

# Overview of Android: The OS Kernel Layer

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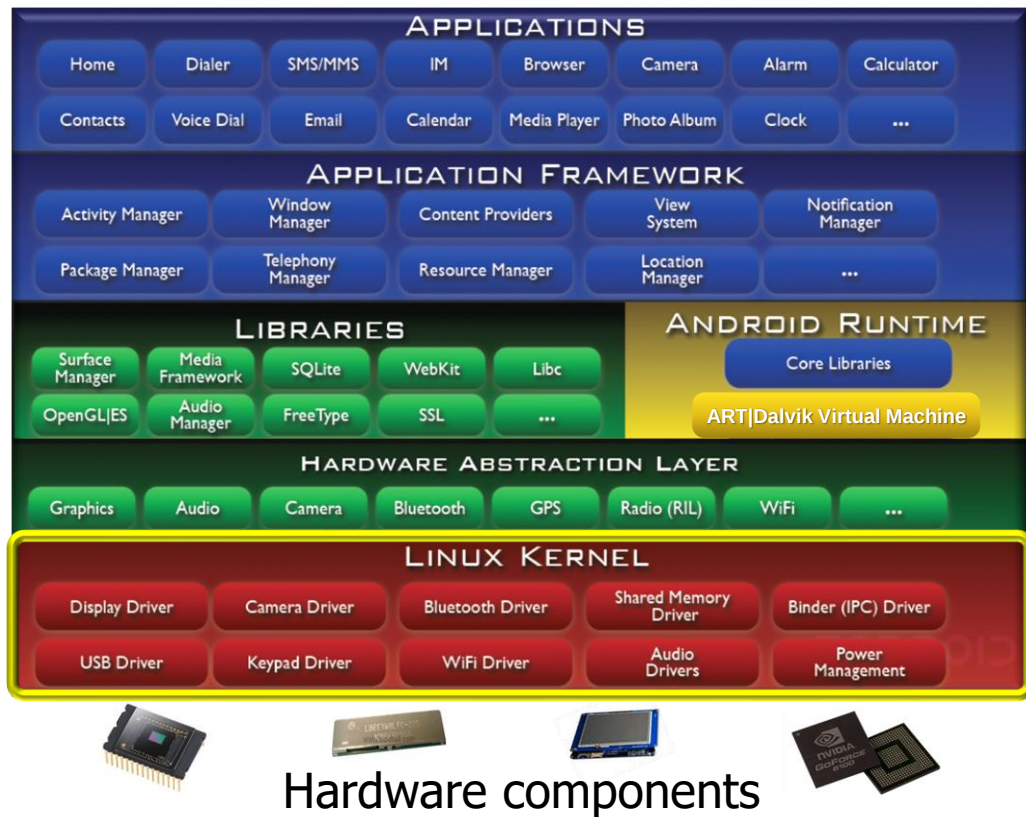
**Institute for Software  
Integrated Systems**

