

Overview of Android: The OS Kernel Layer

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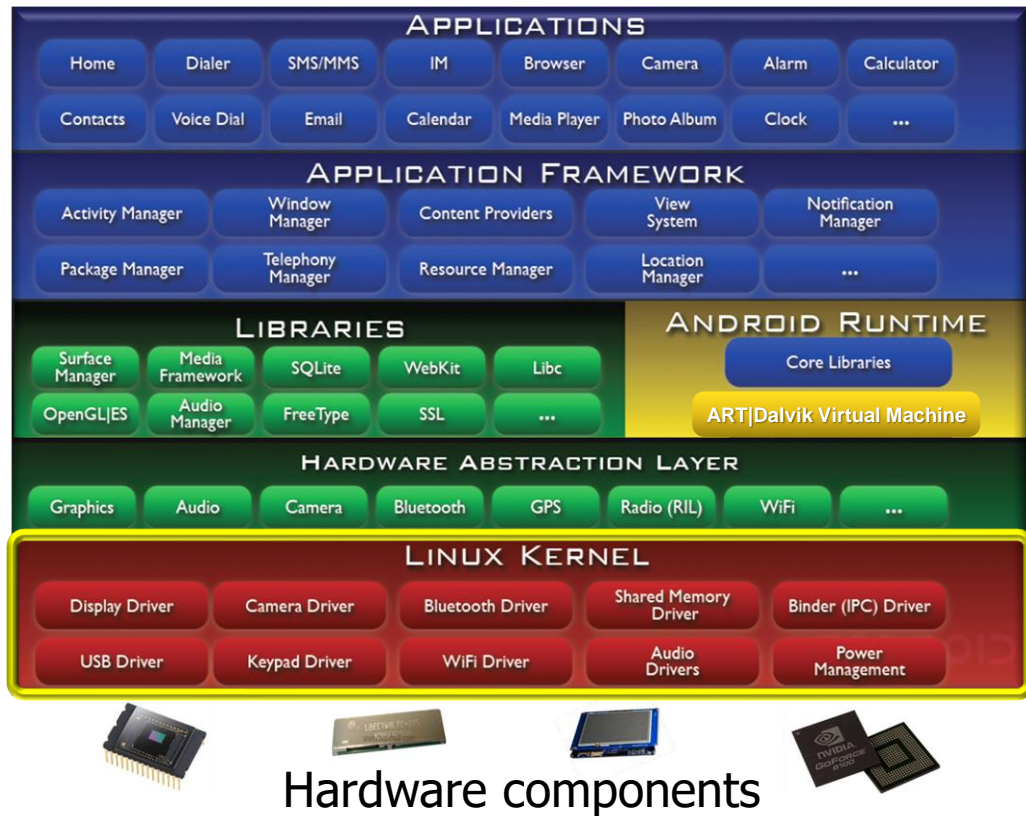
**Institute for Software
Integrated Systems**

**Vanderbilt University
Nashville, Tennessee, USA**



Learning Objectives in this Part of the Lesson

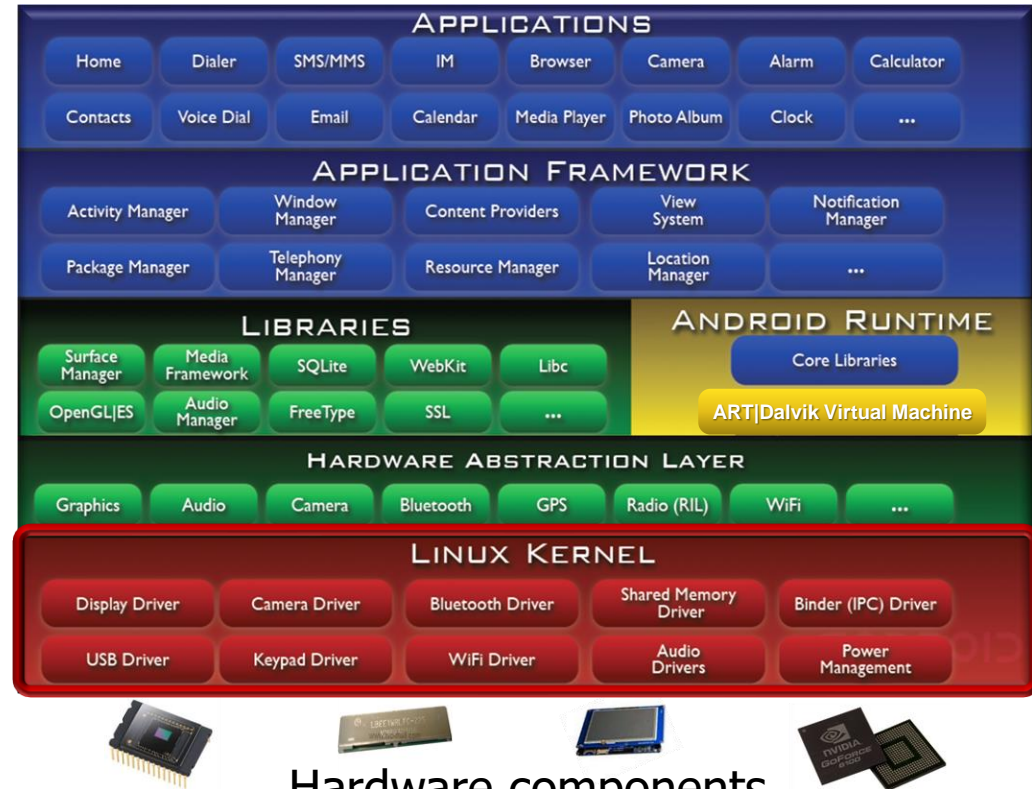
- Understand common hardware elements in Android
- Recognize key characteristics of the Android Linux kernel
 - e.g., its purpose & its extensions to GNU Linux



