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Linaro

Introducing Aster - a tool for remote GUI testing on Android

For Android Builders Summit 2015

Presented by

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Date

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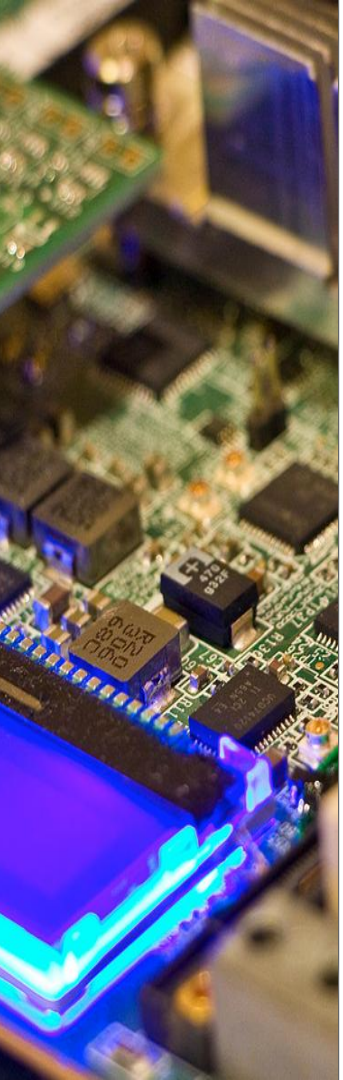

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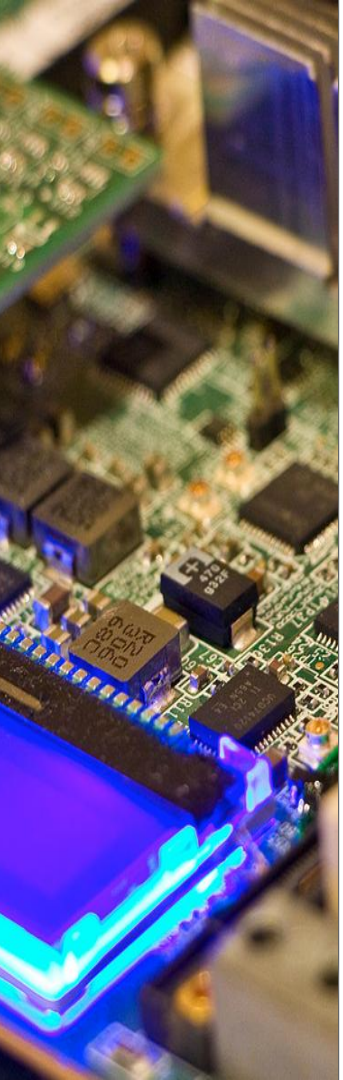
Background(1)

Aster is the abbreviation of Android System Testing Environment and Runtime, which is developed by 0xlab originally, which is said built upon the concept of Sikuli.
We can use it to control the UI of local android device, but since it is based on the monkey runner engine, we can not use it to control the device at the remote side. **Change it!**

Background(2)

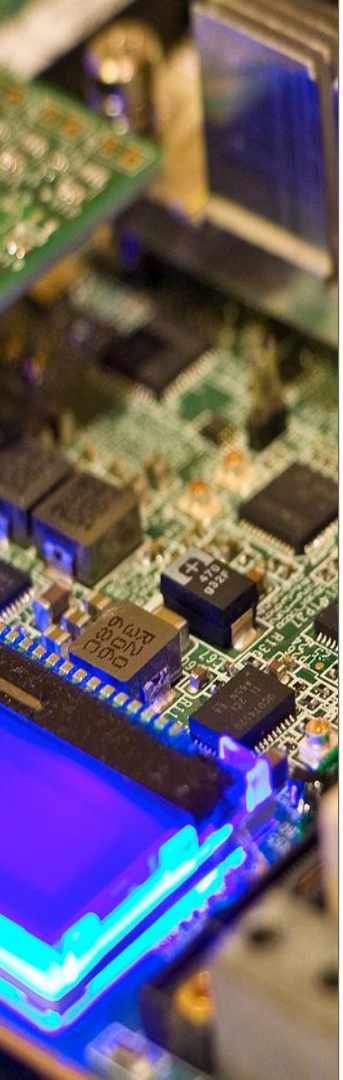
About one months ago, I got to know AndroidViewClient, yeah, it's so great that I can not keep me from borrowing something from there, So Aster supports Text/ViewID based operations now! Which means the scripts you created for one device can be used for another device as well.

