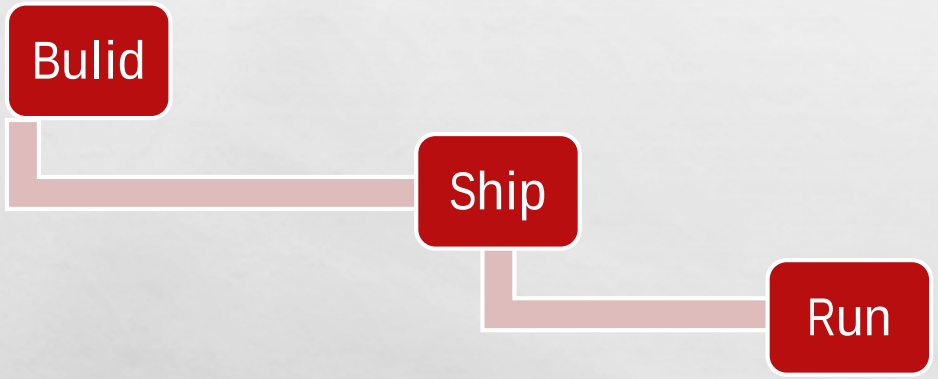
DOCKER ENGINE SERVICES IN ANDROID OS

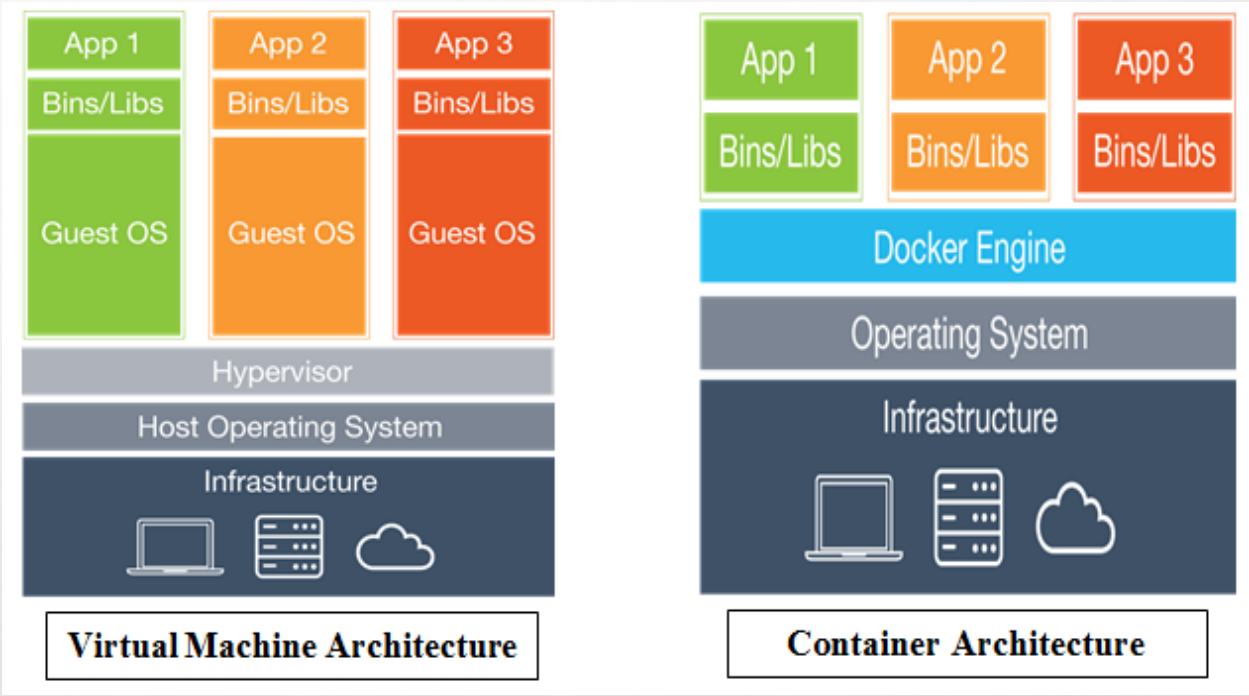
(2.69)	USAMA BIN MASOOD	(CS-071)
(2.60)	JASIM AHMED	(CS-044)
(2.60)	MUHAMMAD HUMMAD	(CS-055)
(2.60)	AMRAT KUMAR	(CS-069)

