按钮：确定



则需要去注册监听器，其核心逻辑是：

- 之前用： watcher

xpath

- 后改用: `xpath`
- 20210239 作者后来又改回: `watcher`

详细解释:

## 用 `watcher` 实现监听

```
# 注册单个监听器
d.watcher("安装").when(text="安装").click()
# 等价于
d.watcher("安装").when(text="安装").click(text="安装")

# (此刻) 单次运行 (一次)
d.watchers.run()

# 后台长期的运行
# d.watchers.watched = True # 旧
d.driver.watcher.start() # 新
```

其中的:

- 20210329更新: 版本 v2.5.3 之后, 又从 `xpath` 换回 `watcher`
  - 之前: `d.watchers.watched` 在 `uiautomator2`  
`>=1.0.0` 版本后已废弃。
    - 当时: 推荐换用下面的 `xpath` 的写法: `xpath.watch_background`

实际调用举例:

xpath

```
def register_watcher(self):
    # Note: since uiautomator2 v2.5.3, change xpath back to v
    for key in self.config["install"]:
        logging.debug("register {}".format(key))
        # self.driver.watcher(key).when(text=key).click()
        # self.driver.watcher(key).when(text=key).click(text=key)
        # self.driver.watcher.when(key).click()
        self.driver.watcher(key).when(key).click()

XpathConfigKeyList = [
    "Confirm_Button_Xpath_List",
    "NextStep_Button_Xpath_List",
    "PopupWindow_CloseButton_Xpath_List",
]
for eachXpathConfigKey in XpathConfigKeyList:
    curXPathList = self.config[eachXpathConfigKey]
    for eachXPath in curXPathList:
        self.driver.watcher.when(eachXPath).click()
        logging.debug("Registered xpath wathcher: %s", eachXPath)

self.driver.watcher.when(self.config["Vivo_Password_Input"])
self.driver.watcher.when(self.config["Vivo_Register_Vivo"])
self.driver.watcher.when(self.config["Permission_Settings"])
# self.driver.watcher.when(self.config["Qihoo360_Login_Re"])
self.driver.watcher.when(self.config["Qihoo360_PasswordL"])

self.driver.watcher.start()
```

## 用 xpath 实现监听

```
# 注册单个监听器
d.xpath.when(text="安装").click()

# 单次运行一次
d.xpath.run_watchers()

# 后台长期的运行=开启后台监控模式
d.xpath.watch_background() # 默认每4s检查一次
# 或手动设置间隔时间
d.xpath.watch_background(2.0) # 2.0表示每2秒检查一次

# 如果需要，再去停止后台监听
d.xpath.watch_stop()
```

更多关于xpath的细节和用法，详见：

[uiautomator2/uiautomator2/ext/xpath at master · openatx/uiautomator2](#)

xpath

(注：不在主页的readme中，所以一般很少人能找到。我是从[raw](#)的[readme.md](#)中反推才找到的)

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## 查找元素

安卓测试期间，最常用的要属于，查找和定位页面中的相关元素了。

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## xpath

xpath本身是一套独立的技术，常用于web领域内。

此处uiautomator2也支持xpath，用于元素定位，可以实现复杂条件的元素的查找。

## xpath常见操作

### 定位节点和操作节点

```
tbsNodeList = self.driver.xpath("//com.tencent.tbs.core.webview/tbsNodeList")
```

### 获取属性content-desc的值

```
eachTbsNode.attrib.get("content-desc", "")
```

### 给属性content-desc设置值

```
eachTbsNode.attrib["content-desc"] = "add something to avoid conflict"
```

### 删除一个属性

```
eachTbsNode.attrib.pop("NAF")
```

## 文档

关于Xpath的详细用法，见官网中的xpath的文档：

[uiautomator2/uiautomator2/ext/xpath at master · openatx/uiautomator2](#)

-» 文档已经移至：

[uiautomator2/XPATH.md at master · openatx/uiautomator2](#)

其内部用的lxml，具体功能和语法都可以参考：

[The lxml.etree Tutorial](#)

## 查找元素 相关函数

## findAndClickNode: 查找当前节点的父级符合条件的节点 并点击

```
def findAndClickNode(self, curNodeXpath):
    """
        寻找可以clickable=true的当前或父级元素，并点击
    注：主要用于当节点clickable=false，点击无效时，使用此方法
    """
    foundAndClicked = False
    matchDict = {"clickable": "true"}
    clickableParentNode = self.findParentNode(curNodeXpath)
    if clickableParentNode:
        foundNodeAttrib = clickableParentNode.attrib
        clickableParentNode.click()
        foundAndClicked = True
        logging.info("clicked element [%s] found by [xpath: %s]" % (curNodeXpath, foundNodeAttrib))
    else:
        logging.warning("Fail click %s for not found %s(parent)" % (curNodeXpath, clickableParentNode))

    return foundAndClicked
```

调用：

```
if curNodeXpath:
    foundAndClicked = self.findAndClickNode(curNodeXpath)
```

相关函数：

## findParentNode: 寻找父节点

xpath

```
def findParentNode(self, curNodeXpath, matchDict, maxUpLevel):
    """ 寻找符合特定条件的父级节点，最多向上找3级

    如果当前节点符合条件，则返回当前节点
    .....
    matchNode = None

    try:
        curNode = self.driver.xpath(curNodeXpath).get()
        curNodeAttrib = curNode.attrib # .attrib contain '(
        # curNodeInfo = curNode.info # .info not contain '(
        isCurMatch = self.isMatchNode(curNodeAttrib, matchDict)
        if isCurMatch:
            # current is match
            matchNode = curNode
        else:
            # try parent nodes
            curUpLevel = 1
            curParentNodeXpath = curNodeXpath
            while(curUpLevel <= maxUpLevel):
                curParentNodeXpath += "/.."
                curParentNode = self.driver.xpath(curParentNodeXpath).get()
                curParentNodeAttrib = curParentNode.attrib
                isCurParentMatch = self.isMatchNode(curParentNodeAttrib, matchDict)
                if isCurParentMatch:
                    matchNode = curParentNode
                    break
            curUpLevel += 1

    except XPathElementNotFoundError as xpathNotFoundError:
        logging.error("XPathElementNotFoundError: %s", xpathNotFoundError)

    if not matchNode:
        logging.warning("Not found match parent for xpath=%s" % curNodeXpath)

    return matchNode
```

**isMatchNode:** 节点是否匹配

xpath

```
def isMatchNode(self, curNodeAttrib, toMathInfo):
    """判断当前节点属性是否满足条件"""
    isAllMatch = True
    for eachKey, eachToMatchValue in toMathInfo.items():
        if eachKey not in curNodeAttrib:
            isAllMatch = False
            break

        curValue = curNodeAttrib[eachKey]
        if curValue != eachToMatchValue:
            isAllMatch = False
            break

    return isAllMatch
```

### findAndClickTextNode: 寻找节点并点击

```
def findAndClickTextNode(self, text):
    """
    对于text类型节点: android.widget.TextView, text=xxx
    寻找可以clickable=true的当前或父级元素，并点击

    注: 主要用于当text=xxx的节点clickable=false, 点击无效时使用
    """

    curTextNodeXpath = "//android.widget.TextView[@text='{}']".format(text)
    self.findAndClickNode(curTextNodeXpath)
```

### xpathFindElement: 用xpath查找元素

```
def xpathFindElement(self, curClass=None, curId=None, curBox=None):
    """
    find element by xpath

    return value type
    is: u2.webdriver.WebElement
    not: u2.session.UiObject
    """

    foundElement = None
    curXpath = self.generateElementXpath(curClass=curClass,
                                         curId=curId,
                                         curBox=curBox)
    try:
        foundElement = self.driver.xpath(curXpath).get()
    except XPathElementNotFoundError as xpathNotFoundError:
        logging.error("XPathElementNotFoundError: {} from {}".format(
            xpathNotFoundError, curXpath))

    return foundElement
```

xpath

调用:

(1)

```
foundElement = self.xpathFindElement(curClass=locatorClass,
```

相关函数:

## generateElementXpath: 生成元素xpath

```
def generateElementXpath(self, curClass=None, curId=None, curBounds=None):
    """generate element xpath"""
    # nodeXPath = ""
    # if locatorClass:
    #     nodeXPath = "//%s[@bounds='%s']" % (locatorClass, locatorBounds)
    # elif locatorId:
    #     nodeXPath = "//*[@resource-id='%s' and @bounds='%s']" % (locatorId, locatorBounds)
    # else:
    #     nodeXPath = "//*[@@bounds='%s']" % locatorBounds

    classRule = "*"
    if curClass:
        classRule = curClass # 'android.widget.ImageView'

    propertyRule = ""
    if curId:
        propertyRule += "@resource-id='%s'" % curId
        # "@resource-id='com.netease.newsreader.activity:id/icon'"

    if curBounds:
        if propertyRule:
            propertyRule += " and "
        propertyRule += "@bounds='%s'" % curBounds
        # "@resource-id='com.netease.newsreader.activity:id/icon' and @bounds='[10,10,100,100]'

    # TODO: add other support: text, desc, instance, ...
    curXPath = "//%s[%s]" % (classRule, propertyRule)
    # "//android.widget.ImageView[@resource-id='com.netease.newsreader.activity:id/icon' and @bounds='[10,10,100,100]']"

    return curXPath
```

调用:

xpath

```
curClassname = None
curResId = None
curBoundsStr = None

# curAttrib = foundElement.attrib
# AttributeError: 'UiObject' object has no attribute 'attrib'
if hasattr(foundElement, "attrib"):
    curAttrib = foundElement.attrib
    # {'index': '0', 'text': '', 'resource-id': 'com.netease.x...'}
    curResId = curAttrib["resource-id"]
    curBoundsStr = curAttrib["bounds"]
else:
    # # for debug
    # self.debugPrintElement(foundElement, "no attrib")
    logging.debug("")

curInfo = foundElement.info
# {'bounds': {'bottom': 2134, 'left': 75, 'right': 141, 'top': 2098}}
if not curClassname:
    curClassname = curInfo["className"] # 'android.widget.Image'

if not curBoundsStr:
    boundsDict = curInfo["bounds"]
    x0 = boundsDict["left"]
    y0 = boundsDict["top"]
    x1 = boundsDict["right"]
    y1 = boundsDict["bottom"]
    curBoundsStr = "[%d,%d] [%d,%d]" % (x0, y0, x1, y1)
    # '[75,2098] [141,2134]'

if not curResId:
    if "resourceName" in curInfo:
        curResId = curInfo["resourceName"] # 'com.netease.x...'

curNodeXpath = self.generateElementXpath(
    curClass=curClassname,
    curId=curResId,
    curBounds=curBoundsStr,
)
```

## 查找元素

```

def find_element_Android(self, locator):
    """Android: find element"""
    foundElement = None
    locatorType = locator.get("type")
    locatorText = locator.get("text")
    locatorClass = locator.get("class")
    locatorDesc = locator.get("desc")
    locatorId = locator.get("id")
    locatorInstance = locator.get("instance")
    locatorBounds = locator.get("bounds")

    if locatorType:
        if locatorType == "text":
            foundElement = self.driver(text=locatorText)
        elif locatorType == "desc":
            foundElement = self.driver(description=locatorDesc)
        elif locatorType == "id":
            foundElement = self.driver(resourceId=locatorId)
        elif locatorType == "id+bounds":
            foundElement = self.xpathFindElement(curClass=locatorClass,
                                                curId=locatorId,
                                                curX=locatorBounds["x"],
                                                curY=locatorBounds["y"])
        elif locatorType == "class+bounds":
            foundElement = self.xpathFindElement(curClass=locatorClass,
                                                curX=locatorBounds["x"],
                                                curY=locatorBounds["y"])
        elif locatorType == "id+text":
            foundElement = self.driver(resourceId=locatorId,
                                       text=locatorText)
        elif locatorType == "id+desc":
            foundElement = self.driver(resourceId=locatorId,
                                       description=locatorDesc)
        elif locatorType == "class+instance":
            # foundElement = self.driver(className=locatorClass,
            instanceInt = int(locatorInstance)
            # foundElement = self.driver(className=locatorClass,
            foundElementList = self.driver(className=locatorClass)
            if foundElementList:
                curIdx = instanceInt
                shouldMaxNumber = curIdx + 1
                if foundElementList.count >= shouldMaxNumber:
                    foundElement = foundElementList[curIdx]
            else:
                foundElement = None
        else:
            foundElement = None
    else:
        if locatorText:
            foundElement = self.driver(text=locatorText)
        elif locatorClass:
            foundElement = self.driver(className=locatorClass)
        elif locatorDesc:
            foundElement = self.driver(description=locatorDesc)
        elif locatorId:
            foundElement = self.driver(resourceId=locatorId)
        elif locatorInstance:
            foundElement = self.driver(instance=locatorInstance)
        elif locatorBounds:
            foundElement = self.xpathFindElement(curClass=locatorClass,
                                                curX=locatorBounds["x"],
                                                curY=locatorBounds["y"])
    return foundElement

```

xpath

```
        foundElement = self.xpathFindElement(curBounds)

    return foundElement
```

调用：

```
EditTextClass = "android.widget.EditText"

curBounds = ""
if self.isAndroid:
    curLeft = eachEditTextLocation[0]
    curTop = eachEditTextLocation[1]
    curRight = curLeft + eachEditTextLocation[2]
    curBottom = curTop + eachEditTextLocation[3]
    curBounds = "[%s,%s] [%s,%s]" % (curLeft, curTop, curRight, curBottom)
# foundElement = self.xpathFindElement(curClass=EditTextClass)
editTextLocator = {
    "type": "class+bounds",
    "class": EditTextClass, # 'android.widget.EditText'
    "bounds": curBounds, # '[939,423] [1621,558]'
}
foundElement = self.find_element_Android(editTextLocator)
# Note: Not use follow wait_element_setText, for it on
# setIsOk = self.wait_element_setText(editTextLocator,
if foundElement:
    foundElement.set_text(curInputValue)
```

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## 操作元素

找到元素后，往往会涉及到操作元素，其中常见的一些操作有：

- 点击元素
- （给元素）输入内容

下面详细介绍如何操作。

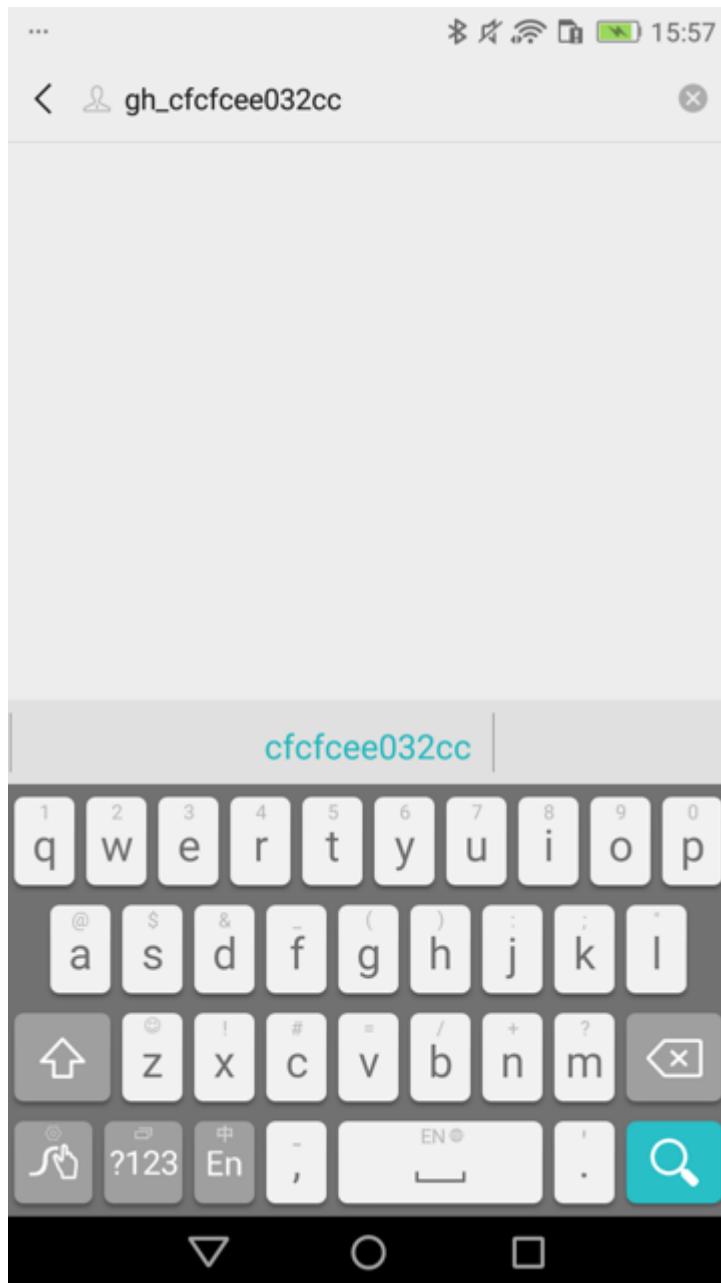
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## 点击元素

找到元素后，往往涉及到点击元素。

### 举例：点击搜索按钮

此处，对于安卓手机，华为畅享6S DIG-AL00，当前微信的公众号搜索界面中，已经处于系统自带输入法：华为Skype输入法时



用对应代码：

xpath

```
self.driver.send_action("search")
```

可以实现点击对应的 蓝色搜索🔍 按钮，触发搜索，进入搜索结果页面。

详见：

【已解决】uiautomator2中点击华为手机中系统自带Swype的输入法中的搜索按钮

## 点击元素（带等待时间）

```

def wait_element_click_Android(self, locator, wait=0.1):
    foundAndClicked = False

    if isinstance(locator, list):
        self.tap(locator)
        foundAndClicked = True
    elif isinstance(locator, dict):
        locatorType = locator.get("type")
        locatorText = locator.get("text")
        locatorClass = locator.get("class")
        locatorDesc = locator.get("desc")
        locatorId = locator.get("id")
        locatorInstance = locator.get("instance")
        locatorBounds = locator.get("bounds")

        foundElement = None
        hasClicked = False
        if locatorType:
            if locatorType == "text":
                foundElement = self.driver(text=locatorText)
            elif locatorType == "desc":
                foundElement = self.driver(description=locatorDesc)
            elif locatorType == "id":
                foundElement = self.driver(resourceId=locatorId)
            elif locatorType == "id+bounds":
                foundElement = self.xpathFindElement(curClass=locatorClass,
                                                      locatorId=locatorId,
                                                      locatorText=locatorText)
            elif locatorType == "id+text":
                foundElement = self.driver(resourceId=locatorId,
                                           text=locatorText)
            elif locatorType == "id+desc":
                foundElement = self.driver(resourceId=locatorId,
                                           description=locatorDesc)
            elif locatorType == "class+instance":
                # foundElement = self.driver(className=locatorClass,
                instanceInt = int(locatorInstance)
                # foundElement = self.driver(className=locatorClass,
                foundElementList = self.driver(className=locatorClass)
                if foundElementList:
                    curIdx = instanceInt
                    shouldMaxNumber = curIdx + 1
                    if foundElementList.count >= shouldMaxNumber:
                        foundElement = foundElementList[curIdx]
                    else:
                        foundElement = None
                else:
                    foundElement = None
            elif locatorType == "bounds+centerPoint":
                foundElement = self.driver(bounds=locatorBounds)

        if not foundElement:
            if locatorText:
                foundElement = self.driver(className=locatorClass,
                                           text=locatorText)
            elif locatorDesc:
                foundElement = self.driver(className=locatorClass,
                                           description=locatorDesc)
            elif locatorId:
                foundElement = self.driver(resourceId=locatorId)
            elif locatorInstance:
                foundElement = self.driver(instance=locatorInstance)
            elif locatorBounds:
                # # method 1: click center point
                # centerPoint = self.boundsToCenterPoint(locatorBounds)
                # self.tap(centerPoint)
                foundElement = None
    else:
        self.tap(locator)
        foundAndClicked = True

    if foundAndClicked:
        time.sleep(wait)

```

xpath

```
        # hasClicked = True

            # method 2: find by xpath with bound
            foundElement = self.xpathFindElement(locator)
            if locatorType == "point":
                centerPoint = self.boundsToCenterPoint(locator)
                self.tap(centerPoint)
                hasClicked = True
                foundAndClicked = True
            else:
                if locatorText:
                    foundElement = self.driver(text=locatorText)
                elif locatorDesc:
                    foundElement = self.driver(description=locator)
                elif locatorId is not None:
                    foundElement = self.driver(resourceId=locator)
                elif locatorClass and locatorInstance:
                    foundElement = self.driver(className=locator)
                elif locator.get('wixin_text_matched') is not None:
                    # TODO 优化微信公众号异常
                    foundElement = self.driver(textContains=locator)

            logging.debug("hasClicked=%s, foundElement=%s", hasClicked, foundElement)
            if not hasClicked:
                isFound = False
                isClickable = None
                hasTimeoutPara = False

                if isinstance(foundElement, u2.xpath.XMLElement):
                    hasTimeoutPara = False
                    if foundElement:
                        isFound = True
                        isClickableStr = foundElement.attrib["clickable"]
                        isClickableStr = isClickableStr.lower()
                        if isClickableStr == "true":
                            isClickable = True
                        elif isClickableStr == "false":
                            isClickable = False
                    # elif isinstance(foundElement, u2.session.UiObject):
                    elif isinstance(foundElement, u2.UiObject):
                        hasTimeoutPara = True
                        if foundElement and foundElement.exists:
                            isFound = True
                            if (foundElement.count > 1):
                                foundElement = foundElement[0]

                            isClickable = foundElement.info["clickable"]

                if isFound:
                    # # for debug: click clickable=false element
                    # isClickable = True
```

```

if isClickable:
    if hasTimeoutPara:
        foundElement.click(timeout=wait)
    else:
        foundElement.click()
    foundAndClicked = True
else:
    logging.info("Try auto find and click")
    logging.debug("clickable=false element")

# curClassName = foundElement.info["class"]
# curNodeXPath = None
# if locatorText:
#     # most case: android.widget.TextView
#     # sometime: android.view.View
#     curNodeXPath = "//%s[@text='%s']"
# elif locatorId:
#     # {'bounds': [41,323][1039,727]
#     curNodeXPath = "//%s[@resource-id='%s']"

curClassName = None
curResId = None
curBoundsStr = None

# curAttrib = foundElement.attrib
# AttributeError: 'UiObject' object has no attribute 'attrib'
if hasattr(foundElement, "attrib"):
    curAttrib = foundElement.attrib
    # {'index': '0', 'text': '', 'resource-id': 'com.tencent.mm:id/aj', 'bounds': [75,2098][141,2134]}
    curResId = curAttrib["resource-id"]
    curBoundsStr = curAttrib["bounds"]
else:
    # # for debug
    # self.debugPrintElement(foundElement)
    logging.debug("")

curInfo = foundElement.info
# {'bounds': {'bottom': 2134, 'left': 75, 'right': 141, 'top': 2098}}
if not curClassName:
    curClassName = curInfo["className"]

if not curBoundsStr:
    boundsDict = curInfo["bounds"]
    x0 = boundsDict["left"]
    y0 = boundsDict["top"]
    x1 = boundsDict["right"]
    y1 = boundsDict["bottom"]
    curBoundsStr = "[%d,%d] [%d,%d]" % (x0, y0, x1, y1)
    # '[75,2098] [141,2134]'

```

xpath

```
        if not curResId:
            if "resourceName" in curInfo:
                curResId = curInfo["resourceName"]

        curNodeXpath = self.generateElementXpath(
            curClass=curClassname,
            curId=curResId,
            curBounds=curBoundsStr,
        )

        if curNodeXpath:
            # # for debug
            # if curResId:
            #     if re.search("(id/a_9)|(id/b_9)", curResId):
            #         self.debugPrintElement(foundElement)
            # else:
            #     self.debugPrintElement(foundElement)

            foundAndClicked = self.findAndClick(
                curNodeXpath,
            )
        else:
            # TODO: add other type later
            logging.warning("Not click for click element: %s", foundElement.info, locator)

        else:
            logging.warning("Not click for not found element: %s", foundElement.info, locator)

        time.sleep(wait)
    return foundAndClicked
```

调用：

```
if self.isAndroid:
    foundAndClicked = self.wait_element_click_Android(locator)
```

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## 输入内容

找到元素后，也会遇到需要输入内容的情况。

典型用法是：

```
# 方式1: xpath的set_text方式
searchElementSelector = self.driver.xpath(locatorText)
searchElementSelector.set_text(text)
```

即可输入文字。

后记：已整理成独立函数：

```
def selectorSetText(self, curXPathSelector, inputText):
    # Special: add click to try workaround for 360 pwd Edit
    # curXPathSelector.click()
    # curXPathSelector.clear_text()
    selectorSetTextResp = curXPathSelector.set_text(inputText)
    logging.debug("selectorSetTextResp=%s", selectorSetTextResp)
    # 在set_text后，输入法会变成FastInputIME输入法
    # 用下面代码可以实现：关掉FastInputIME输入法，切换回系统默认输入法
    self.driver.set_fastinput_ime(False)
```

调用举例：

```
Qihoo360_Account = "yourAccount"
accountXPath = """//android.widget.EditText[@resource-id="com.qihoo360.mobile:id/account"]"""
accountSelector = self.driver.xpath(accountXPath)
self.selectorSetText(accountSelector, Qihoo360_Account)
```

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## 屏幕

此处整理和屏幕相关操作

### 点击（屏幕 坐标）

```
self.driver.click(x, y)
```

### 长按

```
self.driver.long_click(x, y, duration=1.5)
```

### 滑动

```
# 等待时间
SwipeDuration_Android = 0.3

SwipeDirectionBounds = [338, 333, 38, 333]
curSession.swipe(SwipeDirectionBounds[0], SwipeDirectionBounds[1], SwipeDuration_Android)

self.driver.swipe(SwipeDirectionBounds[0], SwipeDirectionBounds[1], SwipeDuration_Android)
```

### （从当前屏幕）返回上一页

```
self.driver.press("back")
```

### （屏幕）坐标值

**boundsToCenterPoint:** 从bounds算出中间坐标值

xpath

```
def boundsToCenterPoint(self, boundsStr):
    """
        从bounds转换出中间点位置坐标
    Example:
        bounds: '[156,1522] [912,2027]'
        return: [534, 1774]
    """
    filterStr = re.sub('\[|\]', "", boundsStr)
    boundStrList = filterStr.split()
    boundMap = map(int, boundStrList)
    boundIntList = list(boundMap)
    x0 = boundIntList[0]
    y0 = boundIntList[1]
    x1 = boundIntList[2]
    y1 = boundIntList[3]
    centerPoint = [(x1 + x0)//2, (y1 + y0)//2]
    return centerPoint
```

调用：

```
centerPoint = self.boundsToCenterPoint(locatorBounds)
self.tap(centerPoint)
```

## 当前屏幕

针对于当前屏幕，最常见的几个动作是：

- 截图=截屏
- 获取(当前)页面源码(xml)

### 给当前屏幕截图

核心代码：

```
fullImgFilePath = self.driver.screenshot(fullImgFilePath)
```

举例：

```
fullImgFilePath = 'debug/GameScreenshot/20191209_171115.png'
fullImgFilePath = self.driver.screenshot(fullImgFilePath)
```

**getCurPageSource**: 获取当前屏幕画面对应的  
xml源码

xpath

函数：

```
def getCurPageSource(self):
    # curPageSrcXml = self.driver.dump_hierarchy()
    curPageSrcXml = self.driver.dump_hierarchy(compressed=False)

    # output, exitCode = self.driver.shell(["adb", "shell"])
    # output, exitCode = self.driver.shell(["uiautomator"])
    # output, exitCode = self.driver.shell("uiautomator dump")
    # output, exitCode = self.driver.shell(["shell", "uiautomator", "dump"])
    # curPageSrcXml = output

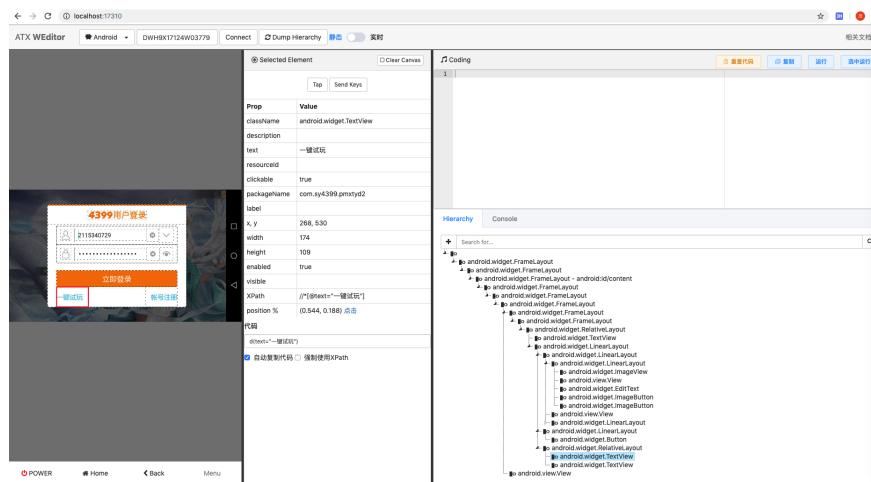
    return curPageSrcXml
```

调用：

```
curPageSrcXml = self.getCurPageSource()
```

举例：

对于下图中左边的登录界面：



用：

```
page_source = self.driver.dump_hierarchy(compressed=False,
```

导出的源码是：

xpath

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<hierarchy rotation="1">
    <node index="0" text="" resource-id="" class="android.widget.ScrollView" ...
        ...
            ...
                ...
                    ...
                        ...
                            ...
                                ...
                                    ...
                                        ...
                                            ...
                                                ...
                                                    ...
                                                        ...
                                                            ...
                                                                ...
                                                                    ...
                                                                        ...
                                ...
                            ...
                        ...
                    ...
                ...
            ...
        ...
    ...
</hierarchy>
```

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xpath

## APP

安裝app

```

def install_app_Android(self, item, packages=None):
    appAccount = item[0]
    appPackage = item[1]
    appMainActivity = item[2]
    apkFilePath = item[3]

    if packages is None:
        packages = self.get_packages()
    if appPackage in packages:
        logging.info("AppName {0} is already installed".format(appPackage))
    else:
        logging.info("start to install app in {}".format(os.path.dirname(apkFilePath)))

        # show current adb command version, makesure is latest
        # os.system("adb --version")
        # Android Debug Bridge version 1.0.41
        # Version 30.0.5-6877874
        # Installed as /Users/limao/dev/tools/android/adb/platform-tools

        # isUseShortCmd = True # use short command to try to avoid permission issue
        isUseShortCmd = False # use default long abd install command

        if isUseShortCmd:
            # sometime will stuck, reason: maybe command length too long
            # so copy to temp folder -> to reduce command string
            tmpFolder = tempfile.TemporaryDirectory()
            logging.info("tmpFolder=%s", tmpFolder)
            # tmpFolder=<TemporaryDirectory '/var/folders/gt/5868sbcd1jq4rxvryqhy2_1s'
            tmpFolderName = tmpFolder.name
            logging.info("tmpFolderName=%s", tmpFolderName)
            # tmpFolderName=/var/folders/gt/5868sbcd1jq4rxvryqhy2_1s
            apkFileName = os.path.basename(apkFilePath)
            logging.info("apkFileName=%s", apkFileName)
            # apkFileName=20201202_fengyun_0192LeiMoChuanShuo_garage.apk
            tmpApkFile = os.path.join(tmpFolderName, apkFileName)
            logging.info("tmpApkFile=%s", tmpApkFile)
            # tmpApkFile=/var/folders/gt/5868sbcd1jq4rxvryqhy2_1s/tmp/20201202_fengyun_0192LeiMoChuanShuo_garage.apk
            logging.info("Copy %s to tmp file %s", apkFilePath, tmpApkFile)
            # Copy /Users/limao/dev/xxx/crawler/appAutoCrawler/Apps/20201202_fengyun_0192LeiMoChuanShuo_garage.apk
            copyfile(apkFilePath, tmpApkFile)
            # copy2(apkFilePath, tmpFolderName)

            curApkFile = tmpApkFile
        else:
            curApkFile = apkFilePath
            # os.system("adb -s {0} install {1}".format(self.dev_id, apkFilePath))

            # show file size
            fileSizeInt = os.path.getsize(curApkFile) # 259106541
            fileSizeStr = CommonUtils.formatSize(fileSizeInt) # '259M'

```

xpath

```
logging.info("file size: %s", fileSizeStr) # file size

# adbInstallCmd = "adb -s {0} install -r {1}".format(self.deviceSerial, self.packageName)
# adbInstallCmd = "adb -s {0} install -r {1}".format(self.deviceSerial, self.packageName)
# installPara = " "
# installPara = "-r"
installPara = "-r -f"
adbInstallCmd = "adb -s {0} install {1} {2}".format(self.deviceSerial, self.packageName, installPara)
# adbInstallCmd = "adb shell pm install -s {0} {1}".format(self.packageName, self.packageName)
# adbInstallCmd = "adb shell pm install -s {0} -r {1}".format(self.packageName, self.packageName)
# adbInstallCmd = "adb shell pm install -s {0} -f {1}".format(self.packageName, self.packageName)
# adb -s hmucae175ptk7szs install -r /var/folders/gt/56/.../com.fingertip.fivechess.m...
# length=243 command:
# adb -s hmucae175ptk7szs install -r /Users/limao/dev/com.fingertip.fivechess.m...
# 'adb -s hmucae175ptk7szs install -r -f /Users/limao/dev/com.fingertip.fivechess.m...

logging.info("Run length=%d, command: %s", len(adbInstallCmd))
# Run length=153, command: adb -s hmucae175ptk7szs install -r -f /Users/limao/dev/com.fingertip.fivechess.m...
os.system(adbInstallCmd)
```

调用：

```
if self.isAndroid:
    return self.install_app_Android(item, packages)
```

## 启动app

对于app：

- 五子棋经典版
  - 包名： com.fingertip.fivechess.mi
  - 主页面： .StartAct

启动代码：

```
appPackage = "com.fingertip.fivechess.mi"
appActivity = ".StartAct"
self.driver.app_start(appPackage, activity=appActivity, start=True)
```

## 卸载app

xpath

```
def uninstallApp_Android(self, item):
    # 卸载安装包
    appPackage = item[1]
    adbUninstallCmd = "adb -s %s uninstall %s" % (self.device,
                                                    appPackage)
    logging.info(adbUninstallCmd)
    os.system(adbUninstallCmd)
    logging.info("Uninstalled Android app %s", appPackage)
```

调用：

```
if self.isAndroid:
    self.uninstallApp_Android(item)
```

## 获取app信息

### 获取当前正在运行的app的包名和activity

```
def get_PackageActivity_Android(self):
    # adb直接获取当前活跃app及activity
    package, activity = "", ""
    cmds = ['dumpsys activity |grep {}'.format(item) for item in self.apps]
    for cmd in cmds:
        output = self.driver.shell(cmd).output
        result = re.search("\u00d7(.*)/", output)
        package = result.group(1).strip() if result else ""

        result = re.search("/(.*)\s", output)
        activity = result.group(1).strip() if result else ""
        if package and activity:
            return package, activity
    return package, activity
```

调用：

```
package, activity = get_PackageActivity_Android()
```

## 其他功能

此处整理其他一些常见的功能。

### 长按

```
self.driver.long_click(x,y,duration=1.5)
```

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## 相关

uiautomator2开放期间，往往会涉及到一些其他一些内容，此处把相对独立的部分整理出来，单独解释，方便查阅和理解。

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## weditor

折腾u2期间，少不了要调试设备当前的页面，以及希望了解其中的元素和细节。

这时候，同一个作者开发的，用于辅助u2的 `weditor`，就可以派上用场了。

- 主页
  - Github
    - [openatx/weditor: web editor for atx](#)

安装：