Please give me more feedbacks!



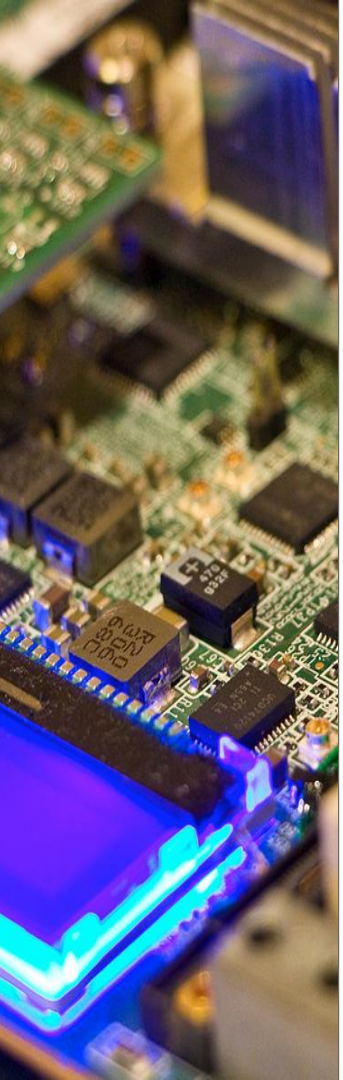
Features of Aster(diff with others)

- The same as operating on the screen
- No need to install anything into device, works with the user variant build
- No need much programing skills
- Easily to add/extend more features
  - Actions/Clients/UIs/Logs
  - Advance Tech, like OpenCV, OCR?
- Help make App Android Style



New Features

- Support access for remote device
  - only support access via ssh now
- Support to run multiple devices
- Support Text/ID based operations
  - which makes the script more reusable
- Display of logcat/kmsg/UI Dump info
- Support more actions



Supported Actions

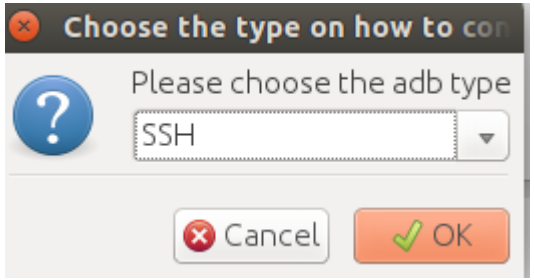
Touch / TouchWithText TouchWithContentDesc TouchWithResId	Touch operations, which you can touch based image, Text, or ID
Drag	Simulate the drag operation on device
Press	Simulate the operation of pressing keys
Type	input text operation into device
Call	Call an exist aster script, help to reuse existing scripts.
InstallApk/UninstallPackage	Install and uninstall applications
AdbShell	Help to run some adb shell commands
WaitTimeout/WaitImage/WaitIdWith TextMatch	Wait operations, wait for some time, wait for text, wait for image