HIGH PERFORMANCE COMPUTING CENTER

Introduction

- In 2008 Linux Containers introduced
- DotCloud released Docker as open source project
- Application Capsulization
- 1000's on a host in a LXC
- less resource and more lightweight

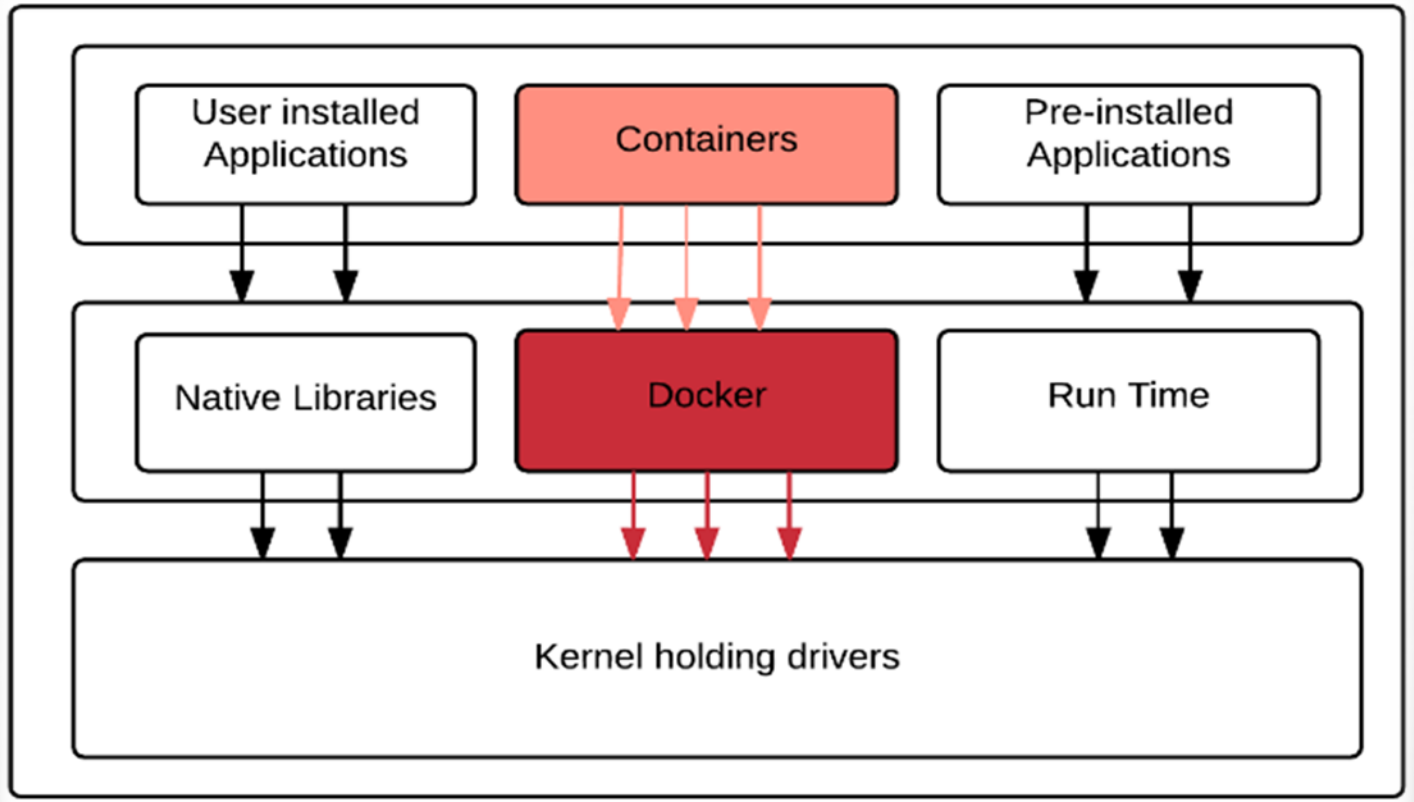




(THE RESEARCH AND IMPLEMENTATION OF CLOUD COMPUTING PLATFORM BASED ON DOCKER, DI LIU1, LIBIN ZHAO1)

