oniro

From development boards to mobile phones
Porting Oniro to Volla devices

Volla Community Days ‘25

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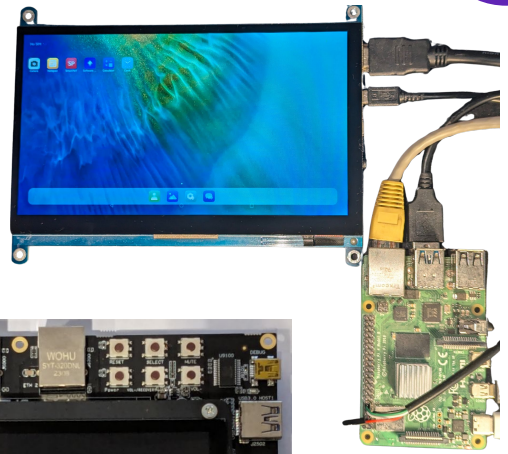
Introduction

- Supported Boards:
  - OpenHarmony supports boards like Hoperun Dayu200 (Rockchip).
  - Oniro adds support for Raspberry Pi.
- From development boards to mobile
- Goal: Oniro on Volla devices



Why Oniro on Volla?

- Alternative to traditional Android-based FOSS
- Cross-device interoperability
- Modular architecture for IoT to mobile
- Based on strong foundations of OpenHarmony

Cross-device Intelligent Interoperablity

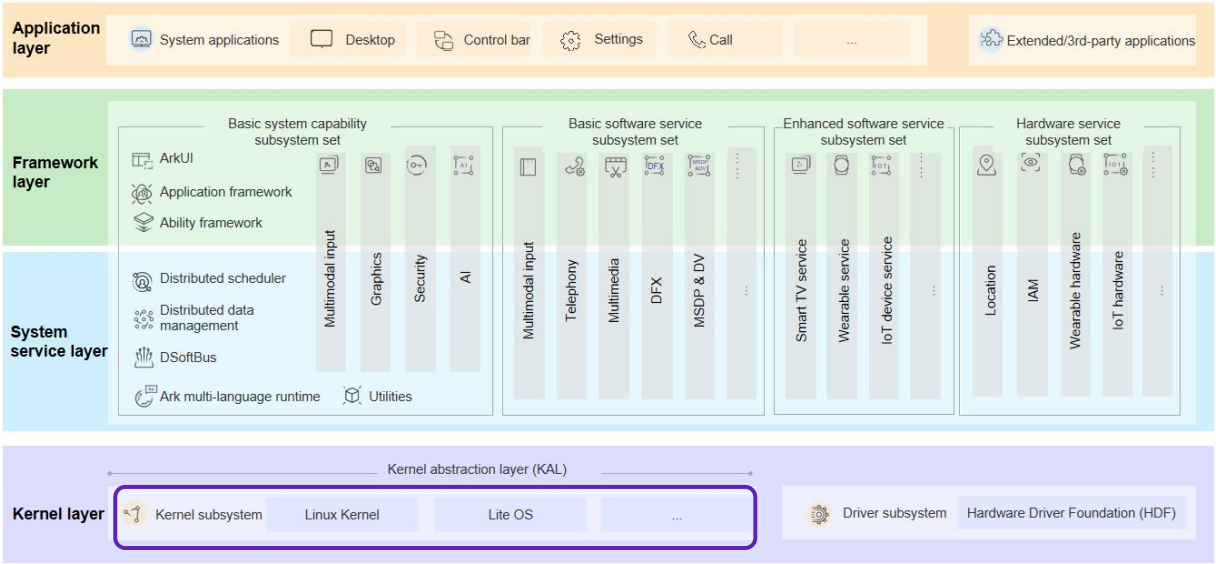
Technical Architecture Overview

- **Mini system**: low-memory devices (≥128 KiB), ARM Cortex-M or RISC-V processors
- **Small system**: ≥1 MiB of memory, ARM Cortex-A processors
- **Standard system**: ≥128 MiB of memory, typically ARM Cortex-A processors