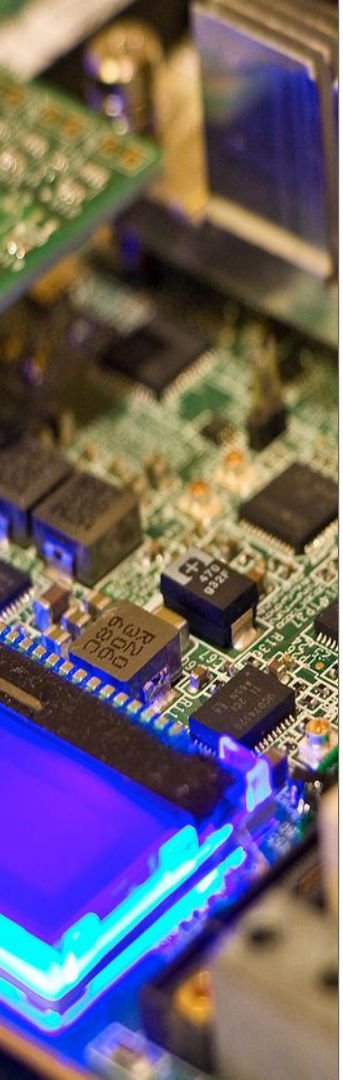
How to control remote device

1. make “ssh aster-adb-host adb devices” work
   a. add “aster-adb-host” Host in .ssh/config with necessary account and Hostname information
   b. copy public key information to ssh side so that no interaction when run “ssh aster-adb-host adb”s
2. select “ssh” as the adb type
3. input serial number you want to control
4. Check if you can see the home screen displayed in the Aster window

SSH Entry and ADB Type

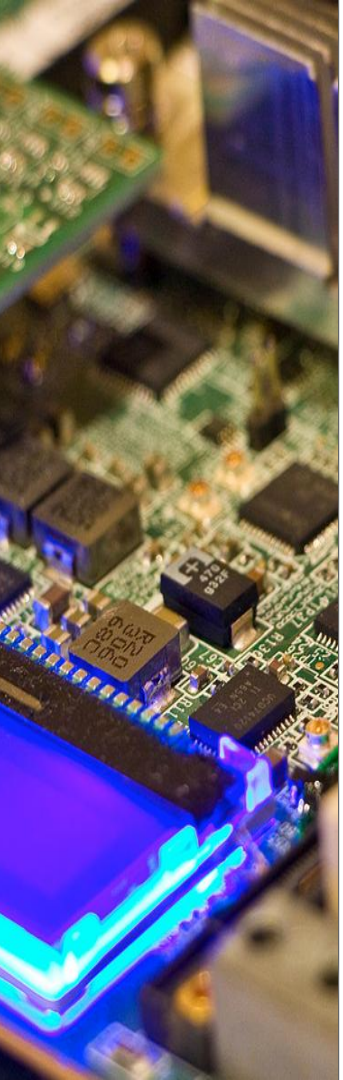
```
Host aster-adb-host
#    HostName 127.0.0.1
    HostName lab.validation.linaro.org
    ServerAliveInterval 60
    User liuyq0307
    Port 22
```





Dependencies

- Device Side
  - adb connection
  - adb shell input
  - adb shell screencap
  - adb shell uiautomator
- Host Side
  - Java
  - adb connection
  - OpenCV libs(optional)



Limitations(Will support later)

- Not support Monkeyrunner yet
- Can not edit actions or scripts yet
- No support for interaction between devices(Like IM app/Phone Call)
- Only tested on Ubuntu14.04 with Android L
- Call action has some bugs