**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

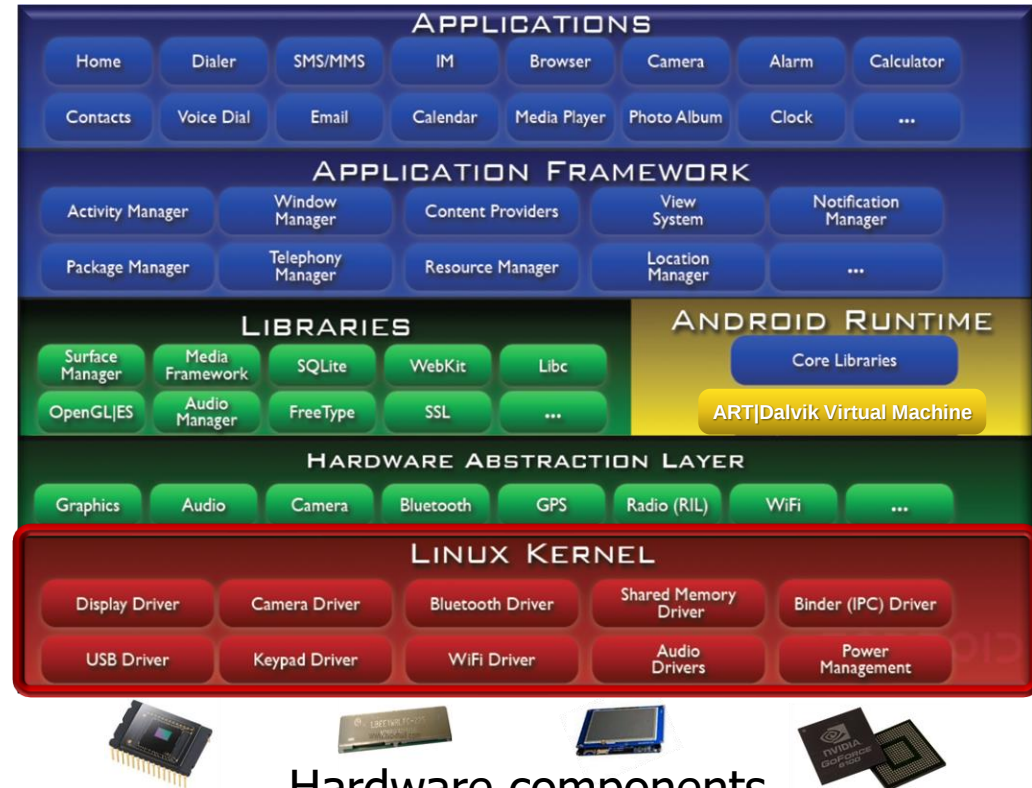


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# Overview of the Android Linux Kernel

# Overview of Android Layers: Android Linux Kernel

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



See [en.wikipedia.org/wiki/Linux\\_kernel](https://en.wikipedia.org/wiki/Linux_kernel)

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

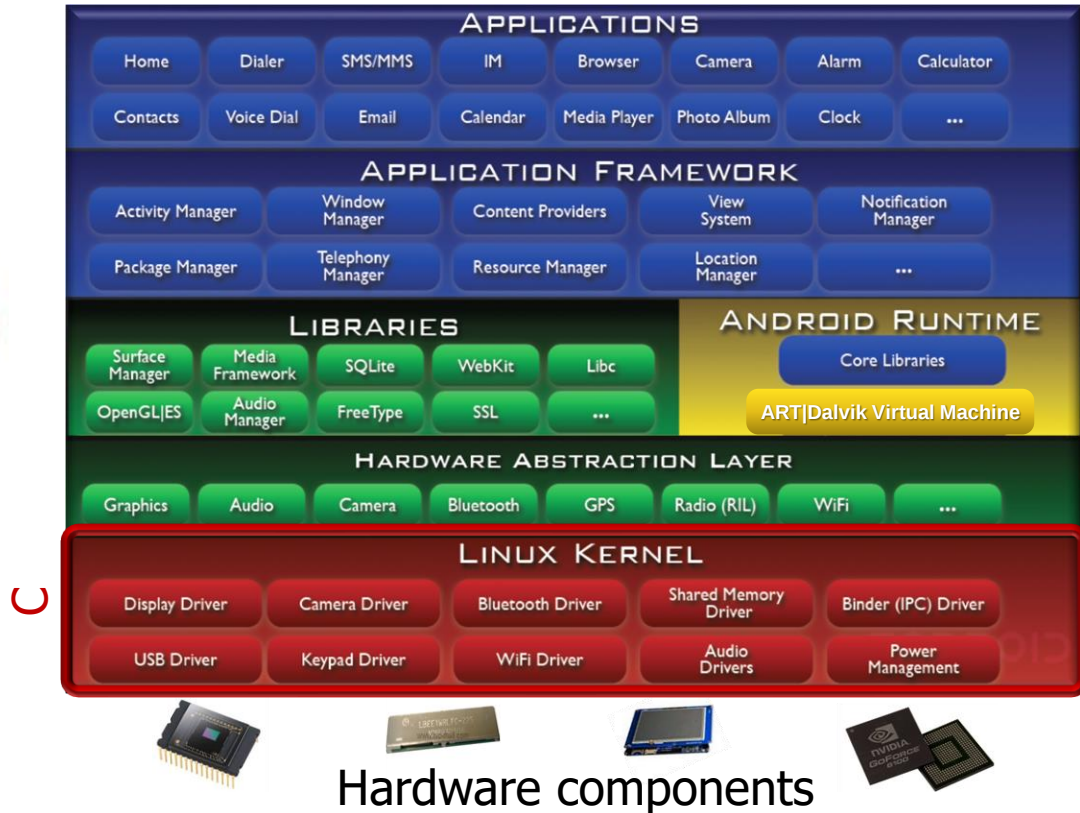


Hardware components

See [source.android.com/source/building-kernels.html#downloading-sources](https://source.android.com/source/building-kernels.html#downloading-sources)

