

GDG DevFest 2015 HCMC



GDG
Vietnam



TEKCAFE
Android Developers Community

How to build Android ROM from source



Getting started with Android ROM building

Presentation for Vietnamese developers at Google Devfest 2015

By TekCafe Team

October 4th, 2015



Which tools should I have?
Where do I get started?



About TekCafe



TEKCAFE
Android Developers Community

About TekCafe

- Established in Ho Chi Minh City 2 years ago
- First Vietnamese team can build Android ROM from source
- Bringing many Android smartphone update to Android Lollipop through custom Android ROM

(Techz.vn) Bphone là chiếc điện thoại được nhiều người mong chờ nhất trong thời gian qua và điều này cũng cuốn hút những nhà phát triển, những đội ngũ “vọc vạch” có tiếng tại Việt Nam. Mới đây, TekCafe team đã root và cài custom recovery trên Bphone thành công.

[BÀI VIẾT LIÊN QUAN](#)

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GA IRON 2

a Pantech ở thời
ế đẹp và không
ổ sự trải nghiệm
đầu năm 2015,
t nâng cấp hệ
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Goals for this guide

Goals for this guide

1. Getting started on Android Open Source Project (AOSP) and some open source firmware distributions based on Android OS.
2. Getting knowledge on Android Firmware source code.
3. Setting up environment for ROM building
4. Know how to build ROM from source

Agenda

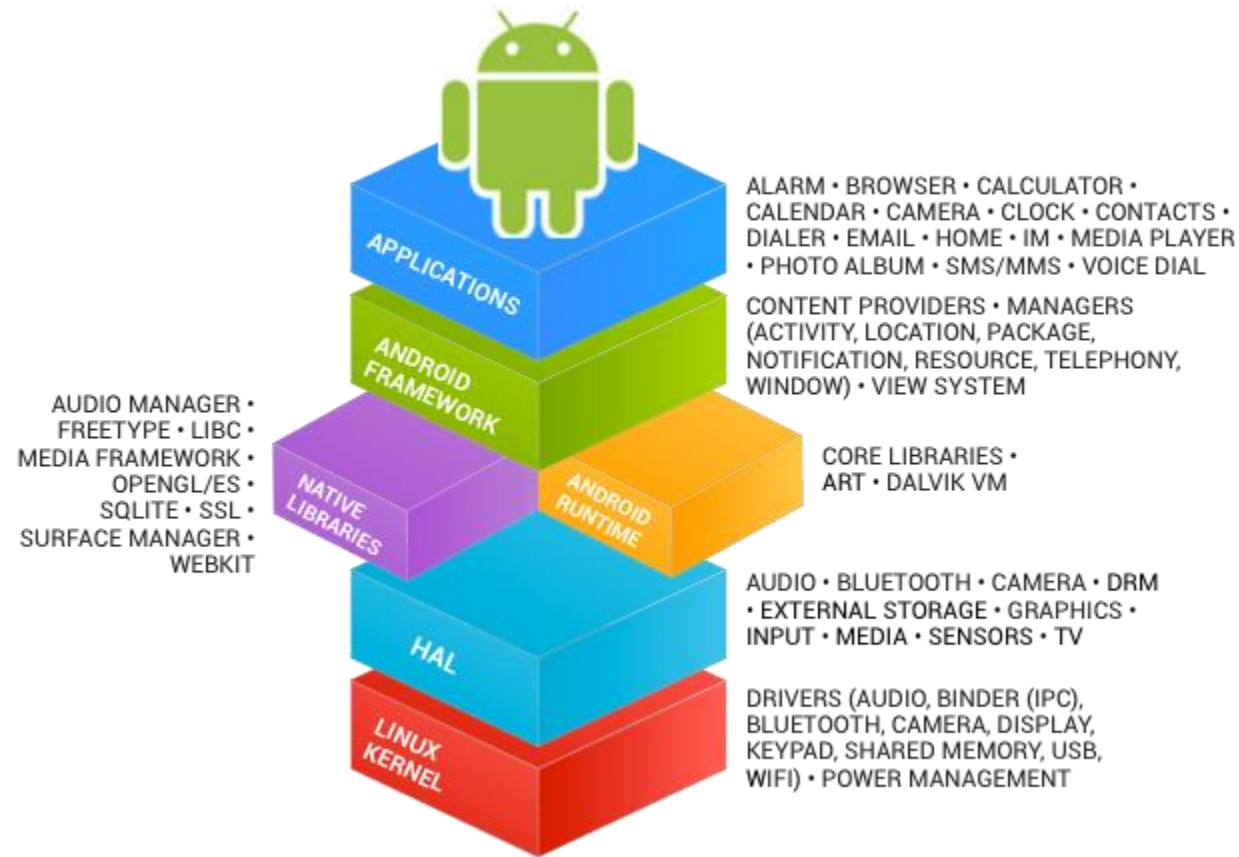
- What is Android Open Source Project?
- What are common open source firmware distribution?
- Establishing a Build Environment.
- Downloading the Source.
- Exploring the Source.
- Building the System.
- Known Issues
- Q/A



What is Android Open Source Project?



