



Mobile & Embedded Computing Lab

*An introduction to*

# *Android system development*

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# Outline

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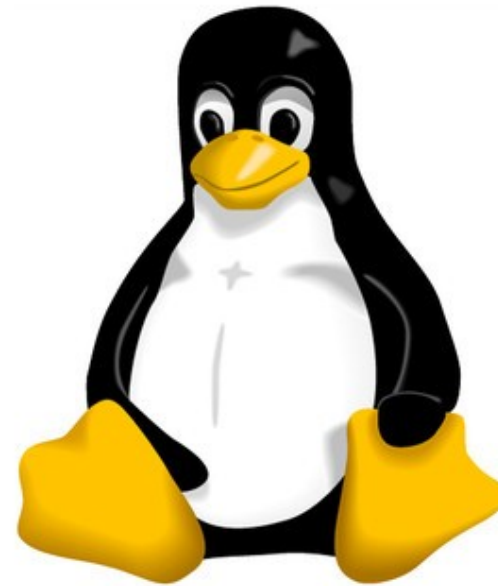
- Linux Vs Android
- Android Boot Process
- AOSP (Android OpenSource Project)
- Open Hardware
- Cubieboard



# *Linux Vs Android*

# Linux

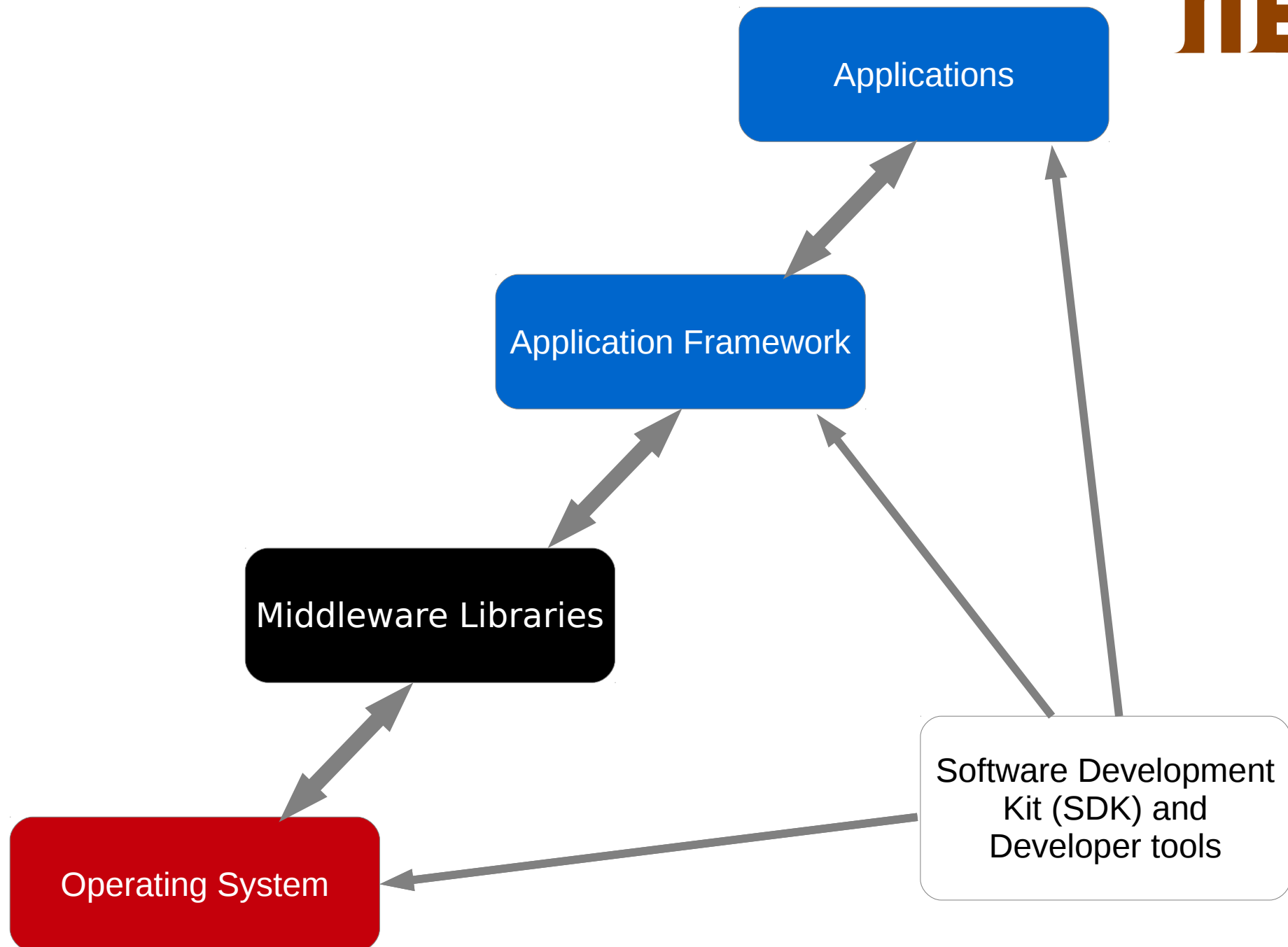
- Linux Kernel
- Glibc
- Other Libraries
- X-Server
- X-Client
- Application Tool-Kits
- Applications