```
pip3 install -U weditor
```

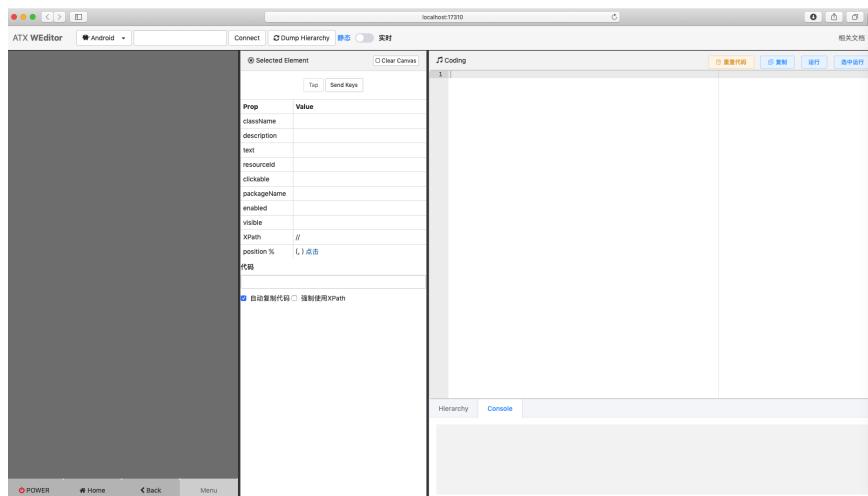
启动：

```
python -m weditor
```

会自动调用浏览器并打开网址：

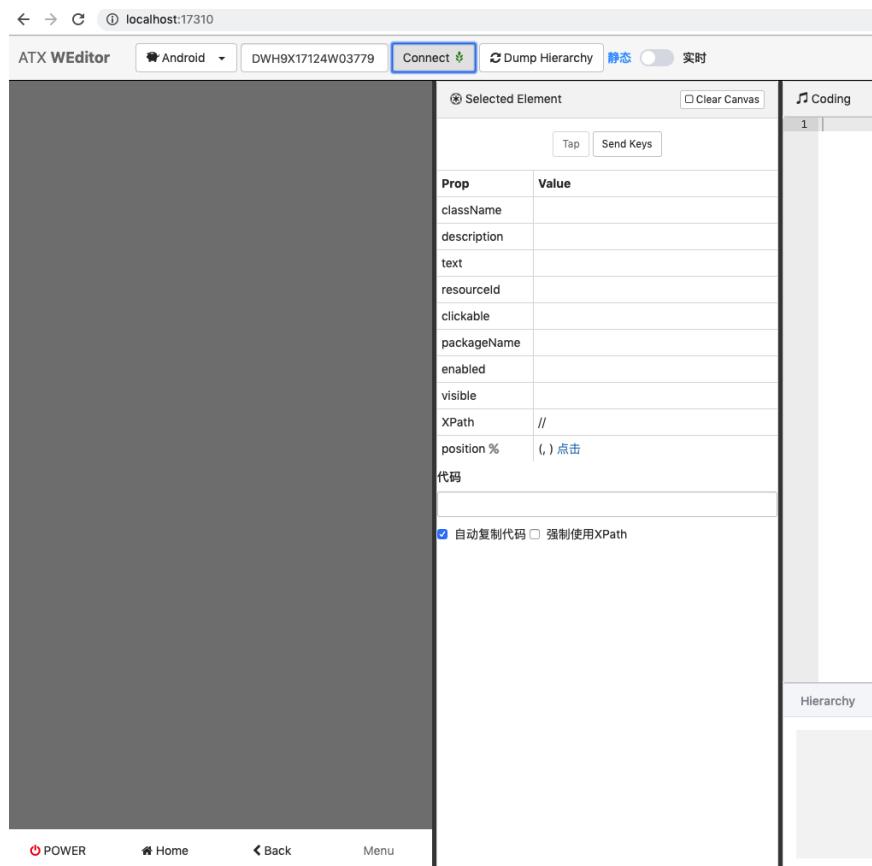
<http://localhost:17310>

效果：



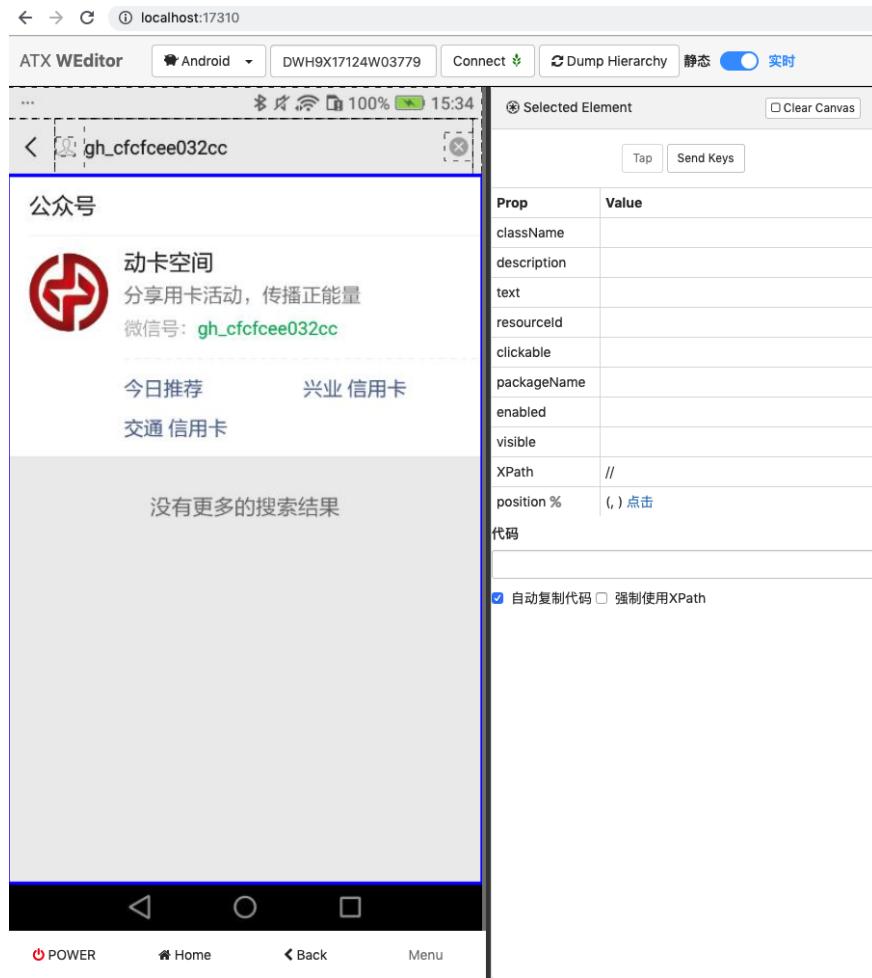
输入 安卓设备的id 后，点击 Connect 连接设备：

xpath

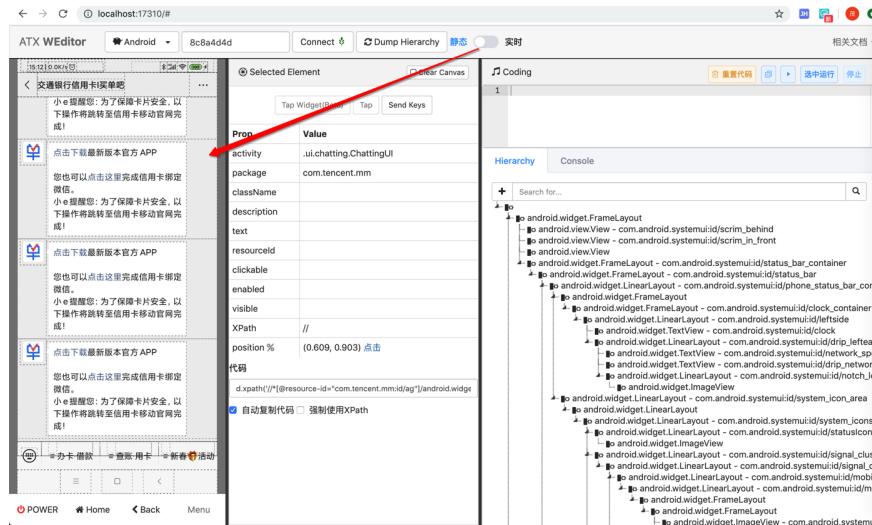


然后 多次在 静态 实时 直接切换几次，最后一次点击 静态，稍等片刻，就能看到页面内容了：

xpath



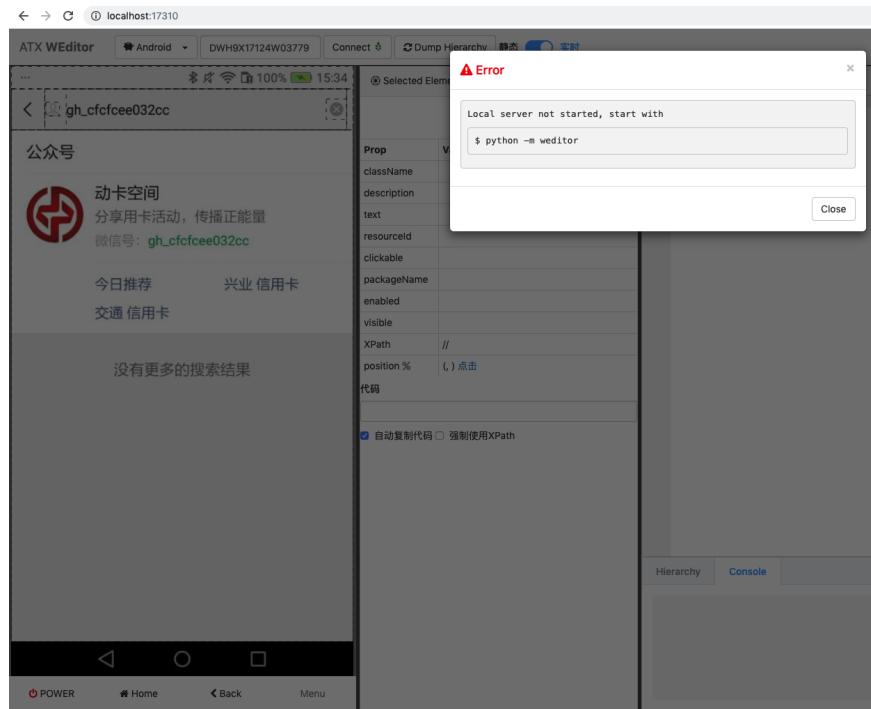
和：



## 报错可忽略

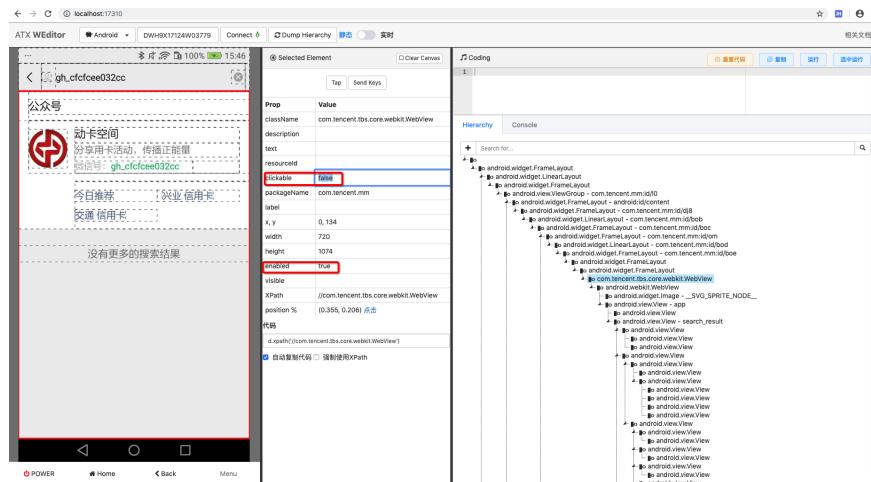
注意，切换期间偶然会报错：

xpath



不用理会，关闭弹框，多试几次即可。

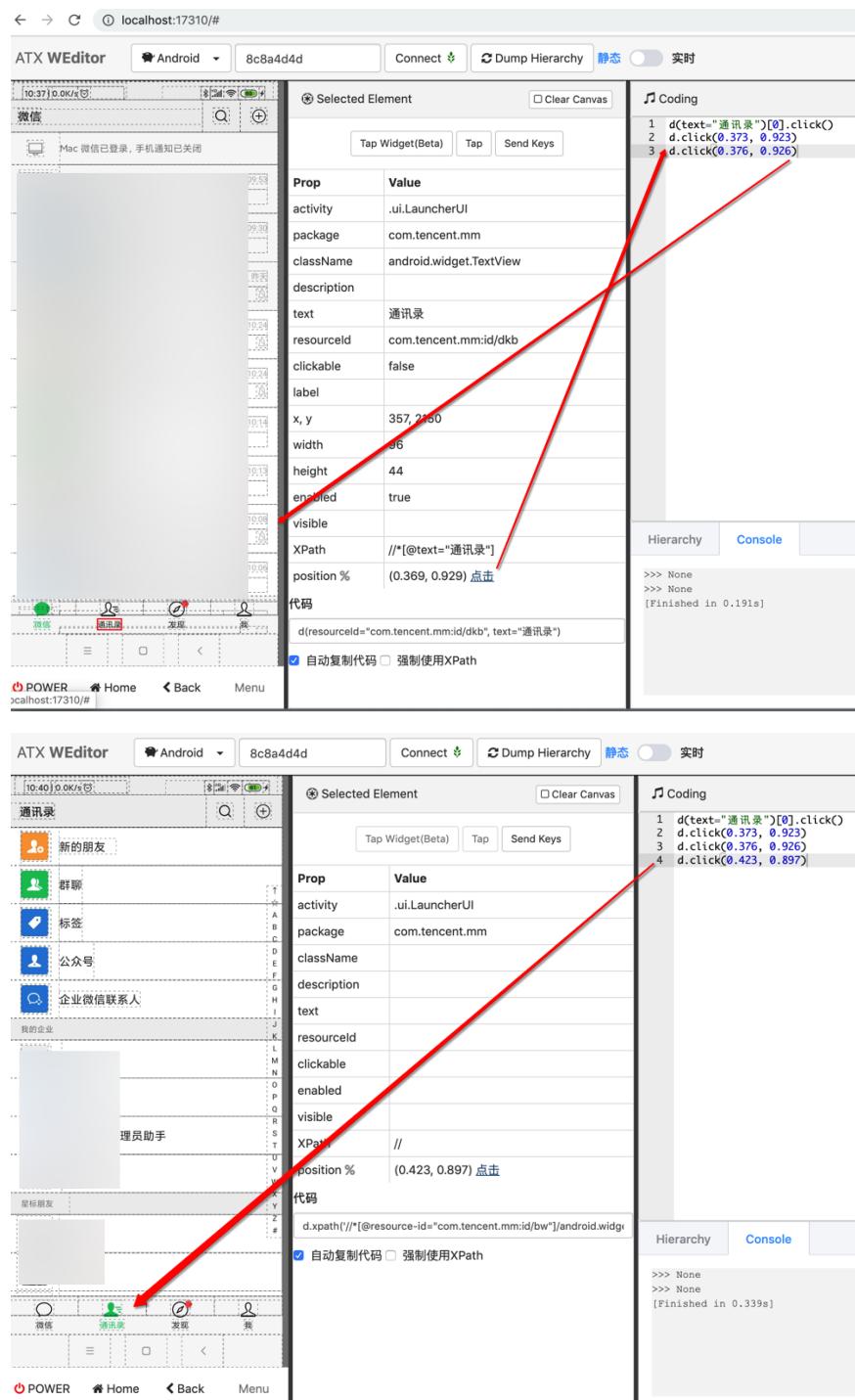
点击 Dump Hierarchy 后，能查看到页面的结构：



## Coding中可以调试代码

之前有用过输入并运行代码，用于调试，效果不错：

xpath



再比如：

```
d(className="android.view.View")
d(className="android.view.View").count
```

选中第一行后，点击 选中运行：

xpath

The screenshot shows the '实时' (Real-time) tab of the Appium Inspector's Coding interface. At the top, there are buttons for 'Command+Shift+Enter' (run selected), '重置代码' (Reset code), and '运行' (Run). Below the buttons is a 'Coding' section containing two lines of Python code:

```
1 d(className="android.view.View")
2 d(className="android.view.View").count
```

Below the coding area is a 'Console' tab which displays the following output:

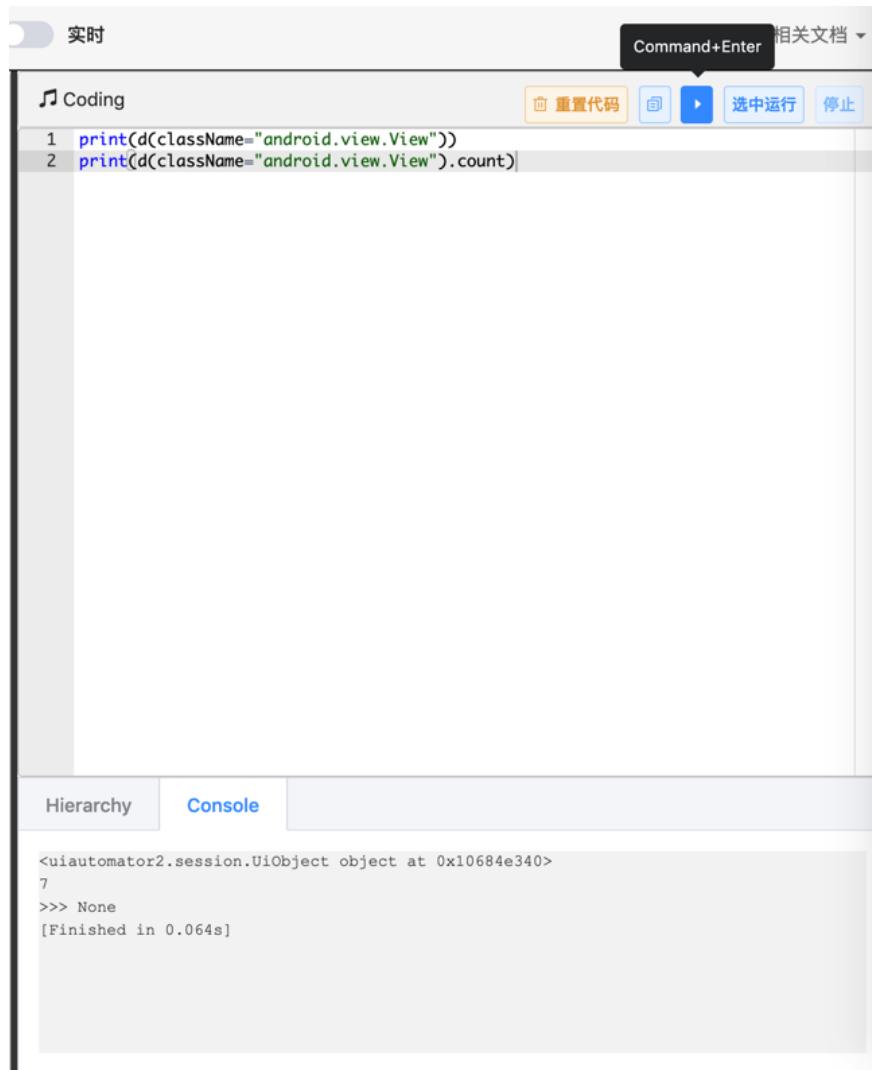
```
>>> <uiautomator2.session.UiObject object at 0x1068653a0>
>>> None
[Finished in 0.001s]
```

加上print后

```
print(d(className="android.view.View"))
print(d(className="android.view.View").count)
```

不选中，点击 运行按钮，表示全部运行：

xpath



可以实时调试，很方便。

详见：

【未解决】自动抓包工具抓包公众号买单吧某个元素通过class+instance定位不到

【已解决】uiautomator2用click点击微信中的通讯录不起作用

## Hierarchy支持有限的搜索

对于xml中的节点：

```
<node NAF="true" index="0" text="" resource-id="com.tencent.mm:id/pq">
```

想要去WEeditor中

搜id值，即搜 com.tencent.mm:id/pq，结果找不到

搜pq，也搜不到

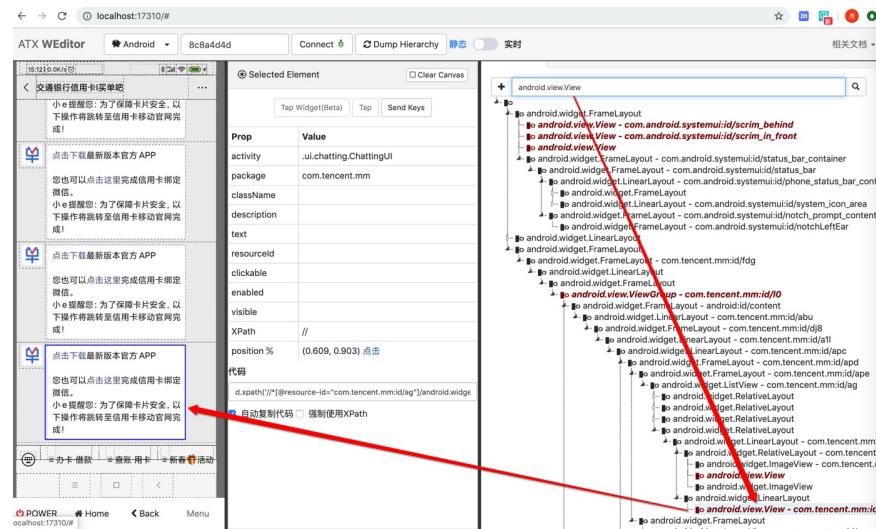
xpath

后来发现，只能搜：当前显示出来的内容，即节点的class的类型

比如： `android.view.View`

是可以搜出并深红色高亮显示的对应节点的

然后才找到此处对应节点：



详见：

【已解决】用weditor实时查看安卓当前页面中的xml源码

【已解决】Mac中安装uiautomator2的UI界面工具：weditor

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## adb

此处整理uiautomator2开发期间，用到的和 adb 相关的东西。

### 解锁屏幕

安卓手机，华为的DIG-AL00，想要从锁屏界面，进入（等待输入密码的）解锁界面，可以用：

```
adb -s DWH9X17124W03779 shell input swipe 300 300 500 1000
```

或：

```
adb -s DWH9X17124W03779 shell input touchscreen swipe 300 :
```

其中：

- DWH9X17124W03779：是手机的序列号
- 300 300 500 1000 100：
  - 300 300 500 1000：是屏幕坐标：X, Y, 宽, 高
  - 100：滑动时间，单位毫秒

即可实现进入解锁界面。

输入文字（密码）：

```
adb -s DWH9X17124W03779 shell input text 1234
```

用于解锁手机。

特殊：

- 华为畅享6S DIG-AL00：不支持
  - 相关信息
    - android版本:6.0
    - 系统：EMUI 4.1
  - 原因：估计是系统问题
  - 解决办法：无法解决

详见：

【无法解决】adb发送密码无法解锁安卓手机屏幕

### adb shell中的am start命令

android的adb调试工具，有个shell，可以执行很多命令。

其内部都是调用对应的子工具去处理具体功能的。

此处相关的有：

- 调用 Activity 管理器 ( am )
  - Activity Manager
- 调用软件包管理器 ( pm )
- 调用设备政策管理器 ( dpm )

其中am的解释是：

在 adb shell 中，您可以使用 Activity 管理器 (am) 工具发出命令以执行各种系统操作，如启动某项 Activity、强行停止某个进程、广播 intent、修改设备屏幕属性，等等。

在 shell 中，相应的语法为：

```
am command
```

您也可以直接从 adb 发出 Activity 管理器命令，无需进入远程 shell。例如：

```
adb shell am start -a android.intent.action.VIEW
```

具体参数含义解释：

command的语法=可用的 Activity 管理器命令

有很多，其中的start的语法是：

```
start [options] intent
```

- options=选项，包括：
  - -D：启用调试。
  - -W：等待启动完成。
  - --start-profiler file：启动分析器并将结果发送到 file。
  - -P file：类似于 --start-profiler，但当应用进入空闲状态时分析停止。
  - -R count：重复启动 Activity count 次。在每次重复前，将完成顶层 Activity。
  - -S：启动 Activity 前强行停止目标应用。
  - --opengl-trace：启用对 OpenGL 函数的跟踪。
  - --user user\_id | current：指定要作为哪个用户运行；如果未指定，则作为当前用户运行。
- intent：启动 intent 指定的 Activity。

- (主要) 语法是:

- -a action
  - 指定 intent 操作, 例如 android.intent.action.VIEW (只能声明一次)。
- -d data\_uri
  - 指定 intent 数据 URI, 例如 content://contacts/people/1 (只能声明一次)。
- -t mime\_type
  - 指定 intent MIME 类型, 例如 image/png (只能声明一次)。
- -c category
  - 指定 intent 类别, 例如 android.intent.category.APP\_CONTACTS。
- -n component
  - 指定带有软件包名称前缀的组件名称以创建显式 intent, 例如 com.example.app/.ExampleActivity。
- -f flags
  - 将标记添加到 setFlags() 支持的 intent。
- --esn extra\_key
  - 添加一个空 extra。URI intent 不支持此选项。
- -e | --es extra\_key extra\_string\_value
  - 将字符串数据作为键值对添加进来。
- --ez extra\_key extra\_boolean\_value
  - 将布尔型数据作为键值对添加进来。
- --ei extra\_key extra\_int\_value
  - 将整型数据作为键值对添加进来。
- --el extra\_key extra\_long\_value
  - 将长整型数据作为键值对添加进来。
- --ef extra\_key extra\_float\_value
  - 将浮点型数据作为键值对添加进来。
- --eu extra\_key extra\_uri\_value
  - 将 URI 数据作为键值对添加进来。
- --ecn extra\_key extra\_component\_name\_value
  - 添加组件名称, 该名称作为 ComponentName 对象进行转换和传递。
- --eia extra\_key extra\_int\_value[,extra\_int\_value...]
  - 添加整数数组。
- --ela extra\_key extra\_long\_value[,extra\_long\_value...]
  - 添加长整数数组。
- --efa extra\_key extra\_float\_value[,extra\_float\_value...]
  - 添加浮点数数组。

此处的:

- `am start -a android.intent.action.MAIN -c android.intent.category.LAUNCHER -n com.tencent.mm/.ui.LauncherUI`
  - `am start` : 启动
  - `-a android.intent.action.MAIN` : intent的动作是 `android.intent.action.MAIN`
  - `-c android.intent.category.LAUNCHER` : intent类别是 `android.intent.category.LAUNCHER`
  - `-n com.tencent.mm/.ui.LauncherUI`
    - 要启动的app=包名: `com.tencent.mm`
      - 也就是微信
    - 要启动的activity=界面=页面: `.ui.LauncherUI`
      - 也就是微信的主页面

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## android-uiautomator-server

<https://github.com/openatx/android-uiautomator-server>

其发布出的

<https://github.com/openatx/android-uiautomator-server/releases>

是2个apk:

- app-uiautomator-test.apk
- app-uiautomator.apk

其具体编译过程是:

```
$ ./gradlew build  
$ ./gradlew packageDebugAndroidTest
```

会生成apk，而最终的2个apk是mv生成的。

详见: `.travis.yml` 中的:

```
script:  
  - "./gradlew build"  
  - "./gradlew packageDebugAndroidTest"  
  
before_deploy:  
  - mv app/build/outputs/apk/debug/app-debug.apk app/build/outputs/apk/androidTest/debug/app-debug.apk
```

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## uiautomator

android官网的工具： uiAutomator

主页：[uiAutomator | Android Developers](#)

说了具体用法：

```
adb shell uiAutomator dump
```

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## 常见问题

此处整理出uiautomator2开发期间，遇到的一些常见问题及其解决办法。

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## 输入文字

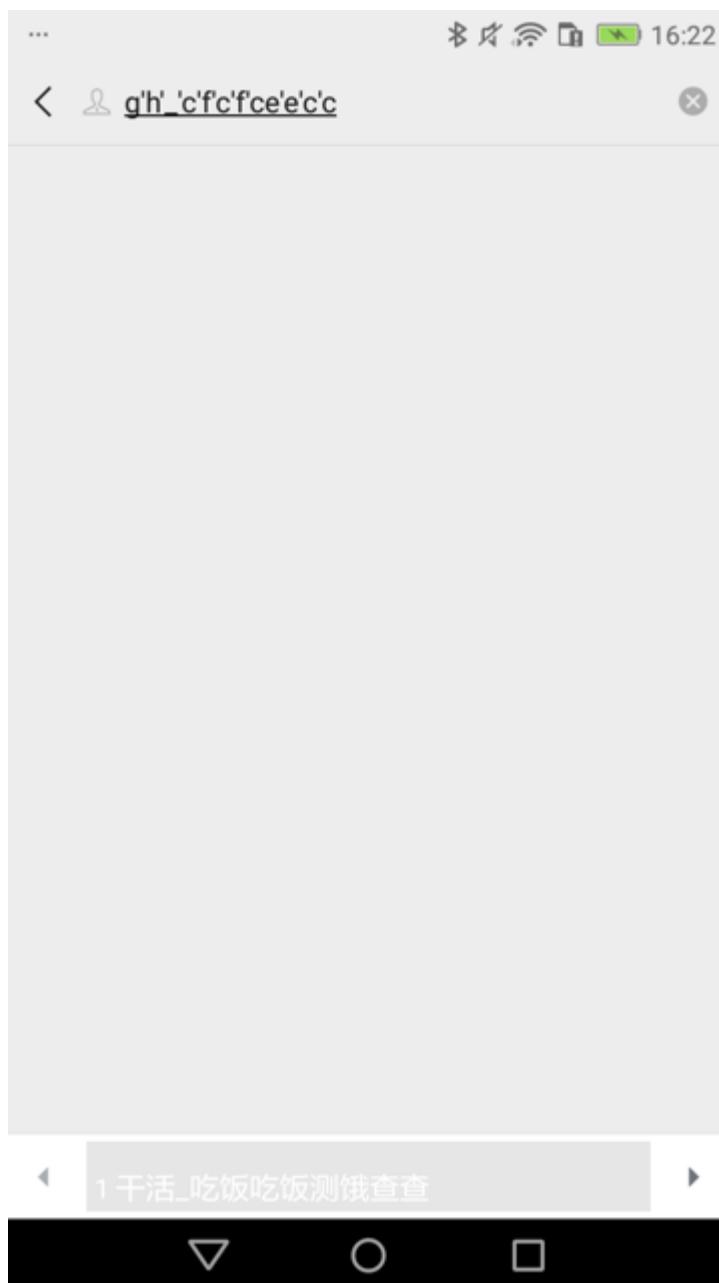
### 输入文字的两种方式

对于输入文字，发现之前的可以工作的代码：

```
self.driver(text=locator["text"]).set_text(text, timeout=Wa:
```

会出现：无法完整输入内容

具体现象：中文输入法中，输入了字母，但是丢失了数字的效果：



xpath

且输入法此时已经也被换了（换成了 FastInputIME 或 系统自带（华为 Swype） 输入法了）

注：

```
self.driver(text=locator["text"]).set_text(text, timeout=Wa:
```

内部是调用的uiautomator2的session的set\_text：

文

件： /Users/limao/.pyenv/versions/3.8.0/lib/python3.8/site-packages/uiautomator2/session.py

```
def set_text(self, text, timeout=None):
    self.must_wait(timeout=timeout)
    if not text:
        return self.jsonrpc.clearTextField(self.selector)
    else:
        return self.jsonrpc.setText(self.selector, text)
```

(除了额外支持timeout参数外)

而换用另外的：

## xpath 的 set\_text

```
searchElementSelector = self.driver.xpath(searchKeyText)
searchElementSelector.set_text(text)
```

内部调用的：

文

件： /Users/limao/.pyenv/versions/3.8.0/lib/python3.8/site-packages/uiautomator2/xpath.py

```
def set_text(self, text: str = ""):
    el = self.get()
    self._parent.send_text() # switch ime
    el.click() # focus input-area
    self._parent.send_text(text)
```

## send\_keys

```
self.driver.send_keys(text)
self.driver.set_fastinput_ime(False) # 关掉FastInputIME输入法
```

其中，是否加上 打开FastInputIME

```
self.driver.set_fastinput_ime(True) # # 切换成FastInputIME输入
self.driver.send_keys(text)
self.driver.set_fastinput_ime(False) # 关掉FastInputIME输入
```

经测试，感觉没区别。

结果都是：

- 可以成功输入文字
  - 此处的：gh\_cfcfcee032cc
- 但是输入法会被切换掉
  - 我之前设置的是：百度的输入法

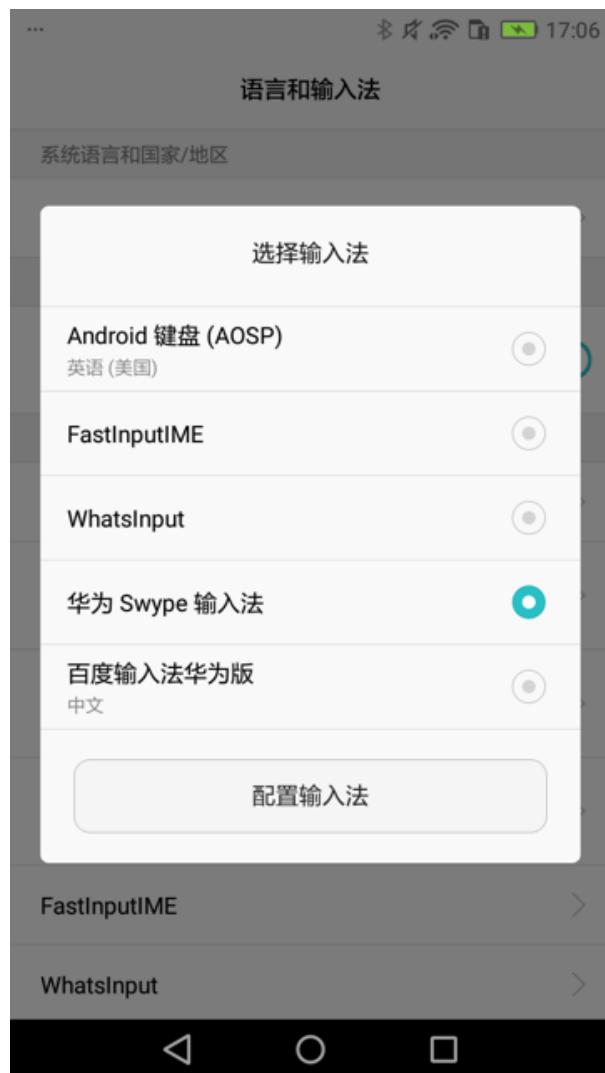
```
* !*[android_input_method_baidu](../assets/img/and
```

- 对应着，输入文字之前，应该是



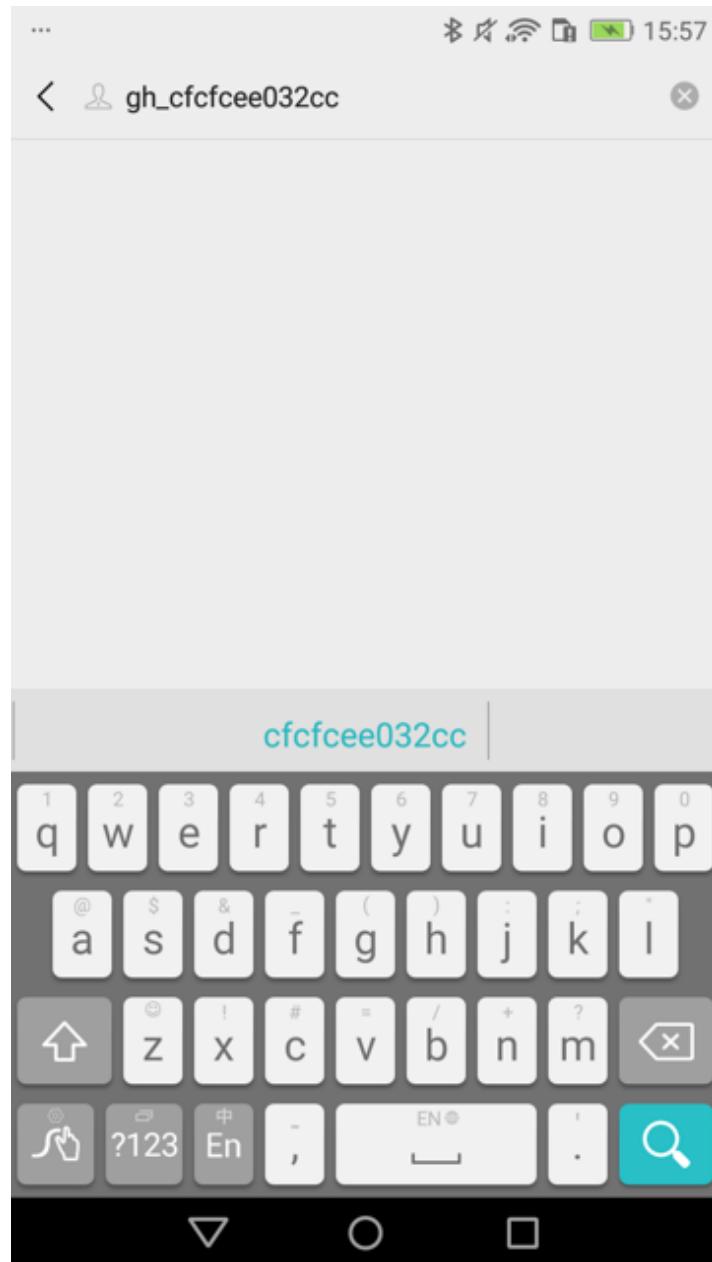
- 会被换成：当前系统默认自带输入法
  - 当前系统是：华为的畅享6S手机 DIG-AL00
  - 自带输入法是：华为Swype输入法

xpath



- 效果是：

xpath



结论：

- 基本上实现了自己的：要输入文字的目的
- 但是：却把之前设置的（百度）输入法切换成系统的（华为）输入法了。
  - 问题不大，但是很不爽
    - 但是没办法改变和保留原有输入法

## **set\_text导致输入法切换，需要恢复**

最终整理出函数：

```
def selectorSetText(u2Dev, curXPathSelector, inputText):
    selectorSetTextResp = curXPathSelector.set_text(inputText)
    logging.info("selectorSetTextResp=%s", selectorSetTextResp)
    # 在set_text后，输入法会变成FastInputIME输入法
    # 用下面代码可以实现：关掉FastInputIME输入法，切换回系统默认输入法
    u2Dev.set_fastinput_ime(False)
```

## 用set\_text输入字符串：小米安全键盘 影响输入，可以考虑禁止掉

代码本身：

```
passwordStr = "请输入密码"
passwordXPath = "//*[contains(@text, '请输入密码')]"
passwordSelector = u2Dev.xpath(passwordXPath)
if passwordSelector.exists:
    logging.info("Found %s", passwordStr)
    # pwdClickResp = passwordSelector.click()
    # logging.debug("pwdClickResp=%s", pwdClickResp)
    # doScreenshot(u2Dev)
    selectorSetText(u2Dev, passwordSelector, Vivo_Password)

def selectorSetText(u2Dev, curXPathSelector, inputText):
    selectorSetTextResp = curXPathSelector.set_text(inputText)
    logging.info("selectorSetTextResp=%s", selectorSetTextResp)
    doScreenshot(u2Dev)
    # 在set_text后，输入法会变成FastInputIME输入法
    # 用下面代码可以实现：关掉FastInputIME输入法，切换回系统默认输入法
    u2Dev.set_fastinput_ime(False)
```

是可以输入密码=字符串的

但是

- 之前开启了：小米安全键盘
  - 导致：输入不顺利
    - 小米安全键盘 会弹出显示 消失掉，多次之后
    - (等待1, 2秒后) 触发异常：
      - /Users/limao/dev/xxx/crawler/appAutoCrawler/AppCrawler/venv/lib/python3.8/site-packages/uiautomator2/\_\_init\_\_.py:1646: Warning: set FastInputIME failed. use "d(focused=True).set\_text instead"
      - warnings.warn()
    - 最终才能输入密码
  - 解决办法：关闭 小米安全键盘

xpath

◦ 步骤：

- 系统设置-》更多设置-》语言与输入法-》安全键盘-》取消勾选：开启安全键盘



## 安全键盘

开启安全键盘



## 重启服务

当偶尔遇到uiautomator2本身出问题，而后台服务停止或者异常时，可以去重启uiautomator2的服务。

经研究，总结出相关代码：