Technical Architecture Overview

Multi-kernel support

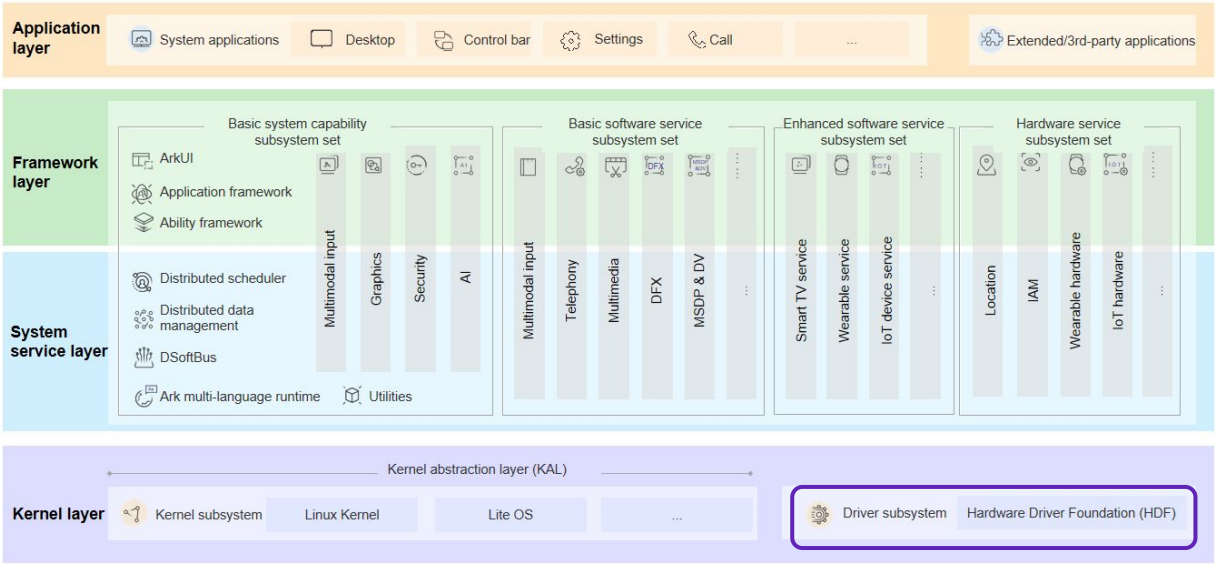
- LiteOS for mini system
- Linux for standard system
- And ...



Technical Architecture Overview

HDF (Hardware Driver Foundation)

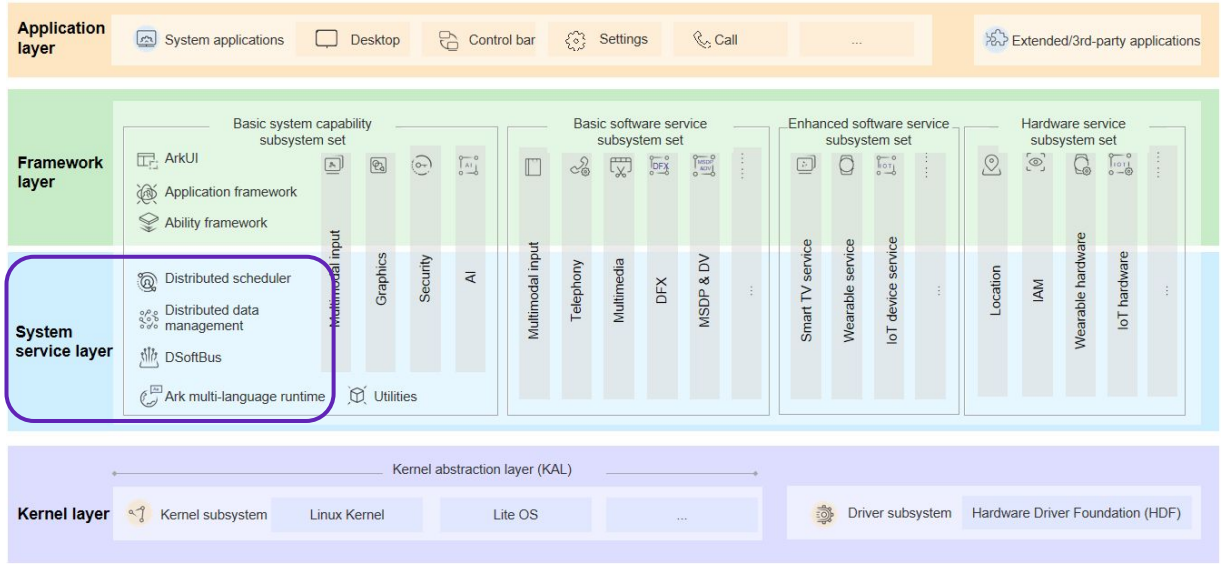
- a unified framework for hardware drivers abstraction
- Supports cross-platform compatibility and modular design.
- Includes standardized APIs (HDI), driver lifecycle management, and PnP support.