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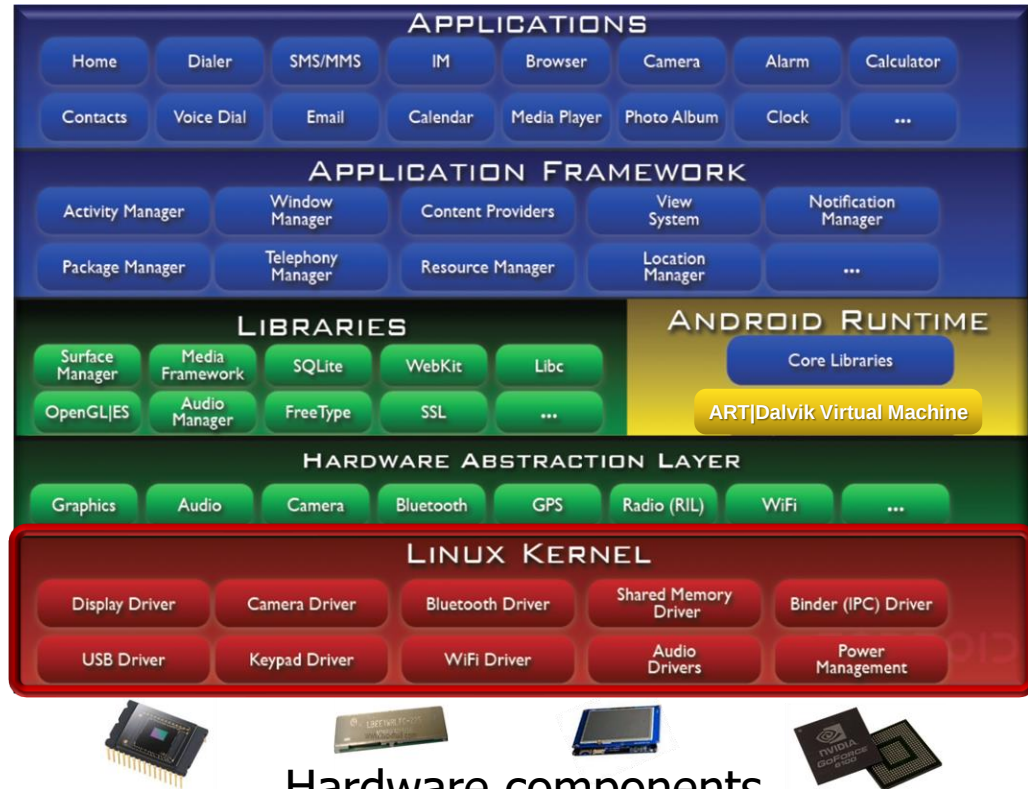
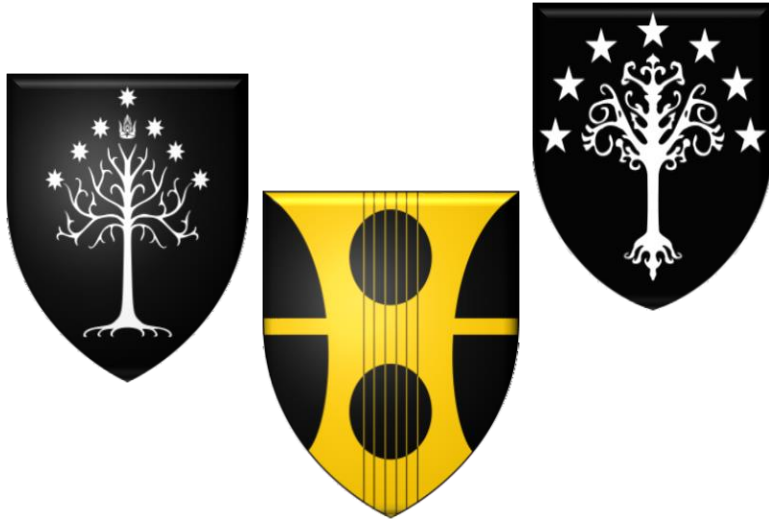
- Android Linux is a variant of the GNU Linux operating system (OS) kernel
  - Optimized to meet the needs of mobile devices & apps