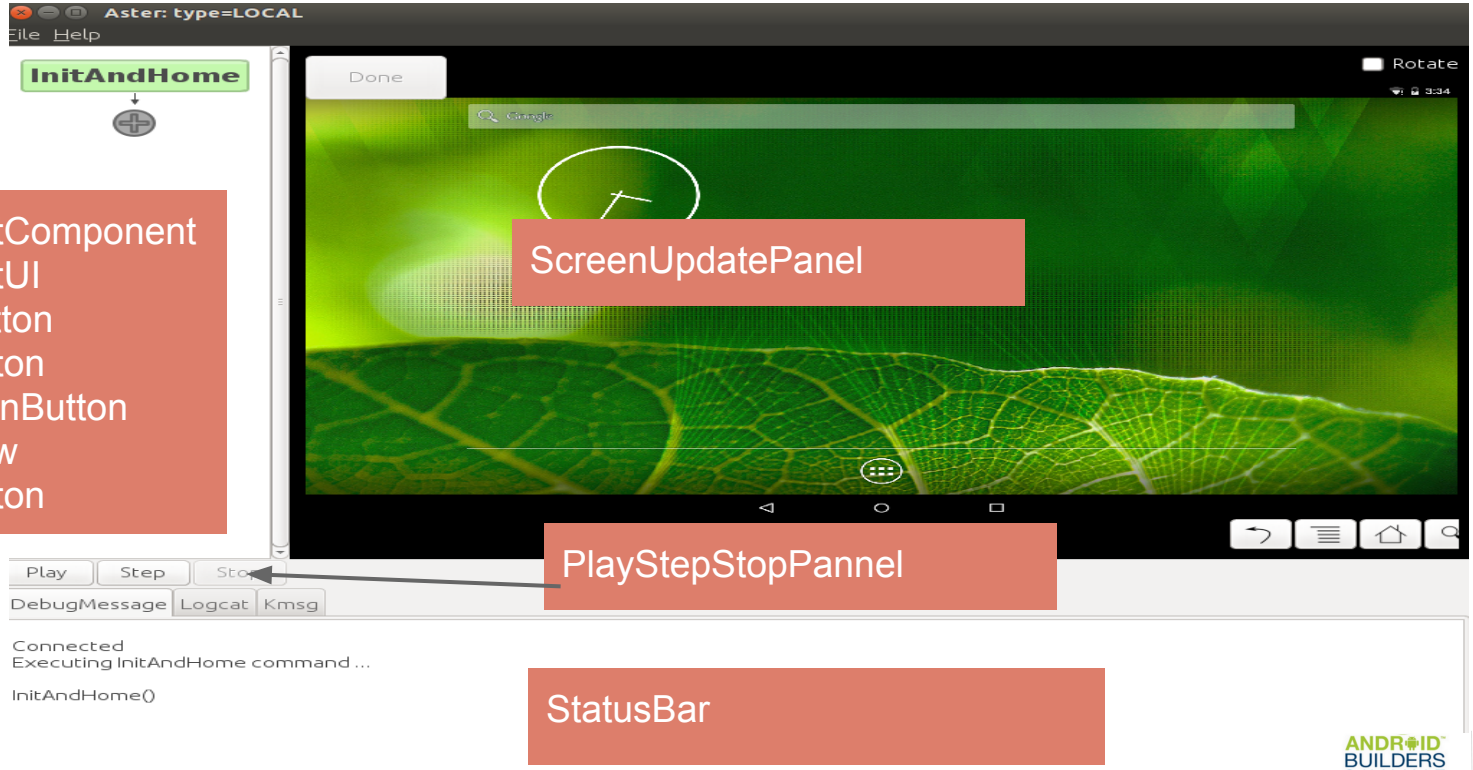
Develop with Eclipse

1. git clone https://github.com/liuyq/aster.git
2. Open Eclipse, and import the aster project, Run/Debug as “Java Application”, and use org.zeroxlab.aster.AsterMain as Main class

OR

3. run “ant” under the aster project to compile, then run “dist/aster” to start aster

UI Concept



ActionListComponent
ActionListUI
ActionButton
CloseButton
NewActionButton
LittleArrow
CloseButton