```
def u2ServiceRestart(self):
    """ restart uiautomator2 service """
    # self.driver.reset_uiautomator()
    # self.driver.service.stop()
    # self.driver.service.start()
    self.driver.service("uiautomator").stop()
    self.driver.service("uiautomator").start()
    # self.driver.uiautomator.stop()
    # self.driver.uiautomator.start()
    time.sleep(1)
```

调用举例：

```
def wait_AccountSearched(self, account):
    ...
    if self.isAndroid:
        # Note1:
        # for 华为畅享6S android 6: following can not get la
        # here reset uiautomator2 is workaround for later (
        # Note2: 小米9 Android 10 / 红米 Note8 Pro Android 9
        isNeedRestartU2 = False

        curAndroidVersionFloat = self.getAndroidVersion()
        ANDROID_VERSION_NEED_RESTART_U2 = 7.0
        if curAndroidVersionFloat <= ANDROID_VERSION_NEED_R
            isNeedRestartU2 = True

        if isNeedRestartU2:
            self.u2ServiceRestart()
```

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## NAF

此处所用安卓手机： 华为畅享6S DIG-AL00



The screenshot shows the device information screen of an Android smartphone. At the top, it displays the model number 'DIG-AL00'. Below this, there is a table with the following data:

型号	DIG-AL00
版本号	Diego-AL00C00B165
系统版本号	EMUI 系统 4.1
Android 版本	6.0
IMEI	864193037098249 864193037098256
MEID	A00000698EA48B
处理器	Qualcomm Snapdragon 435
运行内存	3.0 GB
手机存储	可用空间: 10.92 GB 总容量: 32.00 GB
分辨率	720 x 1280
Android 安全补丁程序级别	2017年4月5日
基带版本	MPSS.TA. 2.2.c8-00022-8940_GEN_PACK-1, MPSS.TA. 2.2.c8-00022-8940_GEN_PACK-1
内核版本	3.18.24-perf-gfe882d3 android@localhost #1

对于最新版的 v7.0.8 的微信，公众号搜索结果的页面，去导出源码，发现：

- `uiautomator2` 中用代码：`self.driver.dump_hierarchy()`
  - 只能导出部分页面的源码
    - 其中红框内的源码无法导出

xpath



- Mac中终端运行adb命令: adb shell uiautomator dump
  - 能导出完整页面的源码

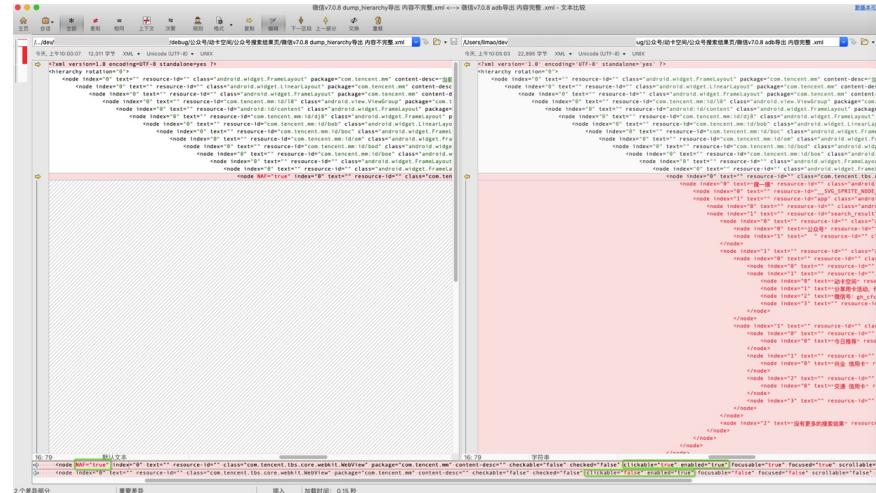
核心代码差异是:

```
<node NAF="" true="" index="" 0="" text="" resource-id="" class="" com.tencent.t...>
```

和

```
<node index="" 0="" text="" resource-id="" class="" com.tencent.t...>
<node index="" 0="" text="搜一搜" resource-id="" class="android.widget.Button">
...

```



另外：

之前旧版本 v6.7.3 的微信，是可以正常导出的。

所以去研究：

微信版本升级前后的页面源码的变化：

- 升级前 = 微信 v6.7.3

- 2018 微信 v6.7.3 老旧历史版本安装包官方免费下载\_豌豆荚
- 页面源码：

```
<node index="0" text="" resource-id="" class="android.widget.TextView" checked="false" clickable="true" enabled="true" focusable="true" focused="true" scrollable="false">
<node index="0" text="" resource-id="" class="android.widget.ImageView" checked="false" clickable="true" enabled="true" focusable="true" focused="false" scrollable="false">
<node index="0" text="" resource-id="__SVG_SPRITE" checked="false" clickable="true" enabled="true" focusable="true" focused="false" scrollable="false">
...

```

- 升级后 = 微信 v7.0.8

- 2019 微信 v7.0.8 老旧历史版本安装包官方免费下载\_豌豆荚
- 页面源码：

```
<node index="0" text="" resource-id="" class="com.tencent.mm:id/bu" checked="false" clickable="true" enabled="true" focusable="true" focused="true" scrollable="false">
<node index="0" text="搜一搜" resource-id="" class="com.tencent.mm:id/bu" checked="false" clickable="true" enabled="true" focusable="true" focused="false" scrollable="false">
<node index="0" text="" resource-id="__SVG_SPRITE" checked="false" clickable="true" enabled="true" focusable="true" focused="false" scrollable="false">
...

```

对比的区别：

```
报错：java.lang.NullPointerException: Attempt to invoke interface method 'void com.tencent.mm.plugin.sns.model.SnsInfo.setSnsInfo(com.tencent.mm.plugin.sns.model.SnsInfo)' on a null object reference
at com.tencent.mm.plugin.sns.ui.SnsDetailActivity$1.onClick(SnsDetailActivity.java:103)
at android.view.View.performClick(View.java:5207)
at android.view.View$PerformClick.run(View.java:2208)
at android.os.Handler.handleCallback(Handler.java:733)
at android.os.Handler.dispatchMessage(Handler.java:95)
at android.os.Looper.loop(Looper.java:136)
at android.app.ActivityThread.main(ActivityThread.java:5001)
at java.lang.reflect.Method.invoke(Native Method)
at com.android.internal.os.ZygoteInit$MethodAndArgsCaller.run(ZygoteInit.java:856)
at com.android.internal.os.ZygoteInit.main(ZygoteInit.java:670)

原因：在 SnsDetailActivity 中，当尝试调用 setSnsInfo 方法时，对象为 null。这通常发生在从 XML 布局文件中动态加载视图时，如果未正确设置视图的父容器，或者视图本身未被正确初始化。
```

主要是class的不同：

- v6.7.3 : class="android.webkit.WebView"
  - v7.0.8 : class="com.tencent.tbs.core.webkit.WebView"

而 tbs = 腾讯浏览器服务 = X5浏览器 = X5内核

即，新版本微信的浏览器的内核，用上了新的X5内核

- 什么是NAF
    - = Not Accessibility Friendly
      - 直译：不可方便地访问（的节点）
        - Accessibility = 可访问性 = 可及性
        - 与之相对的是：（元素节点） Accessible 可访问
      - 其他普通的节点都是属于可访问的
      - 被谁访问：被其他的工具或软件等读取和操作
        - 其他的工具和软件：用来查看和研究 android 页面源码的工具
        - 比如
          - android 自带 的 uiautomatorviewer
          - 其还支持选项 "Toggle NAF Nodes"，打开后，可以查看到NAF的节点
          - 默认不能查看到NAF节点
        - 详见：
          - [UI Testing | Android Developers](#)
      - Accessibility可访问性：主要指的是描述内容 content description 和 text 文本
        - 只有描述内容或文本有内容

- 普通用户，才能从页面上才能看到该元素
  - 否则对于普通用户就看不到该元素了，也就没太大意义了
    - 或许可以被视为不可见元素了
- 节点=元素=xml中的节点=某个UI控件=android程序中页面上的某个控件
  - =android的页面源码=xml代码
- 判定NAF的逻辑=如何判定一个节点是NAF
  - 根据上面的代码中的 `!nafExcludedClass(node) && !nafCheck(node)` 可以看出：
    - 先判断节点的类型
      - `!nafExcludedClass(node)` : 是属于那些可能被当做NAF节点的类型
      - 哪些节点，可能会被当做NAF节点呢？
        - `class="xxx"` 中 `xxx`，即类名不在 `NAF_EXCLUDED_CLASSES` 范围内的
        - 而 `NAF_EXCLUDED_CLASSES` 包括哪些呢？，包括如下：
          - `android.widget.GridLayout`
          - `android.widget.GridView`
          - `android.widget.ListView`
          - `android.widget.TableLayout`
        - 可见：除了上面4种节点，其他类型的节点，(只要符合特定条件) 都可能会被判定为NAF
      - 再判断节点的内容是否符合条件
        - `!nafCheck(node)` :
        - 是可点击的
          - xml代码中：`clickable="true"`
        - 是已启用的=是有效的
          - xml代码中：`enabled="true"`
        - 描述内容是空的
          - xml代码中：`content-desc=""`
        - 文本是空的
          - xml代码中：`text=""`
    - 如果上述2个条件都满足则判定是：NAF节点
      - 输出的节点中，会加上：`NAF="true"`
      - 这类节点，往往 `resource-id` 也是空
        - 典型的xml源码：
          - ```
<node NAF="true" ... text="" resource-
id=""
class="com.tencent.tbs.core.webkit.WebView"
package="com.tencent.mm" content-
desc="" ... clickable="true"
enabled="true" ... />
```

◦ 思考：

- 为何对于：可点击的、已启用的，但是描述内容是空的、文本是空的 节点，被当做NAF，认为不能被访问到呢？
  - 因为，这类节点，从android的界面上，往往是看不到的，但是却又能被点击，所以基本上处于不可用状态
  - 所以（代码的作者）认为这类节点，属于（从设计角度来说，就是故意）不想被普通用户看到，接触到
  - 所以被判定为NAF，不应该被访问到
  - 在导出页面源码时，被忽略掉，不导出 NAF节点
- 为何上述4种节点：`GridLayout`，`GridView`，`ListView`，`TableLayout`，不会被当做NAF呢？
  - 因为：满足了前面的 可点击的、已启用的，但是描述内容是空的、文本是空的 节点
  - 如果是本身属于（android系统自带的）列表、表格等类型的节点，
    - 看起来就是：属于正常的节点了，因为这类节点，本身是可以没有描述内容，文本是空的
    - 而列表，表格等节点，就是android中的：`GridLayout`, `GridView`, `ListView`, `TableLayout`等类型的节点
    - 当然，作者自己也说了，这4个类型，未必完整
    - 理论上，你也可以把其他的，合理的节点类型加到这个
    - `NAF_EXCLUDED_CLASSES` =不应该被认为是NAF的节点的类型中

详见：

【已解决】uiautomator2中导出页面源码中NAF是什么意思

而关于NAF如何规避解决，详见：

【未解决】如何确保uiautomator2的dump\_hierarchy能导出页面中NAF的元素节点

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xpath

## long\_click不工作

权限问题导致long\_click不工作

之前小米9中用long\_click

```
self.driver(text=locator["text"]).click(timeout=WaitFind)
```

报错：

```
uiautomator2.exceptions.JsonRpcError: 0 Unknown error: <In:
```

即： INJECT\_EVENTS 问题=权限问题

解决办法：去开启权限 USB调试（安全设置） -> 允许通过USB调试修改权限或模拟点击

17:41 | 0.9K/s ☺

信号强度图标



## 开发者选项

### 信任状态结束时锁定屏幕

启用后，系统会在最后一个可信代理结束信任  
状态时锁定设备



### 调试

#### USB 调试

连接 USB 后启用调试模式



#### 撤销 USB 调试授权 >

#### USB安装

允许通过USB安装应用



#### USB调试 (安全设置)

允许通过USB调试修改权限或模拟点击



#### 选择模拟位置信息应用

尚未设置模拟位置信息应用



#### 强制启用 GNSS 测量结果全面跟踪

在停用工作周期的情况下跟踪所有 GNSS 星  
座和频率



#### 启用视图属性检查功能



注：期间会3次提醒你

- 因为这个权限很重要
  - 如果随便给了其他坏的应用
    - 可能会滥用，而导致你手机被恶意操控
    - 所以多次提醒你确认

- 自己此处是调试手机，自动抓包，所以没问题，是打算开启此权限

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## 后台服务已被杀掉

如果uiautomator2过段时间 偶尔 不定期 被杀掉 导致服务需要重启，则很可能是 后台服务被杀掉了，需要设置 允许后台运行

即把： ATX 、 com.github.uiautomator.test 的 应用智能省电， 改为：无限制

- ATX

xpath





- com.github.uiautomator.test

xpath



xpath



其他还有类似的：

在设置中的 后台高耗电 中：

- 允许后台运行：ATX和com.github.uiautomator.test

17:33 信号强度 电池电量 3.60%

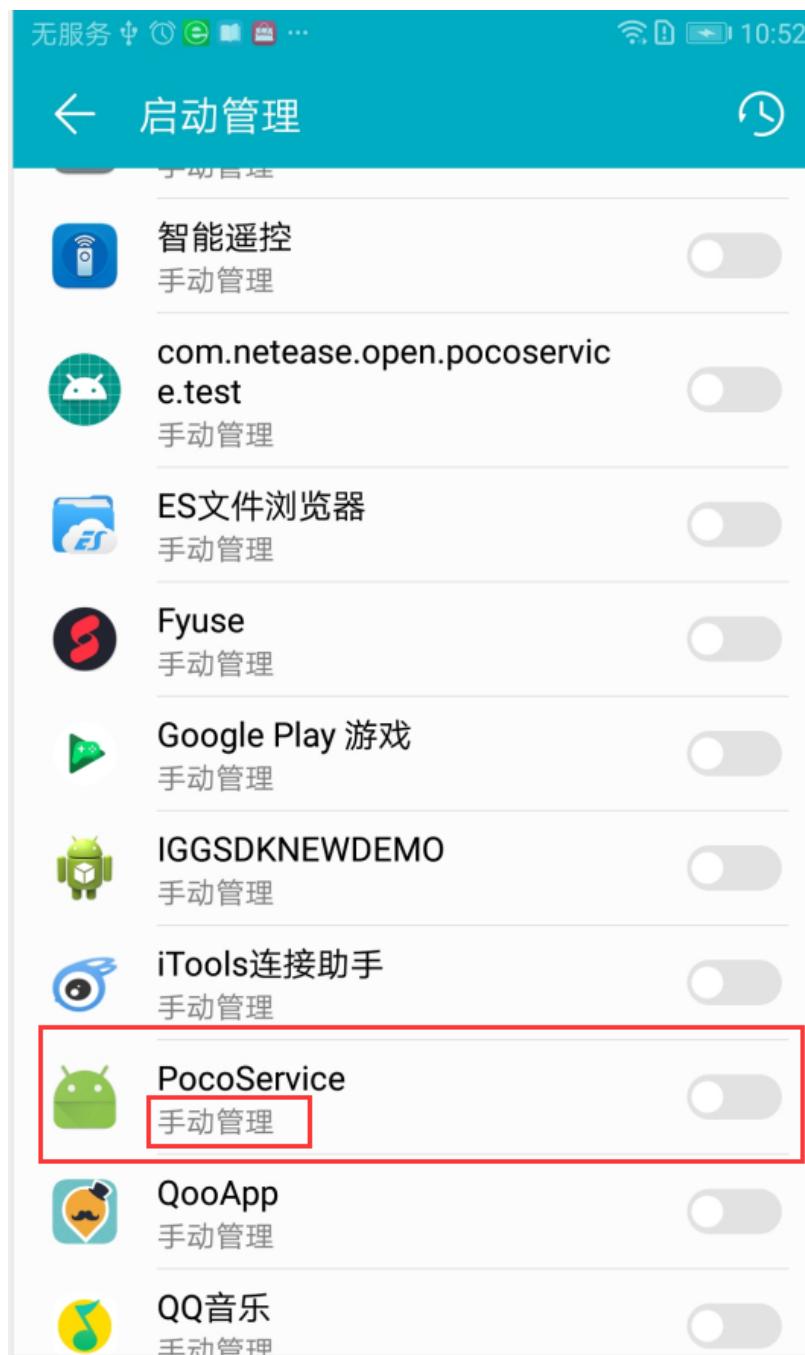
## ← 后台高耗电

2个应用允许在后台高耗电时继续运行

|     |                                 |                 |                                     |
|-----|---------------------------------|-----------------|-------------------------------------|
|     | <b>微信</b>                       | 今日后台耗电: 5.1 mAh | •                                   |
|     | <b>ATX</b>                      | 今日后台耗电: 3.5 mAh | <input checked="" type="checkbox"/> |
|     | <b>拼多多</b>                      | 今日后台耗电: 3.3 mAh | •                                   |
|     | <b>支付宝</b>                      | 今日后台耗电: 0.7 mAh | •                                   |
|     | <b>百度地图</b>                     | 今日后台耗电: 0.0 mAh | •                                   |
|     | <b>com.github.uiautomato...</b> | 今日后台耗电: 0.0 mAh | <input checked="" type="checkbox"/> |
|     | <b>京东</b>                       | 今日后台耗电: 0.0 mAh | •                                   |
|     | <b>今日头条</b>                     | 今日后台耗电: 0.0 mAh | •                                   |
|     | <b>QQ</b>                       | 今日后台耗电: 0.0 mAh | •                                   |
| ... |                                 |                 |                                     |

另外内部用了 `uiautomator2` 的网易的 `AirTest`，也是类似逻辑：

5.如果华为手机出现poco在启动后十几秒内自动断开的话，可以检查一下手机管家的版本号是否大于8.0，如果是的话，就在手机管家->启动管理里面，找到pocoservice，勾选允许自启动和允许后台活动



## 源码分析

折腾uiautomator2期间，分析了其中部分源码。现把过程整理如下供参考。

### uiautomator-server中最终的底层实现 dumpWindowHierarchy的处理返回页面数 据的逻辑

先启动了底层的jsonrpc的服务，监听发送过来  
的，要执行的动作

文

件： app/src/androidTest/java/com/github/uiautomator/stub/St  
ub.java

```
import com.googlecode.jsonrpc4j.JsonRpcServer;

public class Stub {
    ...
    int PORT = 9008;
    AutomatorHttpServer server = new AutomatorHttpServer(PORT);

    @Before
    public void setUp() throws Exception {
        launchService();
        JsonRpcServer jrs = new JsonRpcServer(new ObjectMapper());
        ...
        server.route("/jsonrpc/0", jrs);
        server.start();
    }
}
```

其中对于launchService：

```

private void launchService() throws RemoteException {
    UiDevice device = UiDevice.getInstance(InstrumentationContext context =
InstrumentationRegistry.getConte)
device.wakeUp();

// Wait for launcher
String launcherPackage = device.getLauncherPackageName();
Boolean ready = device.wait(Until.hasObject(By.pkg(launcherPac
if (!ready) {
    Log.i(TAG, "Wait for launcher timeout");
    return;
}

Log.d("Launch service");
startMonitorService(context);
}

private void startMonitorService(Context context) {
    Intent intent = new Intent("com.github.uiautomator
intent.setPackage("com.github.uiautomator"); // fi
context.startService(intent);
}

```

去启动了 `com.github.uiautomator`，应该就是在后台运行的 `uiautomator` 的服务了。

而前面的 `JsonRpcServer` 的 `jrs`，则是：

- 负责监听 `/jsonrpc/0`
  - 对应着之前 `uiautomator2` 中发送过来的请求
    - Shell\$ curl -X POST -d 'b'{"jsonrpc": "2.0",
"id": "1f056baf5d6b2ea2cb7e546efb7cd64f",
"method": "dumpWindowHierarchy", "params": [true,
null]}' http://127.0.0.1:64445/jsonrpc/0
    - 中的 `jsonrpc/0`
- 其具体实现的类是 `AutomatorServiceImpl` 的 `AutomatorService`
  - 下面就来介绍 `AutomatorServiceImpl`

文

件：`app/src/androidTest/java/com/github/uiautomator/stub/Auto
tomatorServiceImpl.java`

```

public class AutomatorServiceImpl implements AutomatorService {

    /**
     * It's to test if the service is alive.
     *
     * @return 'pong'
     */
    @Override
    public String ping() {
        return "pong";
    }

    /**
     * Get the device info.
     *
     * @return device info.
     */
    @Override
    public DeviceInfo deviceInfo() {
        return DeviceInfo.getDeviceInfo();
    }

    ...
}

```

上面是最基本的几个函数：

- `ping`
  - 返回 `pong`
    - 表示服务还在，有效、alive
- `deviceInfo`
  - 对应着之前调试：
    - `d = u2.connect('8c8a4d4d')`
  - 期间输出的：
    - `conn=<urllib3.connection.HTTPConnection object at 0x1077f4be0>, method=POST, url=/jsonrpc/0, timeout_obj=Timeout(connect=2, read=2, total=None), body='{"jsonrpc": "2.0", "id": 1, "method": "deviceInfo"}, headers={'User-Agent': 'python-requests/2.22.0', 'Accept-Encoding': 'gzip, deflate', 'Accept': '*/*', 'Connection': 'keep-alive', 'Content-Length': '51'}}, chunked=False`
  - 中的
    - `"method": "deviceInfo"`
  - 用于返回设备信息

xpath

而AutomatorServiceImpl中海油其他很多很多功能的具体实现。下面分别介绍一下之前接触过的。

```
public boolean click(int x, int y) {  
    public boolean drag(int startX, int startY, int endX, int endY) {  
    public boolean swipe(int startX, int startY, int endX, int endY, int duration) {  
        ...  
    }
```

都是常见的基础功能。

```
// Multi touch is a little complicated  
@Override  
public boolean injectInputEvent(int action, float x, float y) {  
    MotionEvent e = MotionEvent.obtain(SystemClock.uptimeMillis(),  
        SystemClock.uptimeMillis(),  
        action, x, y, metaState);  
    e.setSource(InputDevice.SOURCE_TOUCHSCREEN);  
    boolean b = uiAutomation.injectInputEvent(e, true);  
    e.recycle();  
    return b;  
}
```

之前就遇到过多次，上层调用一些函数会报错，其中就会提到这个

比如：

【已解决】python的uiautomator2报错：

uiautomator2.exceptions.JsonRpcError -32601 Method not found data  
injectInputEvent

中的

```
obj.jsonrpc.injectInputEvent(ACTION_DOWN, x, y, 0)
```

其他还有很多很多：

```

    /**
     * Simulates a short press using key name.
     *
     * @param key possible key name is home, back, left, right, up, down, center, menu, search, enter, delete, recent, volume_up, volume_down, power
     * @return true if successful, else return false
     * @throws RemoteException
     */
    @Override
    public boolean pressKey(String key) throws RemoteException {
        boolean result;
        key = key.toLowerCase();
        if ("home".equals(key)) result = device.pressHome();
        else if ("back".equals(key)) result = device.pressBack();
        else if ("left".equals(key)) result = device.pressLeft();
        else if ("right".equals(key)) result = device.pressRight();
        else if ("up".equals(key)) result = device.pressUp();
        else if ("down".equals(key)) result = device.pressDown();
        else if ("center".equals(key)) result = device.pressCenter();
        else if ("menu".equals(key)) result = device.pressMenu();
        else if ("search".equals(key)) result = device.pressSearch();
        else if ("enter".equals(key)) result = device.pressEnter();
        else if ("delete".equals(key) || "del".equals(key)) result = device.pressDelete();
        else if ("recent".equals(key)) result = device.pressRecent();
        else if ("volume_up".equals(key)) result = device.pressVolumeUp();
        else if ("volume_down".equals(key))
            result = device.pressKeyCode(KeyEvent.KEYCODE_VOLUME_DOWN);
        else if ("volume_mute".equals(key))
            result = device.pressKeyCode(KeyEvent.KEYCODE_VOLUME_MUTE);
        else if ("camera".equals(key)) result = device.pressCamera();
        else result = "power".equals(key) && device.pressPower();

        return result;
    }

    public boolean pressKeyCode(int keyCode) {
    public boolean pressKeyCode(int keyCode, int metaState) {

        public void clearTextField(Selector obj) throws UiObjectNotFoundException {
            selector = obj;
            String text = readText();
            if (!text.equals("")) {
                String[] keys = text.split(" ");
                for (String key : keys) {
                    if (key.equals("left") || key.equals("right"))
                        pressKey(key);
                    else if (key.equals("enter"))
                        pressKey("enter");
                    else if (key.equals("del"))
                        pressKey("delete");
                    else if (key.equals("space"))
                        pressKey("space");
                    else if (key.equals("back"))
                        pressKey("back");
                    else if (key.equals("up"))
                        pressKey("up");
                    else if (key.equals("down"))
                        pressKey("down");
                    else if (key.equals("center"))
                        pressKey("center");
                    else if (key.equals("menu"))
                        pressKey("menu");
                    else if (key.equals("search"))
                        pressKey("search");
                    else if (key.equals("recent"))
                        pressKey("recent");
                    else if (key.equals("volume_up"))
                        pressKey("volume_up");
                    else if (key.equals("volume_down"))
                        pressKey("volume_down");
                    else if (key.equals("volume_mute"))
                        pressKey("volume_mute");
                    else if (key.equals("camera"))
                        pressKey("camera");
                    else if (key.equals("power"))
                        pressKey("power");
                }
            }
        }
    }

    /**
     * Reads the text property of the UI element
     *
     * @param obj the selector of the UiObject.
     * @return text value of the current node represented by the selector
     */
}

```

xpath

```
* @throws UiObjectNotFoundException
*/
@Override
public String getText(Selector obj) throws UiObjectNotFoundException {
    if (obj.toUiObject2() == null) {
        return device.findObject(obj.toUiSelector()).getText();
    } else {
        return obj.toUiObject2().getText();
    }
}

/**
 * Sets the text in an editable field, after clearing it.
 *
 * @param obj the selector of the UiObject.
 * @param text string to set
 * @return true if operation is successful
 * @throws UiObjectNotFoundException
 */
@Override
public boolean setText(Selector obj, String text) throws UiObjectNotFoundException {
    try {
        obj.toUiObject2().click();
        obj.toUiObject2().setText(text);
        return true;
    } catch (NullPointerException | StaleObjectException e) {
        return device.findObject(obj.toUiSelector()).setText(text);
    }
}

/**
 * Performs a click at the center of the visible bounds.
 *
 * @param obj the target ui object.
 * @return true if successful else false
 * @throws UiObjectNotFoundException
 */
@Override
public boolean click(Selector obj) throws UiObjectNotFoundException {
    if (obj.toUiObject2() == null) {
        return device.findObject(obj.toUiSelector()).click();
    } else {
        obj.toUiObject2().click();
        return true;
    }
}

/**
```

xpath

```
* Clicks the bottom and right corner or top and left corner.
*
* @param obj    the target ui object.
* @param corner "br"/"bottomright" means BottomRight,
* @return true on success
* @throws UiObjectNotFoundException
*/
@Override
public boolean click(Selector obj, String corner) throws UiObjectNotFoundException {
    return click(device.findObject(obj.toUiSelector()));
}

private boolean click(UiObject obj, String corner) throws UiObjectNotFoundException {
    if (corner == null) corner = "center";
    corner = corner.toLowerCase();
    if ("br".equals(corner) || "bottomright".equals(corner))
        return clickBottomRight(obj);
    else if ("tl".equals(corner) || "topleft".equals(corner))
        return clickTopLeft(obj);
    else if ("c".equals(corner) || "center".equals(corner))
        return clickCenter(obj);
    return false;
}

public boolean dragTo(Selector obj, Selector destObj, int steps) throws UiObjectNotFoundException {
    return swipe(obj, destObj, steps);
}

/**
 * Performs the swipe up/down/left/right action on the target ui object.
 *
* @param obj    the target ui object.
* @param dir    "u"/"up", "d"/"down", "l"/"left", "r"/"right"
* @param steps indicates the number of injected move steps
* @return true if successful
* @throws UiObjectNotFoundException
*/
@Override
public boolean swipe(Selector obj, String dir, int steps) throws UiObjectNotFoundException {
    return swipe(device.findObject(obj.toUiSelector()), steps);
}

private boolean swipe(UiObject item, String dir, int steps) throws UiObjectNotFoundException {
    dir = dir.toLowerCase();
    boolean result = false;
    if ("u".equals(dir) || "up".equals(dir)) result = swipeUp(item, steps);
    else if ("d".equals(dir) || "down".equals(dir)) result = swipeDown(item, steps);
    else if ("l".equals(dir) || "left".equals(dir)) result = swipeLeft(item, steps);
    else if ("r".equals(dir) || "right".equals(dir)) result = swipeRight(item, steps);
    return result;
}
```

xpath

```
}
```

```
...  
...  
...
```

其他更多函数就不贴代码了。

## 底层调用dumpWindowHierarchy，处理，返回数据

如上所述，AutomatorServiceImpl.java 中的很多功能函数，此处最关心的 dumpWindowHierarchy 了：

xpath

```
/*
 * Helper method used for debugging to dump the current
 *
 * @param compressed use compressed layout hierarchy or
 * @param filename the filename to be stored. @deprecated
 * @return the absolute path name of dumped file.
 */
@Deprecated
@Override
public String dumpWindowHierarchy(boolean compressed, String filename) {
    return dumpWindowHierarchy(compressed);
}

/**
 * Helper method used for debugging to dump the current
 *
 * @param compressed use compressed layout hierarchy or
 * @return the absolute path name of dumped file.
 */
@Override
public String dumpWindowHierarchy(boolean compressed) {
    device.setCompressedLayoutHierarchy(compressed);
    ByteArrayOutputStream os = null;
    try {
        os = new ByteArrayOutputStream();
        AccessibilityNodeInfoDumper.dumpWindowHierarchy(
            device.dumpWindowHierarchy(os));
    } catch (IOException e) {
        Log.d("dump Window Hierarchy got IOException ");
    } finally {
        if (os != null) {
            try {
                os.close();
            } catch (IOException e) {
                //ignore
            }
        }
    }
    return os.toString("UTF-8");
}
}
```

前一个：

```
public String dumpWindowHierarchy(boolean compressed, String filename)
```

xpath

已废弃。

后一个，核心是调用：

```
AccessibilityNodeInfoDumper.dumpWindowHierarchy(device, os)
```

```
app/src/androidTest/java/com/github/uiautomator/stub/AccessibilityNodeInfoDumper.java
```

```
public static void dumpWindowHierarchy(UiDevice device,
    XmlSerializer serializer = Xml.newSerializer();
    serializer.setFeature("http://xmlpull.org/v1/doc/features.xml#setEntityResolver");
    serializer.setOutput(out, "UTF-8");
    serializer.startDocument("UTF-8", true);
    serializer.startTag("", "hierarchy");
    serializer.attribute("", "rotation", Integer.toString(rotation));
    AccessibilityNodeInfo[] arr$ = getWindowRoots(device);
    int len$ = arr$.length;

    for (int i$ = 0; i$ < len$; ++i$) {
        AccessibilityNodeInfo root = arr$[i$];
        dumpNodeRec(root, serializer, 0, device.getDisplayId());
    }

    serializer.endTag("", "hierarchy");
    serializer.endDocument();
}
```

最终返回的内容，就是此处的dumpWindowHierarchy函数的处理，生成xml内容后，所返回的。

比如某次调试过程：

jsonrpc的调用：

```
[191120 10:17:07] [__init__.py 493] jsonrpc_call: jsonrpc_uiauto
```

底层发送的请求是：

```
Shell$ curl -X POST -d '{"jsonrpc": "2.0", "id": "5a175f3159cc1aa2e27f1cb68f5c"}'
```

最终返回的结果是：

```
Output> {"jsonrpc": "2.0", "id": "5a175f3159cc1aa2e27f1cb68f5c", "result": "OK"}
```

可见其中的xml头部的内容：

```
<?xml version='1.0' encoding='UTF-8' standalone='yes' ?><h:
```

就是上面的 `XmlSerializer` 的代码所生成的。

而其他的node节点，则是`dumpNodeRec`所生成的。

由此，后续深入研究，才知道，最终返回的节点中，如果符合NAF条件，则会被忽略其下内容，最终返回一个NAF="true"的节点，导致后续只返回部分页面内容的。

具体细节详见：

- 【未解决】uiautomator2中`dump_hierarchy`中只能获取到页面的部分的xml源码
- 【已解决】搞懂uiautomator-server中最终的底层实现`dumpWindowHierarchy`的处理返回页面数据的逻辑

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## 常用代码段

开发uiautomator2期间，把一些常用的功能，常用代码段，封装成了通用的函数并贴出来，和具体调用方式，供参考。

其中后续各种通用功能和函数，往往都会调用到一些基础的工具类函数，详见接下来的工具类函数，后续就不再赘述。

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## 工具类函数

在介绍通用功能之前，要先把常用到的基础的工具类的函数贴出来，供参考使用。

## 获取命令执行后返回的结果

```
def get_cmd_lines(cmd, text=False):
    # 执行cmd命令，将结果保存为列表
    resultStr = ""
    resultStrList = []
    try:
        consoleOutputByte = subprocess.check_output(cmd, shell=True)
        try:
            resultStr = consoleOutputByte.decode("utf-8")
        except UnicodeDecodeError:
            # TODO: use chardet auto detect encoding
            # consoleOutputStr = consoleOutputByte.decode('gb18030')
            resultStr = consoleOutputByte.decode("gb18030")

        if not text:
            resultStrList = resultStr.splitlines()
    except Exception as err:
        print("err=%s when run cmd=%s" % (err, cmd))

    if text:
        return resultStr
    else:
        return resultStrList
```

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## adb

uiautomator2操作安卓设备期间，往往会涉及到，借助于安卓体系内本身就有的工具 `adb`，去实现对设备的一些操控。

此处整理出一些常见的用法和通用功能。

### 获取当前安卓手机名

```
def get_phone_name_Android(self):
    # cmd = 'adb -s {} shell getprop ro.product.model'.format(self.serial)
    cmd = 'adb -s {} shell getprop ro.product.name'.format(self.serial)
    text = CommonUtils.get_cmd_lines(cmd, text=True)
    # https://miuiver.com/xiaomi-device-codename/
    #     begonia -> 红米Note 8内部代号为 "begonia"
    return re.sub("\s+", "", text)
    # isRunCmdOk, outputText = self.getCommandOutput(cmd)
    # if isRunCmdOk:
    #     phoneName = outputText
    # else:
    #     phoneName = ""
    # return phoneName
```

调用：

```
def get_phone_name(self):
    # 获取手机名称，以提取配置信息
    if self.isAndroid:
        return self.get_phone_name_Android()
```

### 获取当前连接的设备

```
def get_devices_Android(self):
    lines = CommonUtils.get_cmd_lines('adb devices')
    return [line.split()[0] for line in lines if line and line[0] != '-']
```