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

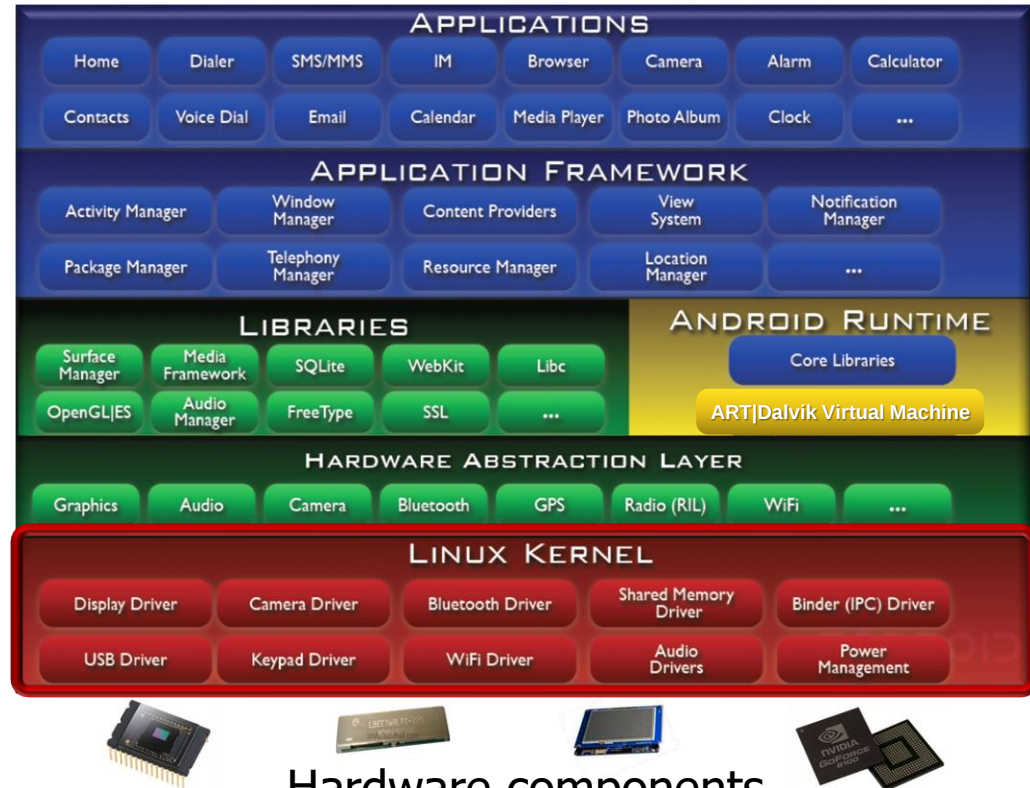
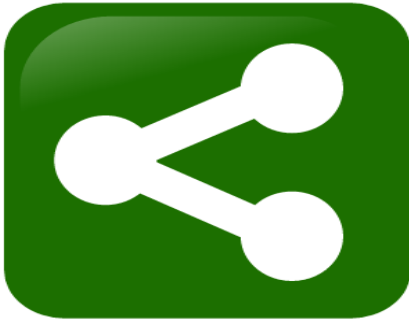


Hardware components

See [en.wikipedia.org/wiki/List\\_of\\_Linux-supported\\_computer\\_architectures](https://en.wikipedia.org/wiki/List_of_Linux-supported_computer_architectures)

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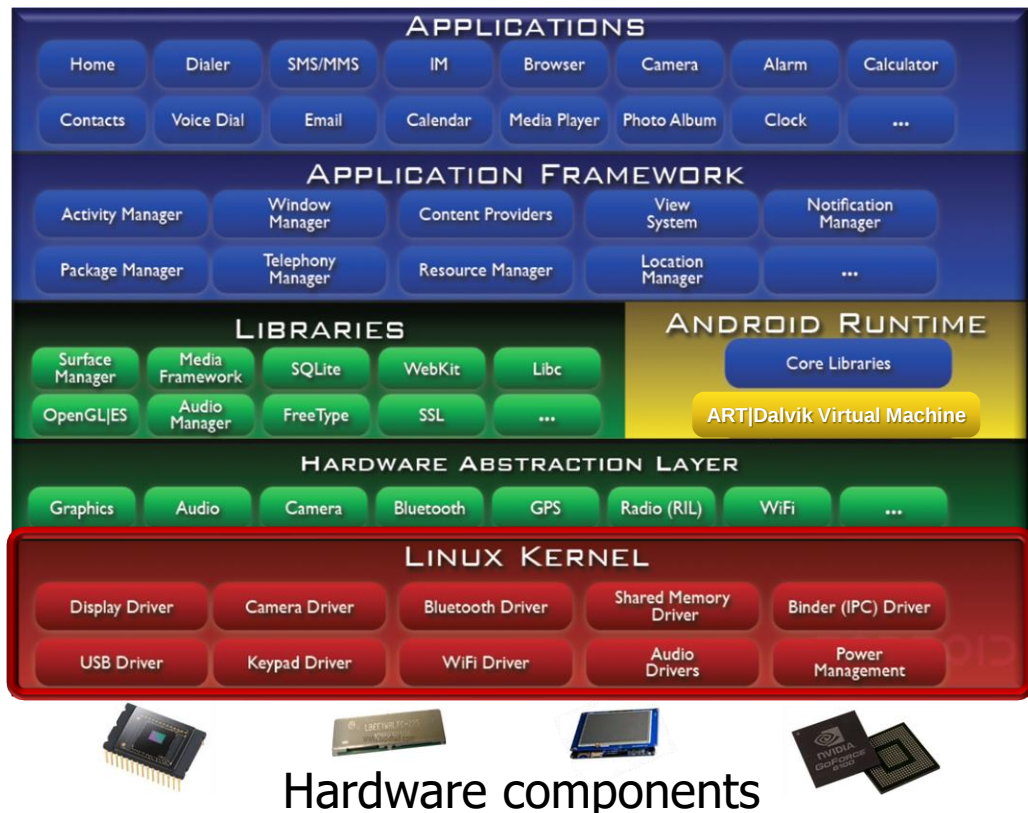
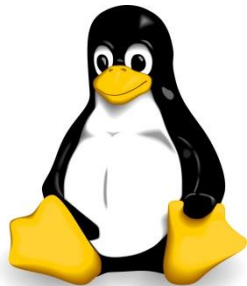
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  - Shields higher Android layers from hardware diversity
  - Mediates access to—and sharing of—hardware resources