Overview of the Android Linux Kernel

Overview of Android Layers: Android Linux Kernel

- Android Linux is a variant of the GNU Linux operating system (OS) kernel



Hardware components

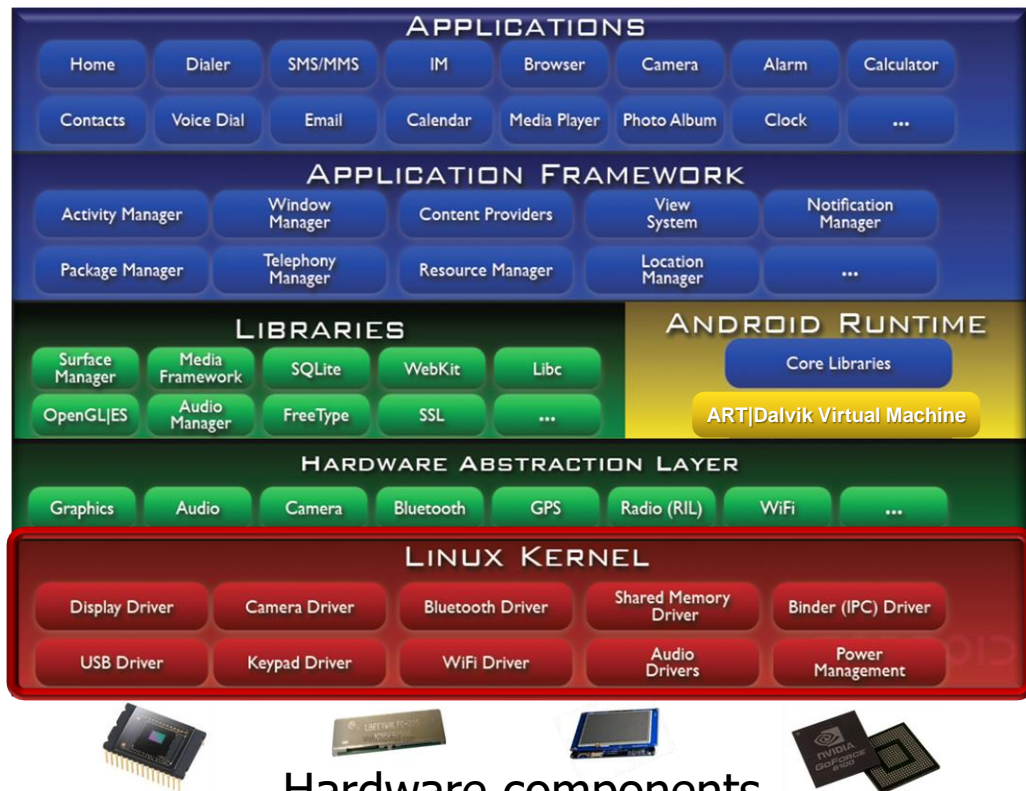
See en.wikipedia.org/wiki/Linux_kernel

Overview of Android Layers: Android Linux Kernel

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Android Linux kernel is written in C & ships separately from rest of Android platform stack