调用：

```
devices = self.get_devices_Android()
```

相关命令输出举例：

xpath

```
→ ~ adb devices
List of devices attached
8c8a4d4d    device
```

## 优化版：获取安卓设备列表

xpath

```
def getAndroidDeviceList(self, isGetDetail=False):
    """Get android device list

    Args:
        isGetDetail (bool): True to use `adb devices -l`, False otherwise
    Returns:
        device list(list)
    Raises:
    Examples:
        output:
            False -> ['2e2a0cb1', 'orga4pmzee4ts47t', '192.168.31.84:5555']
            True -> {'2e2a0cb1': {'usb': '338952192X', 'product': 'PD2065', 'model': '...', 'serial': '2e2a0cb1', 'device': '...', 'ip': '192.168.31.84:5555', 'id': '...', 'label': '...'}, 'orga4pmzee4ts47t': {'usb': '338886656X', 'product': '...', 'model': '...', 'serial': 'orga4pmzee4ts47t', 'device': '...', 'ip': '...', 'id': '...', 'label': '...'}, '192.168.31.84:5555': {'usb': '...', 'product': '...', 'model': '...', 'serial': '...', 'device': '...', 'ip': '192.168.31.84:5555', 'id': '...', 'label': '...'}}

    deviceList = []

    getDevicesCmd = 'adb devices'
    if isGetDetail:
        getDevicesCmd += " -l"
    logging.debug("getDevicesCmd=%s", getDevicesCmd)

    deviceLines = CommonUtils.get_cmd_lines(getDevicesCmd)
    logging.debug("deviceLines=%s", deviceLines)
    # ['List of devices attached', '2e2a0cb1\tdevice', 'orga4pmzee4ts47t\tdevice', '192.168.31.84:5555\tdevice', ...]

    adb devices :
        List of devices attached
        2e2a0cb1      device
        orga4pmzee4ts47t      device
        192.168.31.84:5555      device
    ....
    ....
    ....
    adb devices -l:
        List of devices attached
        2e2a0cb1              device usb:338952192X product:...
        orga4pmzee4ts47t      device usb:338886656X product:...
        192.168.31.84:5555      device product:PD2065 model:...
    ....
    ....
    for eachLine in deviceLines:
        if not eachLine:
            continue

        if "devices attached" in eachLine:
            continue

        foundDevice = re.search("(?P<devSerial>[\w\.:]+)\s+"
                               ".*", eachLine)
        logging.debug("foundDevice=%s", foundDevice)
        # foundDevice=<re.Match object; span=(0, 101), match='2e2a0cb1\tdevice'>
        if foundDevice:
```

xpath

```
devSerial = foundDevice.group("devSerial")
logging.debug("devSerial=%s", devSerial)
# devSerial=2e2a0cb1
if isGetDetail:
    devDetail = foundDevice.group("devDetail")
    logging.debug("devDetail=%s", devDetail)
    # devDetail=usb:338952192X product:PD2065
    keyValueIter = re.finditer("(?P<key>\w+):(?P<value>\w+)")
    keyValueMatchList = list(keyValueIter)
    logging.debug("keyValueMatchList=%s", keyValueMatchList)
    # keyValueMatchList=[<re.Match object; span=(0, 14), groupdict={'key': 'usb', 'value': '338952192X'}, re_type=re_types.<...
    detailInfoDict = {}
    for eachMatch in keyValueMatchList:
        eachKey = eachMatch.group("key")
        eachValue = eachMatch.group("value")
        detailInfoDict[eachKey] = eachValue
    logging.debug("detailInfoDict=%s", detailInfoDict)
    # detailInfoDict={'usb': '338952192X', 'product': 'PD2065'}
    curDevDetailDict = {
        devSerial: detailInfoDict
    }
    logging.debug("curDevDetailDict=%s", curDevDetailDict)
    # curDevDetailDict={'2e2a0cb1': {'usb': '338952192X', 'product': 'PD2065'}}
    deviceList.append(curDevDetailDict)
else:
    deviceList.append(devSerial)

logging.debug("deviceList=%s", deviceList)
# deviceList=[{'2e2a0cb1': {'usb': '338952192X', 'product': 'PD2065'}, ...
# ['2e2a0cb1', 'orga4pmzee4ts47t', '192.168.31.84:5555']
return deviceList
```

调用：

```
deviceDetailList = self.getAndroidDeviceList(isGetDetail=False)
# ['2e2a0cb1', 'orga4pmzee4ts47t', '192.168.31.84:5555']
```

或：

```
deviceDetailList = self.getAndroidDeviceList(isGetDetail=True)
# [{'2e2a0cb1': {'usb': '338952192X', 'product': 'PD2065', ...}}
```

## 检测安卓设备是否连接

xpath

```
def isAndroidUsbConnected(self, deviceSerialId):
    """Check whether android device is currently USB wired

    Args:
        deviceSerialId (str): android devivce serial id
    Returns:
        connected or not (bool)
    Raises:
    Examples:
        input: "orga4pmzee4ts47t"
        output: True
    """
    isUsbConnected = False
    isRealSerialId = re.search("\w+", deviceSerialId)
    if not isRealSerialId:
        # makesure is not wifi, such as: 192.168.31.84:5555
        logging.error("Invalid android USB wired connected")
        return isUsbConnected

    deviceDetailList = self.getAndroidDeviceList(isGetData)
    for eachDevDetailDict in deviceDetailList:
        curDevSerialStr, curDevDetailDict = list(eachDevDetailDict.items())
        if deviceSerialId == curDevSerialStr:
            detailInfoKeyList = list(curDevDetailDict.keys())
            # ['usb', 'product', 'model', 'device', 'transports']
            if "usb" in detailInfoKeyList:
                isUsbConnected = True
            break

    return isUsbConnected
```

调用：

```
deviceId = "orga4pmzee4ts47t"
isUsbConnected = self.isAndroidUsbConnected(deviceId)
```

## 用adb通过WiFi连接设备

xpath

```
def androidConnectWiFiDevice(self, wifiSerial):
    """Use Android `adb connect` to connect WiFi wireless device.

    Args:
        wifiSerial (str): android devivce WiFi serial, eg: "192.168.31.84:5555"
    Returns:
        connect ok or not (bool)
    Raises:
    Examples:
        input: "192.168.31.84:5555"
        output: True
    """
    isConnectOk = False

    adbConnectCmd = "adb connect %s" % wifiSerial
    logging.info("Try connect Android device: %s", adbConnectCmd)
    # os.system(adbConnectCmd) # when failed, will wait too long
    cmdOutputStr = CommonUtils.get_cmd_lines(adbConnectCmd)
    logging.info("console output: %s", cmdOutputStr)
    # connected to 192.168.31.84:5555
    # already connected to 192.168.31.84:5555
    # failed to connect to '192.168.31.84:5555': Operation not permitted
    # "failed to connect to '192.168.31.84:5555': Connection refused"
    # err=Command 'adb connect 192.168.31.84:5555' timed out
    if cmdOutputStr:
        if "connected" in cmdOutputStr:
            isConnectOk = True
        elif ("failed" in cmdOutputStr) or ("timed out" in cmdOutputStr):
            isConnectOk = False
    else:
        isConnectOk = False

    return isConnectOk
```

调用：

```
devWifiSerialId = "192.168.31.84:5555"
isWiFiConnected = self.androidConnectWiFiDevice(devWifiSerialId)
```

## 获取当前正在运行的app和页面activity

xpath

```
def get_PackageActivity_Android(self):
    # adb直接获取当前活跃app及activity
    package, activity = "", ""
    cmds = ['dumpsys activity |grep {}'.format(item) for item in items]
    for cmd in cmds:
        output = self.driver.shell(cmd).output
        result = re.search("\u00d7(.*)/", output)
        package = result.group(1).strip() if result else ""
        result = re.search("/(.*)\s", output)
        activity = result.group(1).strip() if result else ""
    if package and activity:
        return package, activity
    return package, activity
```

调用：

```
package, activity = self.get_PackageActivity()
```

## 获取已安装app列表

```
def get_packages(self):
    # 获取已安装的app的appPackage列表
    if isinstance(self.driver, u2.UIAutomatorServer):
        text = self.driver.shell("pm list packages")[0]
        return re.findall(':(.*?)\n', text)
    else:
        cmd = 'adb -s {} shell pm list packages'.format(self.device)
        lines = CommonUtils.get_cmd_lines(cmd)
        return [line.split(":")[-1].strip() for line in lines]
```

调用：

```
packages = self.get_packages()
```

## 安装安卓app

xpath

```
def install_app_Android(self, item, packages=None):
    if packages is None:
        packages = self.get_packages()
    if item[1] in packages:
        logging.info("AppName {} is already installed".format(item[1]))
    else:
        logging.info("start to install app in {}".format(os.getcwd()))
        os.system("adb -s {} install {}".format(self.dev_id, item[1]))
```

调用：

```
def install_app(self, item, packages=None):
    # 安装app
    if self.isAndroid:
        return self.install_app_Android(item, packages)
```

## 卸载安卓app

```
def uninstall_app(self, item):
    # 卸载安装包
    os.system("adb -s {} uninstall {}".format(self.device_id, item[1]))
    logging.info("uninstall app {} end".format(item[1]))
```

调用：

```
if item[1] in packages:
    self.uninstall_app(item)
```

## 判断屏幕是否已解锁

xpath

```
def is_device_unlock_Android(self, device):
    os.system('adb -s {} shell input keyevent 3'.format(device))
    time.sleep(1)
    # cmds = [
    #     'adb -s {} shell dumpsys window policy | grep isShowingDream',
    #     'adb -s {} shell dumpsys window policy | grep mShowingDream',
    #     'adb -s {} shell dumpsys window policy | grep mDisplaySuspendLock',
    # ]
    # for cmd in cmds:
    #     text = CommonUtils.get_cmd_lines(cmd, text=True)
    #     if text and "=true" in text:
    #         logging.info("start to unlock device {}".format(device))
    #         return False

    # cmds = [
    #     'adb -s {} shell dumpsys power | grep mHoldingDisplaySuspendBlocker',
    # ]
    # for cmd in cmds:
    #     text = CommonUtils.get_cmd_lines(cmd, text=True)
    #     if text and "=false" in text:
    #         # 'mHoldingDisplaySuspendBlocker=false\n'
    #         logging.info("start to unlock device {}".format(device))
    #         return False

    checkCmds = 'adb -s {} shell dumpsys window | grep mDisplaySuspendLock'
    text = CommonUtils.get_cmd_lines(checkCmds, text=True)
    if text and "mDreamingLockscreen=true" in text:
        # 'mShowingDream=false mDreamingLockscreen=true'
        logging.info("start to unlock device {}".format(device))
        return False

    logging.info("device {} is already unlock".format(device))
    return True
```

调用：

```
if self.isAndroid:
    return self.is_device_unlock_Android(device)
```

## 获取安卓手机电量

xpath

```
def get_device_electricity_Android(self):
    shell_cmd = 'dumpsys battery | grep level'
    adb_cmd = 'adb -s {0} shell {1}'.format(self.device, shell_cmd)
    # level = self.driver.shell(shell_cmd).output if isinstance(self.driver, RemoteDriver) else None
    level = self.driver.shell(shell_cmd).output if isinstance(self.driver, WebDriver) else None
    result = re.search("\d+", level)
    ratio = int(result.group()) if result else 100
    return ratio
```

调用：

```
batteryElectricityPercentInt = self.get_device_electricity()
```

## 获取安卓手机名

```
def get_phone_name_Android(self):
    # cmd = 'adb -s {} shell getprop ro.product.model'.format(self.device)
    cmd = 'adb -s {} shell getprop ro.product.name'.format(self.device)
    text = CommonUtils.get_cmd_lines(cmd, text=True)
    # https://miuiver.com/xiaomi-device-codename/
    #     begonia -> 红米Note 8内部代号为“begonia”
    return re.sub("\s+", "", text)
    # isRunCmdOk, outputText = self.getCommandOutput(cmd)
    # if isRunCmdOk:
    #     phoneNumber = outputText
    # else:
    #     phoneNumber = ""
    # return phoneNumber
```

调用：

```
if self.isAndroid:
    return self.get_phone_name_Android()
```

## 设备相关

此处整理出，和安卓设备相关的一些通用功能的函数和调用举例。

### 获取安卓设备信息

```
def getDeviceInfo(self):
    return self.driver.device_info
```

调用：

```
deviceInfo = self.getDeviceInfo()
logging.info("deviceInfo=%s" % deviceInfo)
```

输出举例：

```
# deviceInfo={'udid': '2e2a0cb1-36:59:fa:77:bb:a6-V2065A',
```

### 获取(u2)驱动信息

代码：

```
driverInfo = self.driver.info
logging.info("driverInfo=%s" % driverInfo)
```

输出举例：

```
# driverInfo={'currentPackageName': 'com.bbk.launcher2', 'c
```

### 获取安卓版本

```
def getAndroidVersion(self):
    """返回安卓版本号, float值: 6.0, 9.0 """
    deviceInfo = self.getDeviceInfo()
    logging.debug("deviceInfo=%s" % deviceInfo)
    androidVersionStr = deviceInfo["version"] # '6.0'
    androidVersionFloat = float(androidVersionStr)
    return androidVersionFloat
```

调用：

xpath

```
curAndroidVersionFloat = self.getAndroidVersion()
ANDROID_VERSION_NEED_RESTART_U2 = 7.0
if curAndroidVersionFloat <= ANDROID_VERSION_NEED_RESTART_U2:
    isNeedRestartU2 = True
```

## 获取安卓屏幕分辨率

```
def getCurScreenResolution(self):
    """Get current screen resolution"""
    driverInfo = self.driver.info
    logging.debug("driverInfo=%s" % driverInfo)
    # displayWidth = driverInfo["displayWidth"]
    # displayHeight = driverInfo["displayHeight"]
    # logging.info("displayWidth=%s, displayHeight=%s", displayWidth, displayHeight)
    # deviceInfo = self.driver.device_info
    deviceInfo = self.getDeviceInfo()
    logging.debug("deviceInfo=%s" % deviceInfo)
    deviceDisplay = deviceInfo["display"]
    logging.debug("deviceDisplay=%s" % deviceDisplay)
    screenWidth = deviceDisplay["width"]
    screenHeight = deviceDisplay["height"]
    logging.debug("screenWidth=%s, screenHeight=%s", screenWidth, screenHeight)
    if driverInfo["displayRotation"]:
        curScreenWidth = screenHeight
        curScreenHeight = screenWidth
    else:
        curScreenWidth = screenWidth
        curScreenHeight = screenHeight
    logging.debug("curScreenWidth=%s, curScreenHeight=%s", curScreenWidth, curScreenHeight)

    return (curScreenWidth, curScreenHeight)
```

调用：

```
screenWidth, screenHeight = self.getCurScreenResolution()
```

输出：

```
[191213 16:16:13] [AppCrawler.py 209] driverInfo={'currentPa...
[191213 16:16:13] [AppCrawler.py 212] displayWidth=1196, di...
[191213 16:16:13] [AppCrawler.py 214] deviceInfo={'udid': '...
[191213 16:16:13] [AppCrawler.py 216] deviceDisplay={'widt...
[191213 16:16:13] [AppCrawler.py 219] screenWidth=720, scre...
[191213 16:16:13] [AppCrawler.py 226] curScreenWidth=1280, c...
```

得到了我们要的：屏幕的宽度和高度

xpath

且知道了是当前屏幕是否已旋转（从安卓手机的默认的竖屏，旋转成游戏的横屏）了

另外，当屏幕故意不去旋转，回到默认竖屏后：

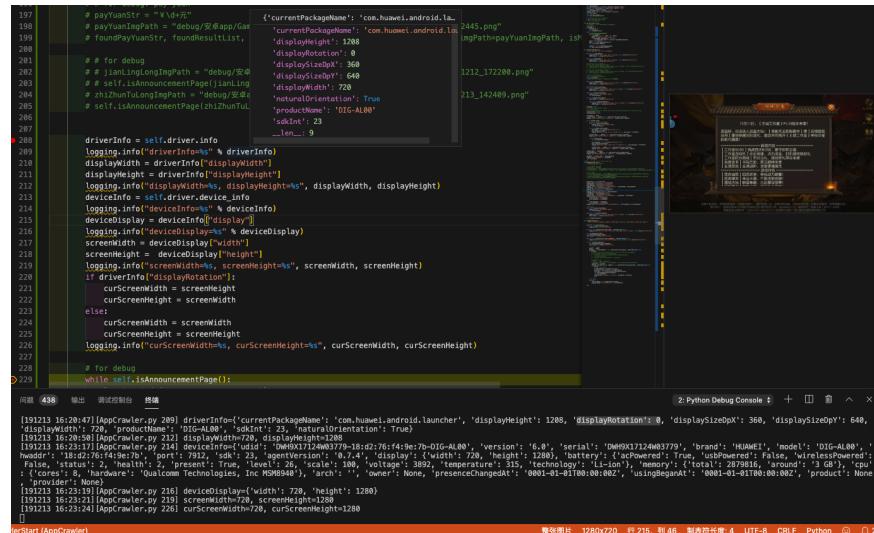
xpath



此时

- 旋转为 False
  - displayRotation : 0
  - naturalOrientation : True
- 但 displayHeight 值有变化: 是 1208
  - 却不是 1280

如图:



The screenshot shows a Python debugger interface with two panes. The left pane displays the source code of `AppCrawler.py`, specifically the `getScreenSize` method. The right pane shows the Python Debug Console with log messages. The log output includes driver and device information, such as `currentPackageName: com.huawei.android.launcher`, `displayHeight: 1208`, and `displayWidth: 720`. It also shows the path to the application's resources and the execution of `self.isAnnouncementPage()`.

```

197     # payYuanImgPath = "debug/S@apc/Gar
198     # if roundPayYuanTr, foundResultList,
199     #     for debug
200     #         if JianImgLongImgPath = "debug/贝
201     #             self.isAnnouncementPage(jianImg
202     #             self.isAnnouncementPage(zhizhunTu
203     #             self.isAnnouncementPage(zhizhunTu
204     #             self.isAnnouncementPage(zhizhunTu
205     #             self.isAnnouncementPage(zhizhunTu
206     #             self.isAnnouncementPage(zhizhunTu
207     #             self.isAnnouncementPage(zhizhunTu
208
209     driverInfo = self.driver.info
210     logging.info("driverInfo=%s" % driverInfo)
211     displayWidth = driverInfo["displayWidth"]
212     displayHeight = driverInfo["displayHeight"]
213     displayImgPath = "displayWidth=%s, displayHeight=%s" % (displayWidth, displayHeight)
214     deviceInfo = self.device.info
215     logging.info("deviceInfo=%s" % deviceInfo)
216     deviceDisplay = deviceInfo["display"]
217     logging.info("deviceDisplay=%s" % deviceDisplay)
218     screenWidth = deviceDisplay["width"]
219     screenHeight = deviceDisplay["height"]
220     logging.info("screenWidth=%s, screenHeight=%s" % (screenWidth, screenHeight))
221     if driverInfo["displayRotation"]:
222         curScreenWidth = screenWidth
223         curScreenHeight = screenHeight
224     else:
225         curScreenWidth = screenHeight
226         curScreenHeight = screenWidth
227     logging.info("curScreenWidth=%s, curScreenHeight=%s" % (curScreenWidth, curScreenHeight))
228
229     # for debug
230     while self.isAnnouncementPage():

```

详细log:

```

[191213 16:20:47] [AppCrawler.py 209] driverInfo={ 'currentPa
[191213 16:20:50] [AppCrawler.py 212] displayWidth=720, dis
[191213 16:23:17] [AppCrawler.py 214] deviceInfo={ 'udid': 'I
[191213 16:23:19] [AppCrawler.py 216] deviceDisplay={ 'widt
[191213 16:23:21] [AppCrawler.py 219] screenWidth=720, scre
[191213 16:23:24] [AppCrawler.py 226] curScreenWidth=720, cu

```

详见:

【已解决】uiautomator2获取当前屏幕的宽和高即屏幕大小分辨率信息

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powered by Gitbook最后更新: 2021-03-30 20:17:37

## 其他

### 获取元素属性

```

# 获取元素属性值
def get_ElementBounds(self, element):
    # 将元素坐标转成数组
    if self.isAndroid:
        # <node index="1" text="" resource-id="com.tencent.xposed.XposedBridge$XposedInit" bounds="16,20,46,64"/>
        bounds = element.attrib.get("bounds")
        return list(map(int, re.sub('\[|,|\]', " ", bounds)))
    elif self.isiOS:
        # <XCUIElementTypeButton ... name="返回" label="返回"/>
        # attrib = element.attrib
        # xStr = attrib["x"]
        # yStr = attrib["y"]
        # widthStr = attrib["width"]
        # heightStr = attrib["height"]
        # x = int(xStr)
        # y = int(yStr)
        # width = int(widthStr)
        # height = int(heightStr)
        x = self.get_ElementX(element)
        y = self.get_ElementY(element)
        width = self.get_ElementWidth(element)
        height = self.get_ElementHeight(element)
        x1 = x + width
        y1 = y + height
        boundList = [x, y, x1, y1]
        return boundList # [16, 20, 46, 64]

def get_ElementX(self, element):
    if self.isAndroid:
        bounds = self.get_ElementBounds(element)
        x = bounds[0]
        return x
    elif self.isiOS:
        attrib = element.attrib
        xStr = attrib["x"]
        x = int(xStr)
        return x

def get_ElementY(self, element):
    if self.isAndroid:
        bounds = self.get_ElementBounds(element)
        y = bounds[1]
        return y
    elif self.isiOS:
        attrib = element.attrib
        yStr = attrib["y"]
        y = int(yStr)
        return y

def get_ElementWidth(self, element):

```

xpath

```
if self.isAndroid:
    bounds = self.getElementBounds(element)
    width = bounds[2] - bounds[0]
    return width
elif self.isiOS:
    attrib = element.attrib
    widthStr = attrib["width"]
    width = int(widthStr)
    return width

def getElementHeight(self, element):
    if self.isAndroid:
        bounds = self.getElementBounds(element)
        height = bounds[3] - bounds[1]
        return height
    elif self.isiOS:
        attrib = element.attrib
        heightStr = attrib["height"]
        height = int(heightStr)
        return height

def getElementSize(self, element):
    # 获取元素方框大小
    bounds = self.getElementBounds(element)
    return (bounds[2] - bounds[0]) * (bounds[3] - bounds[1])

def getElementPoint(self, element):
    # 获取元素中心点坐标
    bounds = self.getElementBounds(element)
    return [(bounds[2] + bounds[0])//2, (bounds[3] + bounds[1])//2]

def getElementText(self, element):
    if self.isAndroid:
        # 返回元素text文本
        textKey = "text"
    elif self.isiOS:
        # 返回元素label
        textKey = "label"
    textValue = element.attrib.get(textKey, "")
    return textValue

def getElementContentdesc(self, element):
    if self.isAndroid:
        # 返回元素content-desc文本
        descKey = "content-desc"
    elif self.isiOS:
        # 返回元素value
        descKey = "value"
    descValue = element.attrib.get(descKey, "")
    return descValue
```

xpath

```
def get_ElementDescribe(self, element):
    # # 返回元素text文本和content-desc文本
    # 返回元素 文本 和 描述
    elementText = self.get_ElementText(element)
    elementContentDesc = self.get_ElementContentdesc(element)
    descText = elementText + elementContentDesc
    return descText
```

## 判断是否是布局类型的元素

```
def is_element_layout_Android(self, element):
    # 判断元素是否是out类型(如LinearLayout、RelativeLayout)
    # return "Layout" in element.attrib.get("class")
    curClass = element.attrib.get("class")
    #TODO: 换成re正则匹配 xxxLayout ?
    isLayout = "Layout" in curClass
    # 可能:
    #     android.widget.FrameLayout
    #     android.widget.LinearLayout
    #     android.widget.RelativeLayout
    # for debug
    if isLayout:
        knownLayoutList = [
            "android.widget.FrameLayout",
            "android.widget.LinearLayout",
            "android.widget.RelativeLayout",
        ]
        foundNew = curClass not in knownLayoutList
        if foundNew:
            print("curClass=%s" % curClass)
    return isLayout
```

## 判断元素是否是某种类型

```

def is_element_Button(self, element):
    # 元素是否为Button
    if self.isAndroid:
        # return "Button" in element.attrib.get("class")
        return self.is_element_SomeType_Android(element, "XCUIElementTypeButton")
    elif self.isiOS:
        # <XCUIElementTypeButton type="XCUIElementTypeButton"
        # iOSTagButton = "XCUIElementTypeButton"
        # elementTag = element.tag
        # isButton = elementTag == iOSTagButton
        # return isButton
        return self.is_element_SomeType_iOS(element, "XCUIElementTypeButton")

def is_element_Image(self, element):
    # 元素是否为ImageView
    if self.isAndroid:
        # return "Image" in element.attrib.get("class")
        return self.is_element_SomeType_Android(element, "XCUIElementTypeImage")
    elif self.isiOS:
        # <XCUIElementTypeImage type="XCUIElementTypeImage"
        # iOSTagImage = "XCUIElementTypeImage"
        # elementTag = element.tag
        # isImage = elementTag == iOSTagImage
        # return isImage
        return self.is_element_SomeType_iOS(element, "XCUIElementTypeImage")

def is_element_EditText(self, element):
    if self.isAndroid:
        # 元素是否为EditText
        # return "EditText" in element.attrib.get("class")
        return self.is_element_SomeType_Android(element, "XCUIElementTypeEditText")
    elif self.isiOS:
        # <XCUIElementTypeStaticText type="XCUIElementTypeStaticText"
        # iOSTagStaticText = "XCUIElementTypeStaticText"
        # elementTag = element.tag
        # isStaticText = elementTag == iOSTagStaticText
        # return isStaticText
        # return self.is_element_SomeType_iOS(element, "XCUIElementTypeStaticText")

        # <XCUIElementTypeSearchField type="XCUIElementTypeSearchField"
        #     <XCUIElementTypeButton type="XCUIElementTypeButton"
        # </XCUIElementTypeSearchField>
        isSearchField = self.is_element_SomeType_iOS(element, "XCUIElementTypeSearchField")
        # <XCUIElementTypeTextField type="XCUIElementTypeTextField"
        isTextField = self.is_element_SomeType_iOS(element, "XCUIElementTypeTextField")
        #
        isSecureTextField = self.is_element_SomeType_iOS(element, "XCUIElementTypeSecureTextField")
        isEditableText = isSearchField or isTextField or isSecureTextField
        #
        return isEditableText

```

xpath

```
def is_element_Link(self, element):
    # 元素是否是 XCUIElementTypeLink
    .....
    <XCUIElementTypeLink type="XCUIElementTypeLink" name="XCUIElementTypeLink">
        <XCUIElementTypeStaticText type="XCUIElementTypeText" value="XCUIElementTypeLink" />
    </XCUIElementTypeLink>
    .....
    return self.is_element_SomeType_iOS(element, "XCUIElementTypeLink")

def is_element_SomeType_iOS(self, element, typeName):
    elementType = None
    if hasattr(element, "tag"):
        # lxml Element
        elementTag = element.tag
        elementType = elementTag
    elif hasattr(element, "attrs"):
        # BeautifulSoup soup node
        elementAttrDict = element.attrs
        elementType = elementAttrDict.get("type")
    isCurrentType = elementType == typeName
    return isCurrentType

def is_element_SomeType_Android(self, element, typeName):
    curClass = element.attrib.get("class")
    isTypeInClass = typeName in curClass
    isCurrentType = isTypeInClass
    return isCurrentType
```

## 点击元素（中间坐标值）

```

def clickElementCenterPosition(self, curElement):
    """Click center position of element

    Args:
        curElement (Element): Beautiful soup / lxml element
    Returns:
        bool
    Raises:
        ...
    """
    hasClicked = False
    # centerPos = None
    centerX = None
    centerY = None

    hasBounds = hasattr(curElement, "bounds")
    curBounds = None
    if hasBounds:
        curBounds = curElement.bounds

    if hasBounds and curBounds:
        # wda element
        if hasattr(curBounds, "center"):
            # is wda Rect
            curRect = curBounds
            rectCenter = curRect.center
            centerX = rectCenter[0]
            centerY = rectCenter[1]
    else:
        attrDict = None
        if hasattr(curElement, "attrs"):
            # Beautiful soup node
            attrDict = curElement.attrs
        elif hasattr(curElement, "attrib"):
            # lxml element
            attrDict = dict(curElement.attrib)

        if attrDict:
            logging.info("attrDict=%s", attrDict)
            hasCoordinate = ("x" in attrDict) and ("y" in attrDict)
            if hasCoordinate:
                x = int(attrDict["x"])
                y = int(attrDict["y"])
                width = int(attrDict["width"])
                height = int(attrDict["height"])
                centerX = x + int(width / 2)
                centerY = y + int(height / 2)

            if centerX and centerY:
                centerPos = (centerX, centerY)
                self.tap(centerPos)

```

xpath

```
logging.info("Clicked center position: %s", centerPosition)
hasClicked = True
```

```
return hasClicked
```

调用:

```
moreInfoSoup = parentCellSoup.find(
    'XCUIElementTypeButton',
    attrs={"type": "XCUIElementTypeButton", "name": "更多信息"})
if moreInfoSoup:
    clickedOk = self.clickElementCenterPosition(moreInfoSoup)
```

或:

```
page = self.get_page_source()
backElement, nextPage = self.findRealBackElement(page)
if backElement is not None:
    isFoundAndClicked = self.clickElementCenterPosition(backElement)
```

或:

```
# try return to main page, by find main menu and click first item
mainMenuList = self.get_elements_MainMenu(page)
if mainMenuList:
    firstMainMenu = mainMenuList[0]
    clickOk = self.clickElementCenterPosition(firstMainMenu)
```

或:

```
isGetProxyTypeOk, respInfo = self.iOSLaunchSettingsAndGetProxyInfo()
curProxySoup = respInfo
curProxyAttrDict = curProxySoup.attrs
curTypeName = curProxyAttrDict.get("value")

# into config proxy page
self.clickElementCenterPosition(curProxySoup)
```

## 电脑相关

### 获取电脑序列号

xpath

```
def getSerialNumber(self):
    """get current computer serial number"""
    # cmd = "wmic bios get serialnumber"
    cmd = ""
    if CommonUtils.osIsWindows():
        # Windows
        cmd = "wmic bios get serialnumber"
    elif CommonUtils.osIsMacOS():
        # macOS
        cmd = "system_profiler SPHardwareDataType | awk '/"
    # TODO: add support other OS
    # AIX: aix
    # Linux: linux
    # Windows/Cygwin: cygwin

    serialNumber = ""
    lines = CommonUtils.get_cmd_lines(cmd)
    if CommonUtils.osIsWindows():
        # Windows
        serialNumber = lines[1]
    elif CommonUtils.osIsMacOS():
        # macOS
        serialNumber = lines[0] # C02Y3N10JHC8, 'VMfvNykaZWi1'

    return serialNumber
```

调用：

```
serialNumber = self.getSerialNumber() # 'VMfvNykaZWi1'
```

## 调试相关

在安卓手机测试期间，往往会遇到一些和调试相关内容，此处整理出其中相对通用部分，供参考。

### 缩放图片（到原始尺寸比例）

xpath

```
def scaleToOrginSize(self, screenshotImgPath, curScale):
    """resize to original screen size, according to session
    curScreenImg = Image.open(screenshotImgPath)
    originSize = curScreenImg.size # 750x1334
    newWidthInt = int(float(originSize[0])) / curScale
    newHeightInt = int(float(originSize[1])) / curScale
    scaledSize = (newWidthInt, newHeightInt) # 375x667
    scaledFile = screenshotImgPath
    CommonUtils.resizeImage(curScreenImg, newSize=scaledSize)
    return scaledFile
```

## 获取当前屏幕截图文件

```
def getCurScreenshot(self, saveFolder=None):
    """get current screenshot image file path"""

    curDatetimeStr = CommonUtils.getCurDatetimeStr() # '2020-04-22_144915'
    # suffix = "png"
    suffix = "jpg" # '20200422_144915.jpg'
    curFilename = "%s.%s" % (curDatetimeStr, suffix)
    if not saveFolder:
        if self.isAndroid:
            # saveFolder = self.config["CurAndroidAppScreenshotPath"]
            # saveFolder = self.config["CurAndroidWeixinScreenshotPath"]
            # saveFolder = self.config["debug"]["screenshotsPath"]
            saveFolder = self.config["debug"]["screenshotPath"]
        elif self.isiOS:
            # saveFolder = self.config["CuriOSWeixinScreenshotPath"]
            # saveFolder = self.config["CuriOSAppPageSourcePath"]
            # saveFolder = self.config["debug"]["pageSourcePath"]
            # saveFolder = self.config["debug"]["screenshotsPath"]
            # saveFolder = self.config["debug"]["screenshotPath"]
            saveFolder = self.config["debug"]["screenshotPath"]
    # add current date sub folder
    curDateStr = CommonUtils.getCurDatetimeStr("%Y%m%d") #
    saveFolder = os.path.join(saveFolder, curDateStr) # '2020/04/22'
    CommonUtils.createFolder(saveFolder)
    fullImgFilePath = os.path.join(saveFolder, curFilename)
    beforeDriverScreenshotTime = datetime.now()
    if self.isAndroid:
        fullImgFilePath = self.driver.screenshot(fullImgFilePath)
        # optimize size
        displayInfo = self.driver.device_info["display"] #
        originSize = (displayInfo["height"], displayInfo["width"])
        CommonUtils.resizeImage(fullImgFilePath, originSize)
    elif self.isiOS:
        fullImgFilePath = self.debugiOSSaveScreenshot(saveFolder)
    afterDriverScreenshotTime = datetime.now()
    driverScreenshotTime = afterDriverScreenshotTime - beforeDriverScreenshotTime
    logging.debug("driver screenshot time: %s", driverScreenshotTime)
    return fullImgFilePath
```

## 给当前屏幕截图加标记（红框）

xpath

```
def debugDrawScreenRect(self, curRect, curImgPath=None, isShow=True):
    """for debug, draw rectangle for current screenshot"""
    if not curImgPath:
        curImgPath = self.getCurScreenshot()

    curImg = CommonUtils.imageDrawRectangle(
        curImgPath,
        curRect,
        isShow=isShow,
        isAutoSave=isAutoSave,
        isDrawClickedPosCircle=isDrawClickedPosCircle,
    )

    return curImg
```

## 给元素加边框标记

xpath

```
def debugDrawElementRect(self, elementList, curImgPath=None):
    """for debug, to draw rectangle for each element in cur
    if not curImgPath:
        curImgPath = self.getCurScreenshot()

    curImg = Image.open(curImgPath)

    for eachElement in elementList:
        curBoundList = self.getElementBounds(eachElement)
        curWidth = curBoundList[2] - curBoundList[0]
        curHeight = curBoundList[3] - curBoundList[1]
        curRect = [curBoundList[0], curBoundList[1], curWidth, curHeight]
        curTimeStr = CommonUtils.getCurDatetimeStr("%H%M%S")
        curSaveTail = "_rect_{}_{x|y|w|h}_{:s)".format(curTimeStr)
        curInputImg = None
        if isDrawInSinglePic:
            curInputImg = curImg
        else:
            curInputImg = curImgPath
        curImg = CommonUtils.imageDrawRectangle(
            curInputImg,
            curRect,
            isShow=isShowEach,
            isAutoSave=isSaveEach,
            saveTail=curSaveTail,
            isDrawClickedPosCircle=False,
        )

    # always save final result
    curTimeStr = CommonUtils.getCurDatetimeStr("%H%M%S")
    finalSaveTail = "_rect_all_{:s}".format(curTimeStr)
    imgFolderAndName, pointSuffix = os.path.splitext(curImgPath)
    imgFolderAndName = imgFolderAndName + finalSaveTail
    finalImgPath = imgFolderAndName + pointSuffix
    curImg.save(finalImgPath)

    return
```

保存当前截图对应的xml源码

xpath

```
def debugSaveCurPageSource(self, filePrefix="", saveFolder=""):
    """for debug, save current page source xml file"""
    savedSourceFile = None
    curDatetimeStr = CommonUtils.getCurDatetimeStr()
    sourceFormat="xml"
    # sourceFilename = "%s_source.%s" % (curDatetimeStr, sourceFormat)
    sourceFilename = "%s.%s" % (curDatetimeStr, sourceFormat)
    if filePrefix:
        sourceFilename = "%s_%s" % (filePrefix, sourceFilename)
        # 'com.netease.cloudmusic_20200221_170337.xml'

    if not saveFolder:
        # if self.isAndroid:
        #     # saveFolder = self.config["CurAndroidAppPages"]
        #     # saveFolder = self.config["CurAndroidWeixinPages"]
        #     # saveFolder = self.config["debug"]["pageSource"]
        #     saveFolder = self.config["debug"]["pageSource"]
        # elif self.isiOS:
        #     # saveFolder = self.config["CuriOSWeixinPages"]
        #     # saveFolder = self.config["debug"]["pageSource"]
        #     saveFolder = self.config["debug"]["pageSource"]

        # if self.isAndroid:
        #     platformType = "Android"
        # elif self.isiOS:
        #     platformType = "iOS"
        # taskType = self.taskType
        # saveFolder = self.config["debug"]["pageSource"]
        saveFolder = self.config["debug"]["pageSource"]

    CommonUtils.createFolder(saveFolder)
    sourceFilename = os.path.join(saveFolder, sourceFilename)

    pageSource = self.getCurPageSource()
    CommonUtils.saveTextToFile(sourceFilename, pageSource)
    savedSourceFile = sourceFilename
    logging.debug("saved page source: %s", savedSourceFile)
    return savedSourceFile
```

## 保存当前屏幕的图片和源码

```
def debugSaveScreenAndSource(self):
    self.getCurScreenshot()
    self.debugSaveCurPageSource()
```

## 打印元素属性值

```

def debugPrintElement(self, curElement, prefix=""):
    """for debug, to print current element"""
    curElementStr = ""
    curInfoDict = {}
    keyList = []
    if self.isAndroid:
        if hasattr(curElement, "attrib"):
            curInfoDict = curElement.attrib
            keyList = ["resource-id", "class", "bounds", "name"]
    else:
        curInfoDict = curElement.info
        keyList = ["resourceName", "className", "bounds"]
    elif self.isiOS:
        curInfoDict = curElement.attrib
        # keyList = ["type", "name", "label", "value", "enabled"]
        keyList = ["type", "name", "label", "value", "enabled"]

    valueList = []
    for eachKey in keyList:
        if eachKey in curInfoDict.keys():
            eachValue = curInfoDict.get(eachKey)
            eachValueStr = str(eachValue)
            valueList.append(eachValueStr)
        # else:
        #     logging.debug("no %s key for %s", eachKey, curElement)

    curElementStr = " | ".join(valueList)
    logging.info("%s element: %s", prefix, curElementStr)
    return

```

调用：

```
self.debugPrintElement(curSubElement, "is subSubLen=1")
```

## 实际案例

此处整理和 `uiautomator2` 相关的一些实际案例，供参考。

### 监听特定元素

对于如下各种常见的按钮，可以用对应代码实现自动点击：

- 确定类按钮
- 广告类弹框
- Vivo自动安装app
- 奇虎360自动登录账号

详情请见后续章节。

以及其他一些小的例子：

### 下一步

代码：

```
NextStep_Button_Xpath_List: [
    "//android.widget.TextView[@text='下一步' and contains(@text, '下一步'))]
]

for eachXpath in NextStep_Button_Xpath_List:
    self.driver.watcher.when(eachXpath).click()
```