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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- Extends GNU Linux

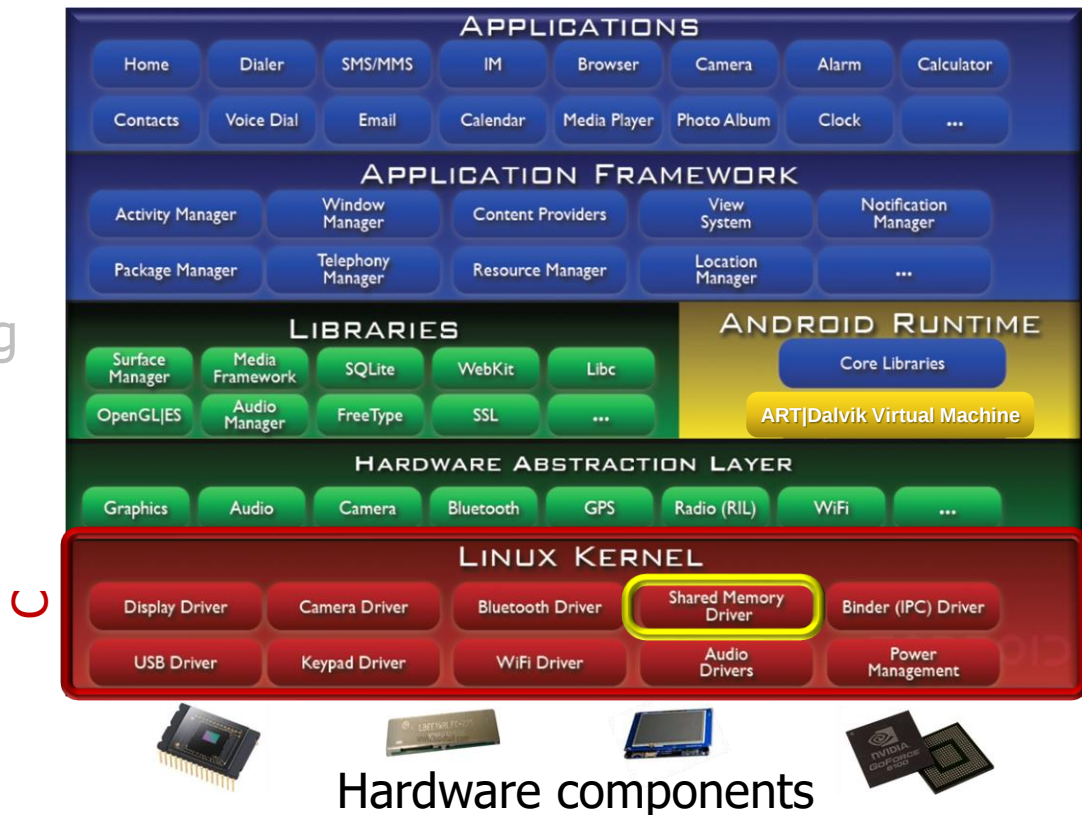


Hardware components

See [elinux.org/Android\\_Kernel\\_Features](http://elinux.org/Android_Kernel_Features)