# Android

- Linux Kernel
- Android Patches
- Bionic Libc
- Other Libs
- Dalvik Vm
- Application Framework
- Applications



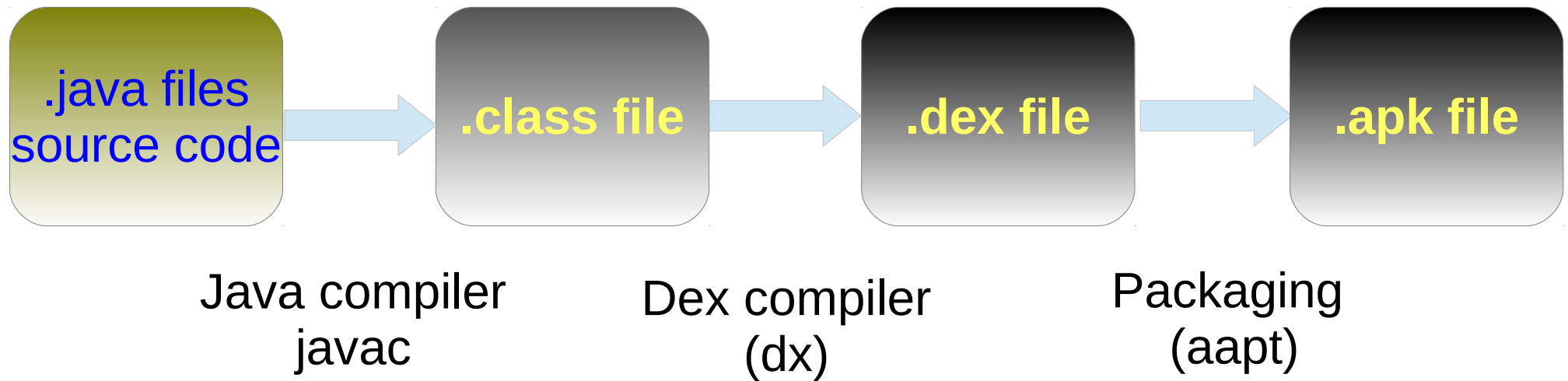


# Dalvik Vm

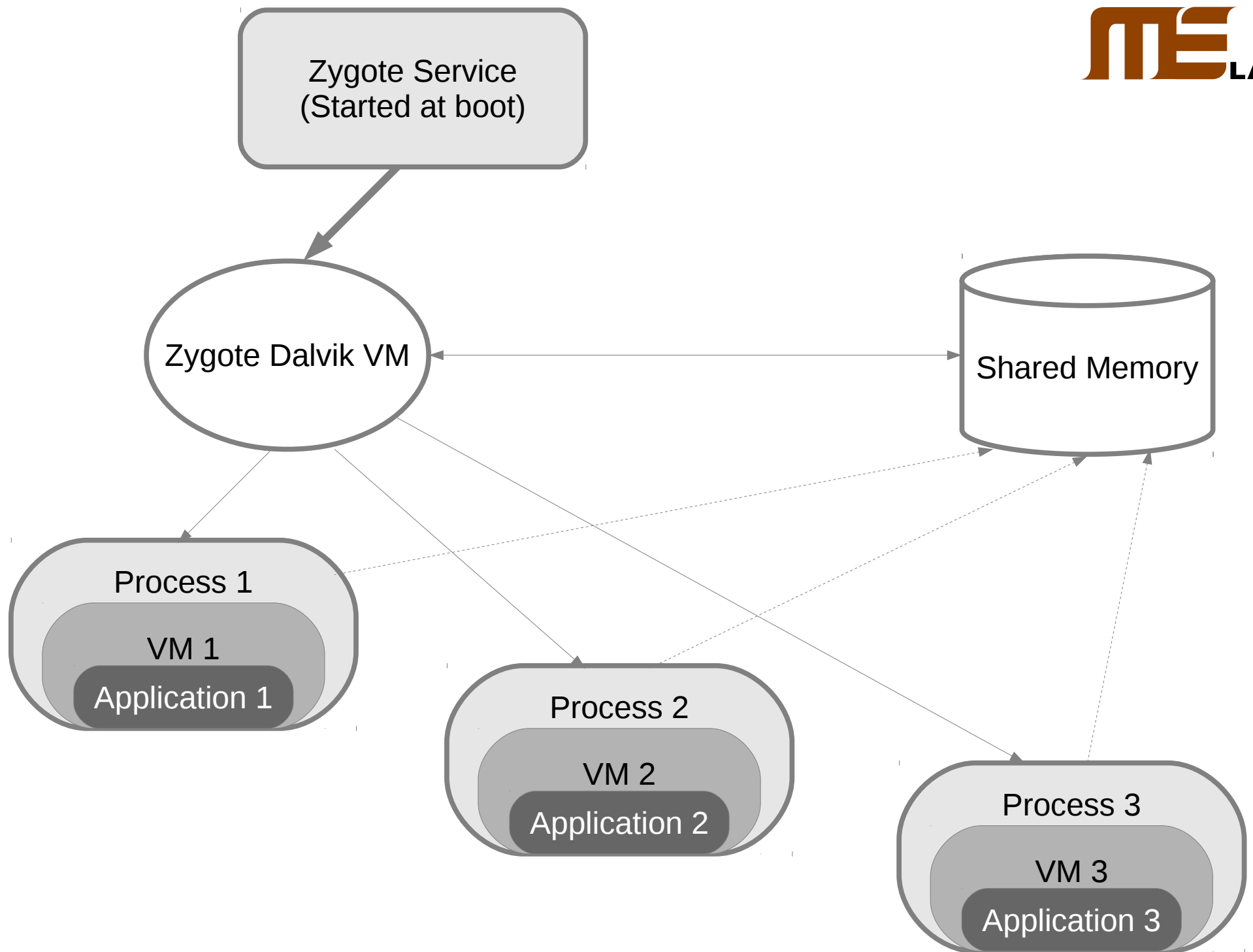
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- Process Virtual Machine
- The software that runs the apps on Android devices
- It's fast, even on weak CPUs
- it will run on systems with little memory
- it will run in an energy-efficient way

# Compiling & packaging









# *Working With Source (AOSP)*

# Major Components



- Bootloader
- Linux Kernel
- RootFs
  - Bionic
  - OSS packages
  - Dalvik
  - Hardware Libraries
- GNU tool chain

# Getting the source tree



- Location:

`http://android.git.kernel.org/`

- Get “repo”:

```
$ curl http://android.git.kernel.org/repo > ~/bin/repo
```

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

- Fetch the AOSP:

```
$ repo init -u
```

```
https://android.googlesource.com/platform/manifest  
-b
```

```
android-4.0.1_r1
```

- `$ repo sync`

# Interacting with Android Devices

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Android has very nice tools to interact with the devices

- Fastboot
- ADB

“fastboot” is a diagnostic protocol to modify the flash filesystem via a USB connection from host computer.

- Fastboot operations
  - Install kernel
  - Install new flash image
  - Boot directly from host
  - format - Format a specific partition. The file system of the partition must be recognized by the device.
- Very useful for test automation

## Android Debug Bridge

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- Android Debug Bridge
- ADB is a toolkit included in the Android SDK package
- Tool for all kinds of target interactions (install, logging, remote shell, file copy)

shell [<command>]

push/pull

Logcat

install/uninstall

# **How to Start with**



# Open Hardware

Opensource - “A key to your Future”

## **OpenSoftware**

A software whose original source code is made freely available and may be redistributed with or without modification

## **OpenHardware**

Is hardware whose design is made publicly available so anyone can study, modify, distribute, make and sell the design or hardware based on the design

# Open Hardware Movement



**Ardunio**



**TI's Beagle/Panda boards**



**RPi**



**Cubie board**



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# Thank You

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