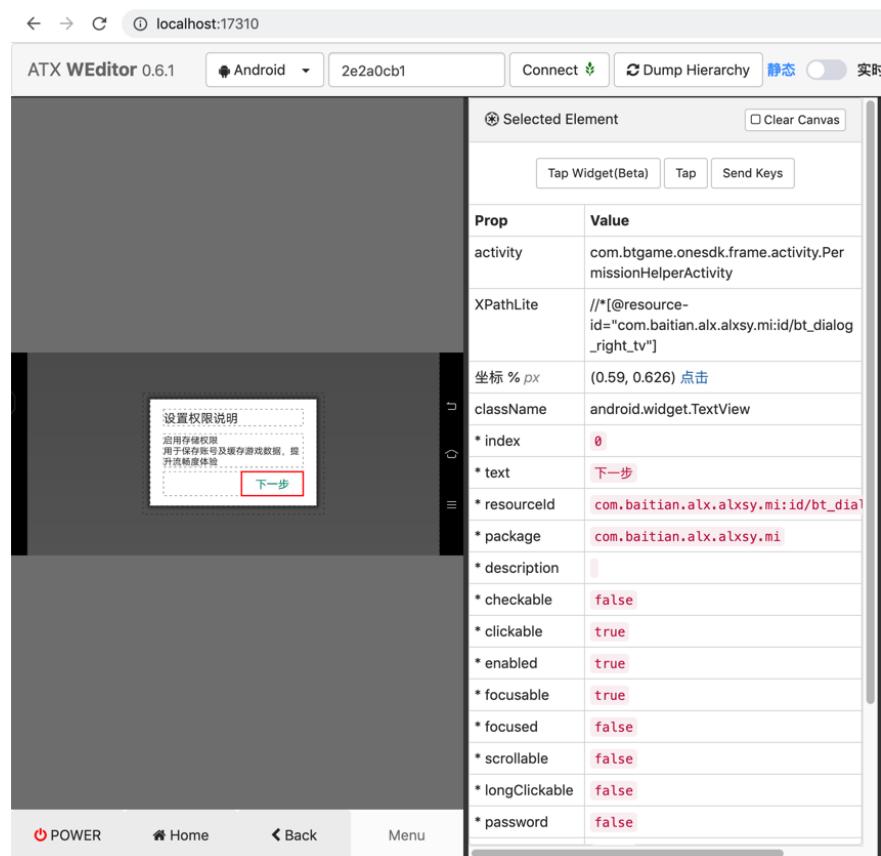
可以点击 下一步 类的按钮：

游戏app截图：



weditor截图：

xpath



属性：

```
Prop      Value
activity   com.btgame.onesdk.frame.activity.PermissionHelperActivity
XPathLite  //*[@resource-id="com.baitian.alx.alxsy.mi:id/bt_dialog_right_tv"]
坐标 % px  (0.59, 0.626) 点击
className  android.widget.TextView
* index    0
* text     下一步
* resourceId  com.baitian.alx.alxsy.mi:id/bt_dialog_right_tv
* package   com.baitian.alx.alxsy.mi
* description
* checkable false
* clickable true
* enabled   true
* focusable true
* focused   false
* scrollable false
* longClickable false
* password   false
* selected   false
# rect      {"x":815,"y":423,"width":218,"height":85}
```

详见：

【或许解决】用uiautomator2实现自动检测并点击安卓弹框：下一步

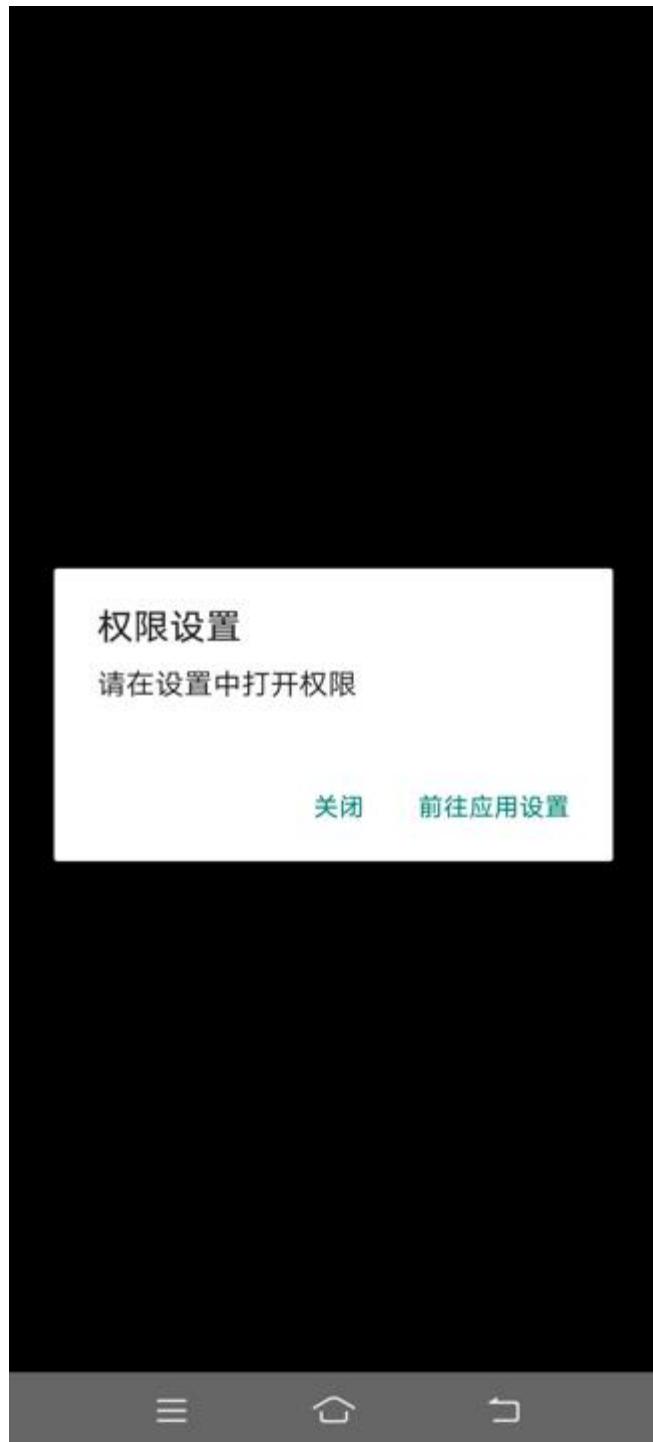
xpath

**自动同意前往应用设置的权限**

代码：

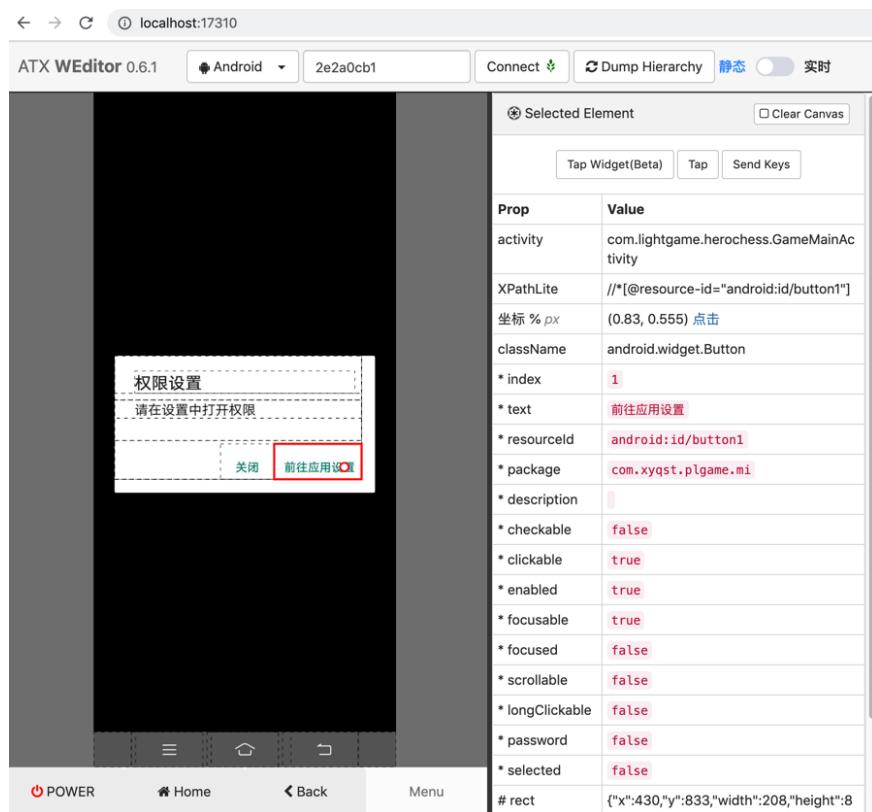
游戏app截图：

xpath



weditor截图：

xpath



属性：

| Prop            | Value                                     |
|-----------------|-------------------------------------------|
| activity        | com.lightgame.herochess.GameMainActivity  |
| XPathLite       | //*[@resource-id="android:id/button1"]    |
| 坐标 % px         | (0.83, 0.555) 点击                          |
| className       | android.widget.Button                     |
| * index         | 1                                         |
| * text          | 前往应用设置                                    |
| * resourceId    | android:id/button1                        |
| * package       | com.xyqst.plgame.mi                       |
| * description   |                                           |
| * checkable     | false                                     |
| * clickable     | true                                      |
| * enabled       | true                                      |
| * focusable     | true                                      |
| * focused       | false                                     |
| * scrollable    | false                                     |
| * longClickable | false                                     |
| * password      | false                                     |
| * selected      | false                                     |
| # rect          | {"x":430,"y":833,"width":208,"height":84} |

代码 d(resourceId="android:id/button1")

注：未完待续

详见：

【未解决】自动化测试工具新增逻辑：权限设置弹框前往应用设置并允许  
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xpath

## 微信相关

### 查找微信公众号中文全名

代码：

xpath

```
# def findWeixinPublicAccountZhcnSoup(self, soup, curAccou
def findWeixinPublicAccountZhcnFullName(self, soup, curAcc
    """Find weixin public account element's zh-CN full name

    Args:
        soup (soup): soup of current page xml
    Returns:
        public account zh-CN full name
    Raises:
        .....
    # accountZhcnTextSoup = None
    accountZhcnFullName = """
    parentNodeLocator = None

    .....
    搜索结果中文名节点是Text
    <XCUIElementTypeOther type="XCUIElementTypeOther">
        <XCUIElementTypeOther type="XCUIElementTypeOther">
            <XCUIElementTypeOther type="XCUIElementTypeOther">
                <XCUIElementTypeStaticText type="XCUIElementTypeText">
                    </XCUIElementTypeOther>
                </XCUIElementTypeOther>
            <XCUIElementTypeOther type="XCUIElementTypeText">
                <XCUIElementTypeOther type="XCUIElementTypeText">
                    <XCUIElementTypeStaticText type="XCUIElementTypeText">
                        </XCUIElementTypeOther>
                    </XCUIElementTypeText>
                </XCUIElementTypeText>
            </XCUIElementTypeText>
            <XCUIElementTypeText>
                <XCUIElementTypeStaticText type="XCUIElementTypeText">
                    </XCUIElementTypeText>
                </XCUIElementTypeText>
            </XCUIElementTypeText>
        </XCUIElementTypeText>
    </XCUIElementTypeText>
</XCUIElementTypeText>
```

搜索结果中文名节点是Other, 其下是多个Text节点:

```
<XCUIElementTypeOther type="XCUIElementTypeOther">
    <XCUIElementTypeOther type="XCUIElementTypeText">
        <XCUIElementTypeStaticText type="XCUIElementTypeText">
            </XCUIElementTypeText>
    </XCUIElementTypeText>
    <XCUIElementTypeImage type="XCUIElementTypeImage">
        <XCUIElementTypeImage type="XCUIElementTypeImage">
            <XCUIElementTypeText>
                <XCUIElementTypeStaticText type="XCUIElementTypeText">
                    </XCUIElementTypeText>
                </XCUIElementTypeText>
            </XCUIElementTypeText>
        </XCUIElementTypeImage>
    </XCUIElementTypeImage>
    <XCUIElementTypeText>
        <XCUIElementTypeStaticText type="XCUIElementTypeText">
            </XCUIElementTypeText>
        </XCUIElementTypeText>
    </XCUIElementTypeText>
</XCUIElementTypeText>
```

xpath

```
<XCUIElementTypeOther type="XCUIElementTypeOther">
    <XCUIElementTypeStaticText type="XCUIElementTypeStaticText">
        <XCUIElementTypeStaticText type="XCUIElementTypeStaticText">
            </XCUIElementTypeStaticText>
        </XCUIElementTypeStaticText>
    </XCUIElementTypeStaticText>
</XCUIElementTypeOther>
```

公众号中文名全部是绿色的：

xpath

```
# idParentPrevSiblingList = idParent.previous_?

# accountDescNode = None
# accountZhcnNode = None

# TypeOther = "XCUIElementTypeOther"
# typeOtherNodeCurIdx = 0
# AccountDescNodeIdx = 1
# AccountZhcnNodeIdx = 2

# for eachPrevSiblingNode in idParentPrevSiblingList:
#     curNodeName = eachPrevSiblingNode.name
#     isTypeOtherNode = curNodeName == TypeOther
#     if isTypeOtherNode:
#         typeOtherNodeCurIdx += 1

#     if AccountDescNodeIdx == typeOtherNodeCurIdx:
#         accountDescNode = eachPrevSiblingNode
#     elif AccountZhcnNodeIdx == typeOtherNodeCurIdx:
#         accountZhcnNode = eachPrevSiblingNode

#     hasFoundAll = accountDescNode and accountZhcnNode
#     if hasFoundAll:
#         break

# logging.info("accountDescNode=%s", accountDescNode)
# logging.info("accountZhcnNode=%s", accountZhcnNode)

# if accountZhcnNode:
#     accountZhcnTextSoup = accountZhcnNode.find_element_by_type(
#         'XCUIElementTypeStaticText',
#         attrs={"type": "XCUIElementTypeStaticText"})
#     )

# method 3: parent.parent is 搜一搜, direct child
idParentParent = idParent.parent
if idParentParent:
    otherSoupList = idParentParent.find_all(
        "XCUIElementTypeOther",
        attrs={"type": "XCUIElementTypeOther"},
        recursive=False,
    )
    if otherSoupList and (len(otherSoupList) >= 2):
        firstOtherSoup = otherSoupList[0]
        if firstOtherSoup.attrs["name"] == "公
            secondOtherSoup = otherSoupList[1]
            zhcnNameSoupList = secondOtherSoup.find_elements(
                "XCUIElementTypeStaticText",
                attrs={"type": "XCUIElementTypeStaticText"})
        )
        if zhcnNameSoupList:
```

xpath

```
for eachTextSoup in zhcnNameSoup:
    curPartName = eachTextSoup
    accountZhcnFullName += curPartName

if accountZhcnFullName:
    secondOtherAttrDict = secondOtherAttrDict
    parentX = secondOtherAttrDict["x"]
    parentY = secondOtherAttrDict["y"]
    parentWidth = secondOtherAttrDict["width"]
    parentHeight = secondOtherAttrDict["height"]
    parentNodeLocator = {
        "type": "XCUIElementTypeImage",
        "enabled": "true",
        "visible": "true",
        "x": parentX,
        "y": parentY,
        "width": parentWidth,
        "height": parentHeight
    }

# return accountZhcnTextSoup
# return accountZhcnFullName
return accountZhcnFullName, parentNodeLocator
```

支持多种情况：

- 普通的： 动卡空间

xpath



- 中英文混合: 牛尔Tmall旗舰店

xpath



- 中英文混合带绿色的: limi里美



## 确定类的按钮

代码：

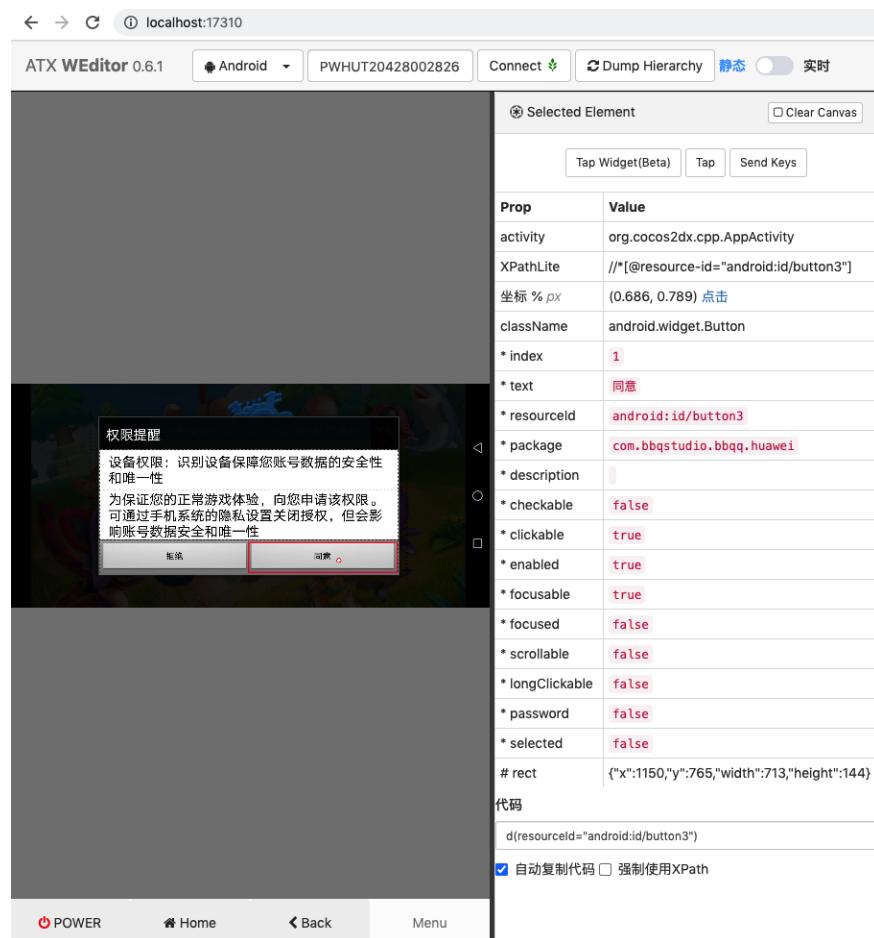
```
# 注：此处 确定 按钮，加了这么多 属性判断，目的是为了防止误触发其他情况
Confirm_Button_Xpath_List: [
    "//android.widget.Button[@text='确定' and @resource-id=...]",
    "//android.widget.Button[@text='确认' and @resource-id=...]",
    "//android.widget.Button[@text='确定' and @resource-id=...]",
    "//android.widget.Button[@text='确定' and @resource-id=...]",
    "//android.widget.Button[@text='确定' and @resource-id=...]",
    "//android.widget.Button[@text='确定' and contains(@res...)",
    "//android.widget.Button[@text='确定' and @resource-id=...]",
    "//android.widget.Button[@text='同意' and @resource-id=...]",
    "//android.widget.Button[contains(@text, '知道了') and (...",
    "//android.widget.Button[@text='同意' and contains(@res...]",
    "//android.widget.Button[@text='同意' and @resource-id=...]",
    "//android.widget.LinearLayout[contains(@resource-id,...",
    # "//android.widget.Button[@text='同意并继续' and @index...",
    "//android.widget.Button[@text='同意并继续' and @clickab...",
    "//android.widget.Button[@text='同意继续' and @clickable...",
    "//android.widget.TextView[@text='同意并继续' and @click...",
]
for eachXpath in Confirm_Button_Xpath_List:
    self.driver.watcher.when(eachXpath).click()
```

自动识别和点击：弹框中各种常见的确定类的按钮

## 权限提醒

weditor截图：

xpath



属性：

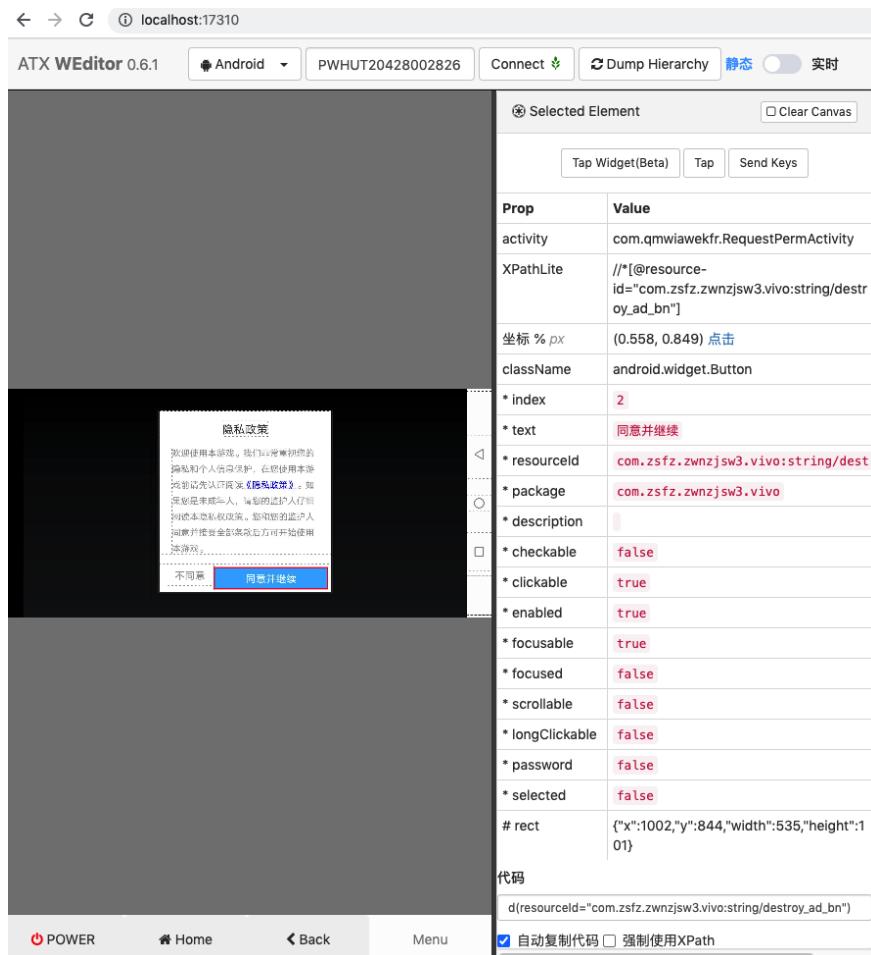
Prop	Value
activity	org.cocos2dx.cpp.AppActivity
XPathLite	//*[@resource-id="android:id/button3"]
坐标 % px	(0.686, 0.789) 点击
className	android.widget.Button
* index	1
* text	同意
* resourceId	android:id/button3
* package	com.bbqstudio.bbqq.huawei
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	true
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false
# rect	{"x":1150,"y":765,"width":713,"height":144}

代码 d(resourceId="android:id/button3")

xpath

## 隐私政策 同意并继续

weditor截图：



属性：

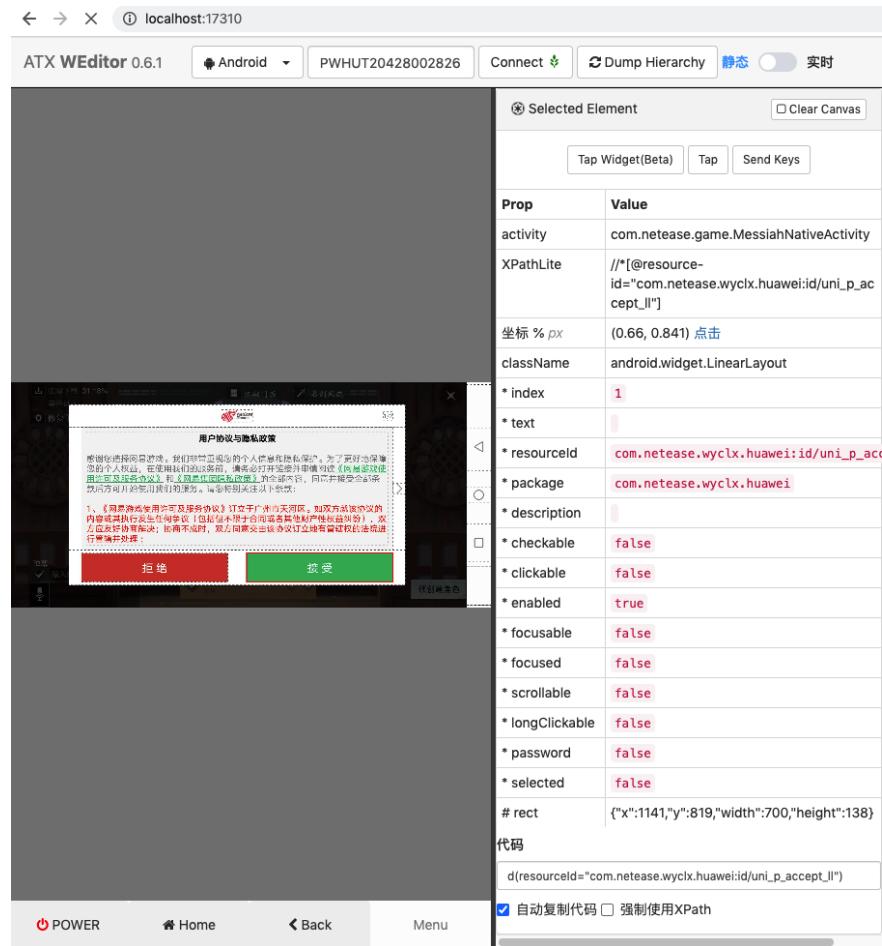
xpath

```
Prop      Value
activity   com.qmwiawekfr.RequestPermActivity
XPathLite  //*[@resource-id="com.zsfz.zwnzjsw3.vivo:string/destroy_ad_button"]
坐标 % px  (0.558, 0.849) 点击
className  android.widget.Button
* index    2
* text     同意并继续
* resourceId  com.zsfz.zwnzjsw3.vivo:string/destroy_ad_button
* package   com.zsfz.zwnzjsw3.vivo
* description
* checkable false
* clickable true
* enabled   true
* focusable  true
* focused   false
* scrollable false
* longClickable false
* password   false
* selected   false
# rect    {"x":1002,"y":844,"width":535,"height":101}
代码 d(resourceId="com.zsfz.zwnzjsw3.vivo:string/destroy_ad_button")
```

## 网易的 用户协议与隐私政策 接收

游戏 com.netease.wyclx.huawei/一梦江湖 的 weditor 截图：

xpath



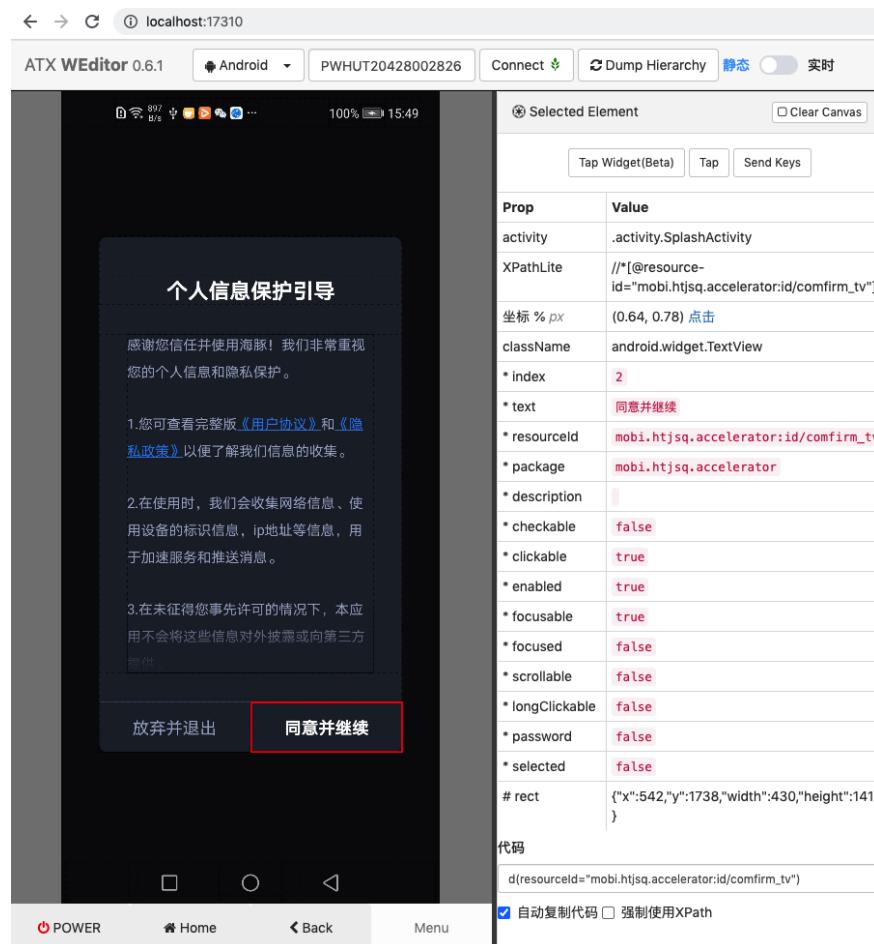
属性：

Prop	Value
activity	com.netease.game.MessiahNativeActivity
XPathLite	//*[@resource-id="com.netease.wyclx.huawei:id/uni_p_accept_ll"]
坐标 % px	(0.66, 0.841) 点击
className	android.widget.LinearLayout
* index	1
* text	
* resourceId	com.netease.wyclx.huawei:id/uni_p_accept_ll
* package	com.netease.wyclx.huawei
* description	
* checkable	false
* clickable	false
* enabled	true
* focusable	false
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false
# rect	{"x":1141,"y":819,"width":700,"height":138}
代码	d(resourceId="com.netease.wyclx.huawei:id/uni_p_accept_ll")

xpath

## 个人信息保护引导 同意并继续

app截图：



属性：

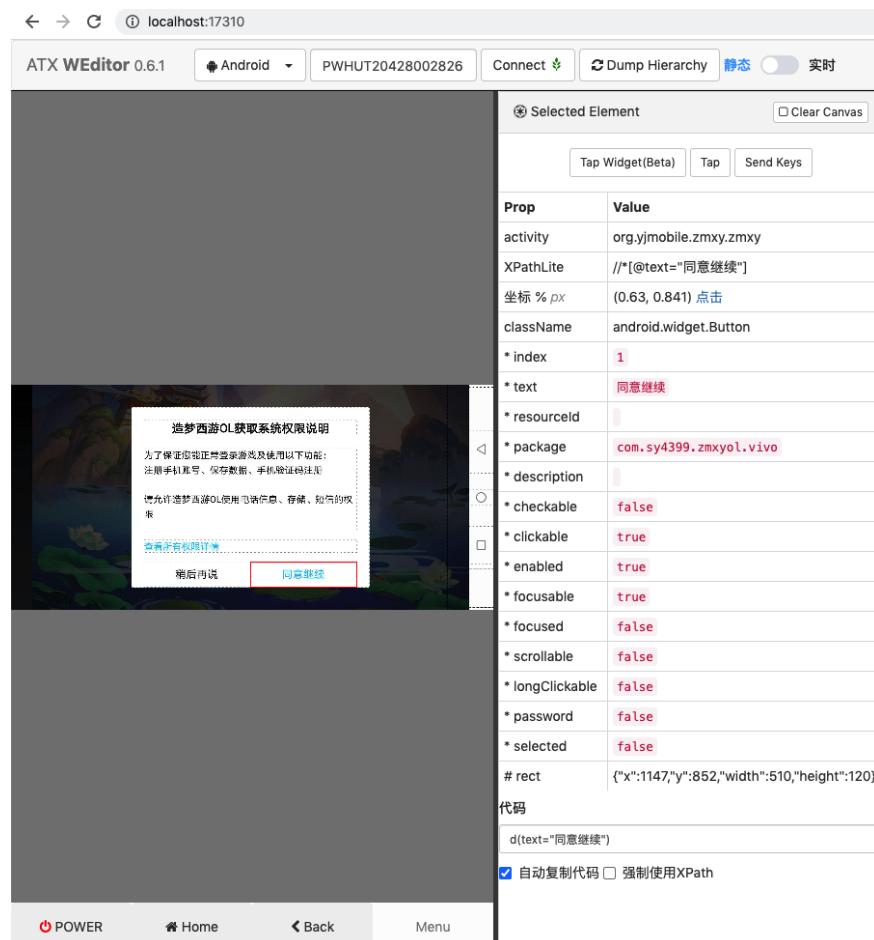
xpath

```
Prop      Value
activity   .activity.SplashActivity
XPathLite  //*[@resource-id="mobi.htjsq.accelerator:id/comfirm_tv"]
坐标 % px (0.64, 0.78) 点击
className  android.widget.TextView
* index    2
* text     同意并继续
* resourceId  mobi.htjsq.accelerator:id/comfirm_tv
* package   mobi.htjsq.accelerator
* description
* checkable  false
* clickable  true
* enabled    true
* focusable  true
* focused    false
* scrollable false
* longClickable  false
* password   false
* selected   false
# rect    {"x":542,"y":1738,"width":430,"height":141}
代码 d(resourceId="mobi.htjsq.accelerator:id/comfirm_tv")
```

## 获取系统权限说明 同意继续

游戏 com.sy4399.zmxyol.vivo/造梦西游OL-新职业 的weditor截图：

xpath

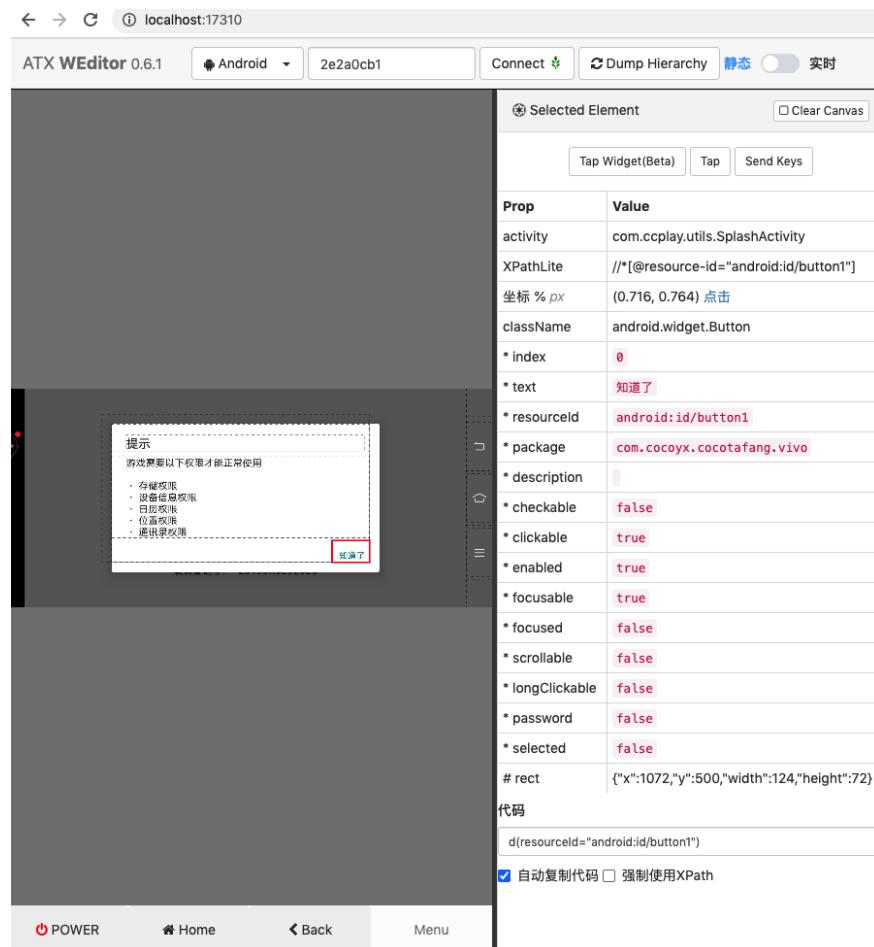


## 提示 需要权限 知道了

游戏 com.cocoyx.cocotafang.vivo/战争模拟器

weditor截图：

xpath



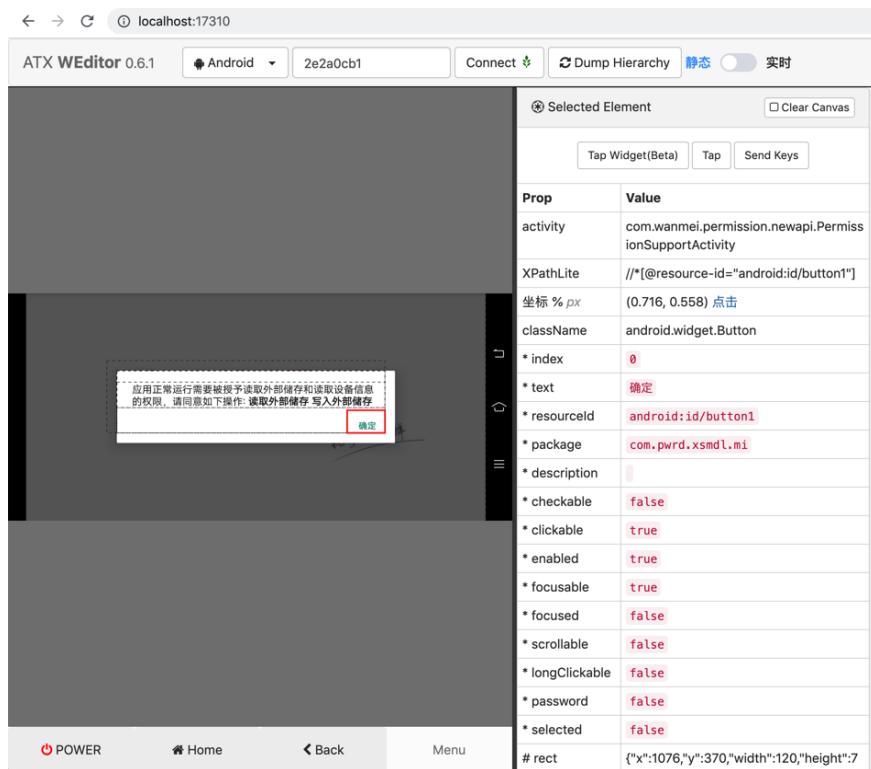
属性：

Prop	Value
activity	com.ccplay.utils.SplashActivity
XPathLite	//*[@resource-id="android:id/button1"]
坐标 % px	(0.716, 0.764) 点击
className	android.widget.Button
* index	0
* text	知道了
* resourceId	android:id/button1
* package	com.cocoyx.cocotafang.vivo
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	true
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false
# rect	{"x":1072,"y":500,"width":124,"height":72}
代码	d(resourceId="android:id/button1")

xpath

## 应用正常运行需要被授予 权限 确定

weditor截图：



属性：

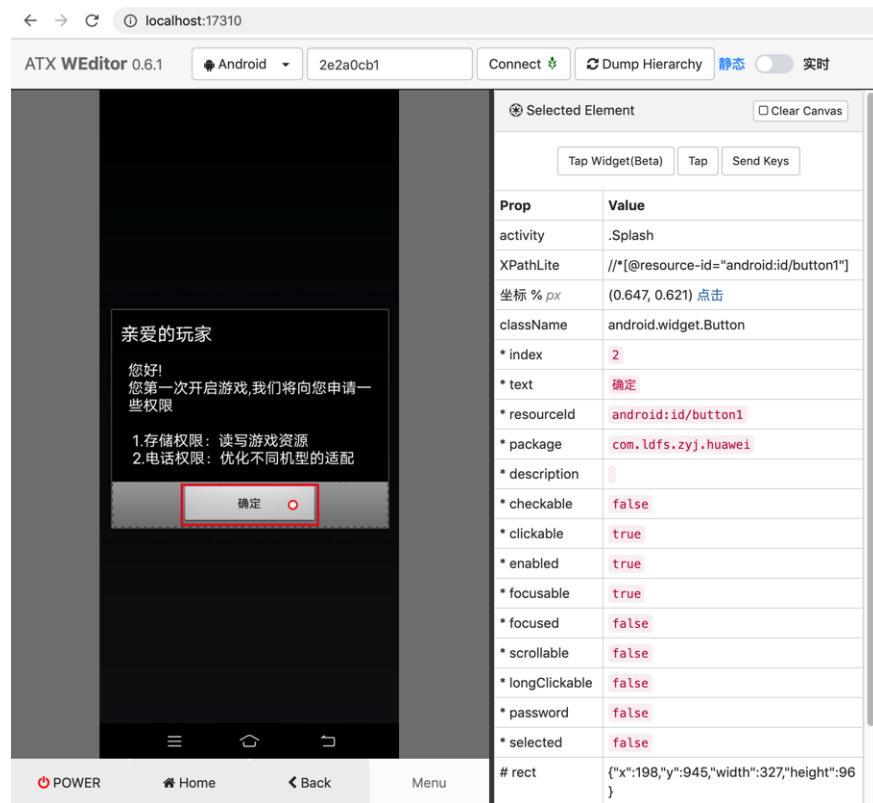
xpath

```
Prop      Value
activity   com.wanmei.permission.newapi.PermissionSupport,
XPathLite  //*[@resource-id="android:id/button1"]
坐标 % px  (0.716, 0.558) 点击
className  android.widget.Button
* index    0
* text     确定
* resourceId  android:id/button1
* package   com.pwrd.xsmdl.mi
* description
* checkable  false
* clickable  true
* enabled    true
* focusable  true
* focused    false
* scrollable false
* longClickable  false
* password   false
* selected   false
# rect    {"x":1076,"y":370,"width":120,"height":72}
代码
d(resourceId="android:id/button1")
```