Project Review

BUILD



RUN

SHIP

HIGH PERFORMANCE COMPUTING CENTER

Project Distribution

- Android as a container
- Debian as virtual Machine
- Build Docker via Android ADB
- Build Docker alongside Android Kernel

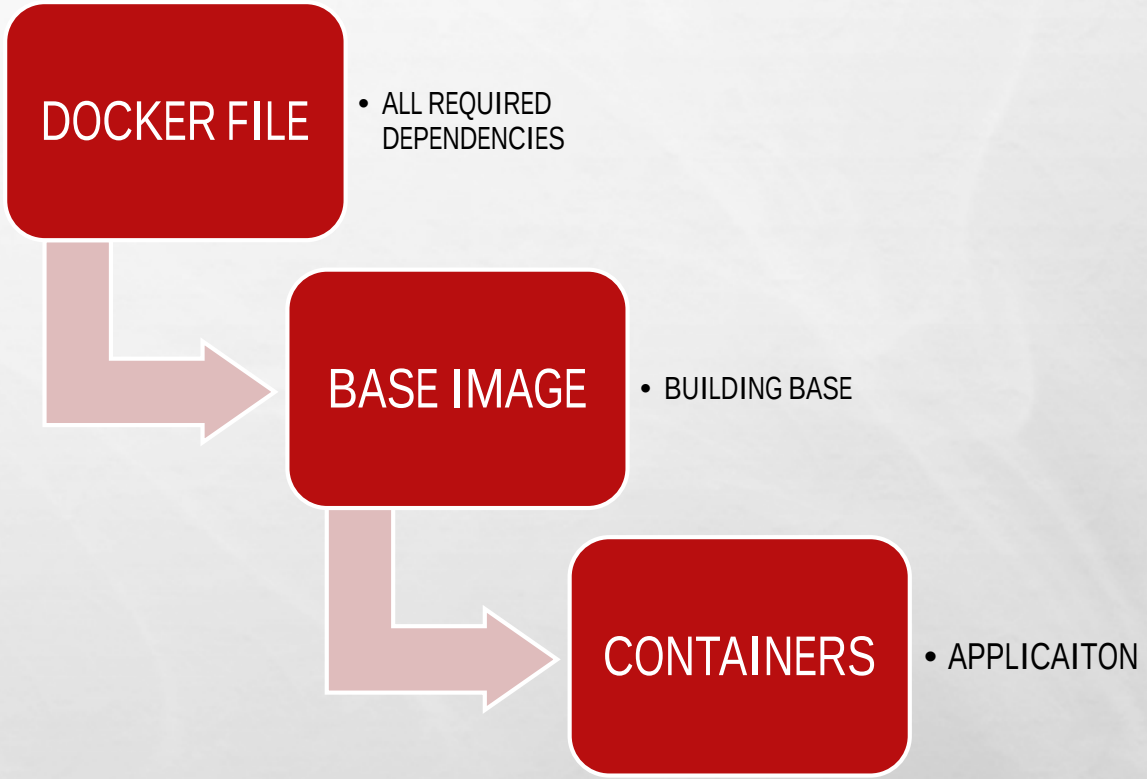
Android as a container

ANDROID BUILD & HARVEST

- Creating build environment
  - Choosing source code to compile.
- Setting up linux environment
- Downloading the source
  - Source Code is managed by git repository. For downloading it we need repo tool.
- Downloading android source tree
- Preparing the build
  - Setting up environment and target to build.
- Build the code
- Run it