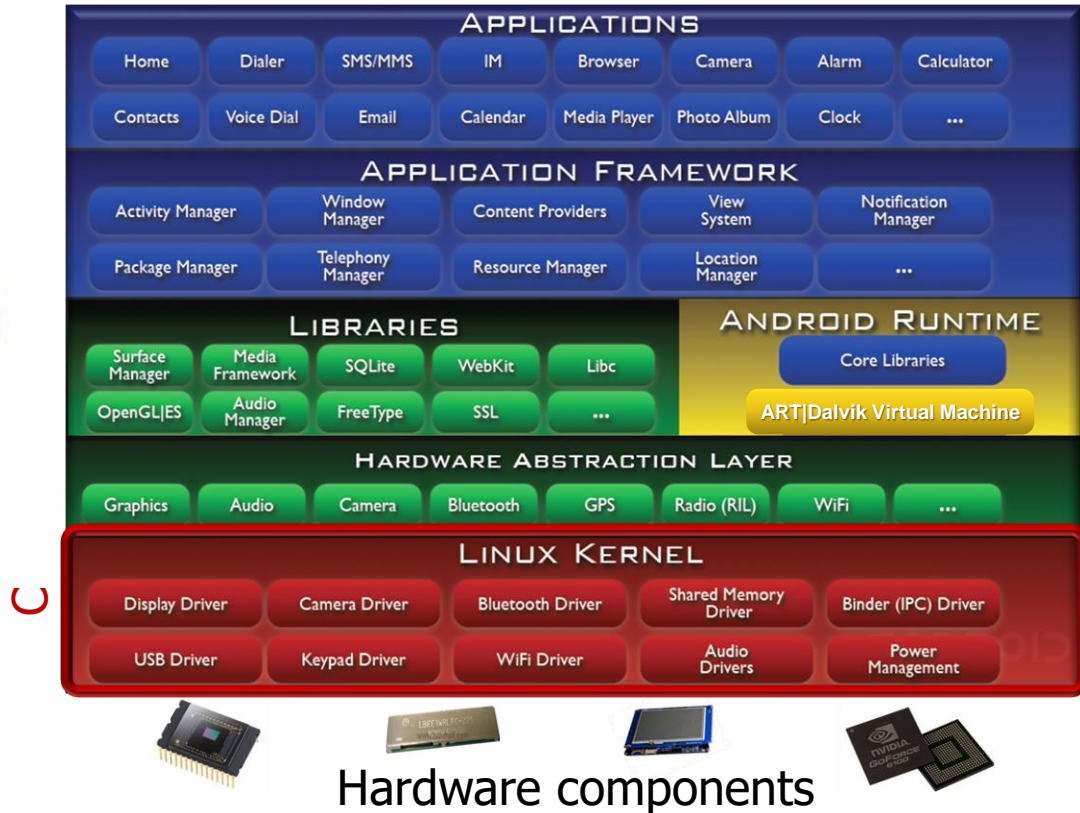


Hardware components

See source.android.com/source/building-kernels.html#downloading-sources

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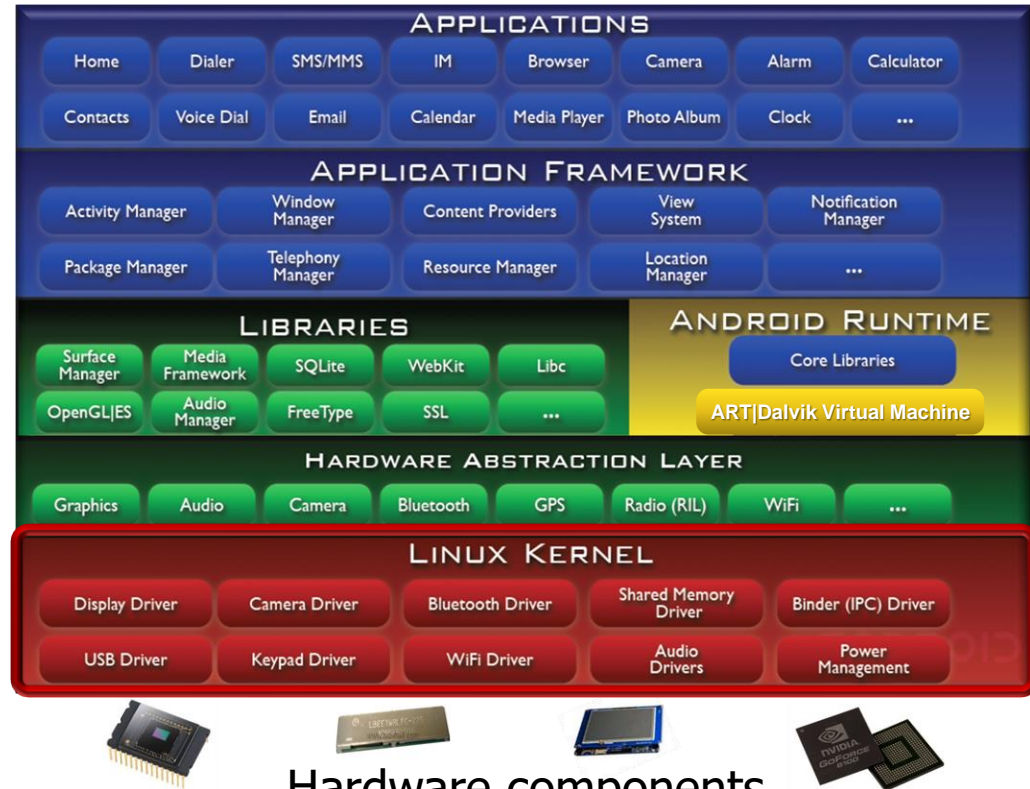
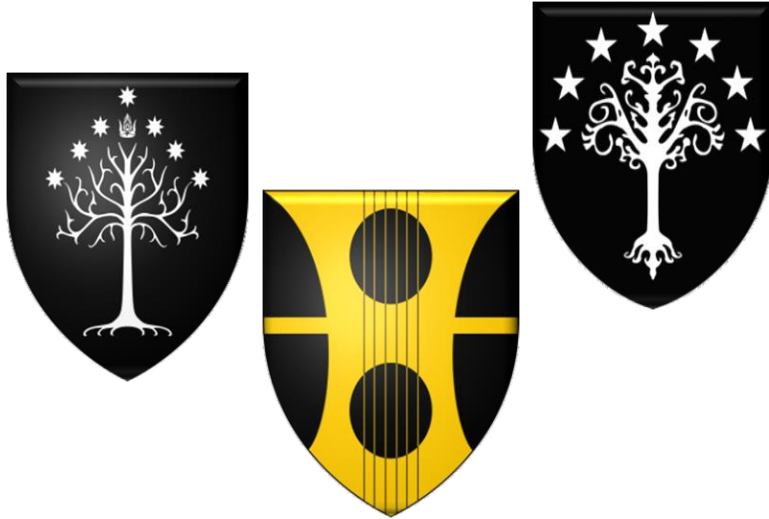
- Android Linux is a variant of the GNU Linux operating system (OS) kernel
 - Optimized to meet the needs of mobile devices & apps