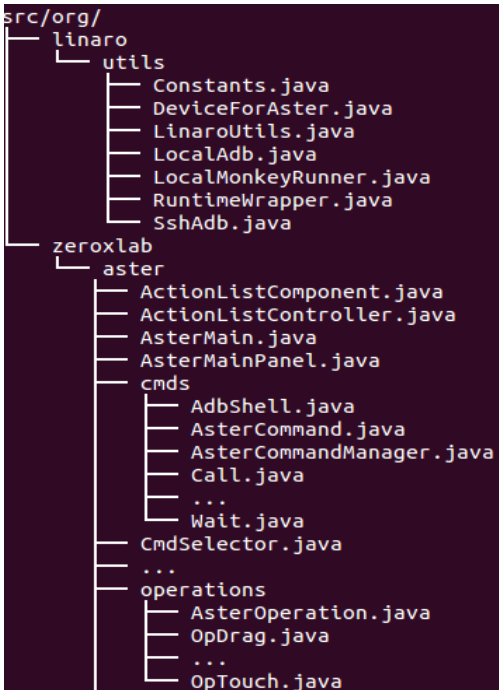
ScreenUpdatePanel

PlayStepStopPannel

StatusBar

Source Concept/Structure

- AsterCommand
- AsterOperation
- DeviceForAster
- UI Components



How to add new action

```
public abstract class AsterCommand {
    private static final Map<String, Class> \
        supportedCommands = \
        new LinkedHashMap<String, Class>() {
        {
            ...
            put("Call", Call.class);
            put("InstallApk", InstallApk.class);
            put("AdbShell", AdbShell.class);
            put("Wait", Wait.class);
        }
    };
    ...
}
```

```
public class InstallApk extends \
AsterCommand {
....
}
```

```
public class AdbShell extends \
AsterCommand {
....
}
```

How to add new remote type

```
public abstract class DeviceForAster {
    ….
    public static void initialize(String adbType, String serial)
            throws Exception {
        if (adbType == null || Constants.ADB_TYPE_LOCAL.equals(adbType)) {
            instance = new LocalAdb(serial);
            return;
        } else if (adbType.equals(Constants.ADB_TYPE_SSH)) {
            instance = new SshAdb(serial, Constants.SSH_ADB_HOST);
            return;
        } else if (adbType.equals(Constants.ADB_TYPE_MONKEYRUNNER)) {
            throw new Exception("Monkeyrunner still not implemented yet");
        }
        throw new Exception("Not supported ADB Type:" + adbType);
    }
    ...
}
```

```
public class SshAdb extends DeviceForAster {
    ...
    protected ...getAdbSerialArrayList() {
        ...
    }
    public void installApk(...){
        ...
    }
    public void push(...){
        ...
    }
    public void pull(...){
        ...
    }
    …
}
```

Contents of Aster Scripts

```
 1 InitAndHome()
 2 TouchWithContentDesc('Apps')
 3 UninstallPackage('it.JBench.bench')
 4 InstallApk('03-JBench.apk')
 5 AdbShell('am start -W -S it.JBench.bench/it.JBench.jbench.MainActivity')
 6 TouchWithResId('it.JBench.bench:id/button1')
 7 WaitIdWithTextMatch('it.JBench.bench:id/textViewResult', '^\d+$', '3600')
 8 UninstallPackage('it.JBench.bench')
~
zipfile:/home/liuyq/Desktop/Jbench3.zip::script.py
 5 script.py
 6 03-JBench.apk
~
~
/home/liuyq/Desktop/Jbench3.zip [RO]
```

Links

https://github.com/liuyq/aster
http://people.linaro.org/~yongqin.liu/aster/Aster_2Devices.mp4
https://github.com/kanru/aster
https://kanru.info/slides/COSCUP_aster.svg
https://gitorious.org/aster
https://code.google.com/p/aster/