DOCKER CONTAINERS AND BASE IMAGES

- BASE IMAGE TAKE SERVICES FROM DOCKER ENGINE
- DOCKER FILE CONTAIN ALL THE DEPENDENCIES
- BASE IMAGE IS BUILD FROM FROM DOCKER FILE
- OVER BASE IMAGE CONTAINERS WORKS AS OUR APPLCATION
- EVERY CONTAINER CAN ACT AS SEPARATE INSTANCE OF THE APPLICATION

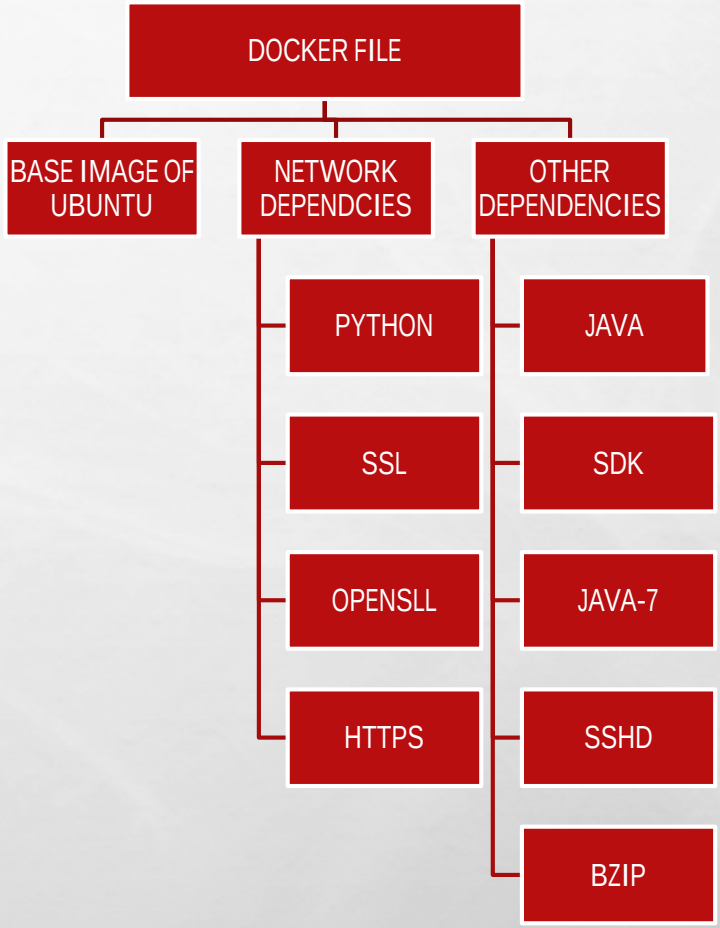


BUILDING ANDROID BASE IMAGE FOR APPLICATION

Container port & host

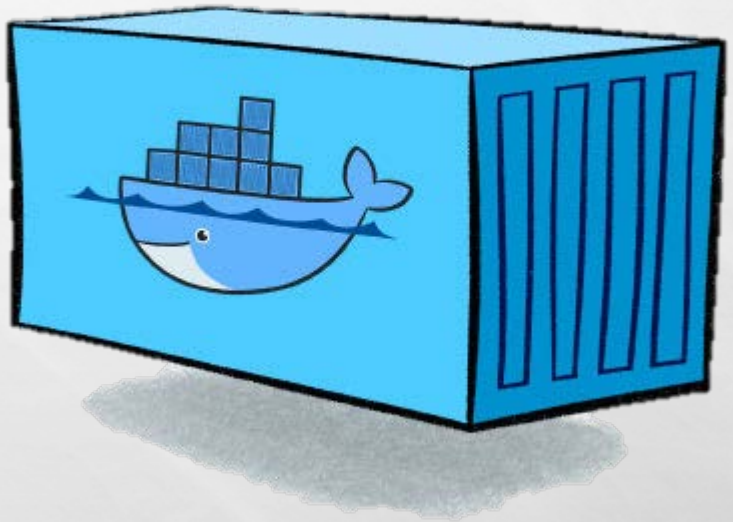
~ Runtime Dependencies for Docker
~ Firewall bypass
~ SSL and python compatible
~ Build Android Version
~ Run Emulator with Device