See [en.wikipedia.org/wiki/Android_\(operating_system\)#Linux_kernel](https://en.wikipedia.org/wiki/Android_(operating_system)#Linux_kernel)

Overview of Android Layers: Android Linux Kernel

- Android Linux is a variant of the GNU Linux operating system (OS) kernel
 - Optimized to meet the needs of mobile devices & apps
 - Shields higher Android layers from hardware diversity

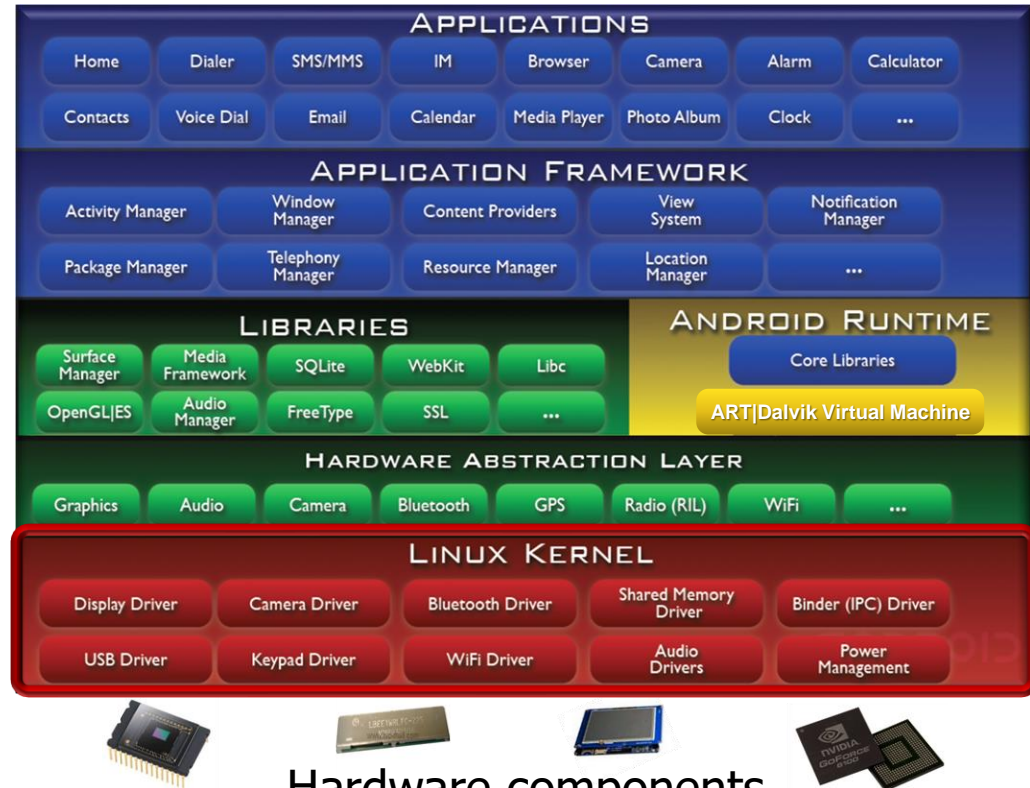
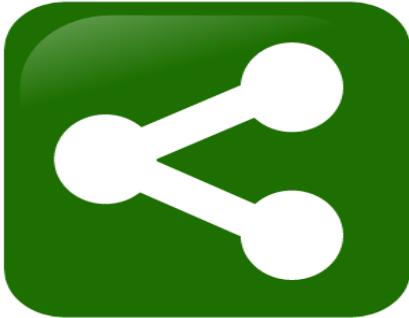


Hardware components

See en.wikipedia.org/wiki/List_of_Linux-supported_computer_architectures

Overview of Android Layers: Android Linux Kernel

- Android Linux is a variant of the GNU Linux operating system (OS) kernel
 - Optimized to meet the needs of mobile devices & apps
 - Shields higher Android layers from hardware diversity
 - Mediates access to—and sharing of—hardware resources