Technical Architecture Overview

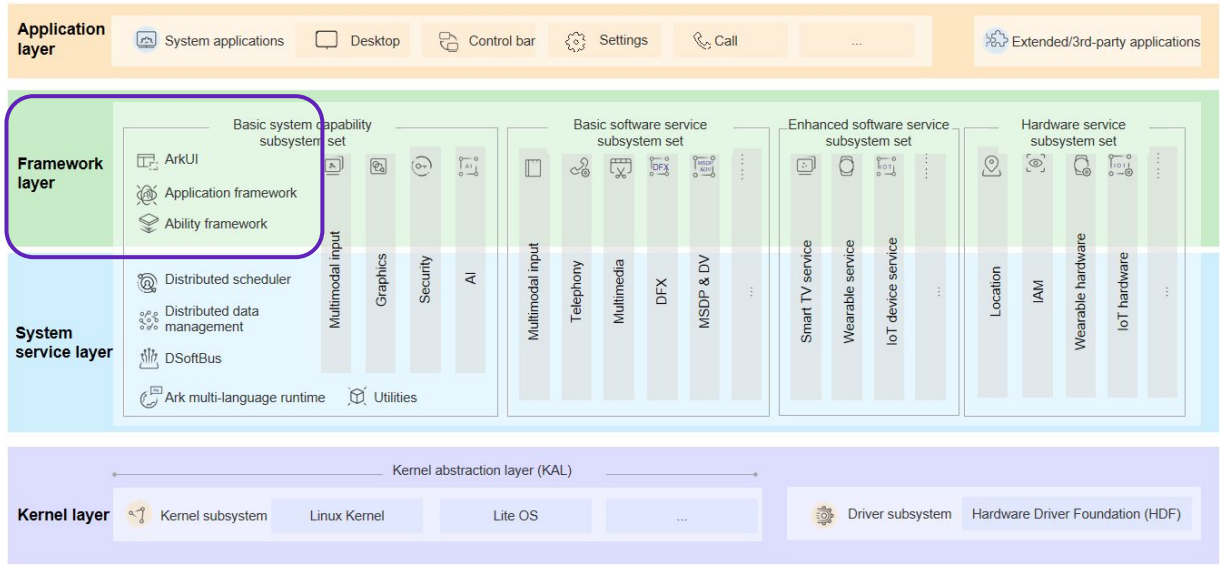
Distributed Capabilities

- **DSoftBus**: Unified device discovery & communication.
- **Distributed Data & Scheduler**: Cross-device data sync & task management.
- **Device Virtualization**: Multiple devices act as one "Super Device".
- **Distributed File System** (HMDFS): Seamless remote file access.
- **One-Time Development**: Write once, run across device types.



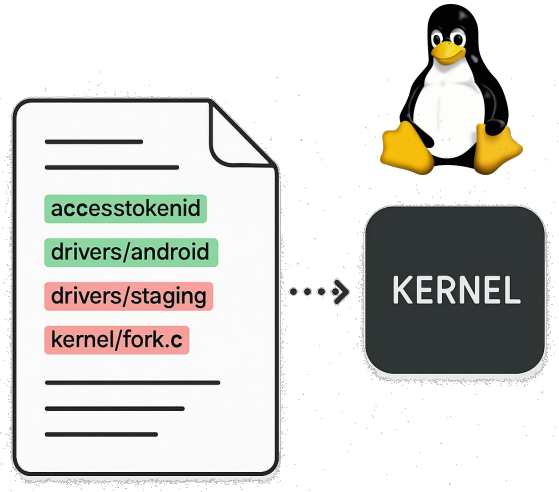
Technical Architecture Overview

- ArkUI: A declarative UI framework (built-in UI components, Responsive layouts, animations and event handling mechanisms)
- ArkTS: A statically typed, compiled programming language extending TypeScript