## 亲爱的玩家 申请一些权限 确定

weditor截图：

xpath



属性：

Prop	Value
activity	.Splash
XPathLite	//*[@resource-id="android:id/button1"]
坐标 % px	(0.647, 0.621) 点击
className	android.widget.Button
* index	2
* text	确定
* resourceId	android:id/button1
* package	com.ldfs.zyj.huawei
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	true
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false
# rect	{"x":198,"y":945,"width":327,"height":96}

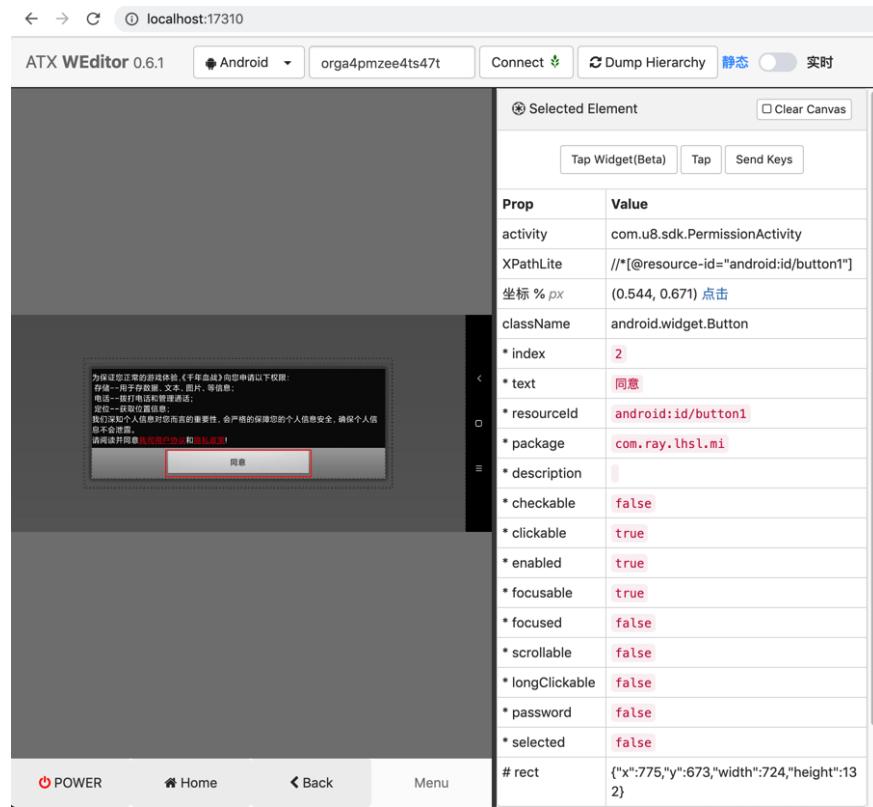
代码 d(resourceId="android:id/button1")

为保证您正常的游戏体验 申请权限 同意

xpath

## 游戏：千年血战

weditor截图：



属性：

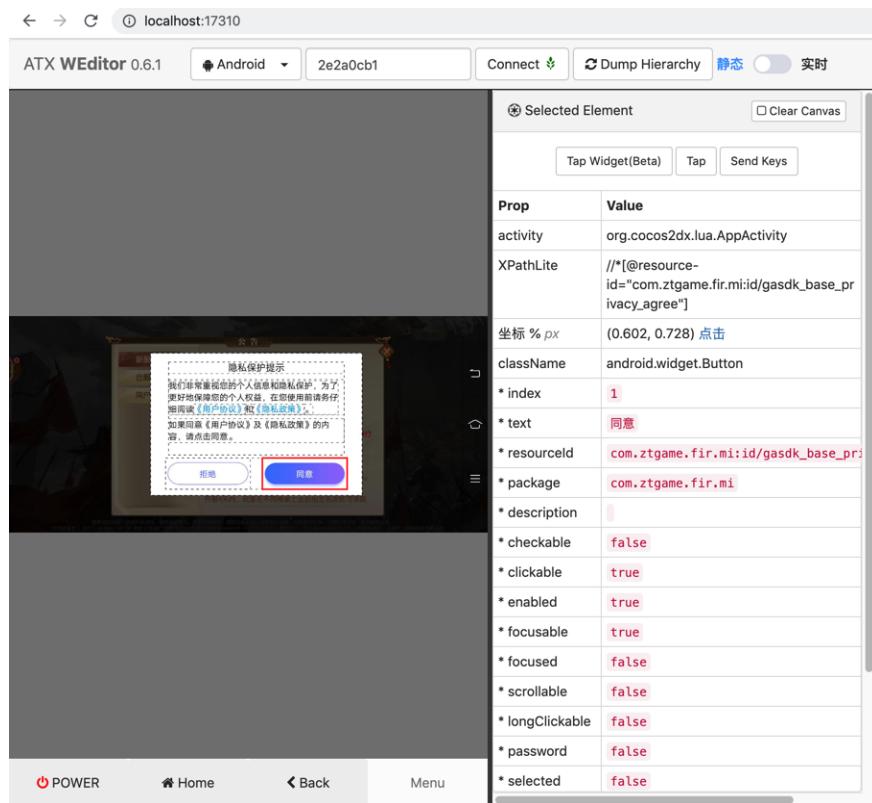
Prop	Value
activity	com.u8.sdk.PermissionActivity
XPathLite	//*[@resource-id="android:id/button1"]
坐标 % px	(0.544, 0.671) 点击
className	android.widget.Button
* index	2
* text	同意
* resourceId	android:id/button1
* package	com.ray.lhsl.mi
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	true
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false
# rect	{"x":775,"y":673,"width":724,"height":132}

代码 d(resourceId="android:id/button1")

xpath

## 隐私保护提示 同意

weditor截图：



属性：

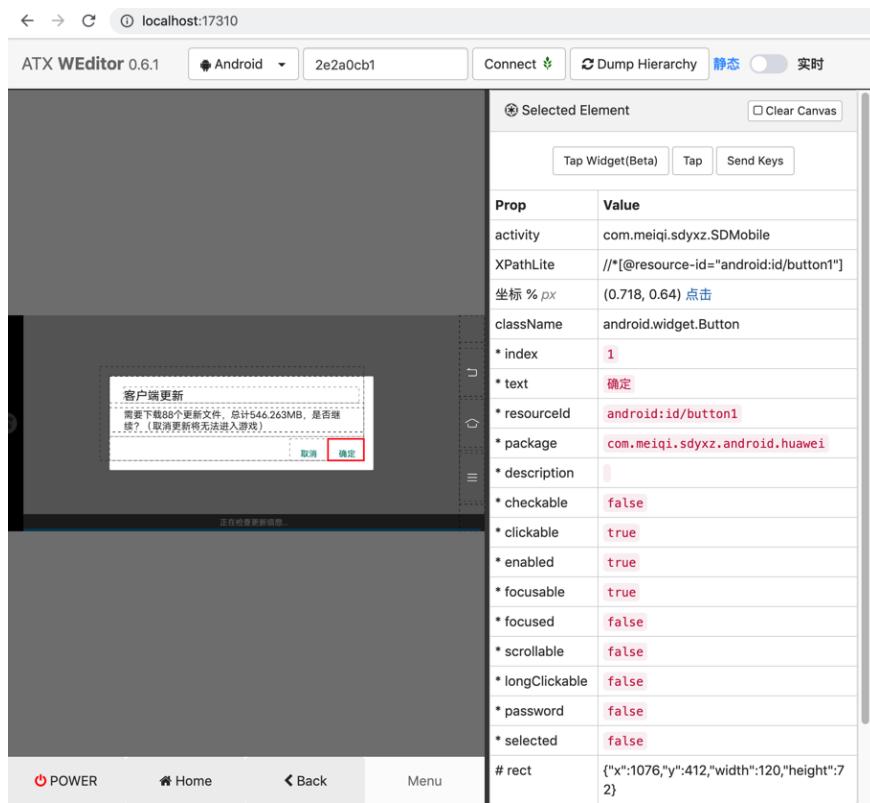
Prop	Value
activity	org.cocos2dx.lua.AppActivity
XPathLite	//*[@resource-id="com.ztgame.fir.mi:id/gasdk_base_privacy_agree"]
坐标 % px	(0.602, 0.728) 点击
className	android.widget.Button
* index	1
* text	同意
* resourceId	com.ztgame.fir.mi:id/gasdk_base_privacy_agree
* package	com.ztgame.fir.mi
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	true
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false

```
# rect {"x":848,"y":472,"width":283,"height":104}
代码 d(resourceId="com.ztgame.fir.mi:id/gasdk_base_privacy_agree")
```

xpath

## 客户端更新 确定

weditor截图：



属性：

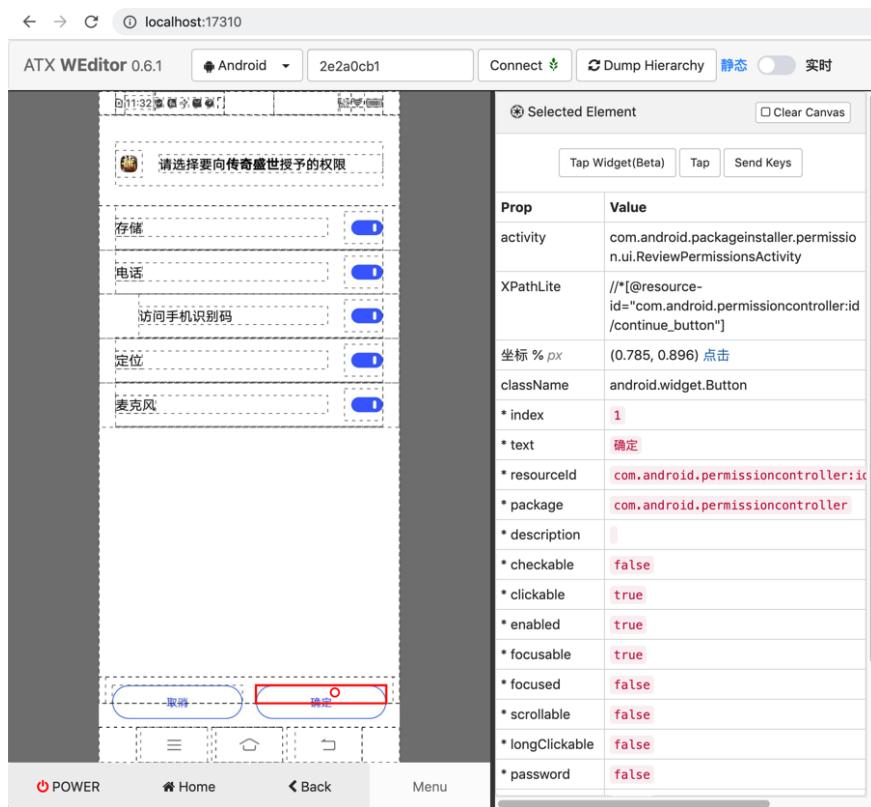
Prop	Value
activity	com.meiqi.sdyxz.SDMobile
XPathLite	//*[@resource-id='android:id/button1']
坐标 % px	(0.718, 0.64) 点击
className	android.widget.Button
* index	1
* text	确定
* resourceId	android:id/button1
* package	com.meiqi.sdyxz.android.huawei
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	true
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false
# rect	{"x":1076,"y":412,"width":120,"height":72}

代码 d(resourceId="android:id/button1")

xpath

## 请选择要向授予权限 确定

weditor截图：



属性：

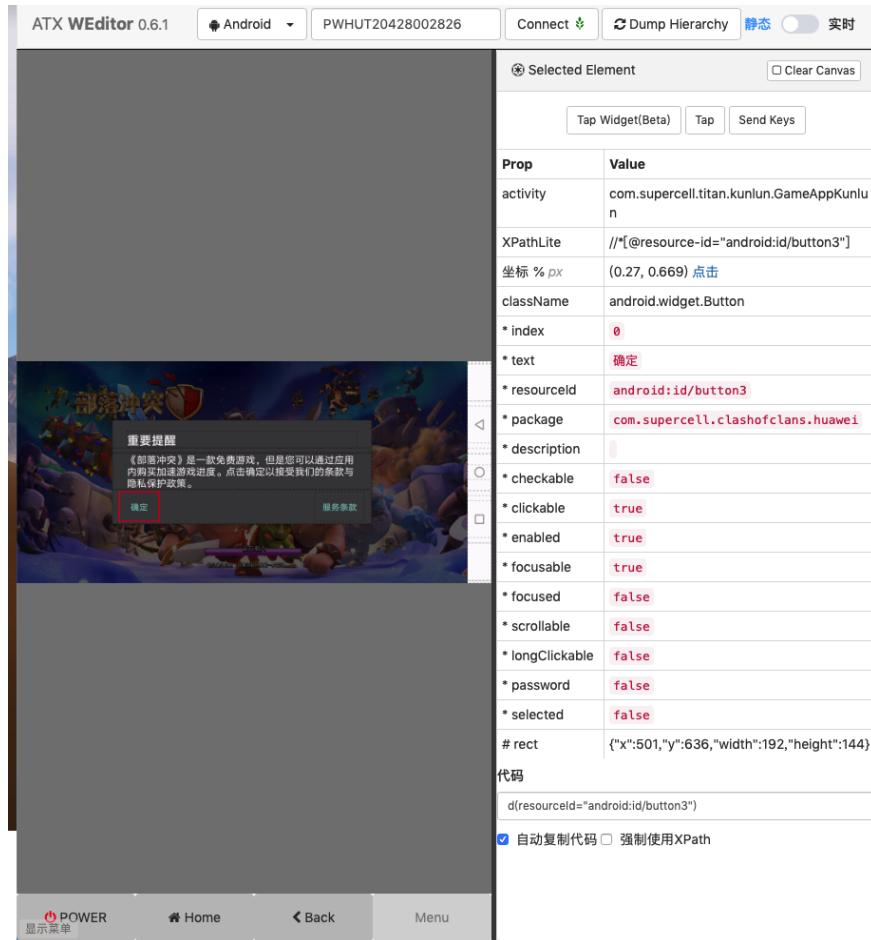
Prop	Value
activity	com.android.packageinstaller.permission.ui.ReviewPermissionsActivity
XPathLite	/*[@resource-id="com.android.permissioncontroller:id/continue_button"]
坐标 % px	(0.785, 0.896) 点击
className	android.widget.Button
* index	1
* text	确定
* resourceId	com.android.permissioncontroller:id/continue_button
* package	com.android.permissioncontroller
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	true
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false
# rect	{"x":376,"y":1416,"width":312,"height":43}
代码	d(resourceId="com.android.permissioncontroller:id/continue_button")

xpath

## 重要提醒 接受条款 确定

游戏：部落冲突

weditor截图：



属性：

xpath

```
Prop      Value
activity   com.supercell.titan.kunlun.GameAppKunlun
XPathLite  //*[@resource-id="android:id/button3"]
坐标 % px  (0.27, 0.669) 点击
className  android.widget.Button
* index    0
* text     确定
* resourceId  android:id/button3
* package   com.supercell.clashofclans.huawei
* description
* checkable  false
* clickable  true
* enabled    true
* focusable  true
* focused    false
* scrollable false
* longClickable  false
* password   false
* selected   false
# rect      {"x":501,"y":636,"width":192,"height":144}
```

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## (各大应用市场授权后的) 广告类弹框

代码:

```
PopupWindow_CloseButton_Xpath_List: [
    "//android.widget.RelativeLayout[contains(@resource-id, 'com.miui.home:id/ad_close')]",
    "//android.widget.ImageView[contains(@resource-id, 'com.miui.home:id/ad_close')]",
    "//android.widget.ImageView[contains(@resource-id, 'com.miui.home:id/ad_close')]",
    "//android.widget.ImageView[contains(@resource-id, 'com.miui.home:id/ad_close')]",
    "//android.widget.ImageView[contains(@resource-id, 'com.miui.home:id/ad_close')]",
    "//android.widget.ImageView[contains(@resource-id, 'com.miui.home:id/ad_close')]",
    "# //android.widget.Image[@text='7cWwAAAABJRU5ErkJgg==']"
    # 小米市场登录后 广告 弹框 关闭按钮
    # 1. d(text="7cWwAAAABJRU5ErkJgg==")
    # 2. d(text="2d7m0DgAAAAAAAAAAAAACV+wGa61esTL2CSwAA")
    # "//android.widget.Image[contains(@text, 'ggg==')]" and
    # 防止误判 实名认证期间输入身份证时的清楚关闭按钮
    # XPathLite      //*[@text="Iuk6V5zR2fE3Srw7HUGlCXpdxkyw"]
    # 改为:
    "//android.widget.ImageView[contains(@text, 'wAAAABJRU5ErkJgg==')]"
    "//android.view.View[@text='知道了' and @index='0' and @resource-id='com.miui.home:id/ad_close']"
]

for eachXpath in PopupWindow_CloseButton_Xpath_List:
    self.driver.watcher.when(eachXpath).click()
```

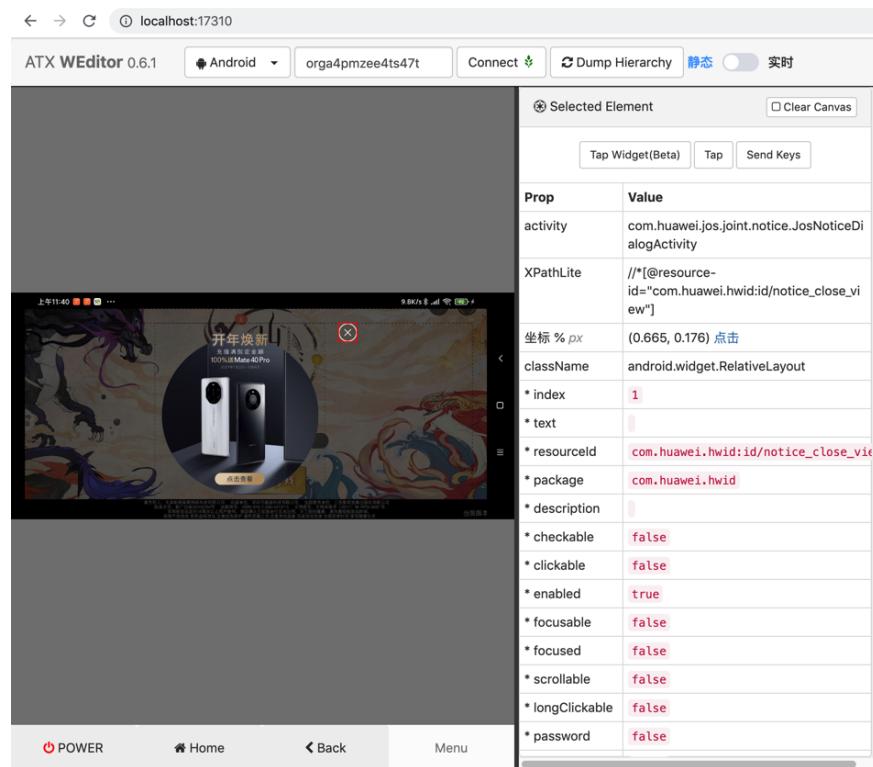
可以自动点击，很多游戏在注册和登录期间遇到的，在各大安卓应用市场同意授权返回后的广告类的弹框：

## 华为应用市场 弹框广告

### 广告1

weditor截图:

xpath



属性:

```
Prop      Value
activity   com.huawei.jos.joint.notice.JosNoticeDialogAct:
XPathLite  //*[@resource-id="com.huawei.hwids:id/notice_c

坐标 % px  (0.665, 0.176) 点击
className  android.widget.RelativeLayout
* index    1
* text
* resourceId  com.huawei.hwids:id/notice_close_view
* package   com.huawei.hwids
* description
* checkable false
* clickable false
* enabled   true
* focusable false
* focused   false
* scrollable false
* longClickable false
* password  false
* selected  false
# rect     {"x":1563,"y":146,"width":88,"height":88}
代码 d(resourceId="com.huawei.hwids:id/notice_close_view")
```

广告弹框被自动点击关闭后，相关log输出是：

```
your input: [I 210104 11:53:14 watcher:255] XPath(hook): [
```

xpath

之后即可看到原先app的内容了：



## 小米应用市场 弹框广告

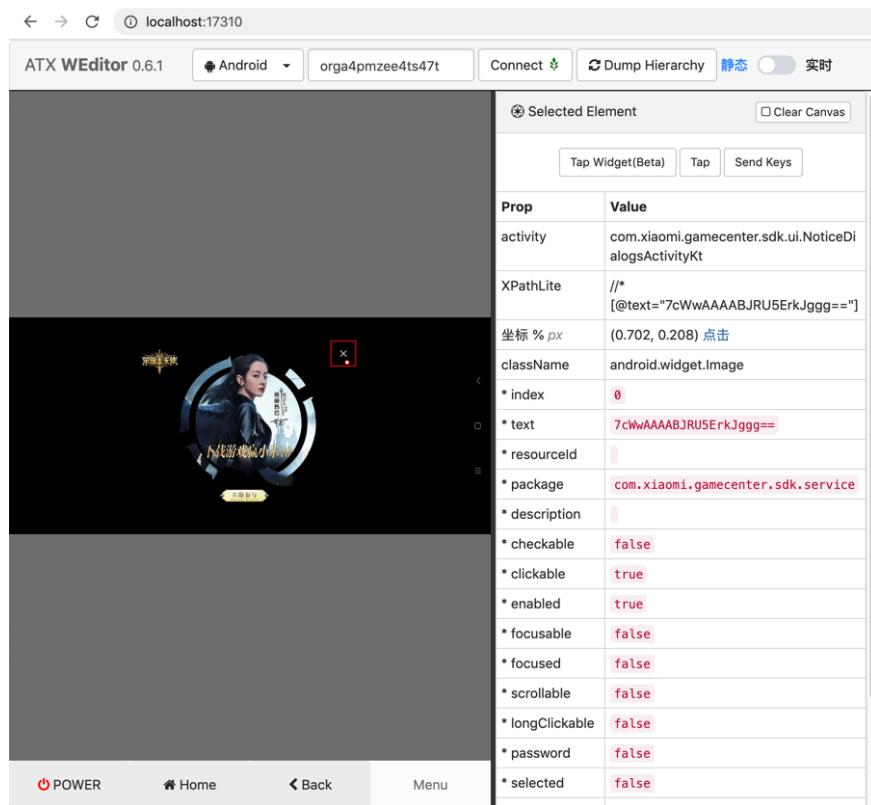
### 广告1

游戏app截图：



weditor截图：

xpath



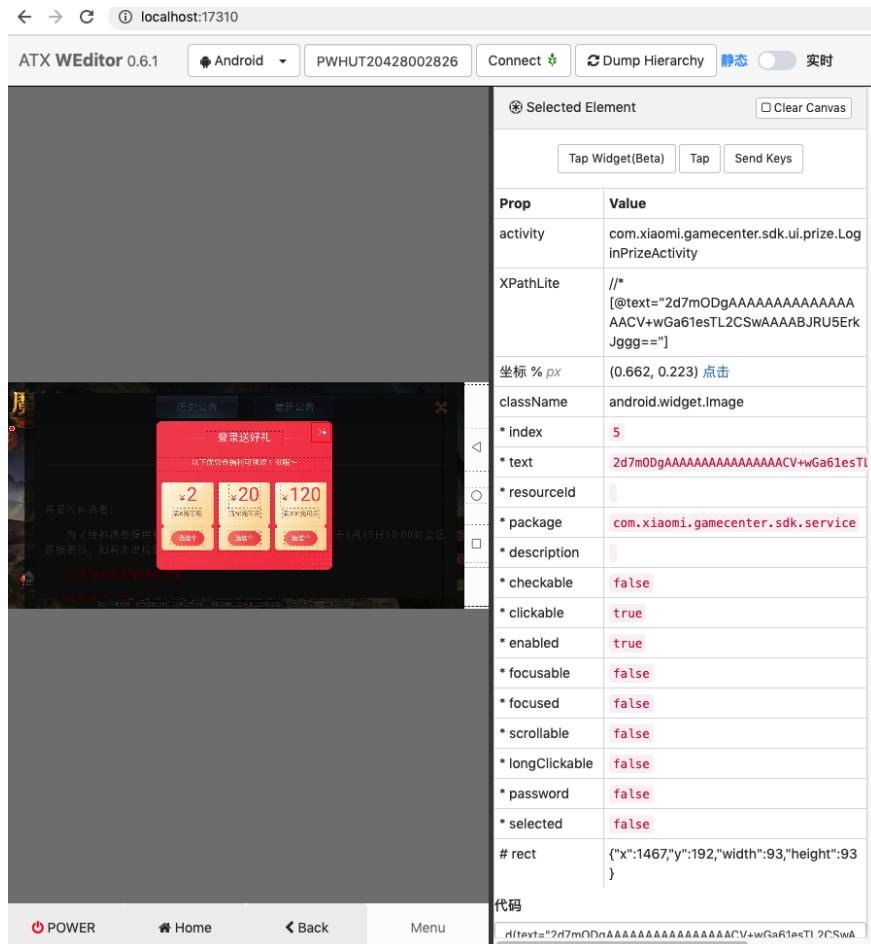
属性：

```
Prop      Value
activity   com.xiaomi.gamecenter.sdk.ui.NoticeDialogsActivityKt
XPathLite  //*[@text="7cWwAAAABJRU5ErkJgg=="]
坐标 % px  (0.702, 0.208) 点击
className  android.widget.Image
* index    0
* text     7cWwAAAABJRU5ErkJgg==
* resourceId
* package   com.xiaomi.gamecenter.sdk.service
* description
* checkable false
* clickable true
* enabled   true
* focusable false
* focused   false
* scrollable false
* longClickable false
* password  false
* selected  false
# rect    {"x":1603,"y":118,"width":124,"height":124}
代码 d(text="7cWwAAAABJRU5ErkJgg==")
```

xpath

## 广告2

weditor截图：



属性：

xpath

```
Prop      Value
activity   com.xiaomi.gamecenter.sdk.ui.prize.LoginPrizeActivity
XPathLite  //*[@text="2d7m0DgAAAAAAAAAAAAACV+wGa61esTL2CSwAAAABJR"]
坐标 % px  (0.662, 0.223) 点击
className  android.widget.Image
* index    5
* text     2d7m0DgAAAAAAAAAAAAACV+wGa61esTL2CSwAAAABJR
* resourceId
* package   com.xiaomi.gamecenter.sdk.service
* description
* checkable  false
* clickable  true
* enabled    true
* focusable  false
* focused    false
* scrollable false
* longClickable  false
* password   false
* selected   false
# rect     {"x":1467,"y":192,"width":93,"height":93}
代码 d(text="2d7m0DgAAAAAAAAAAAAACV+wGa61esTL2CSwAAAABJR
```

## 广告3

游戏: com.yzcm.jr.mi/巨刃

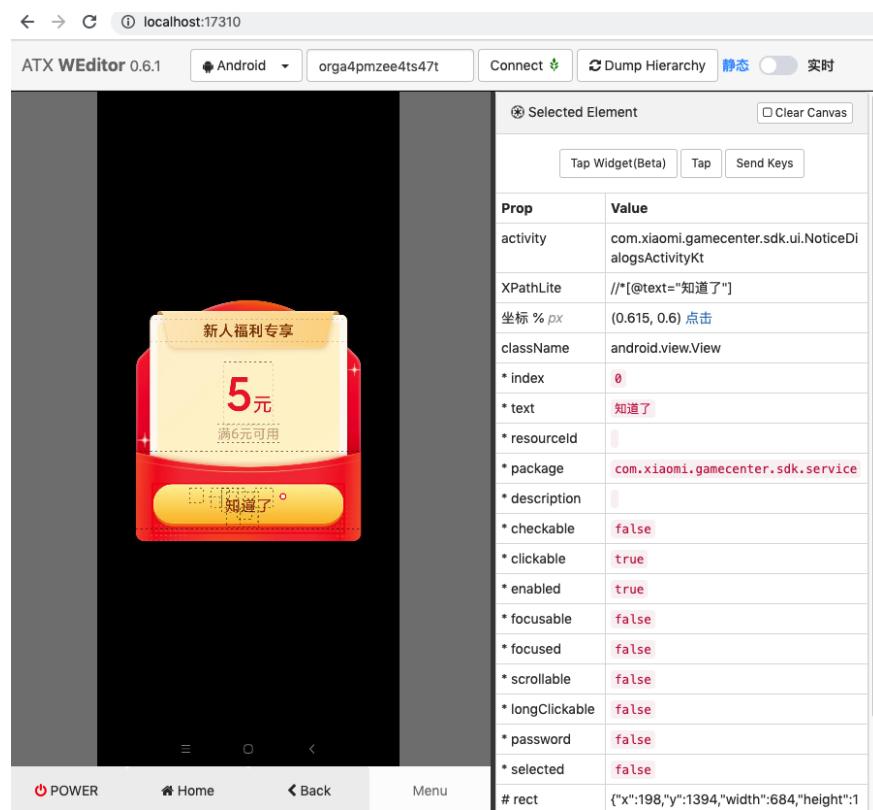
游戏app截图:

xpath



xpath

weditor截图：



属性：

```
Prop      Value
activity   com.xiaomi.gamecenter.sdk.ui.NoticeDialogsActivity
XPathLite  //*[@text="知道了"]
坐标 % px (0.615, 0.6) 点击
className  android.view.View
* index    0
* text     知道了
* resourceId
* package   com.xiaomi.gamecenter.sdk.service
* description
* checkable false
* clickable true
* enabled   true
* focusable false
* focused   false
* scrollable false
* longClickable false
* password  false
* selected  false
# rect     {"x":198,"y":1394,"width":684,"height":176}
代码 d(text="知道了")
```

防止其他页面误判为小米广告

xpath

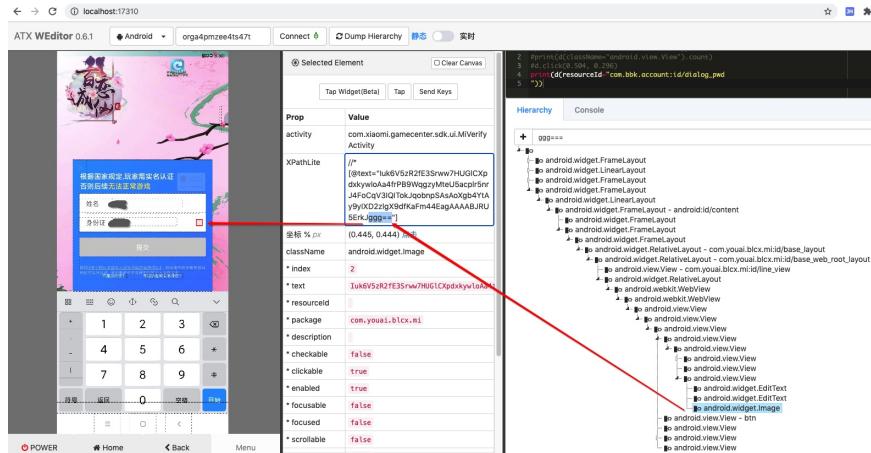
之前还遇到游戏： com.youai.blcx.mi/百恋成仙

会出现：

游戏app截图：



weditor截图：



会发现，当输入框后面的x关闭小按钮时，对应也有类似的字段：

Prop	Value
activity	com.xiaomi.gamecenter.sdk.ui.MiVerifyActivity
XPathLite	<code>//*[@text="Iuk6V5zR2fE3Srww7HUGlCXpdxykwloAa4frPB9WqgzyMteU"]</code>
坐标 % px	(0.445, 0.444) 点击
className	android.widget.Image
* index	2
* text	Iuk6V5zR2fE3Srww7HUGlCXpdxykwloAa4frPB9WqgzyMteU
* resourceId	
* package	com.youai.blcx.mi
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	false
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false
# rect	{"x":878,"y":1056,"width":38,"height":38}

经过调试和思考，最后改为： wAAAABJRU5ErkJgg==

即：

```

# "//android.widget.Image[@text='7cWwAAAABJRU5ErkJgg=='"
# 小米市场登录后 广告 弹框 关闭按钮
# 1. d(text="7cWwAAAABJRU5ErkJgg==")
# 2. d(text="2d7mODgAAAAAAAAAAAAACV+wGa61esTL2CSwAAAAE")
# "//android.widget.Image[contains(@text, 'ggg==') and @text != '7cWwAAAABJRU5ErkJgg==']"
# 防止误判 实名认证期间输入身份证时的清楚关闭按钮
# XPathLite    //*[@text="Iuk6V5zR2fE3Srww7HUGlCXpdxykwloAa4frPB9WqgzyMteU"]
# 改为：
"///android.widget.Image[contains(@text, 'wAAAABJRU5ErkJgg==') and @text != '7cWwAAAABJRU5ErkJgg==']"

```

xpath

即可防止误判：不要误判其他页面为小米的广告，而去关闭弹框了。

细节详见：

【已解决】用uiautomator2自动点击关闭小米应用市场登录后的广告弹框

## Vivo应用市场 弹框广告

### 广告1

游戏app截图：



weditor截图：

Prop	Value
activity	.core.compunctions.activity.UnionActivity
XPathLite	//*[resource-id='com.vivo.sdkplugin:id/h6']
坐标 % px	(0.654, 0.113) 点击
className	android.widget.ImageView
* index	1
* text	
* resourceId	com.vivo.sdkplugin:id/h6
* package	com.vivo.sdkplugin
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	true
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false