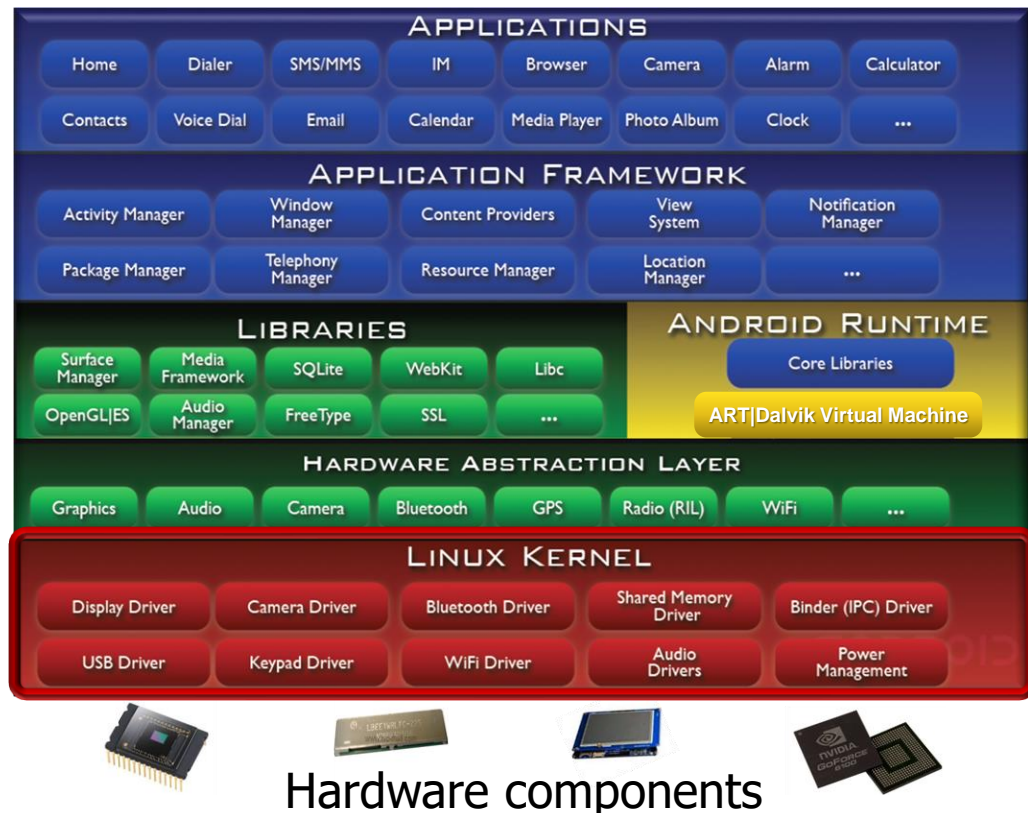
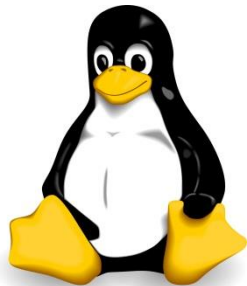


Hardware components

See [en.wikipedia.org/wiki/Kernel_\(operating_system\)#Functions_of_the_kernel](https://en.wikipedia.org/wiki/Kernel_(operating_system)#Functions_of_the_kernel)

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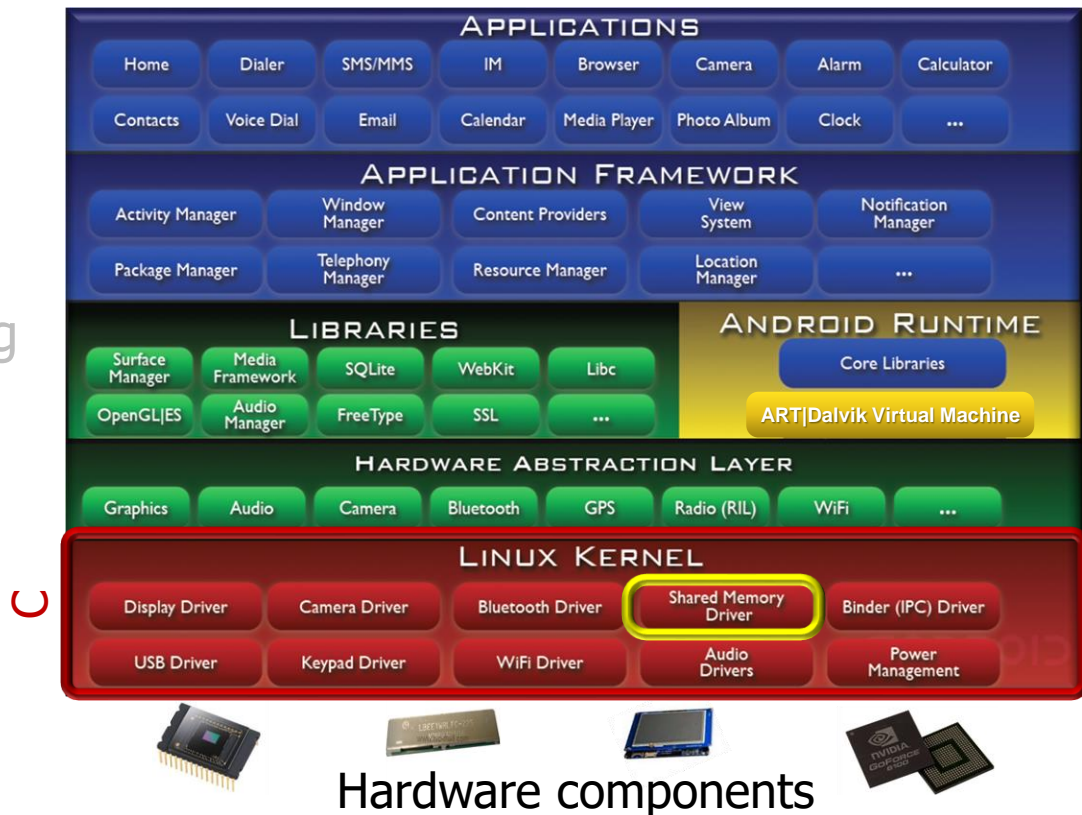
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- Extends GNU Linux