Emulator



Containers

- Web Service
- Web Page
- Emulator
- Apache Web Server
- AWS Beanstalk
- Ghost
- Artifactory
- ElasticSearch
- Odoo
- RabbitMQ

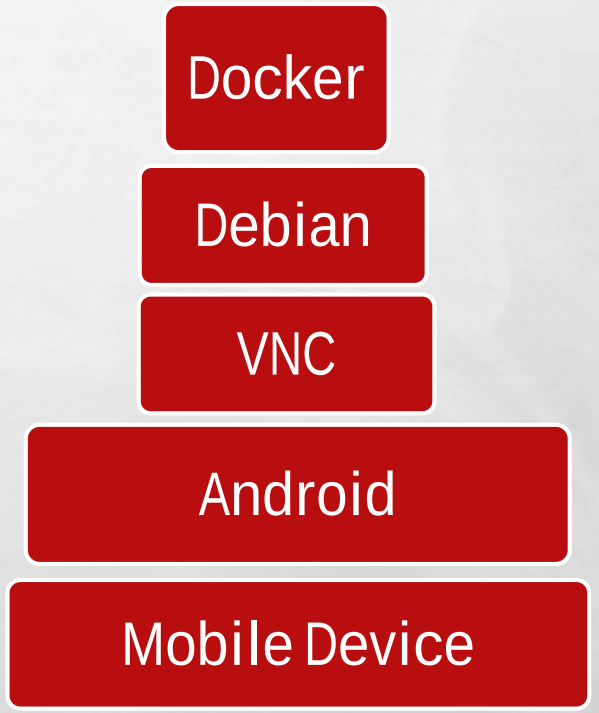


Debian as virtual Machine

HIGH PERFORMANCE COMPUTING CENTER

Initializing

- Purpose
  - Motivation
  - Merits
  - De-merits
- Creating Environment
  - Pre-requisites
  - System Apps
  - Pre-cautions



Installation

- Importing VNC
- Installation of Debian over emulator
  - Linux Deploy
  - Limbo PC Emulator
  - Linux Installer
  - Linux Virtual Image

Build Docker via ADB

HIGH PERFORMANCE COMPUTING CENTER

ADB

- (NDK) Native Development Kit
- ADB Shell
- Developer access
- Root Access

Building Dependencies

- Collecting Tarballs
- Resolving tree Dependencies
- Creating Environment Variables
- Unpack
- Configure
- Configure failed
- Edit Script
- Re-configure
- Make
- Make failed
- Change Make Script
- Make succeed/failed