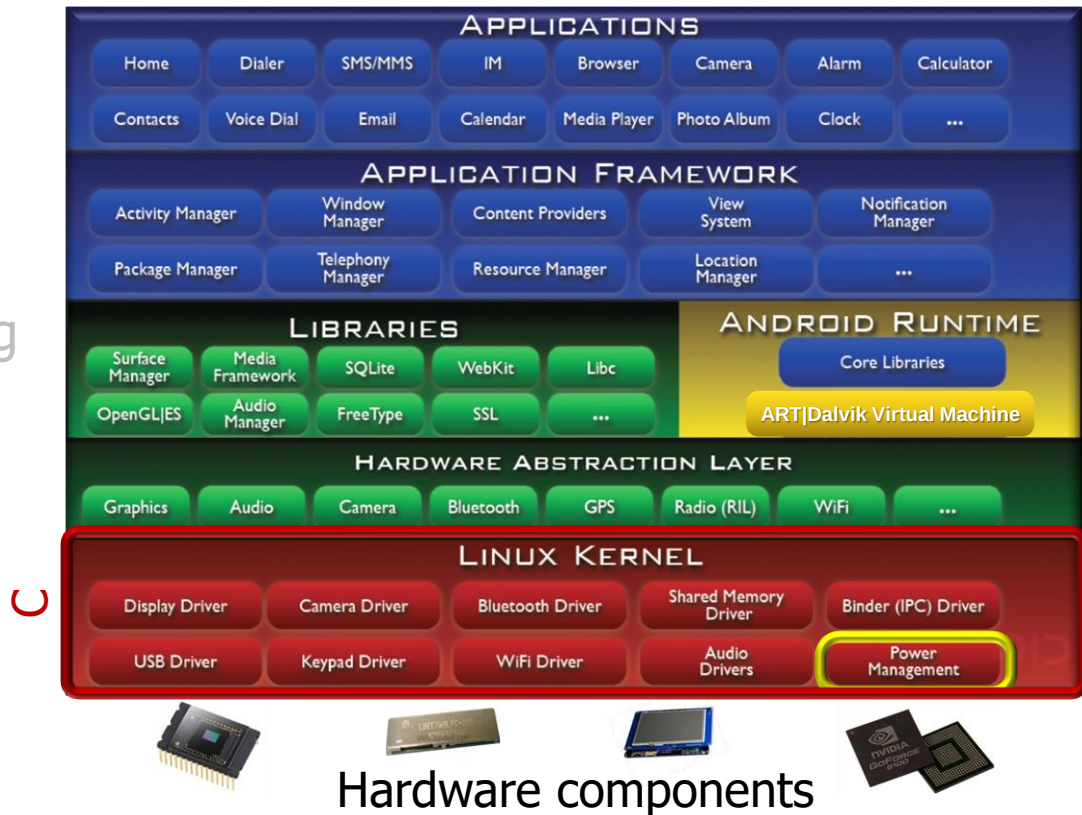
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  - Extends GNU Linux, e.g.
    - conserve memory