See elinux.org/Android_Kernel_Features

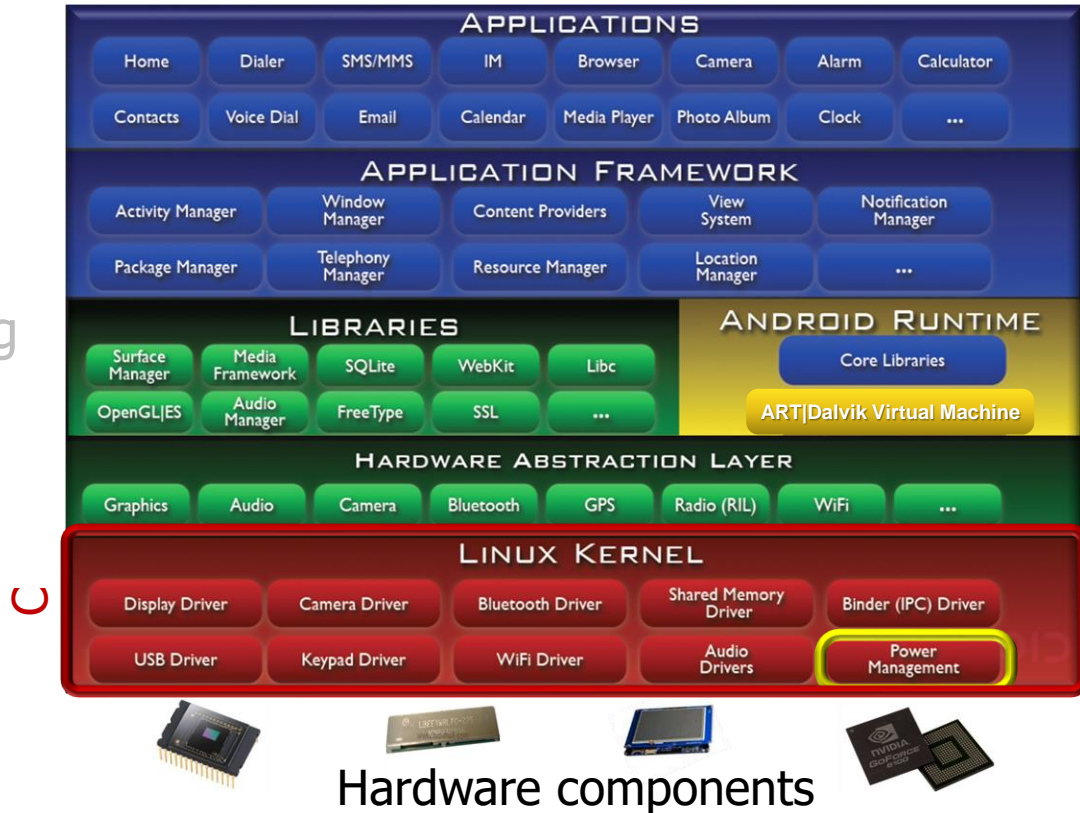
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 - Extends GNU Linux, e.g.
 - conserve memory