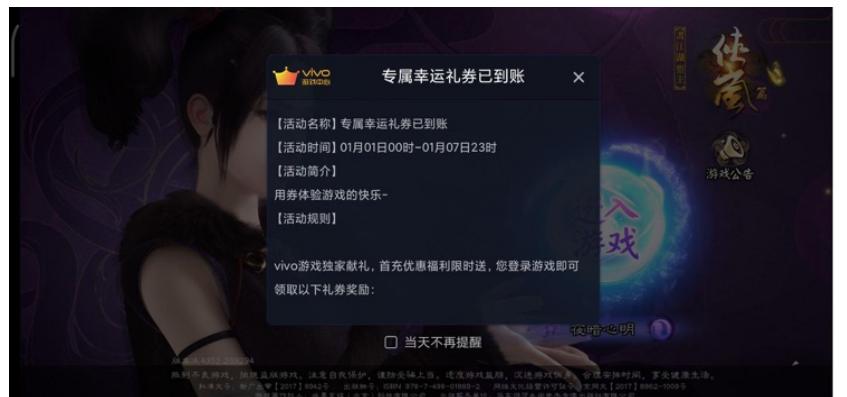
属性：

xpath

```
Prop      Value
activity   .core.compunctions.activity.UnionActivity
XPathLite  //*[@resource-id="com.vivo.sdkplugin:id/h6"]
坐标 % px  (0.654, 0.113) 点击
className  android.widget.ImageView
* index    1
* text
* resourceId com.vivo.sdkplugin:id/h6
* package   com.vivo.sdkplugin
* description
* checkable  false
* clickable  true
* enabled    true
* focusable  true
* focused    false
* scrollable false
* longClickable false
* password   false
* selected   false
# rect     {"x":1517,"y":58,"width":110,"height":110}
代码 d(resourceId="com.vivo.sdkplugin:id/h6")
```

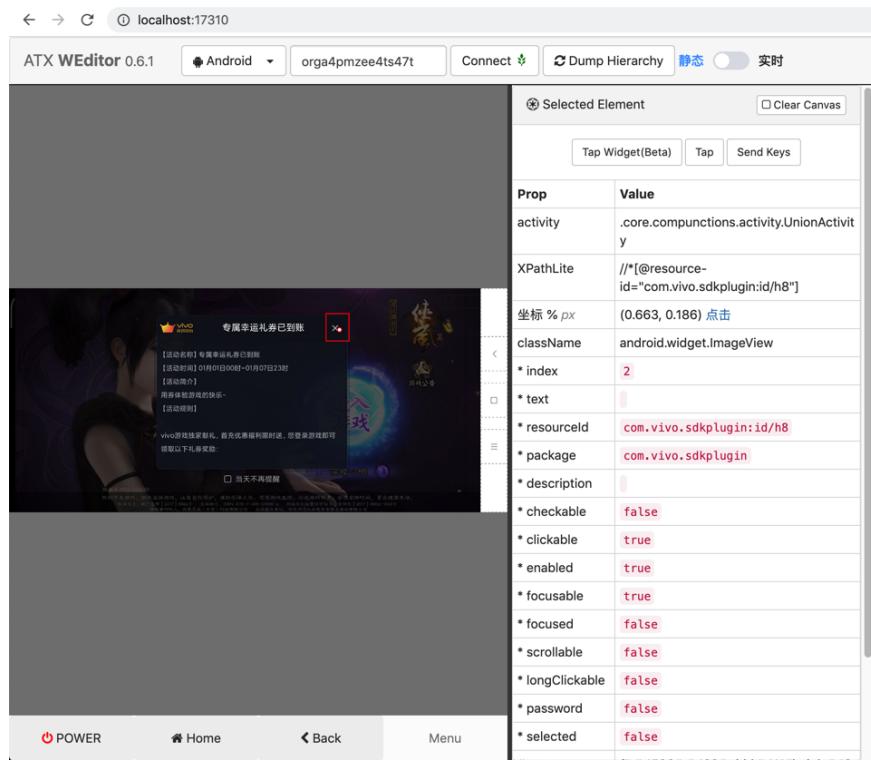
## 广告2

游戏app截图：



weditor截图：

xpath



属性：

Prop	Value
activity	.core.compunctions.activity.UnionActivity
XPathLite	//*[@resource-id="com.vivo.sdkplugin:id/h8"]
坐标 % px	(0.663, 0.186) 点击
className	android.widget.ImageView
* index	2
* text	
* resourceId	com.vivo.sdkplugin:id/h8
* package	com.vivo.sdkplugin
* description	
* checkable	false
* clickable	true
* enabled	true
* focusable	true
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false

```
# rect {"x":1526,"y":122,"width":111,"height":132}
代码 d(resourceId="com.vivo.sdkplugin:id/h8")
```

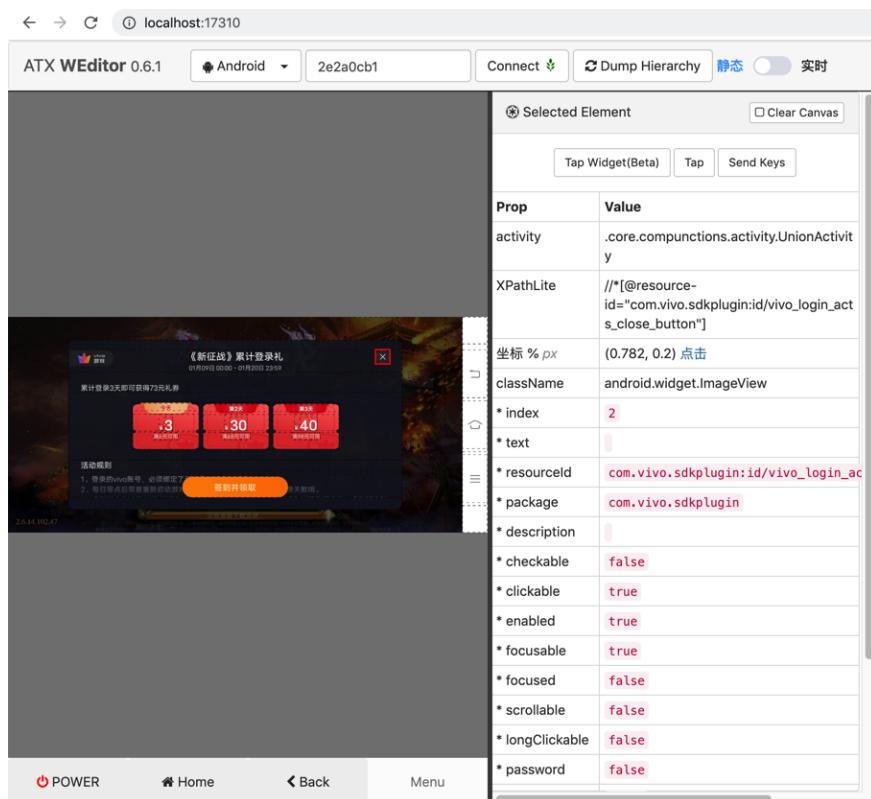
## 广告3

游戏app截图：

xpath



weditor截图：



属性：

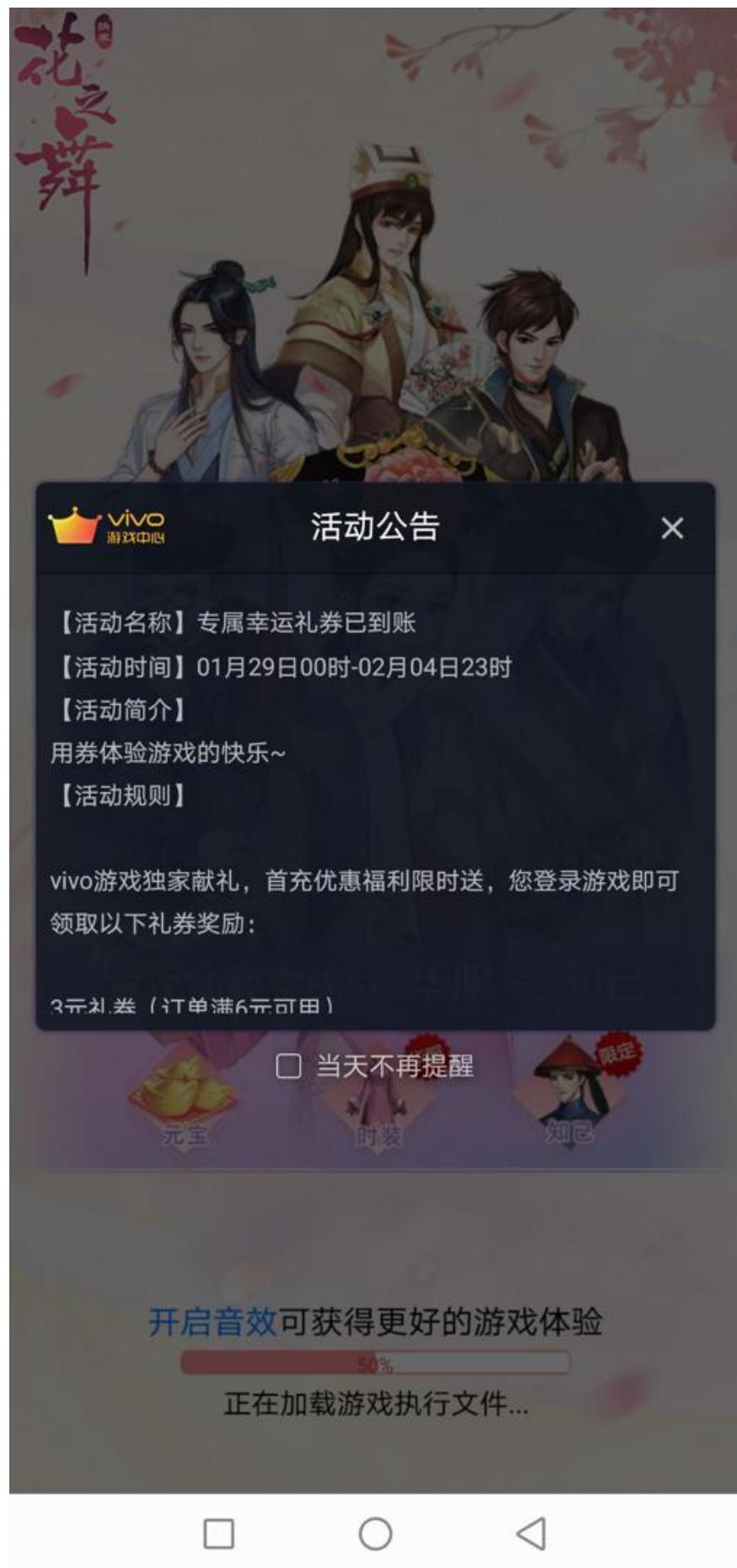
xpath

```
Prop      Value
activity   .core.compunctions.activity.UnionActivity
XPathLite  //*[@resource-id="com.vivo.sdkplugin:id/vivo_"
坐标 % px (0.782, 0.2) 点击
className  android.widget.ImageView
* index    2
* text
* resourceId com.vivo.sdkplugin:id/vivo_login_acts_close
* package   com.vivo.sdkplugin
* description
* checkable  false
* clickable  true
* enabled    true
* focusable   true
* focused    false
* scrollable  false
* longClickable false
* password   false
* selected   false
# rect     {"x":1226,"y":109,"width":48,"height":48}
代码 d(resourceId="com.vivo.sdkplugin:id/vivo_login_acts_cl
```

## 广告4

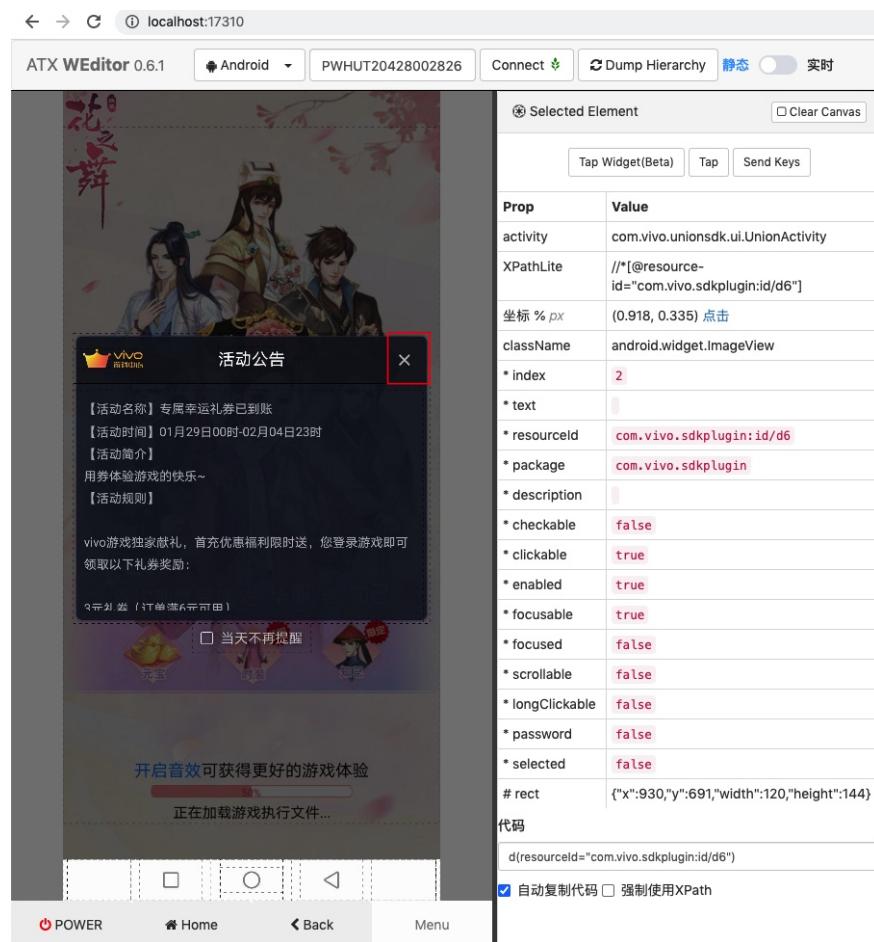
游戏app截图:

xpath



xpath

weditor截图：



核心属性：

- resourceId : com.vivo.sdkplugin:id/d6

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## Vivo手机中安装应用时，自动输入账号密码

背景：

用 adb 去给安卓手机安卓 apk ， 比如：

```
adb -s 2e2a0cb1 install 决战沙邑.apk
```

时，Vivo手机，由于默认安全限制很死，导致无法关闭安全验证，会弹框：

xpath



vivo安全键盘



1 2 3 4 5 6 7 8 9 0

q w e r t y u i o p

a s d f g h j k l

↑ z x c v b n m ✖

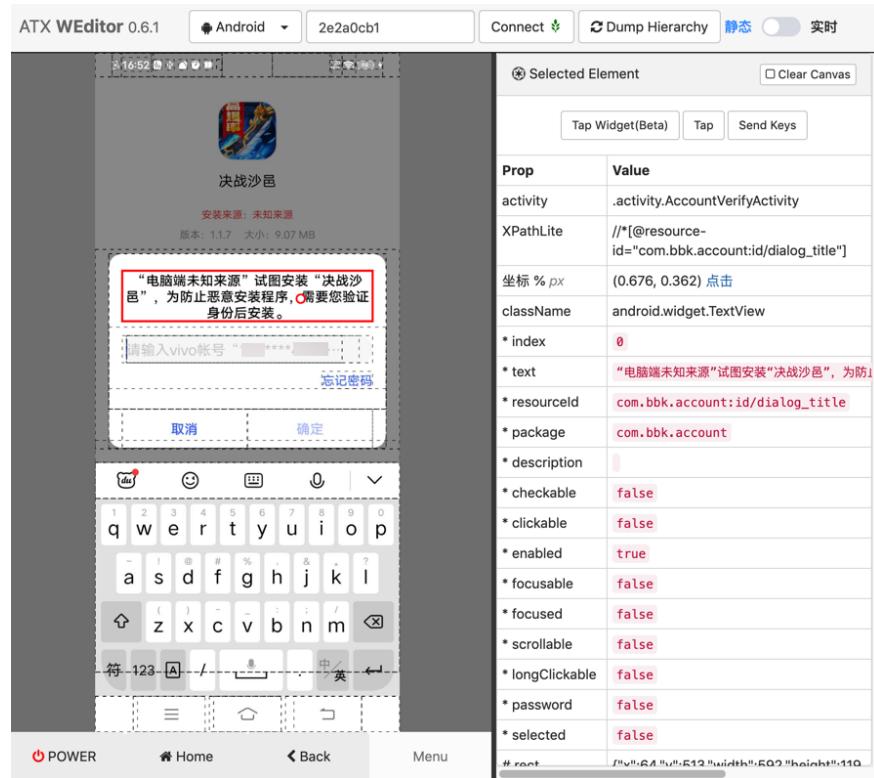
123 符号 , \_ . ←

≡ ⌂ ⌂

必须手动输入账号和密码后才能继续安装。

对应的weditor截图：

xpath



属性是：

Prop	Value
activity	.activity.AccountVerifyActivity
XPathLite	//*[@resource-id="com.bbk.account:id/dialog_title"]
坐标 % px	(0.676, 0.362) 点击
className	android.widget.TextView
* index	0
* text	“电脑端未知来源”试图安装“决战沙邑”，为防止恶意安装程序，需
* resourceId	com.bbk.account:id/dialog_title
* package	com.bbk.account
* description	
* checkable	false
* clickable	false
* enabled	true
* focusable	false
* focused	false
* scrollable	false
* longClickable	false
* password	false
* selected	false
# rect	{"x":64,"y":513,"width":592,"height":119}
代码	d(resourceId="com.bbk.account:id/dialog_title")

经过调试，最终实现了自动化输入账号和密码，得以自动继续安装。

代码：

```

Vivo_Account: "yourPhone" # Vivo account
Vivo_Password: "yourPassword" # password for Vivo account

Vivo_Password_Input_Xpath: "//android.widget.LinearLayout["
    self.driver.watcher.when(Vivo_Password_Input_Xpath]).call():

def selectorSetText(self, curXpathSelector, inputText):
    # Special: add click to try workaround for 360 pwd Edit
    # curXpathSelector.click()
    # curXpathSelector.clear_text()
    selectorSetTextResp = curXpathSelector.set_text(inputText)
    logging.debug("selectorSetTextResp=%s", selectorSetTextResp)
    # 在set_text后, 输入法会变成FastInputIME输入法
    # 用下面代码可以实现: 关掉FastInputIME输入法, 切换回系统默认输入法
    self.driver.set_fastinput_ime(False)

def autoInputVivoPassword(self):
    """Auto input Vivo account password"""
    logging.info("Try auto input vivo password")

    pwdDiaglogSelector = self.driver.xpath(Vivo_Password_Input_Xpath)
    logging.debug("pwdDiaglogSelector=%s", pwdDiaglogSelector)
    # PwdDiaglogSelector=XPathSelector("//android.widget.LinearLayout[")
    logging.info("%s to found password dialog", pwdDiaglogSelector)
    # selectorSetTextResp = pwdDiaglogSelector.set_text(Vivo_Password)
    # logging.debug("selectorSetTextResp=%s", selectorSetTextResp)
    # # selectorSetTextResp=None
    # # 在set_text后, 输入法会变成FastInputIME输入法
    # # 用下面代码可以实现: 关掉FastInputIME输入法, 切换回系统默认输入法
    # self.driver.set_fastinput_ime(False)
    self.selectorSetText(pwdDiaglogSelector, Vivo_Password)
    logging.info("Has input password to dialog")

    okButtonText = "确定"
    okButtonElement = self.driver(text=okButtonText, class_name="android.widget.Button")
    logging.debug("okButtonElement=%s", okButtonElement)
    logging.info("%s to found %s button", okButtonElement, okButtonText)
    if okButtonElement.exists:
        okButtonElement.click()
        logging.info("Clicked 确定 for vivo password")

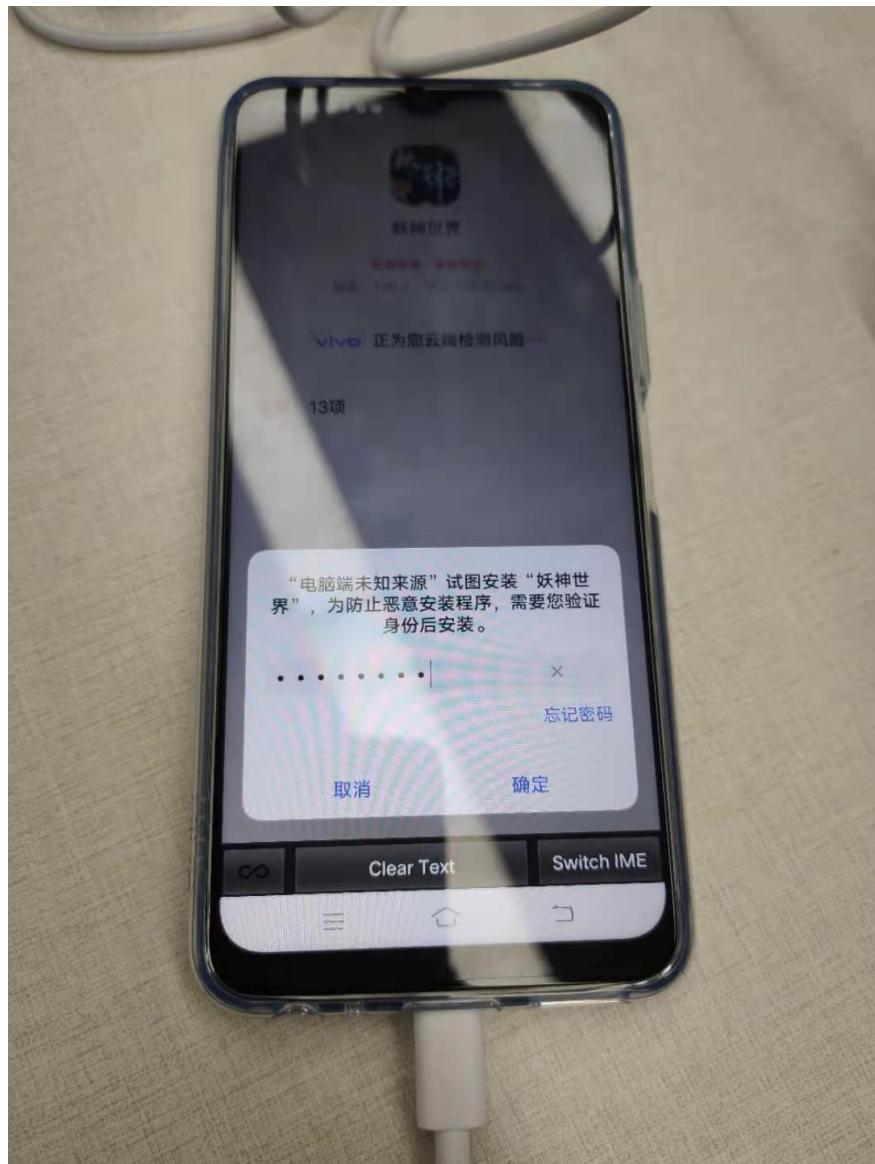
    logging.info("Complete auto input vivo password")

```

对应自动化操作期间的手机截图：

自动输入了密码：

xpath



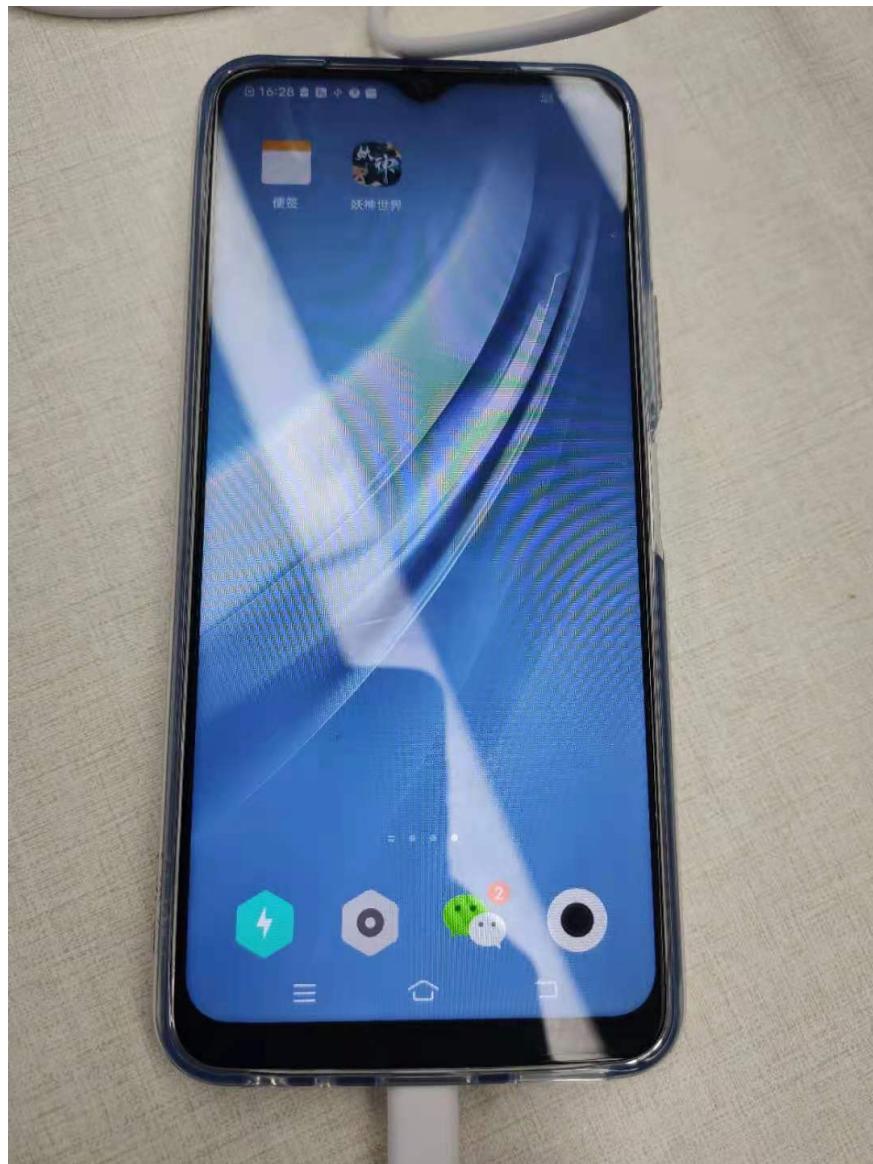
点击了 确定后，再点击点击 继续安装

xpath



之后即可在手机中看到成功安装的app：

xpath

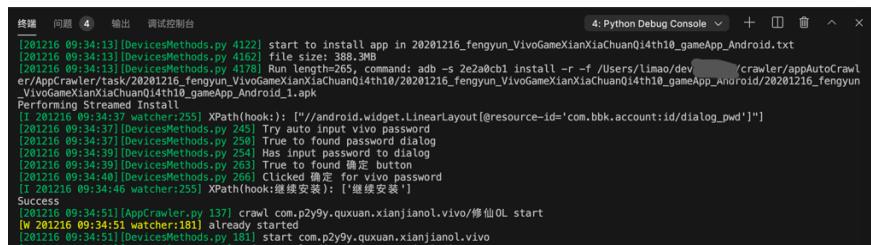


相关shell终端中的日志是：

```
adb -s 2e2a0cb1 install 斩月屠龙_13.5MB.apk
Performing Streamed Install
Success
```

整个调试过程的log是：

```
_VivoGameXianXiaChuanQi4th10_gameApp_Android_1.apk
Performing Streamed Install
[I 201216 09:34:37 watcher:255] XPath(hook:): [/android.
[201216 09:34:37] [DevicesMethods.py 245] Try auto input vivo
[201216 09:34:37] [DevicesMethods.py 250] True to found passw
[201216 09:34:39] [DevicesMethods.py 254] Has input password
[201216 09:34:39] [DevicesMethods.py 263] True to found 确定
[201216 09:34:40] [DevicesMethods.py 266] Clicked 确定 for v
[I 201216 09:34:46 watcher:255] XPath(hook:继续安装): ['继续
Success
```



```
终端 问题 4 输出 调试控制台 4: Python Debug Console + 窗 ^ x
[201216 09:34:13] [DevicesMethods.py 4122] start to install app in 20201216_fengyun_VivoGameXianXiaChuanQi4th10_gameApp_Android.txt
[201216 09:34:13] [DevicesMethods.py 4162] file size: 388.3MB
[201216 09:34:13] [DevicesMethods.py 4178] Run length=265, command: adb -s 2e2a6cb1 install -r -f /Users/limao/dev/crawler/appAutoCrawler/AppCrawler/task/20201216_fengyun_VivoGameXianXiaChuanQi4th10/20201216_fengyun_VivoGameXianXiaChuanQi4th10_gameApp_Android/20201216_fengyun_VivoGameXianXiaChuanQi4th10_gameApp_Android_1.apk
Performing Streamed Install
[I 201216 09:34:37] [watcher:255] XPath(hook:): [/android.widget.LinearLayout[@resource-id='com.bbk.account:id/dialog_pwd']]
[201216 09:34:37] [DevicesMethods.py 245] Try auto input vivo password
[201216 09:34:37] [DevicesMethods.py 250] True to found password dialog
[201216 09:34:39] [DevicesMethods.py 254] Has input password to dialog
[201216 09:34:39] [DevicesMethods.py 263] True to found 确定 button
[201216 09:34:40] [DevicesMethods.py 266] Clicked 确定 for vivo password
[I 201216 09:34:46] [watcher:255] XPath(hook:继续安装): ['继续安装']
Success
[201216 09:34:51] [AppCrawler.py 137] crawl com.p2y9y.quxuan.xianjianol.vivo/修仙OL start
[W 201216 09:34:51] [watcher:181] already started
[201216 09:34:51] [DevicesMethods.py 181] start com.p2y9y.quxuan.xianjianol.vivo
```

详见：

【已解决】用Python的uiautomator2自动识别和输入vivo账号密码以自动安装安卓apk

【已解决】uiautomator2中如何自动实现检测发现匹配元素就执行对应回调函数

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## Vivo账号自动登录

自动化输入vivo账号和密码并登录

背景：

测试游戏期间，遇到非Vivo手机，需要手动输入Vivo的账号和密码，才能继续测试。

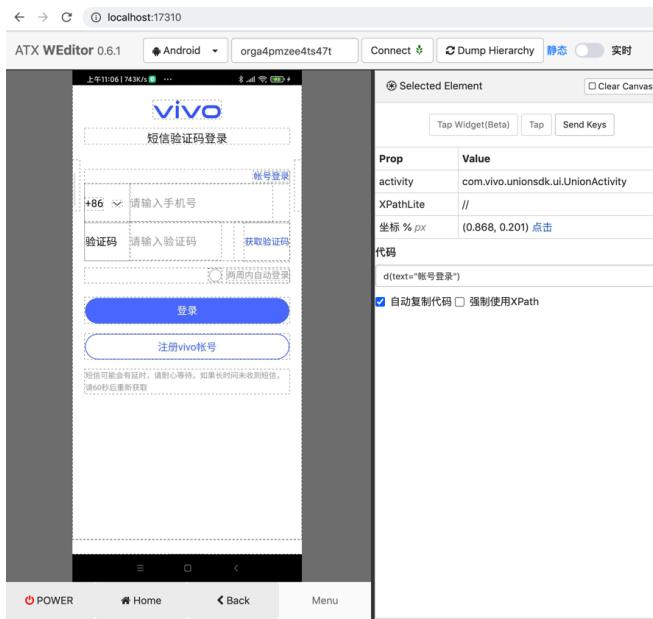
所以写代码将此过程自动化。

具体过程：

- 短信验证码登录页

xpath





- 点击：账号登录 按钮
  - 切换页面到：账号登录页
  - 支持已经切换到 账号登录页，而不会误点击 中间顶部的 账号登录 文字
- 账号登录页

xpath



xpath



- 支持已经输入手机号，再次重新输入手机号
- 此处输入手机号会触发输入法切换到 fastIME
- 请输入密码：输入密码

xpath



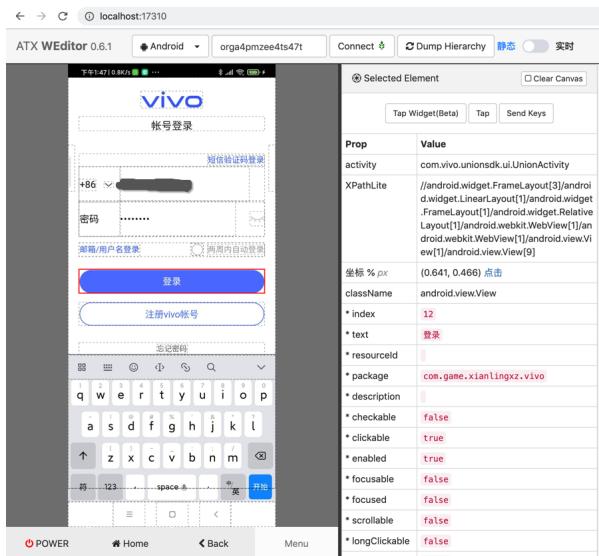
■ 真机效果

xpath



■ weditor调试

xpath



- 支持已经输入密码，再次重新输入密码
- 点击：登录 按钮

代码：

原始独立测试代码：

```

import time
import uiautomator2 as u2

def selectorSetText(u2Dev, curXPathSelector, inputText):
    selectorSetTextResp = curXPathSelector.set_text(inputText)
    logging.info("selectorSetTextResp=%s", selectorSetTextResp)
    # 在set_text后，输入法会变成FastInputIME输入法
    # 用下面代码可以实现：关掉FastInputIME输入法，切换回系统默认输入法
    u2Dev.set_fastinput_ime(False)

#####
# for Redmi 10X: auto do vivo account login, input phone at first
#####

def autoDoVivoLogin(u2Dev):
    doScreenshot(u2Dev)

    RegVivoAccountStr = "注册vivo帐号"
    regVivoAccountXPath = "//*[text()='注册vivo帐号']"
    regVivoAccountSelector = u2Dev.xpath(regVivoAccountXPath)
    if regVivoAccountSelector.exists:
        logging.info("Found %s", RegVivoAccountStr)
        accountLoginStr = "帐号登录"
        # accountLoginXPath = "//*[text()='帐号登录']"
        # #
        # accountLoginSelector = u2Dev.xpath(accountLoginXPath)
        # if accountLoginSelector.exists:
        #     logging.info("Found %s", accountLoginStr)
        #     accountLoginSelector.click()
        accountLoginElement = u2Dev(text=accountLoginStr)
        accountLoginElement.click()
        logging.info("accountLoginElement=%s", accountLoginElement)
        logging.info("accountLoginElement.exists=%s", accountLoginElement.exists)
        if accountLoginElement.exists:
            accountLoginElement.click()
            logging.info("Has clicked %s button", accountLoginElement)

            time.sleep(0.1)
            doScreenshot(u2Dev)
    else:
        logging.warning("Not found %s button", accountLoginStr)

    # phoneXPath = "//*[text()='请输入手机号']"
    phoneXPath = "//*[index='1']"
    phoneSelector = u2Dev.xpath(phoneXPath)
    if phoneSelector.exists:
        logging.info("Found 请输入手机号")
        # phoneSelector.set_text(Vivo_Account)
        selectorSetText(u2Dev, phoneSelector, Vivo_Account)

```

xpath

```
        logging.info("Has input vivo account phone num")
    else:
        logging.warning("Not found 请输入手机号")

    passwordStr = "请输入密码"
    # passwordXPath = """/android.widget.EditText[@text='请输入密码']"""
    passwordXPath = """//android.widget.EditText[@index='1']"""
    passwordSelector = u2Dev.xpath(passwordXPath)
    if passwordSelector.exists:
        logging.info("Found %s", passwordStr)
        # pwdClickResp = passwordSelector.click()
        # logging.debug("pwdClickResp=%s", pwdClickResp)
        # doScreenshot(u2Dev)
        selectorSetText(u2Dev, passwordSelector, Vivo_PASSWORD)
        logging.info("Has input vivo password")
    else:
        logging.warning("Not found %s", passwordStr)

    loginStr = "登录"
    # loginXPath = """//android.view.View[@text='登录']"""
    loginXPath = """//android.view.View[@text='登录' and @resource-id='com.vivo.vivoapp:id/login']"""
    loginSelector = u2Dev.xpath(loginXPath)
    if loginSelector.exists:
        loginSelector.click()
        logging.info("Has clicked %s button", loginStr)
        doScreenshot(u2Dev)
    else:
        logging.warning("Not found %s", loginStr)

def androidAutomation():
    u2Dev = u2.connect(DeviceId)
    logging.info("u2Dev=%s", u2Dev) # u2Dev=<uiautomator2.U2Device: 'u2'>
    ...
    autoDoVivoLogin(u2Dev)
```

合并到项目后：

```
Vivo_Register_Vivo_Account_Xpath: "//android.view.View[@text='']"
self.driver.watcher.when(self.config["Vivo_Register_Vivo_Account_Xpath"])

def autoDoVivoAccountLogin(self):
    """Auto do Vivo account login"""
    logging.info("Try auto do vivo account login")

    accountLoginStr = "帐号登录"
    # accountLoginXpath = """/android.widget.EditText[@text='%s']"""
    # #
    # accountLoginSelector = self.driver.xpath(accountLoginStr)
    # if accountLoginSelector.exists:
    #     logging.info("Found %s", accountLoginStr)
    #     accountLoginSelector.click()
    # accountLoginElement = self.driver(text=accountLoginStr)
    accountLoginElement = self.driver(text=accountLoginStr)
    logging.debug("accountLoginElement=%s", accountLoginElement)
    logging.debug("accountLoginElement.exists=%s", accountLoginElement.exists)
    if accountLoginElement.exists:
        accountLoginElement.click()
        logging.info("Has clicked %s button", accountLoginElement)

        time.sleep(0.1)
    else:
        logging.warning("Not found %s button", accountLoginElement)

    # phoneXPath = """/android.widget.EditText[@text='']"""
    phoneXPath = """/android.widget.EditText[@index='5']"""
    phoneSelector = self.driver.xpath(phoneXPath)
    if phoneSelector.exists:
        logging.info("Found 请输入手机号")
        # phoneSelector.set_text(Vivo_Account)
        self.selectorSetText(phoneSelector, self.config["Vivo_Account"])
        logging.info("Has input vivo account phone number")
    else:
        logging.warning("Not found 请输入手机号")

    passwordStr = "请输入密码"
    # passwordXPath = """/android.widget.EditText[@text='']"""
    passwordXPath = """/android.widget.EditText[@index='2']"""
    passwordSelector = self.driver.xpath(passwordXPath)
    if passwordSelector.exists:
        logging.info("Found %s", passwordStr)
        # pwdClickResp = passwordSelector.click()
        # logging.debug("pwdClickResp=%s", pwdClickResp)
        # doScreenshot(u2Dev)
        self.selectorSetText(passwordSelector, self.config["Vivo_Password"])
        logging.info("Has input vivo password")
    else:
```

xpath

```
logging.warning("Not found %s", passwordStr)

loginStr = "登录"
# loginXpath = """/android.view.View[@text="登录" and @resource-id="com.vivo.account:id/login_button"]"""
loginXpath = """//android.view.View[@text="登录" and @resource-id="com.vivo.account:id/login_button"]"""
loginSelector = self.driver.xpath(loginXpath)
if loginSelector.exists:
    loginSelector.click()
    logging.info("Has clicked %s button", loginStr)
else:
    logging.warning("Not found %s", loginStr)

logging.info("Complete auto do vivo account login")
```