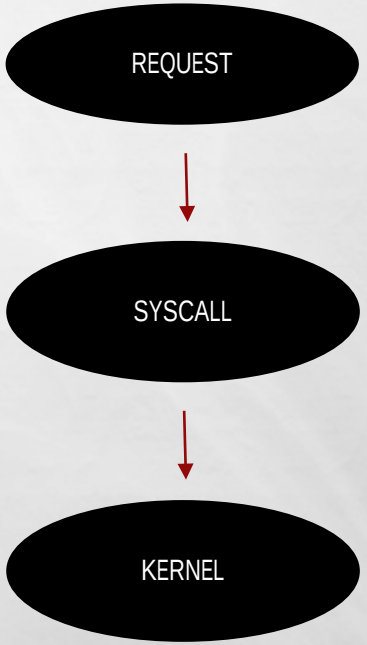
Build Docker alongside

Android Kernel

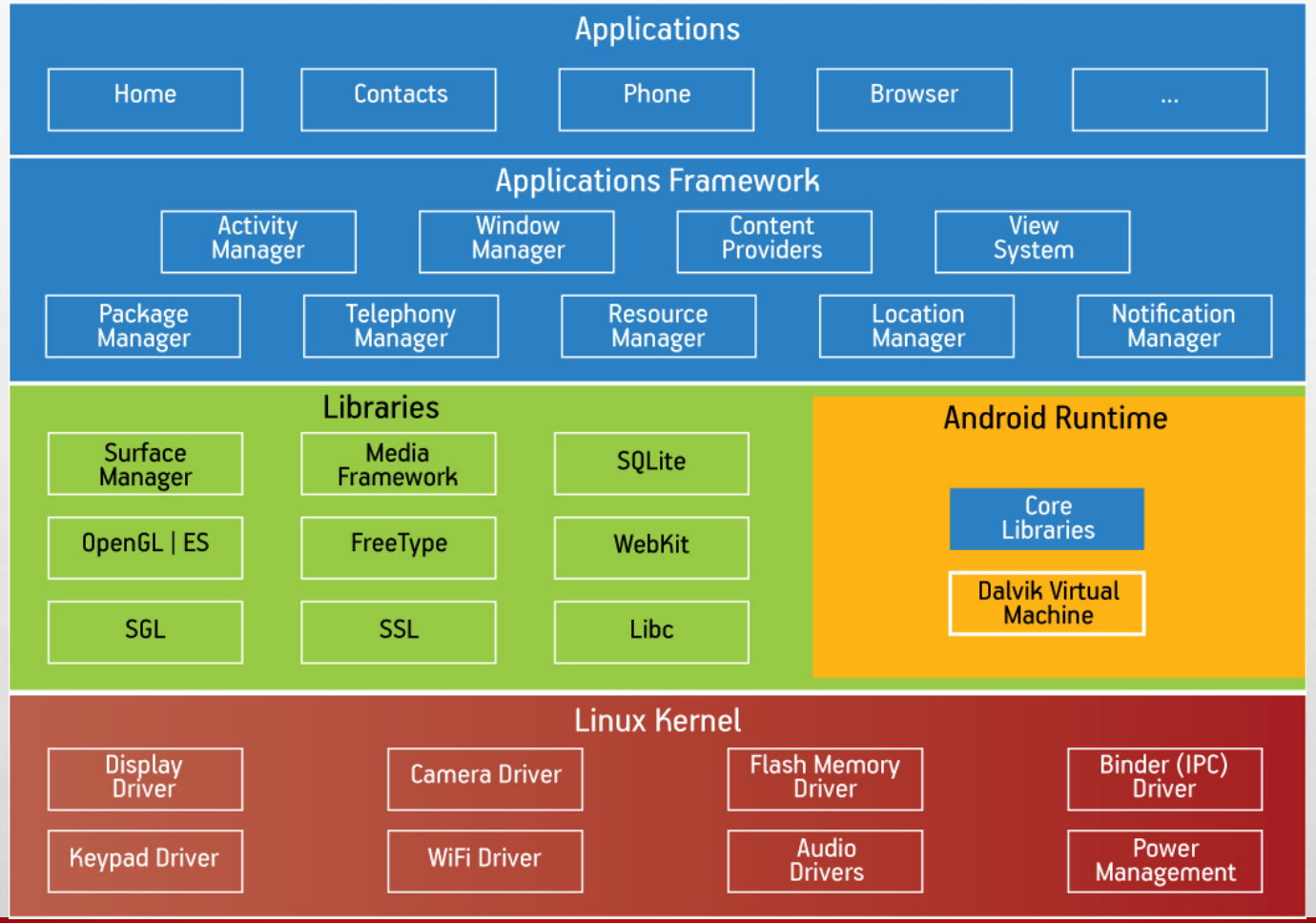
HIGH PERFORMANCE COMPUTING CENTER

ANDROID KERNEL BUILDING ALONG SIDE DOCKER ENGINE

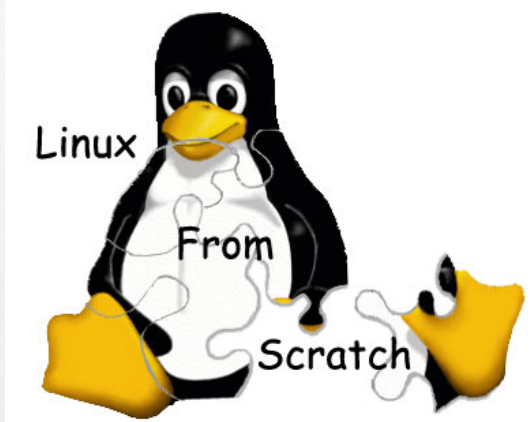
- WHAT IS THE DIFFERENCE BETWEEN ANDROID KERNEL AND LINUX KERNEL ?
  - BOTH ARE ALMOST SAME.
  - ANDROID APPLICATION USES THE RESOURCES OF LINUX KERNEL.
- WHAT IS LXC AND LIBCONTAINER ?



