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The Innovative Mobile Operating System: Strakz OS

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Abstract— We have designed and implemented the Strakz OS an AI-powered operating system. Which concentrates on the user-friendly and User-Controlled policies. This Operating system is based on Linux Kernel which is an open-source Kernel invented by Linus Torvalds. The OS is also adapted from the Google's Official Mobile Operating System Android OS. The main Motto's for the creation of the Operating System are Battery Efficient and optimization on proper Resources utilization. The Operating System is released in two variants one with Google Services included and the one without Google Services. The entire OS is under the Control of AI where the turning on/off of the transmitters, like Bluetooth, WIFI and the Radio Power. The Operating System can also calculate the sleep time of the User with the help of the hardware like Smart Watches.

Keywords: Operating System, Mobile, Smartphone, Google, Android, Artificial Intelligence

1. INTRODUCTION

When Android Initially released on September 23, 2003, the World never knew about its domination in the future. Android is Google's Official Mobile Operating System to took 10 years to completely have the Google Play Protect and many interesting features like Digital Well Being. The revolutionary release and the prestigious version named Android 10 which broke the history of naming the Android release with a code name inspired by famous desserts. Android is a competitor for IOS which is the official mobile operating system for the Apple Handsets which come with the name iPhone. But coming to the privacy part Google Tracks the data of the user. However, Google mentions this statement in its privacy policies. In the same way, the Social Networking Giant Facebook which is Founded by Mark Zuckerberg also tracks our data for advertising purposes. Google admitted it reads our mails in Gmail which is the Email service provider from Google. These privacy issues can make the users feel insecure for his data. So, we came up with a project named StrakzOS which is an Operating System based on Android and lies on the Linux Kernel. We built this OS with all the features necessary for an Android User and the Entire Functionalities can be customized by the User through our Engineers make it work on the default settings. Thus, we provide the Complete Authority over the phone to the User. We solve the Issues like Battery Drains, Privacy Issues, Bloatware, etc...,

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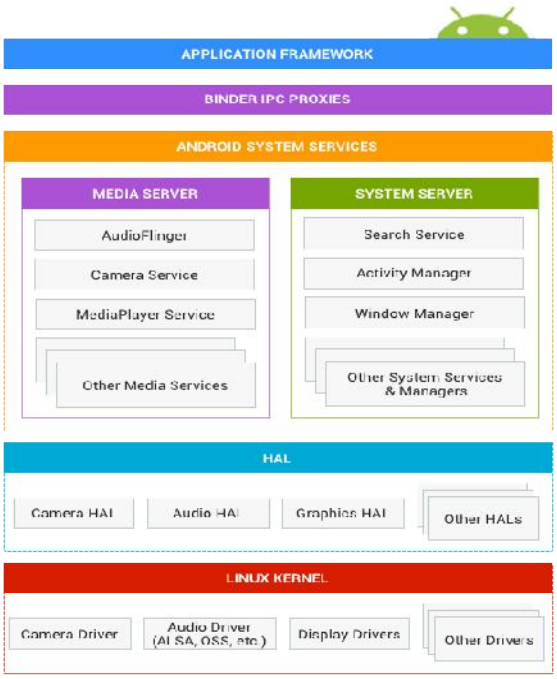
2. KERNEL

Strakz OS is constructed from scratch and it is built on the foundations of Linux Kernel. The Linux Kernel is chosen to have compatibility over all the processors. Linux Kernel is free and Open Source so the patches are updated in the stable update channels regularly. The kernel is powered by the CAF patches to have better stability and performance. The toolchain used for compiling the Linux Kernel is CLANG because CLANG is more advantageous over the native GCC compilers. CLANG is faster and stable. The Kernel is adapted to EAS (Energy-Aware Scheduling) as today's smartphones come with multi-core processors. The Kernel in Strakz OS is built with EAS in mind for better usage of resources.It also maintained by the kernel developers worldwide. The patches are submitted by the Developers worldwide.

3. FRAMEWORK



- **Application framework**:The application framework is employed most frequently by application developers. As a hardware developer, you must remember of developer API's as several map on to the underlying HAL interfaces and may give useful info regarding implementing drivers.

- **Binder IPC**:The Binder Inter-Process Communication (IPC) mechanism allows the application framework to cross process boundaries and call into the Android system services code. This enables high-level framework API's to move with mechanical man system services. At the applying framework level, this communication is hidden from the developer and things appear to "just work".

- **System services:**System services are standard, focused components such as Window Manager, Search Service, or Notification Manager. Functionality exposed by application framework APIs communicate with system services to access the underlying hardware. Android includes two groups of services: system (such as Window Manager and Notification Manager) and media (services involved in playing and recording media).

- **Hardware abstraction layer (HAL)**. A HAL defines a standard interface for hardware vendors to implement, which enables Android to be agnostic about lower-level driver implementations. Using a HAL permits you to implement practicality while not touching or modifying the higher-level system. HAL implementations ar packaged into modules and loaded by the mechanical man system at the acceptable time. For details, see Hardware Abstraction Layer (HAL).

- **Linux kernel**. Developing your utilities is analogous to developing a typical Linux device

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driver. Android uses a version of the Linux kernel with many special additions like Low Memory Killer (a memory management system that's a lot of aggressive in protective memory), wake locks (a Power Managersystem service), the Binder IPC driver, and other features important for a mobile embedded platform. These additions ar primarily for system practicality and don't have an effect on driver development. You can use any version of the kernel as long because it supports the desired options (such because the binder driver). However, we tend to advocate exploitation the newest version of the mechanical man kernel. For details, see Building Kernels.

