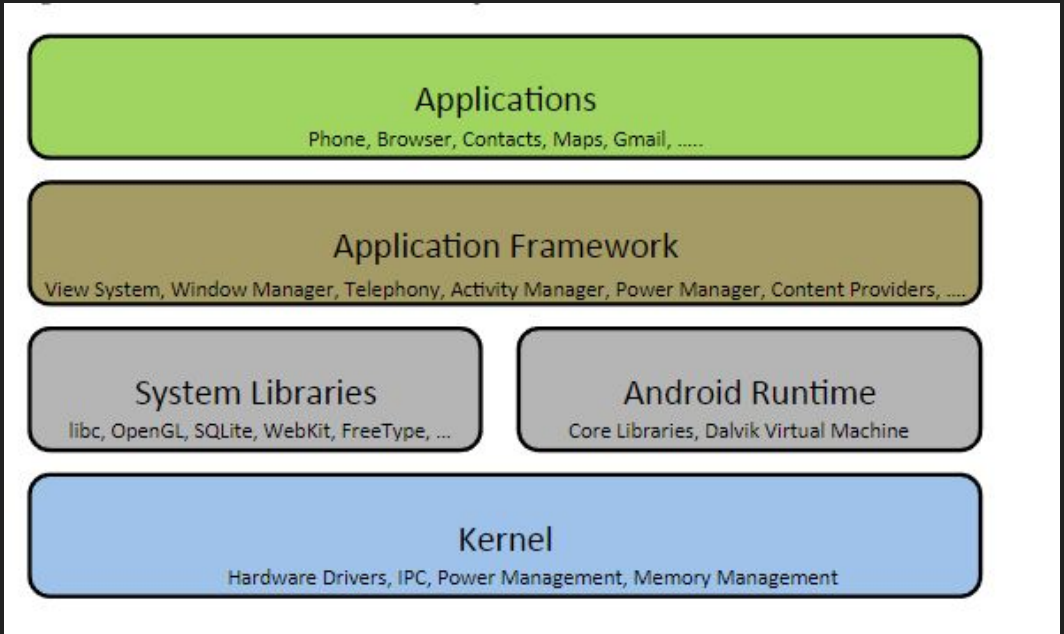
Android Platform Architecture

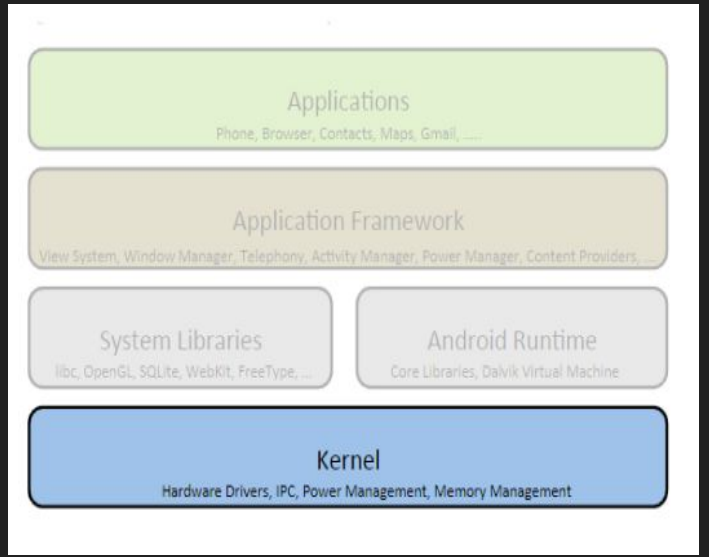
Beneath the surface

Platform Architecture

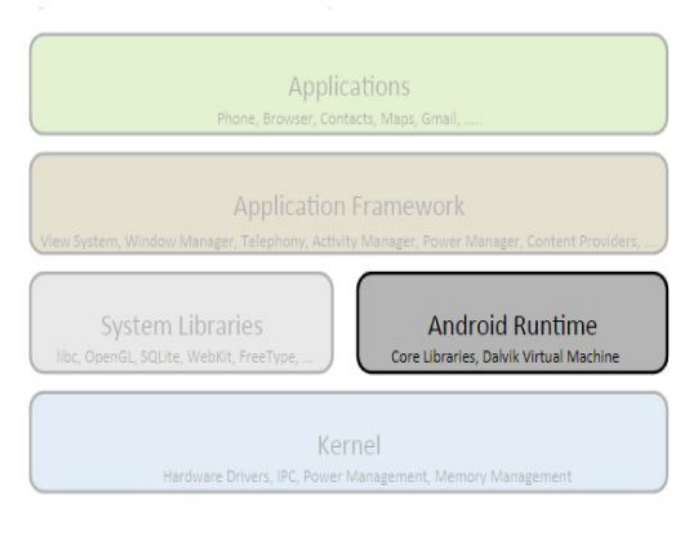


The Kernel

- The Kernel is based on 2.6V of the Linux Kernel.
- Contains the HAL-Hardware Abstraction Layer, components for memory management and IPC .
- YAFFS2-Yet Another Flash File System 2- Solid State flash based storage
- WakeLocks-Force a device from going into low power state . This increases responsiveness and UX.
- Binder- proprietary mechanism for inter-process communication and remote method invocation
- Kernel kills processes that runs low on memroy.