ANDROID ARCHITECTURE

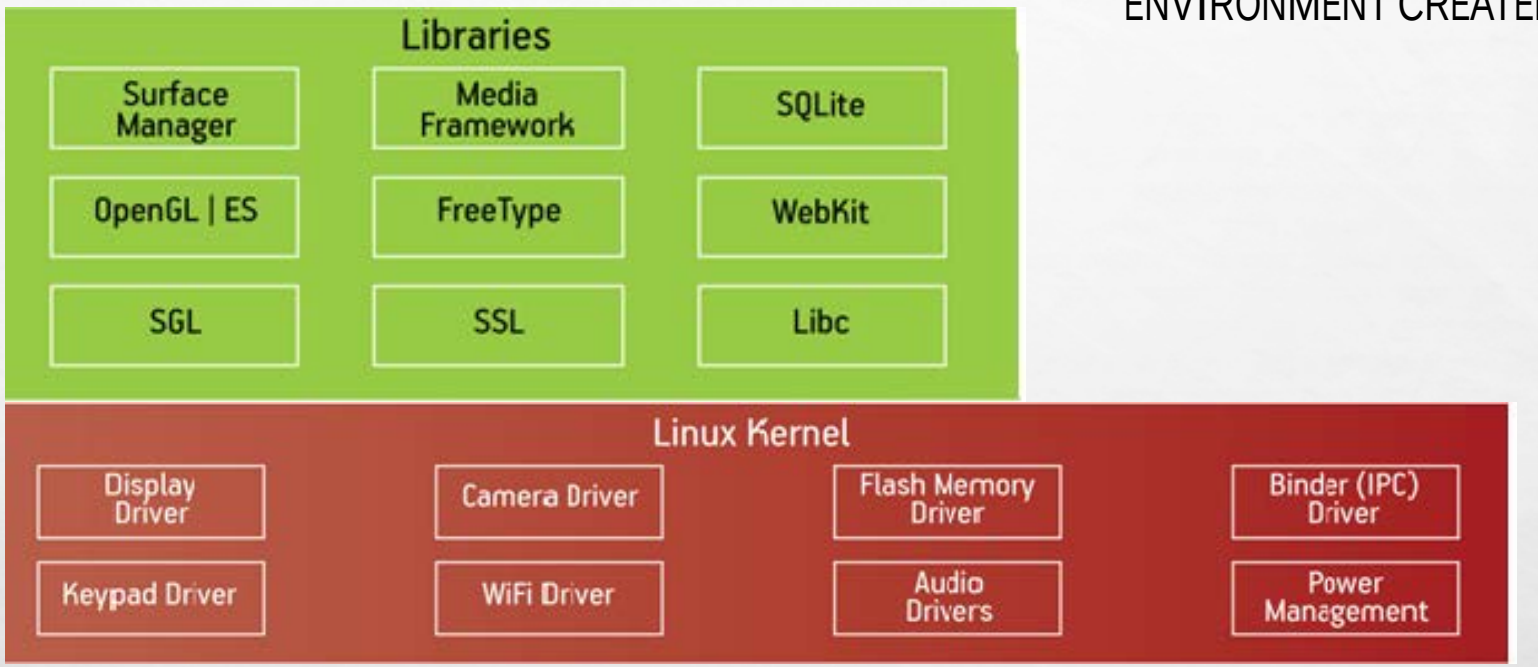


BUILD OF LINUX ENVIRONMENT



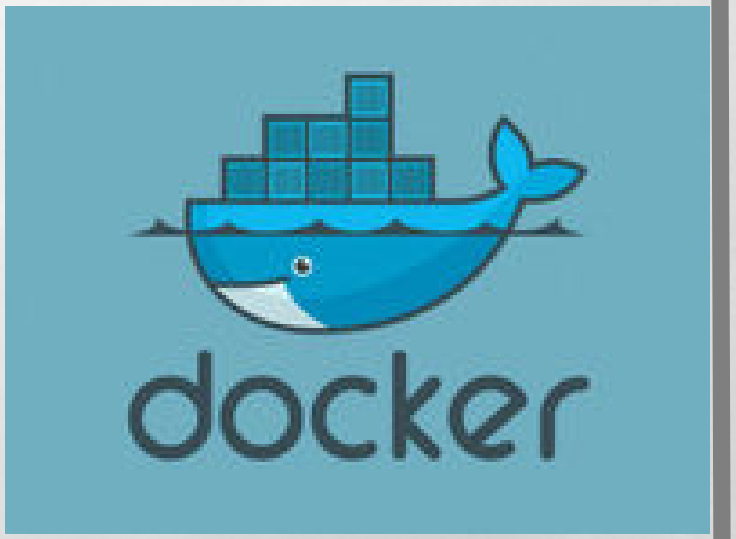
- LINUX KERNEL BUILDING
  - BUILDING ENVIRONMENT
  - UNPACKING THE LINUX PACKAGES
  - GAINING ACCESS TO THE CHROOT ENVIRONMENT
  - INSTALLING THE SYSTEM SOFTWARE
  - RESOLVE DEPENDENCIES IN REVERSE ORDER
  - SOLVING SYSTEM PROBLEMS
  - BUILD THE KERNEL WITH ITS NECESSARY REQUIREMENTS