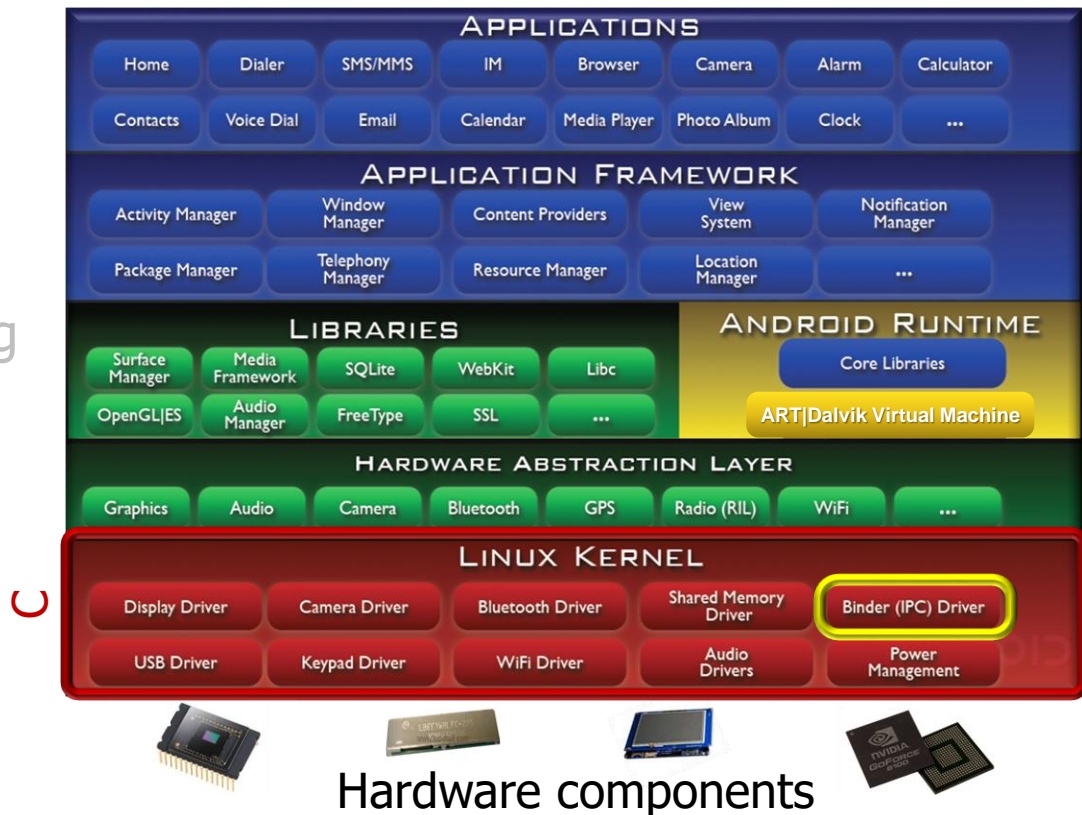
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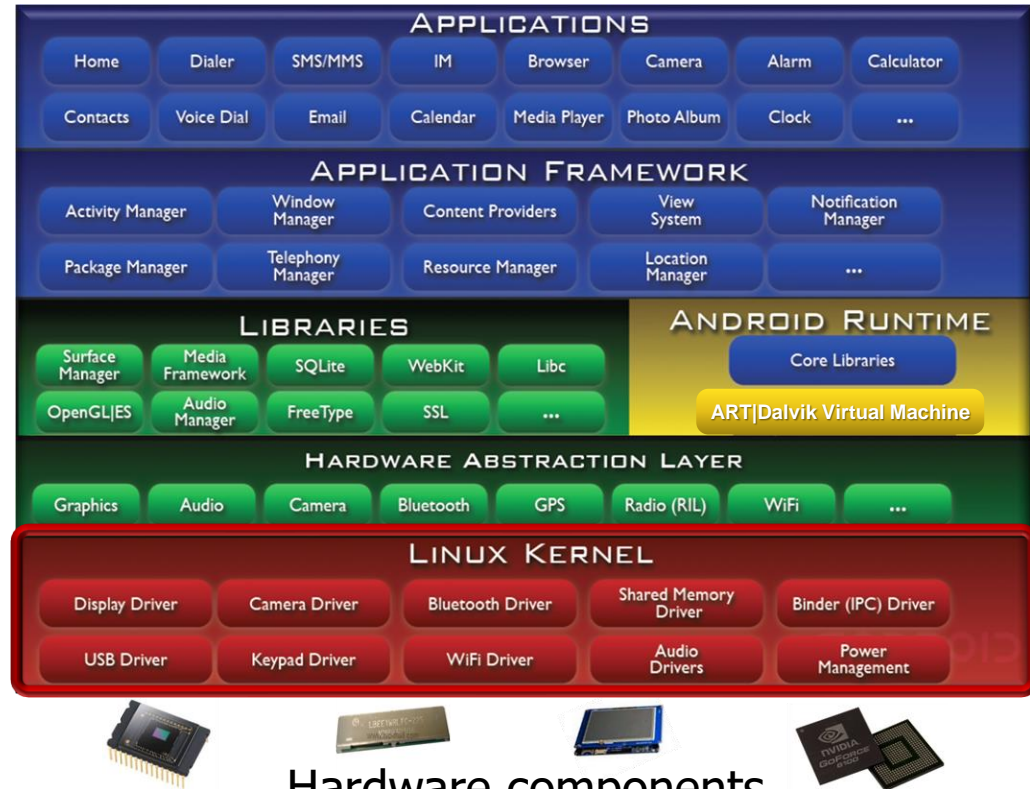
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 - manage power
 - accelerate communication