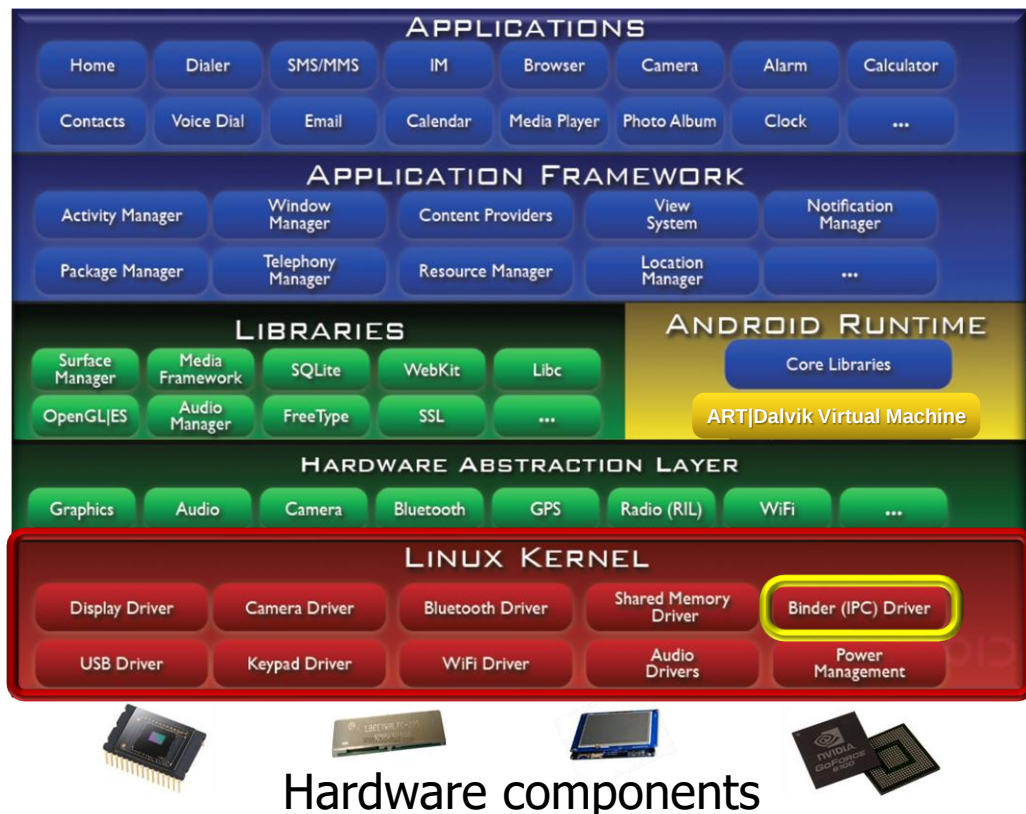
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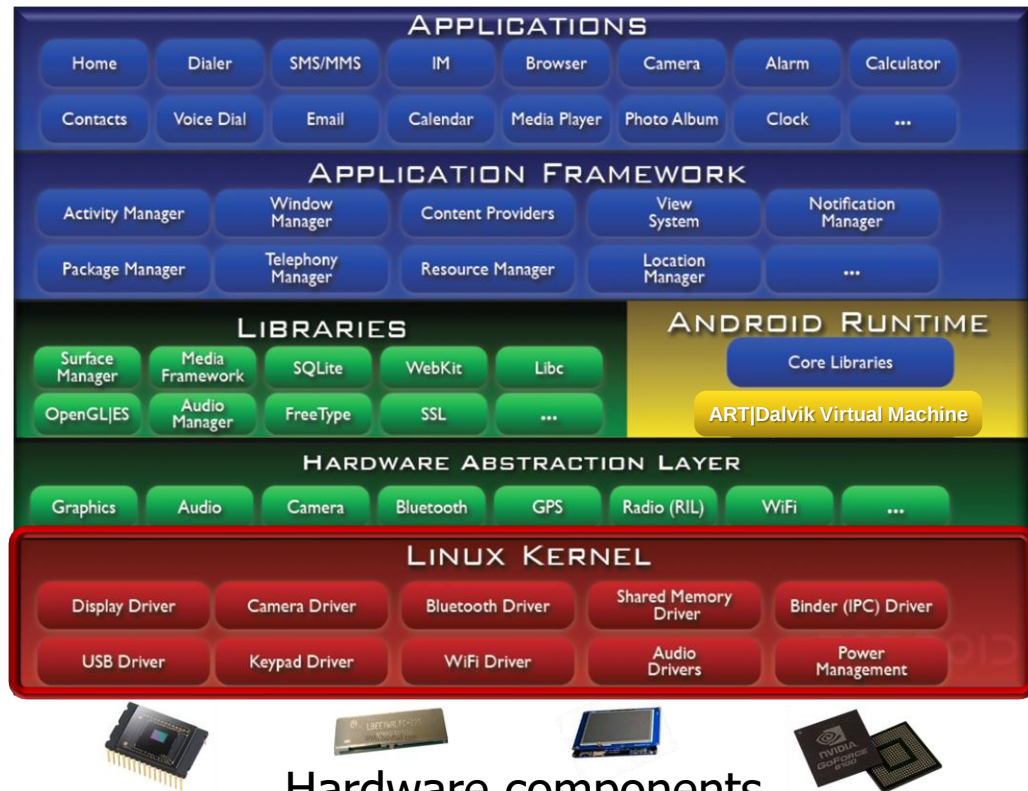
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  - manage power
  - accelerate communication