  - TESTING OF THE LINUX KERNEL

ENVIRONMENT CREATED !!



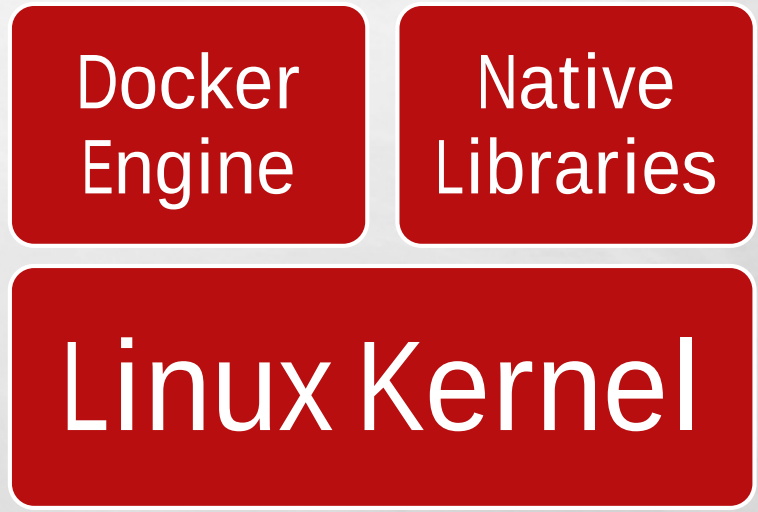
UNPACKING DOCKER ENGINE INTO THE LINUX KERNEL ENVIRONMENT

- Buildtime dependencies
- Runtime dependencies
- Resolving passive dependencies



BUILDING ANDROID KERNEL IN THE ENVIRONMENT CREATED

- Building android kernel
- Enabling the necessary configuration for docker engine.
- Testing the kernel



THANK YOU