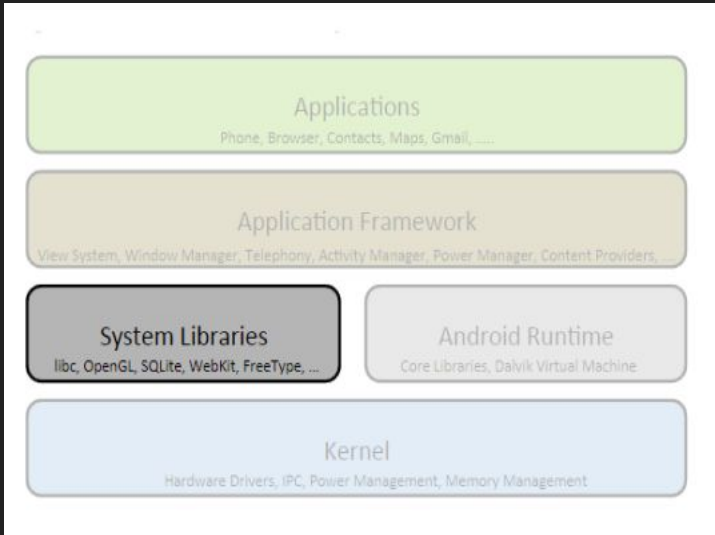
Android Runtime



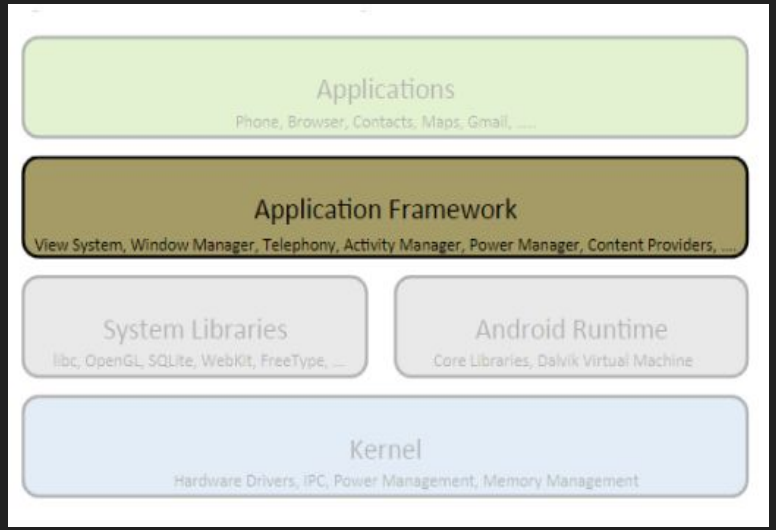
- Dalvik Virtual Machine
- Dalvik runs on top of Kernel and uses it for low-level functions such as multithreading and memory management.
- Android files (JAVA) are converted into JVM compatible .class files
- Absence of AWT(Abstract Window Toolkit) and Swing libraries
- JVM .class->Dalvik Executable .dex , executed by DVM
- DVM includes JIT (Just in time) to improve performance.
- Sandbox Environment

System Libraries

- Provides libraries in C/C++ accessible through Application framework.
- FreeType-Font rendering, SQLite ->database compatibilities,openGL-> 2D and 3D rendering
- LibWeb-Core provides webKit based browser engine embedded as webview (stock android browser)
- The Android Media Library->Image and other multimedia content.



Application Framework



View Class

- Android Application Framework provides a high level API for application developers to take advantage of the various capabilities of the platform
- View System-View Object
- Widgets->derived from view class
- Custom Widgets
- All views in the window are stored in a XML file