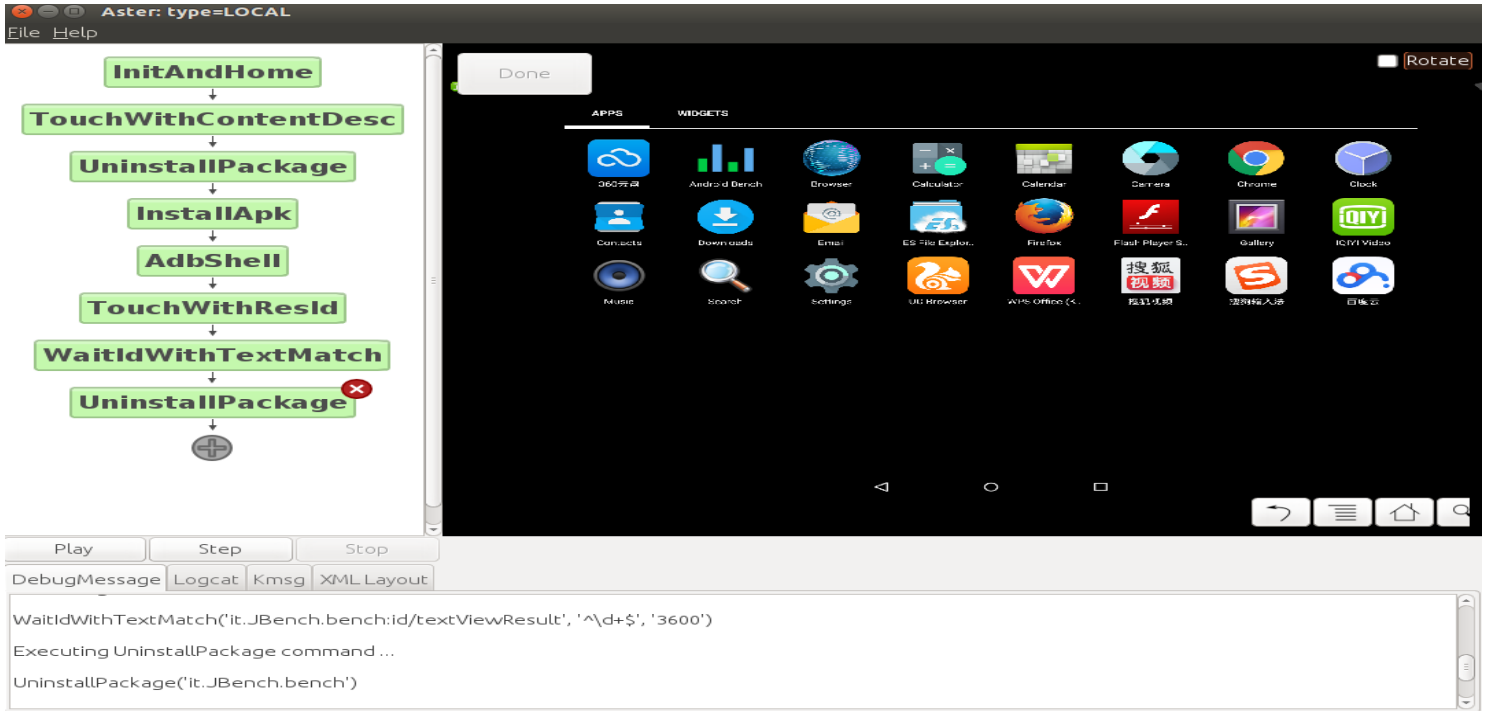
Feedbacks from Linaro HKG15

AndroidViewClient
https://github.com/liuyq/AndroidViewClient

Use ssh forward feature to setup tunnel from local side to android target, so that we will have adb connection with that device on local side

ssh -A -g -L 5555:device_ip:adb_port -N ssh_account@ssh_host -v

Demo


Aster: type=LOCAL
File Help
InitAndHome
TouchWithContentDesc
UninstallPackage
InstallApk
AdbShell
TouchWithResId
WaitIdWithTextMatch
UninstallPackage
Done
Rotate
APPS
WIDGETS
Play
Step
Stop
DebugMessage
Logcat
Kmsg
XML Layout
WaitIdWithTextMatch('it.JBench.bench:id/textViewResult', '^\d+$', '3600')
Executing UninstallPackage command ...
UninstallPackage('it.JBench.bench')

Demo


Aster: type=LOCAL serial=HT4AGJT00220
File Help
InitAndHoi
UninstallPac
InstallAp
AdbShel
TouchWithR
WaitIdWithTex
UninstallPac
JBench
Benchmark
Rankings
Your Device
Search
Sign in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