What is Android?



What is Android Open Source Project?

- Maintained by Google
- Contributions accepted
- Provides templates for building an Android system
- Provides the complete source code (but usually missing proprietary binaries) for a bunch of supported devices (e.g Google Nexus, Android Emulator...)

What are common
open source firmware
distributions?



What are common open source firmware distribution?



Bliss Roms



Why we use these projects instead of Android Open Source Project

- Easy to build for newbie
- Custom distros offer more functions
- Easy to customize

Establishing a Build Environment



Establishing a Build Environment.

- A 64-bit Linux or Mac OS System, recommend Debian-base Linux like Ubuntu.
- At least 16GB of RAM/swap
- 100GB or more disk space
- Recommend Quad core CPU (More threads help build faster)
- Builders can be share between developers

Tips and tricks

- Workstations and desktops are always better than laptops
- Need up to 150GB for a single build, and 200GB or more for multiple builds. With ccache enabled, you will need even more space.
- 8GB RAM + 8GB swap is enough but 16GB RAM is recommend
- Consider upgrade PSU & HSF
- Internet with ACG connected

Setting up required packages



Installing the JDK

Java 7: For the latest version of Android

```
$ sudo apt-get update
```

```
$ sudo apt-get install openjdk-7jdk
```

Set default Java version by running

```
$ sudo update-alternatives --config java
```

```
$ sudo update-alternatives --config javac
```

Installing required packages (Ubuntu 14.04/newer)

Install with “sudo apt-get install” from Debian Terminal

```
$ sudo apt-get install bison g++-multilib git \  
gperf libxml2-utils make python-networkx \  
zlib1g-dev:i386 zip
```

Tips for choosing Android device to test

- Can be unlock bootloader?
- Open source?
- Support reflash stock firmware?
- Device source code can be found on manufacture website?
 - <http://developer.sonymobile.com/downloads/opensource/>
 - <http://opensource.samsung.com/>
 - <http://opensource.pantech.com/>
 - <http://opensource.lge.com/>

Downloading the Source



Installing Repo

Repo is a tool that makes it easier to work with Git in the context of Android.

```
$ mkdir ~/bin
```

```
$ PATH=~/bin:$PATH
```

```
$ curl https://storage.googleapis.com/git-repo-downloads/repo >  
~/bin/repo
```

```
$ chmod a+x ~/bin/repo
```

Initializing a Repo client

Create an empty directory to hold your working files

```
$ mkdir WORKING_DIRECTORY
```

```
$ cd WORKING_DIRECTORY
```

Run repo init to bring down the latest version of Repo with all its most recent bug fixes

```
$ repo init -u https://github.com/CyanogenMod/android.git -b  
cm-12.1
```

Downloading and waiting

It is time! Run command below (depending on your networking speed to initiate the long wait of syncing!)

```
$ repo sync -j{Total of CPU threads}
```



Exploring the Source



Directory tree

- build/
- bootable/
- devices/
- frameworks/
- kernel/
- out/
- packages/
- vendor/

A stylized illustration of a white rocket with blue fins and a blue circular window, launching upwards and to the right. The rocket has a red and orange flame trail. The background is a dark blue space filled with small yellow stars. On the left, a large, pale yellow moon with brown spots is visible. On the right, a large orange sun is partially shown. In the bottom left corner, the curved horizon of the Earth is visible, showing green land and blue oceans. The text "Live demo" is written in a white, sans-serif font in the center-left area.

Live demo



Building the System



Building the System

Initialize the environment with the envsetup.sh script

```
$ . build/envsetup.sh
```

Then, you choose your specific device configuration by command

```
$ lunch
```

Or simply by

```
$ brunch <vendor_name>_<product_name>-<build_variant>
```

Build type

Buildtype	Use
user	limited access; suited for production
userdebug	like "user" but with root access and debuggability; preferred for debugging
eng	development configuration with additional debugging tools

Known issues



FAQ – Common question

- Can I build on Virtual Machine?
- Why build CyanogenMod yourself?
- Where can I find sample source code?

What are your question?

Where do I get started?

- Android Open Source Project <https://source.android.com>
- Check TekCafe Forum on <http://tekcafe.vn/>
- Sample for devices? Search on <https://github.com/>

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