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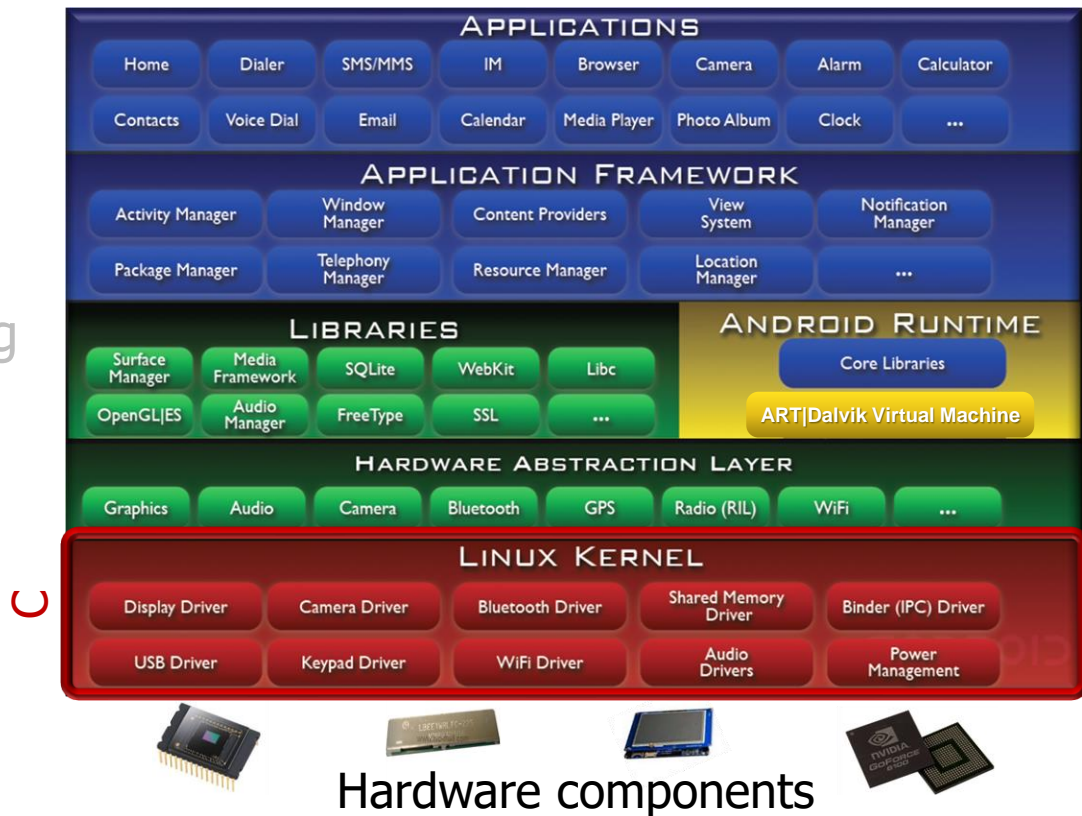
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See elinux.org/Android_Mainlining_Project

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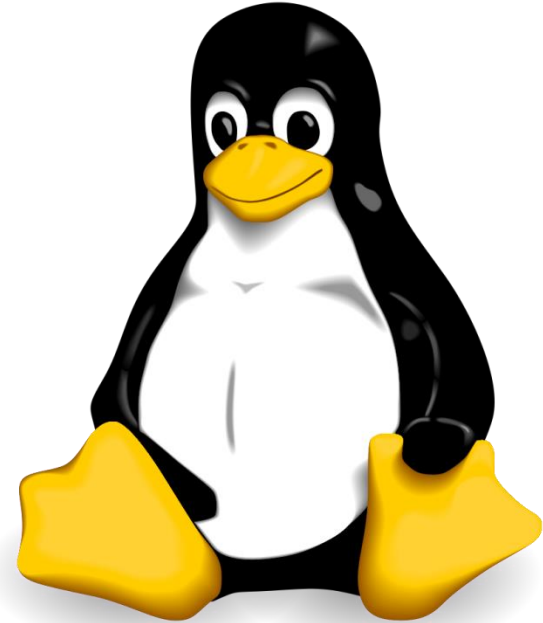


Overview of Android Layers: Android Linux Kernel

- The Android Linux kernel is a forked version of the GNU Linux kernel



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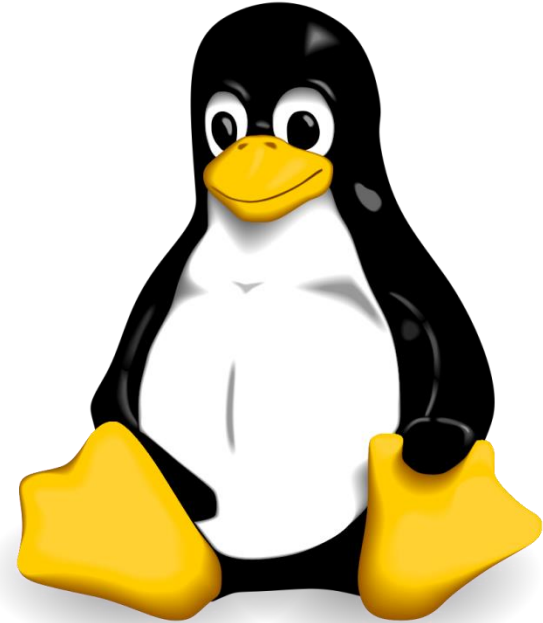
See [en.wikipedia.org/wiki/Fork_\(software_development\)](https://en.wikipedia.org/wiki/Fork_(software_development))

Overview of Android Layers: Android Linux Kernel

- The Android Linux kernel is a forked version of the GNU Linux kernel
 - It therefore isn't entirely compatible with the GNU Linux kernel



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However, Android Linux kernel offers familiar/robust capabilities for mobile apps

End of the Overview of Android: The OS Kernel Layer