Content Provider

- Allows access and sharing of data to other applications
- ContentResolver Interface-> Interface to share and request data
- Receives request , validates and pass it to specific contentProvider
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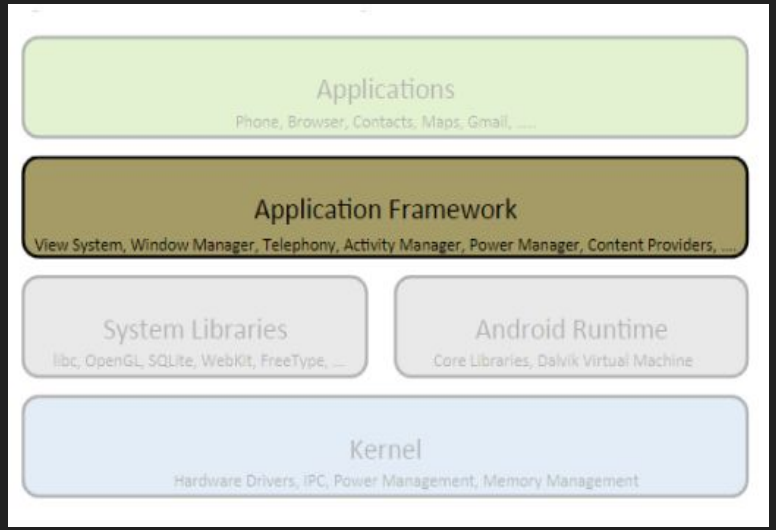
Application Framework



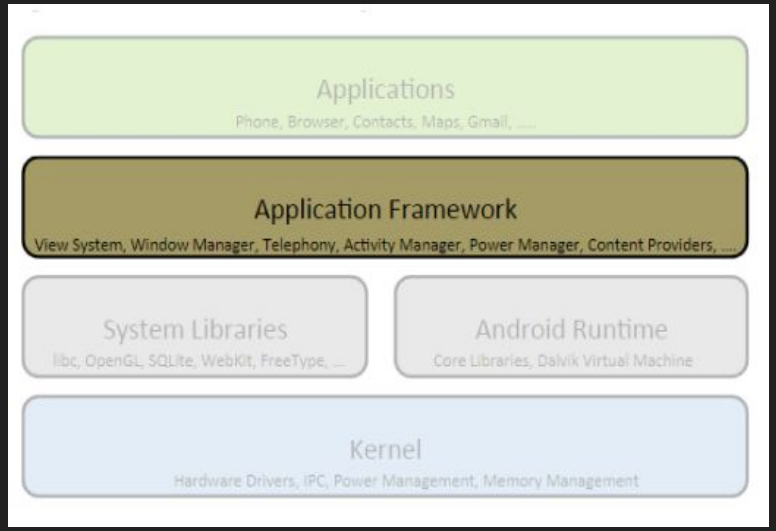
Notification Manager

- Notification Management System– Notification Manager class
- Allows icon, flashing LEDs, or backlight.

Android Resource Manager

- The Android Resource Manager provides a way to separate static resources from the application code
- Any resource is accessible within the code by addressing it using its package name, resource type and resource name in the following syntax: <package_name>.R.<resource_type>.<resource_name>

Application Framework



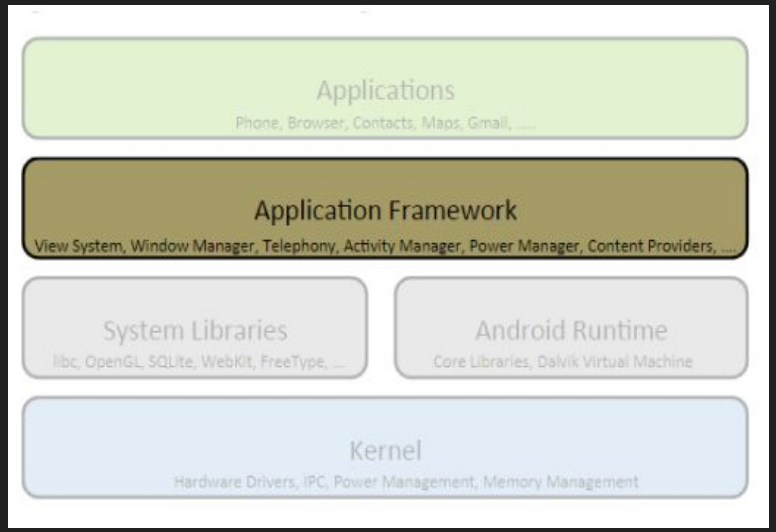
Location Manager

- Google maps support free high-quality turn-by-turn navigation which boosts a lot of map powered applications
- The LocationManager class provides access to the locationing services available on the device
- LBS(Location based service) not only location, but also triggers certain actions when in certain geographical locations
- GpsSatellite and GpsStatus

InputMethod Service

- Enables developers to implement their own custom software keyboards, keypads and even pen input.
- The input is then converted into text and passed on to the target UI element

Application Framework



Telephony Manager

- Ability to determine telephony services on the devices and access specific subscriber information
- Android supports both GSM and CDMA cellular technologies and applications can access information specific to these technologies depending on the device
- SmsManager allows applications to send data and text messages using SMS

Powermanager

- Ability to control the power state of the device using WakeLocks
- Makes sure that the UI is responsive even after inactivity
- Might lead to poor battery and power perfomance

Thank You