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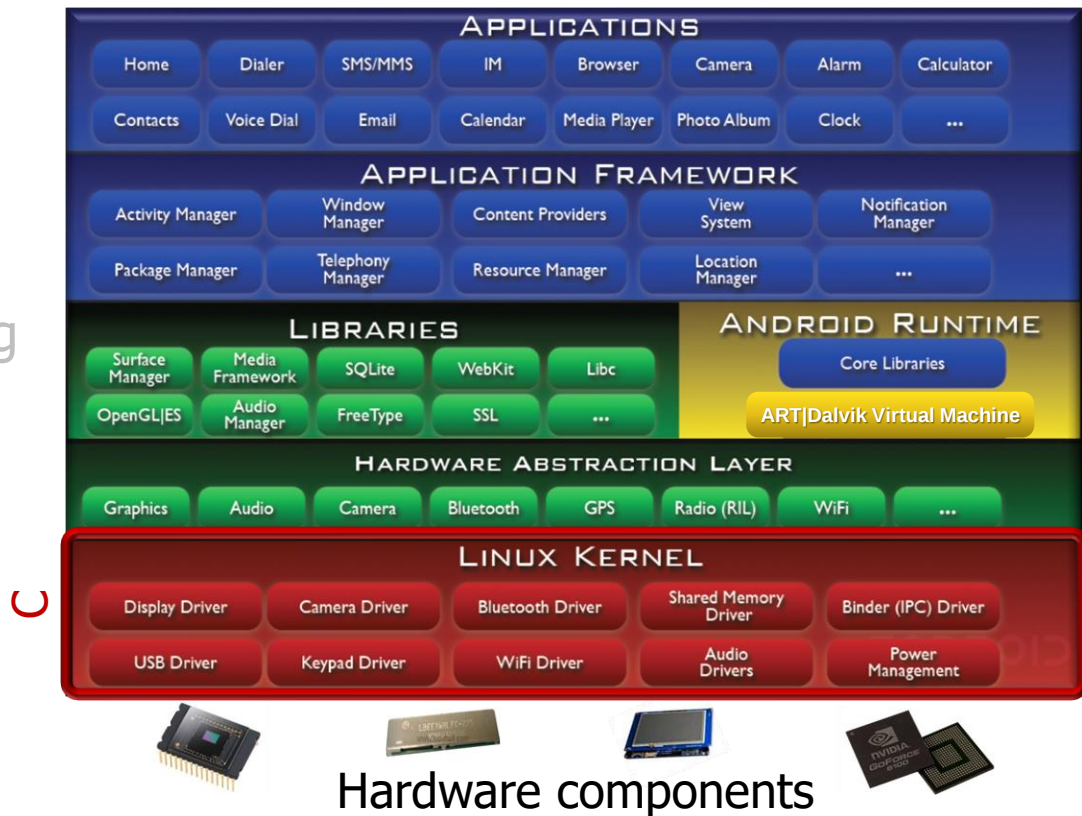
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See [elinux.org/Android\\_Mainlining\\_Project](http://elinux.org/Android_Mainlining_Project)

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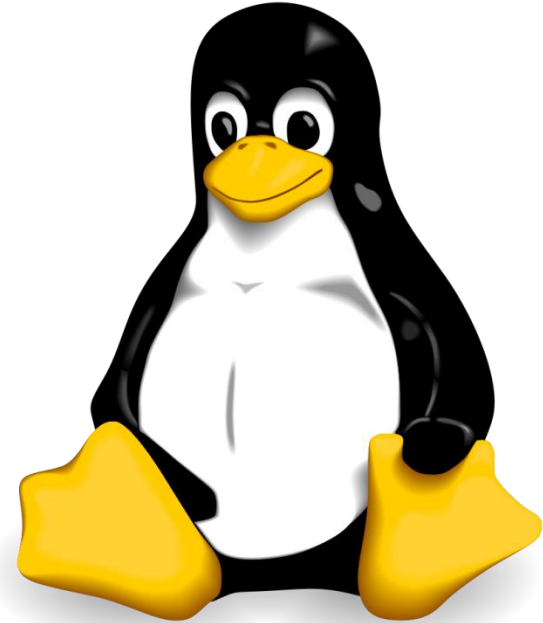
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- The Android Linux kernel is a forked version of the GNU Linux kernel



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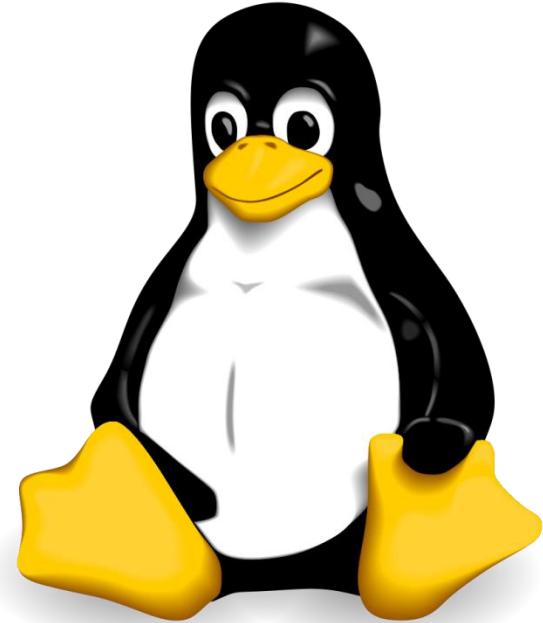
See [en.wikipedia.org/wiki/Fork\\_\(software\\_development\)](https://en.wikipedia.org/wiki/Fork_(software_development))

# 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

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# End of the Overview of Android: The OS Kernel Layer