- **HAL interface definition language (HIDL)**: Android 8.0 re-architected the mechanical man OS framework (in a project called Treble) to form it easier, faster, and fewer pricey for makers to update devices to a replacement version of mechanical man. In this new architecture, the HAL interface definition language (HIDL, pronounced "hide ") specifies the interface between a HAL and its users, enabling the Android framework to be replaced without rebuilding the HALs.

Note: For a lot of details on Project Treble, refer to the developer blog posts Here comes Treble: A modular base for Android and Faster Adoption with Project Treble.

HIDL separates the vendor implementation (device-specific, lower-level software written by silicon manufacturers) from the Android OS framework via a new vendor interface. Vendors or SOC manufacturers build HALs once and place them in a very /vendor partition on the device; the framework, in its own partition, can then be replaced with an over-the-air (OTA) update without recompiling the HALs.

The distinction between the inheritance mechanical man design and therefore the current, HIDL-based architecture is in the use of the vendor interface:

- In Android 7.x and earlier, no formal vendor interface exists, so device makers must update large portions of the Android code to move a device to a newer version of Android:

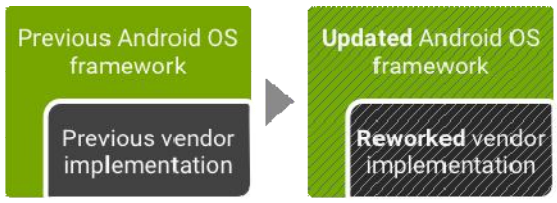

Figure 2. Legacy Android update environment

- In Android 8.0 and higher, a new stable vendor interface provides access to the hardware-specific parts of Android, so device makers can deliver new Android releases simply by updating the mechanical man OS framework—without extra work needed from the semiconductor manufacturers:

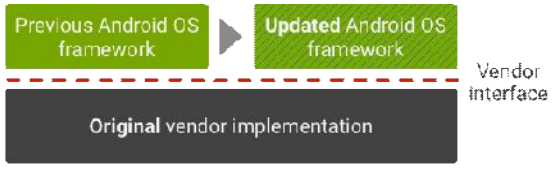

Figure 3. Current Android update environment

All new devices launching with mechanical man eight.0 and higher can take advantage of the new architecture. To ensure forward compatibility of vender implementations, the vendor interface is validated by the Vendor Test Suite (VTS), which is analogous to the Compatibility Test Suite (CTS). You can use VTS to modify HAL and OS kernel

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testing in each inheritance and current mechanical man architectures.

4. ARCHITECTURE

Android ten converts designated system elements into modules, a number of that use the APEX instrumentation format (introduced in mechanical man 10) and a few of that use the APK format. The modular architecture enables system components to be updated with critical bug fixes and other improvements as needed, without affecting lower-level vendor implementations or higher-level apps andservices.

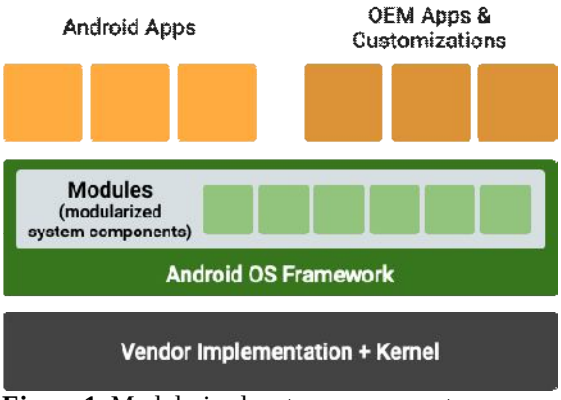

Figure 1. Modularized system components

Module updates don't introduce new APIs. They use only the SDK and System APIs guaranteed by the Compatibility Test Suite (CTS), communicate only with each other, and use only stable C API or stable AIDL interfaces.

Updated modular system components can be packaged together and pushed to end-user devices, either by Google (using the Google Play Store infrastructure) or by the Android partner (using a partner-provided OTA mechanism). The module package installs (and rolls back) atomically, meaning all modules that need to be updated are updated or none are. For example, if a module that needs to be updated can't be updated for any reason, the device doesn't install any of the modules in the package.

5. APPLICATIONS

Strakz OS contains the additional Applications which manages the updates of nightly and stable builds for the security patches and the updates for the inbuilt applications. The Applications present inbuilt apart from the Native Android Open Source Project are Phone, Messages, Contacts, microG, Xposed Framework, Root Manager (Magisk Manager).

- **Phone:**The features like recording and truecaller database for identifying spam callers and blocking suspicious calls are inbuilt.
- Messages: This application is also integrated with the spam filters.
- **Contacts:** Saved contact details are saved in a private server which is secured with the encryption phrases. The contact details cannot be accessed by anyone except the user.
- **Magisk Manager:** The application is a security point for the Rot access for the system partition.
- **Xposed Framework:** This is an under the hood Framework for the Android framework which helps in modification of the byte codes to enable extra customizations through xposed modules.
- **MicroG:** An alternative for the google play services API in the Non-Google play services addition.

6. SECURITY

Strakz OS is secured with the Strakz Security updates its virus and malware definitions daily

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to identify and secure the OS from any malware, rootkits, RAT's and virus. The Network Security is secured by the Strakz itself which creates a tunnel to the Strakz Web Servers through the VPN (Virtual Private Network).

CONCLUSION

Strakz OS solves the Privacy issues and security issues of Android.

REFERENCES

[1] Android Source: source.Android.com