- 后记：
  - 还会额外弹出验证码手动输入页面
    - 此处无法通过代码获取（另外手机收到的）验证码，所以无法代码自动化，只能手动输入
      - 效果

xpath



## 身份验证

验证码 请输入短信验证码 | 重新获取(51s)

验证码短信已发送至

下一步

短信可能会有延时，请耐心等待，如果长时间未收到短信，  
请60秒后重新获取

若手机号码暂时无法验证，请点击 [手机号已停用？](#)  
或联系客服 400-629-9688



xpath



- 验证后，会自动返回

xpath



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# 奇虎360账号自动登录

## 背景

游戏测试期间，遇到很多游戏app，都是来自360应用市场的。

其中在注册和登录期间，会涉及到：

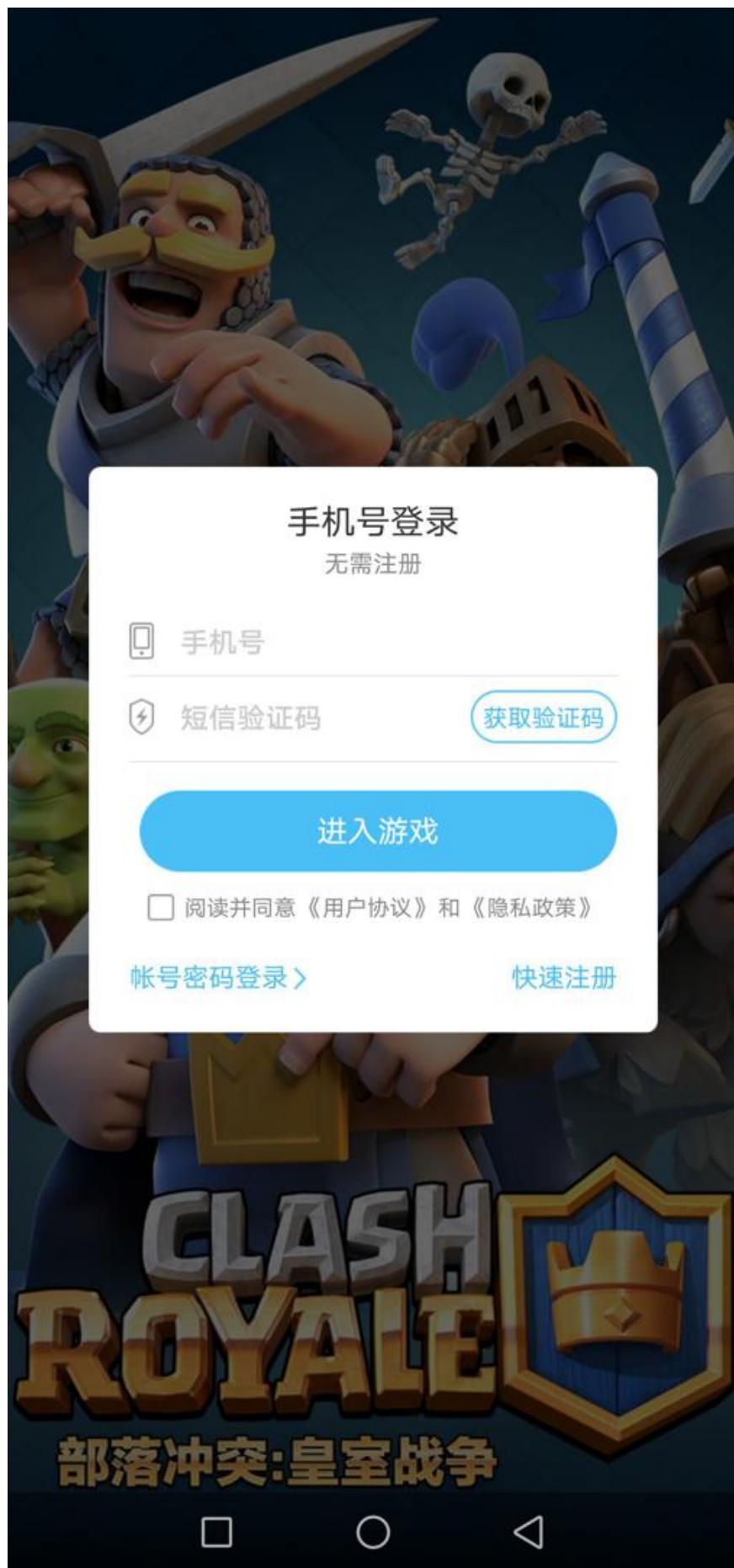
360账号的注册和登录

比如：

游戏： com.supercell.clashroyale.qihoo\_皇室战争

弹框：

xpath



xpath

此时：往往需要手动去，切换登录方式，手动输入（已有的）360的账号和密码等操作。比较耗时。

此处用代码实现，自动切换登录方式，输入账号和密码，点击登录。

## 代码

```

Qihoo360_Account: "yourAccount"
Qihoo360_Password: "yourPassword"

# Qihoo360_Login_ReadAndAgree_Xpath: "//android.widget.TextView[@text='同意并继续']"
# Qihoo360_Login_ReadAndAgree_Xpath: "//android.widget.TextView[@text='我接受']"
Qihoo360_PasswordLogin_Xpath: "//android.widget.TextView[@text='密码登录']"

self.driver.watcher.when(Qihoo360_PasswordLogin_Xpath).call()

def selectorSetText(self, curXpathSelector, inputText):
    # Special: add click to try workaround for 360 pwd EditText
    # curXpathSelector.click()
    # curXpathSelector.clear_text()
    selectorSetTextResp = curXpathSelector.set_text(inputText)
    logging.debug("selectorSetTextResp=%s", selectorSetTextResp)
    # 在set_text后，输入法会变成FastInputIME输入法
    # 用下面代码可以实现：关掉FastInputIME输入法，切换回系统默认输入法
    self.driver.set_fastinput_ime(False)

def autoDo360AccountLogin(self):
    """Auto do 360=qihoo=qihu account login"""
    logging.info("Try auto do qihoo 360 account login")

    # AccountPwdStr = "帐号密码登录"
    AccountPwdStr = "密码登录"
    # reg360AccountPwdXpath = """/android.widget.TextView[@text='帐号密码登录']"
    # reg360AccountPwdXpath = """/android.widget.TextView[@text='密码登录']"
    reg360AccountPwdXpath = """/android.widget.TextView[@text='密码登录']"
    # '/@resource-id='com.qihoo.gmail:id/account_type'"]
    reg360AccountPwdSelector = self.driver.xpath(reg360AccountPwdXpath)
    if reg360AccountPwdSelector.exists:
        # doScreenshot(u2Dev)
        # logging.info("Found %s", AccountPwdStr)
        reg360AccountPwdSelector.click()
        time.sleep(0.1)
        logging.info("Has clicked %s button", AccountPwdStr)
    else:
        logging.warning("Not found %s button", AccountPwdStr)

    SwitchLoginTypeStr = "切换登录方式"
    switchLoginTypeXpath = """/android.widget.TextView[@text='切换登录方式']"
    switchLoginTypeSelector = self.driver.xpath(switchLoginTypeXpath)
    isInAccountPwdLoginPage = switchLoginTypeSelector.exists
    if isInAccountPwdLoginPage:
        logging.info("Found %s", SwitchLoginTypeStr)

    if not isInAccountPwdLoginPage:
        ShortSmsVerifyCodeLoginStr = "短信验证码登录"
        # shortSmsVerifyCodeLoginXpath = """/android.widget.TextView[@text='短信验证码登录']"
        shortSmsVerifyCodeLoginXpath = """/android.widget.TextView[@text='短信验证码登录']"

```

xpath

```
shortSmsVerifyCodeLoginSelector = self.driver.xpath("//android.widget.EditText[@resource-id='com.qihoo.360safe:id/et_login_code']")
isInAccountPwdLoginPage = shortSmsVerifyCodeLoginSelector.exists()
if isInAccountPwdLoginPage:
    logging.info("Found %s", ShortSmsVerifyCodeLoginSelector.text)

if not isInAccountPwdLoginPage:
    AccountLogin360Str = "360帐号登录"
    accountLogin360Xpath = """/android.widget.TextView"""
    accountLogin360Selector = self.driver.xpath(accountLogin360Xpath)
    isInAccountPwdLoginPage = accountLogin360Selector.exists()
    if isInAccountPwdLoginPage:
        logging.info("Found %s", AccountLogin360Str)

if not isInAccountPwdLoginPage:
    logging.error("Not in 360 account and password login page")
    return

logging.info("In 360 account and password login page, continue")

AccountStr = "360帐号/手机号/邮箱"
# accountXpath = """/android.widget.EditText[@resource-id='com.qihoo.360safe:id/et_login_account']"""
accountXpath = """/android.widget.EditText[@resource-id='com.qihoo.360safe:id/et_login_account']"""
accountSelector = self.driver.xpath(accountXpath)
if accountSelector.exists():
    logging.info("Found %s", AccountStr)
    # check already input or not
    curAccount = accountSelector.text
    if curAccount and (curAccount == Qihoo360_Account):
        logging.info("Already inputed 360 account")
    else:
        self.selectorSetText(accountSelector, Qihoo360_Account)
        logging.info("Has input 360 account")
else:
    logging.warning("Not found %s", AccountStr)

# Special: 华为Nova 5i此处元素错乱
# 密码输入框 此时的位置 已经变成了 进入游戏 所以 输入密码 会误点
# TODO: try xiaomi 10X is or or not
return

PasswordStr = "密码"

# # passwordXpath = """/android.widget.EditText[@resource-id='com.qihoo.360safe:id/et_login_password']"""
# # passwordXpath = """/android.widget.EditText[@resource-id='com.qihoo.360safe:id/et_login_password']"""
# # passwordXpath = """/android.widget.EditText[@resource-id='com.qihoo.360safe:id/et_login_password']"""
# passwordXpath = """/android.widget.EditText[@resource-id='com.qihoo.360safe:id/et_login_password']"""
# passwordSelector = self.driver.xpath(passwordXpath)
# if passwordSelector.exists():
#     logging.info("Found %s", PasswordStr)
#     # curPassword = passwordSelector.text
#     # # if curPassword and (curPassword == Qihoo360_Password):
```

xpath

```
#      #      logging.info("Already inputed 360 password")
#      # else:
#      self.selectorSetText(passwordSelector, Qihoo360_Password)
#      logging.info("Has input 360 password")
# else:
#     logging.warning("Not found %s", PasswordStr)

passwordElement = self.driver(className="android.widget.EditText")
logging.info("passwordElement.exists=%s", passwordElement.exists)
if passwordElement.exists:
    passwordElement.set_text(Qihoo360_Password)
    logging.info("Has input 360 password")
else:
    logging.warning("Not found %s", PasswordStr)

AgreeStr = "阅读并同意用户协议"
# agreeeCheckboxElement = u2Dev(className="android.widget.CheckBox")
# if agreeeCheckboxElement.exists:
#     agreeeCheckboxElement.click()
agreeeCheckboxXpath = "//*[contains(@text, '%s')]/preceding-sibling::checkbox[1]"
agreeeCheckboxSelector = self.driver.xpath(agreeeCheckboxXpath)
if agreeeCheckboxSelector.exists:
    agreeeCheckboxSelector.click()
    time.sleep(0.1)
    logging.info("Has clicked %s checkbox", AgreeStr)
else:
    logging.warning("Not found %s checkbox", AgreeStr)
return

IntoGameStr = "进入游戏"
IntoGameXpath = "//*[contains(@text, '%s')]/preceding-sibling::button[1]"
loginSelector = self.driver.xpath(IntoGameXpath)
if loginSelector.exists:
    loginSelector.click()
    time.sleep(0.1)
    logging.info("Has clicked %s button", IntoGameStr)
else:
    logging.warning("Not found %s button", IntoGameStr)

# check 请同意用户协议和隐私政策 弹框
PleaseAgreePopupStr = "请同意用户协议和隐私政策"
PleaseAgreePopupXpath = "//*[contains(@text, '%s')]/preceding-sibling::button[1]"
PleaseAgreePopupSelector = self.driver.xpath(PleaseAgreePopupXpath)
if PleaseAgreePopupSelector.exists:
    logging.info("Found %s popup", PleaseAgreePopupStr)

PositiveButtonStr = "确定"
positiveButtonXpath = "//*[contains(@text, '%s')]/preceding-sibling::button[1]"
positiveButtonSelector = self.driver.xpath(PositiveButtonXpath)
if positiveButtonSelector.exists:
    positiveButtonSelector.click()
```

xpath

```
        logging.info("Has clicked %s button", PositiveStr)
        time.sleep(0.1)

        # do second time
        IntoGameStr = "进入游戏"
        IntoGameXpath = """/android.widget.TextView[@text='%s']"""
        loginSelector = self.driver.xpath(IntoGameXpath)
        if loginSelector.exists:
            loginSelector.click()
            time.sleep(0.1)
            logging.info("Has clicked %s button", IntoGameStr)
        else:
            logging.warning("Not found %s button", IntoGameStr)

    else:
        logging.info("Not found %s", PleaseAgreePopupStr)

    # wait doing login
    LoggingStr = "正在登录..."
    loginingXpath = """/android.widget.TextView[@text="%s"]"""
    loginingSelector = self.driver.xpath(loginingXpath)
    isLogging = loginingSelector.exists
    while isLogging:
        loginingSelector = self.driver.xpath(loginingXpath)
        isLogging = loginingSelector.exists
        logging.info("Is doing login, wait sometime")
        time.sleep(1)

    # locate input cursor to verify code
    VerifyCodeErrorStr = "请输入验证码 (错误码: 5010a)"
    verifyCodeErrorXpath = """/android.widget.TextView[@text='%s']"""
    verifyCodeErrorSelector = self.driver.xpath(verifyCodeErrorXpath)
    if verifyCodeErrorSelector.exists:
        logging.info("Found %s notice", VerifyCodeErrorStr)

    # locate input cursor
    PleaseInputRightVerifyCodeStr = "请输入右侧的验证码"
    # pleaseInputRightVerifyCodeXpath = """/android.widget.EditText[@text='%s']"""
    pleaseInputRightVerifyCodeXpath = """/android.widget.EditText[@text='请输入右侧的验证码']"""
    pleaseInputRightVerifyCodeSelector = self.driver.xpath(pleaseInputRightVerifyCodeXpath)
    if pleaseInputRightVerifyCodeSelector.exists:
        pleaseInputRightVerifyCodeSelector.click()
        logging.info("Has clicked %s", PleaseInputRightVerifyCodeStr)
    else:
        logging.warning("Not found %s button", PleaseInputRightVerifyCodeStr)

else:
    logging.warning("Not found %s button", VerifyCodeErrorStr)
```

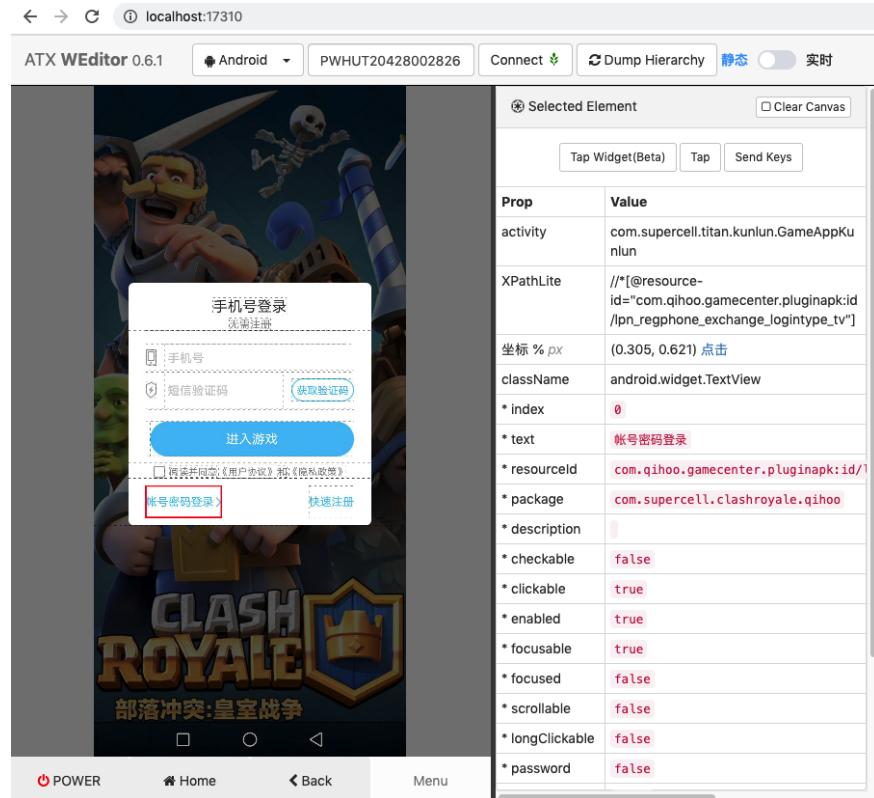
## 相关截图

xpath

## 调试时

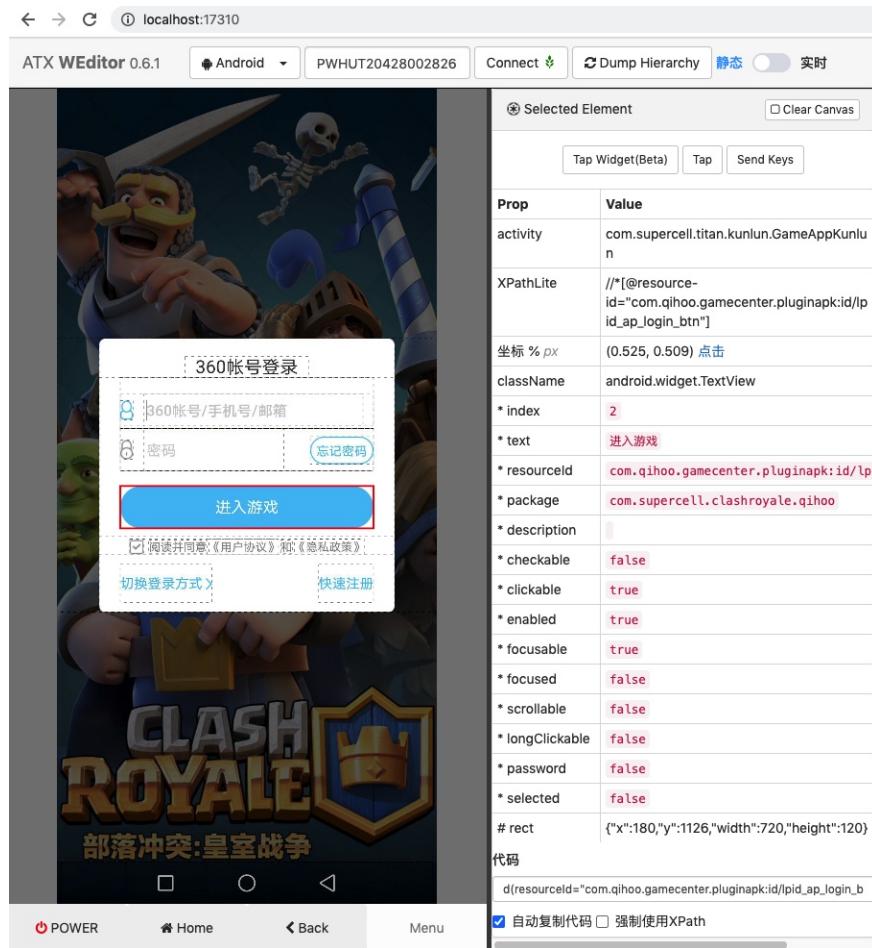
weditor截图：

点击 账号和密码登录：



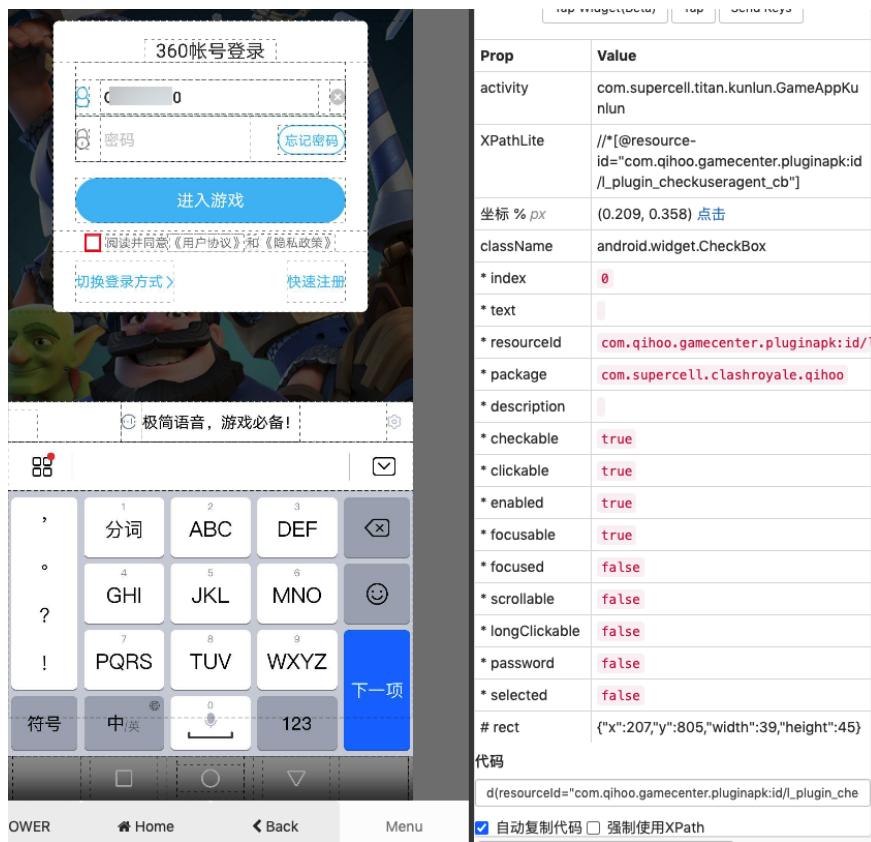
切换到 360账号登录：

xpath



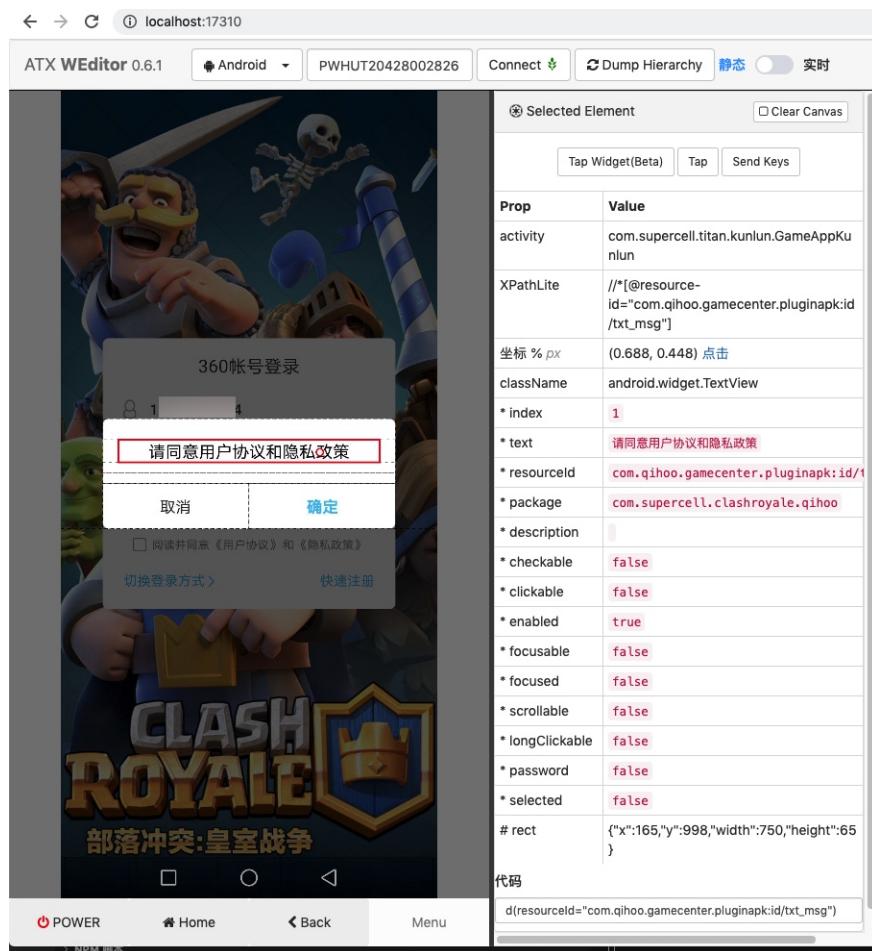
已输入360账号：

xpath



点击登录时，提示：请同意用户协议和隐私政策

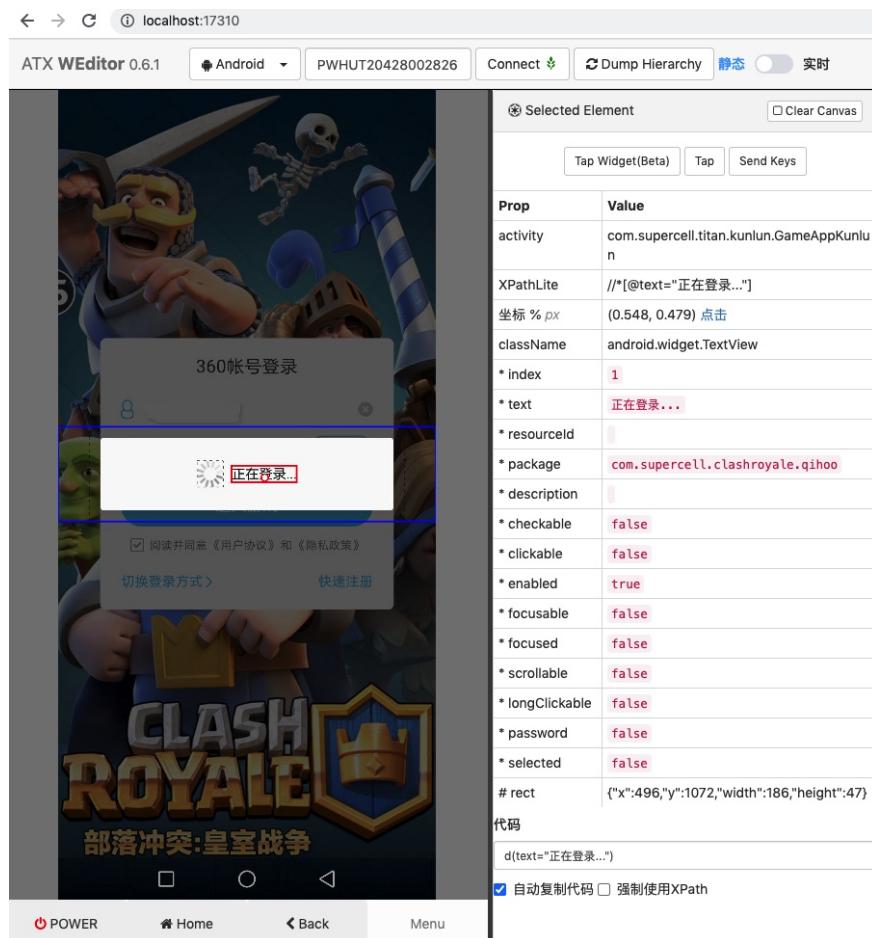
xpath



勾线后，点击 进入游戏

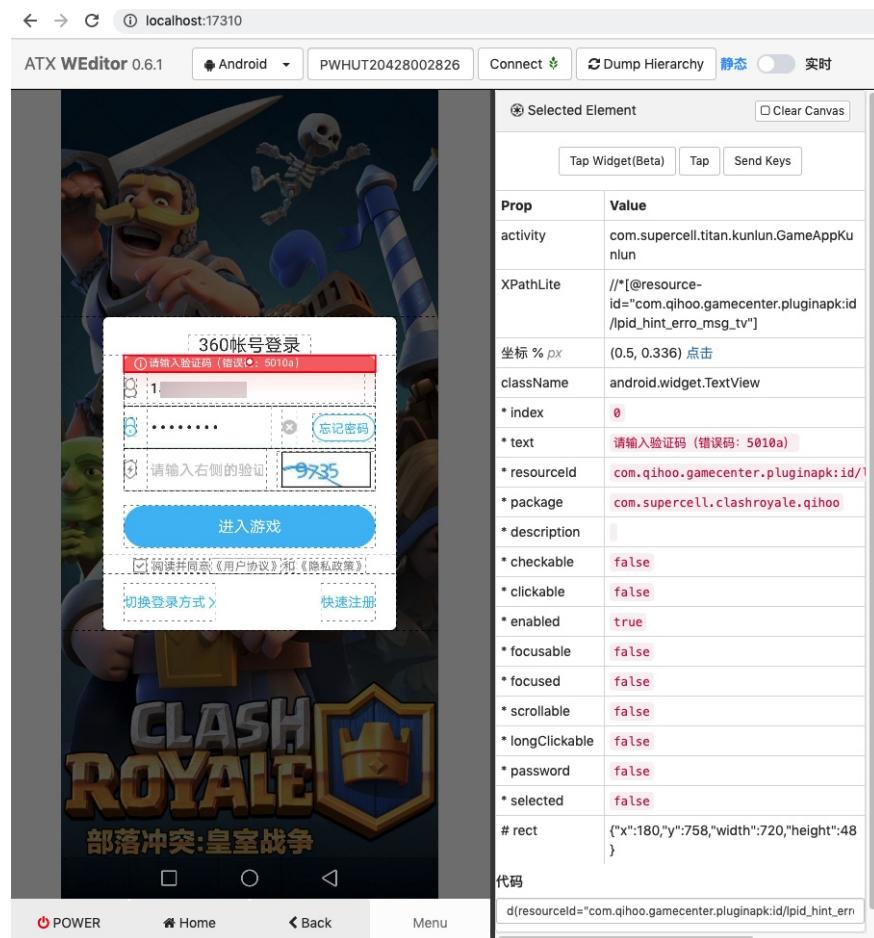
往往提示：正在登录

xpath



有时候，经常，会出现错误：请输入验证码

xpath



## 实际运行效果

此处实际运行后发现，上述代码，只对于部分360的游戏有效

比如：

- com.zhw.xzjh.qihoo\_修真江湖

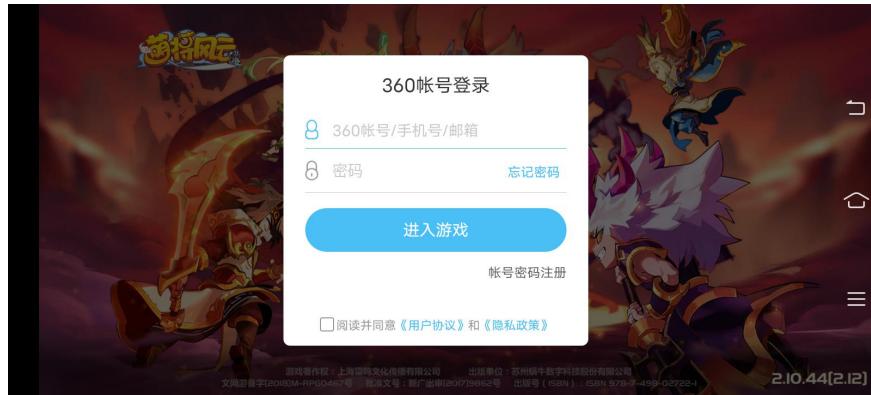
其他还有很多

- 弹框即使一样，但是却也不工作，不起效果的
- 弹框不太一样的

比如：

游戏： com.qianhuan.mjfy.qihoo360/萌将风云

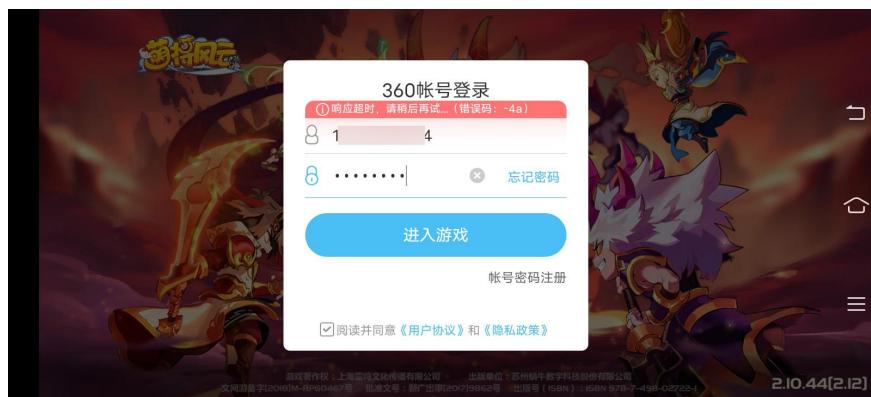
xpath



-》都没有 短信密码登录 的按钮

-》只有 右边才有的 账号密码注册

以及点击登录后，报错也不同：响应超时，请稍后再试 错误码 -4a



红米10X中的游戏 com.mandong.jxqy.qihoo\_剑侠情缘

是旧版本的360账号登录页面：



和游戏 com.Tq.CQ2ClientAndroid.qihoo/口袋征服 的：

xpath



以及游戏 com.noumena.android.tinywarcnqh\_合金要塞 的：



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## 附录

下面列出相关参考资料。

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powered by Gitbook最后更新: 2020-06-20 07:16:03

## 参考资料

- 【记录】 mac中用pipenv安装uiautomator2
- 【未解决】 给安卓手机小米9中欢乐大作战的游戏实现自动挂机
- 【已解决】 红米Note8Pro的uiautomator2初始化出错： OSError  
Errno Uiautomator started failed
- 【已解决】 uiautomator2获取当前屏幕的宽和高即屏幕大小分辨率信息
- 【已解决】 uiautomator2中如何获取到当前画面的截图文件
- 【部分解决】 python的uiautomator2中set\_text导致输入法变化无法顺利输入文字
- 【已解决】 uiautomator2中点击华为手机中系统自带Swype的输入法中的搜索按钮
- 【已解决】 python的uiautomator2报错：  
uiautomator2.exceptions.JsonRpcError -32601 Method not found  
data injectInputEvent
- 【未解决】 uiautomator2中dump\_hierarchy中只能获取到页面的部分的xml源码
- 【已解决】 搞懂uiautomator-server中最终的底层实现  
dumpWindowHierarchy的处理返回页面数据的逻辑
- 【已解决】 uiautomator2中导出页面源码中NAF是什么意思
- 【未解决】 如何确保uiautomator2的dump\_hierarchy能导出页面中NAF的元素节点
- 【无法解决】 adb发送密码无法解锁安卓手机屏幕
- 【未解决】 自动抓包工具抓包公众号买单吧某个元素通过  
class+instance定位不到
- 【已解决】 uiautomator2用click点击微信中的通讯录不起作用
- 【已解决】 用weditor实时查看安卓当前页面中的xml源码
- 【已解决】 Mac中安装uiautomator2的UI界面工具： weditor
- 【未解决】 如何修改Android项目android-uiautomator-server的Java  
代码并重新打包生成2个apk
- 【已解决】 安卓中uiautomator2的set\_text输入导致输入法切换以及  
恢复输入法
- 【已解决】 红米10X中uiautomator2实现点击Vivo的账号登录切换登  
录方式
- 【已解决】 uiautomator2给红米10X的vivo账号页自动输入vivo账号和  
密码
- 【已解决】 自动化游戏测试中合并uiautomator2自动登录vivo账号代  
码逻辑
- 【已解决】 安卓手机红米10X初始化自动化测试环境
- 【已解决】 红米10X中uiautomator2自动识别Vivo账号登录页面并自  
动登录

- 【未解决】自动化测试游戏：自动实现360账号登录弹框检测和登录流程
- 【已解决】uiautomator2给小米安全键盘中输入字符串
- 【已解决】安卓手机小米的红米10X中关闭小米安全键盘输入
- 【已解决】红米10X中把ATX和com.github.uiautomator.test设置为后台运行不被杀掉
- 【已解决】设置Vivo安卓手机中运行ATX等应用后台持续运行而不会被进程管理杀掉
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- [uiautomator | Android Developers](#)
- [Android 手机自动化测试工具有哪几种？ - 知乎](#)
- [一种 Android 端 Web 多进程情况下支持 Web 自动化测试的方法 - 云+社区 - 腾讯云](#)
- [ATX 文档 - iOS 控件操作 API · TesterHome](#)
- [Manual Init · openatx/uiautomator2 Wiki](#)
- [Android连接常见问题 - Airttest Project Docs](#)
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