OpenHarmony Kernel Patches

- Linux kernel 5.10 or 6.6
- Core Driver Infrastructure
  - Access tokens and Binder IPC
- Drivers for Diagnostics
- HDF (Hardware Driver Foundation)



Mainline Support and Demos

OpenHarmony Developer Phone

OpenHarmony on OnePlus 6T

Oniro on qemu-based emulator

Porting Oniro to Volla X23

Current status

- Setup of Oniro within LXC
- Applied Oniro patches to Android Common Kernel 5.10
- Graphical support with software rendering and DRM display output.
- Setting up system and library dependencies.

Porting Oniro to Volla X23

Next steps

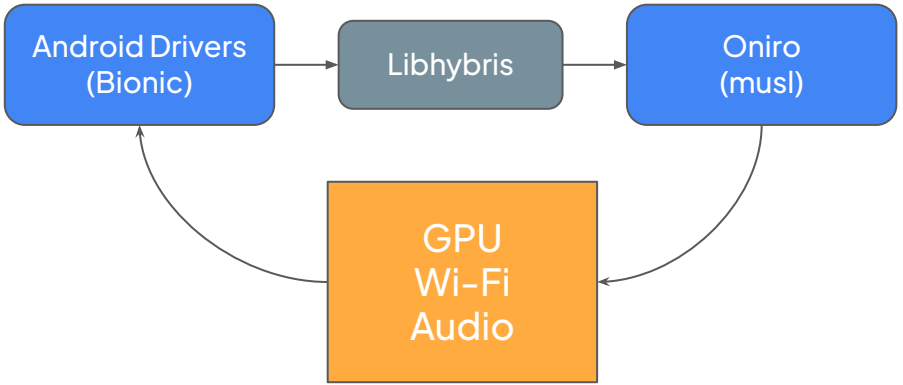
- Adapting drivers to Oniro
- Enable graphical acceleration
- Enable audio, sensors, telephony.
- Create a flashable image

Challenges of Mobile Hardware Porting

- Proprietary driver dependencies
- Android-centric hardware design
- Compatibility with non-Android OS

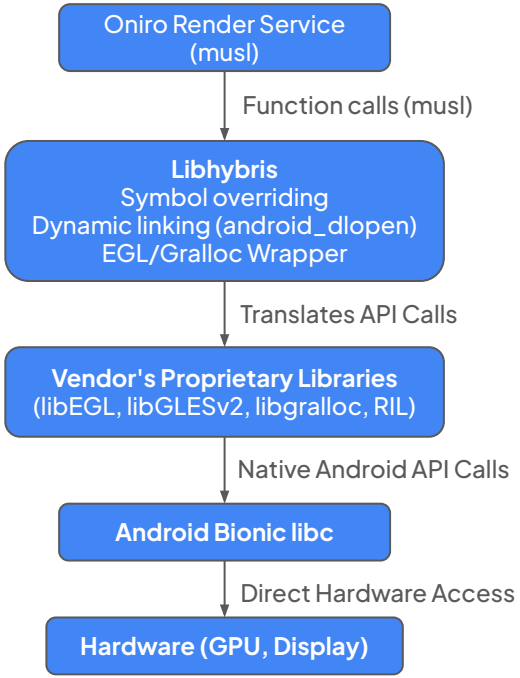
Bridging proprietary Android drivers for open systems

Libhybris



Current Status of Libhybris Integration

- Adapting it to musl (not glibc).
- Manage build system differences
- Integrating with OpenHarmony GN build system
- Managing file system structure differences



Roadmap and Broader Impact

Near term goals:

- Refine Oniro integration on Volla X23
- Transition to latest OpenHarmony version

Long term goals:

- Oniro on more phones and form factors: Volla Phone Quintus/Tablet
- Inspire an open, secure, intelligent mobile platform built in Europe.

Join Us in Shaping the Future

Contribute to Oniro development. Let's create an open, secure mobile ecosystem together.

Think Global and Code Local

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