Open Source Project

Summit Korea 2026

OpenFDE

A New Exploration for the Linux Desktop Environment

- Bridging the Gap Between Linux and Android Ecosystems

Yong Gong

OpenFDE Maintainer

Contact

warlice2021@gmail.com

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01

The Linux Desktop Challenge

背景与痛点

Understanding the fundamental challenges facing the Linux Desktop ecosystem and why current solutions fail to bridge the application gap.

The Problem

The "App Gap" Paradox

Linux dominates servers, but where are the apps?

Server vs. Desktop Paradox

Cloud Market Share	96%
Desktop Adoption	<5%

While Linux powers the vast majority of cloud infrastructure, its desktop presence remains minimal.

The App Gap

3M+	~5,000
Android Apps	Linux Native Apps

The Linux Desktop app ecosystem is stagnating while mobile platforms thrive.

"Mobile-First" Exclusion

Modern collaboration tools prioritize mobile and web platforms, **completely skipping native Linux releases**.

Figma · Notion · TikTok Studio

Developer Reality

- Fragmented ecosystem: GTK/Qt/WxWidgets
- Distribution packaging hell
- No commercial incentive for developers

Current Limitations

Why Existing Android-on-Linux Solutions Fall Short?

现有方案为何不够好?

Virtual Machines

The Fortress Problem

- **8GB+ RAM**
  Just for lightweight apps
- **GPU Passthrough**
  Unstable and unreliable
- **Broken Workflow**
  Copy-paste breaks flow

Translation Layers

The Lottery

- **70% Compatibility**
  Random app failures
- **Random Crashes**
  Especially after updates

Conventional Emulators

The Glass Wall

- **Window-in-Window**
  Chaotic UX experience
- **No Shared Clipboard**
  Isolated environments
- **Hardware Blackholes**
  Camera/Bluetooth broken

The Core Issue: All existing solutions treat Android apps as "guests" rather than native citizens, creating artificial barriers that break the user experience.

Our Vision

Beyond Just "Running Apps"

Reimagining Linux as a Creation Platform, Not Just a Host

> "To make Linux a first-class citizen for modern application ecosystems."

Seamless Fusion

Invisible Integration

- Apps share the exact same **filesystem**
- Unified **clipboard** across ecosystems
- Direct **hardware access** for all apps

"Apps don't know they're guests"

Unified Development

One SDK to Rule Them

- Stop fighting **fragmentation**
- Use **Android Studio** toolchain
- Build for Linux with **zero extra cost**

"Mature toolchain, mature results"

Performance First

Bare-Metal Speed

- Direct **hardware access**
- No **emulation tax**
- Full **GPU acceleration**

"Native speed, native experience"

The Solution

Meet OpenFDE

正式引入项目

Core Definition

OpenFDE is not just a software; it is an **Open Fusion Desktop Environment**.

→ A revolutionary approach to desktop computing

Technical Path

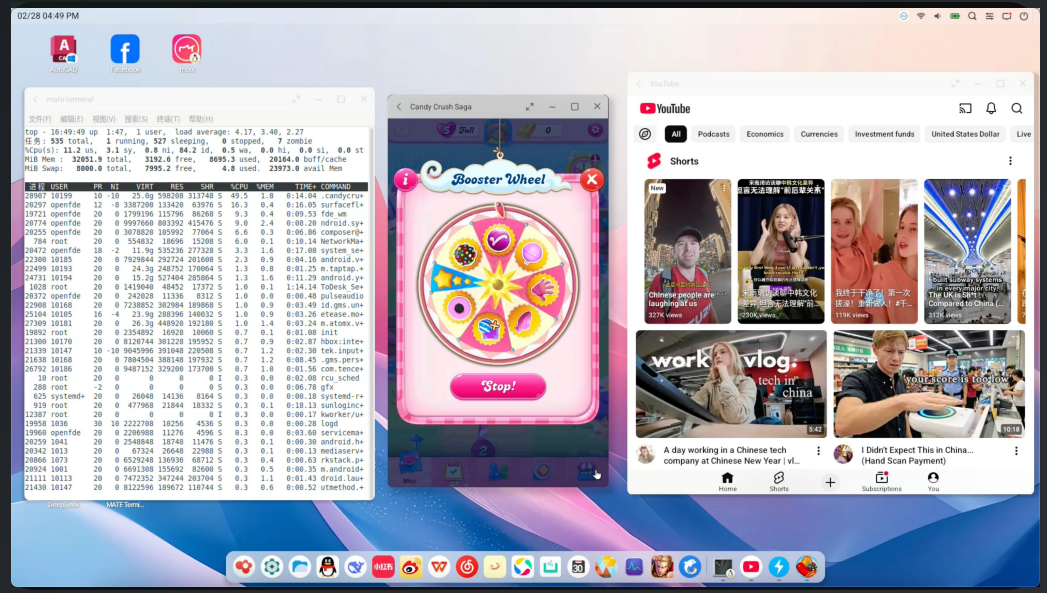
It deeply embeds the **AOSP (Android Open Source Project)** window management and graphics stack into a standard Linux distribution.

- Window Management
- Graphics Stack
- Deep Integration

Core Value

It introduces the **massive Android ecosystem** to Linux while fully retaining the **powerful underlying capabilities** of Linux.

OpenFDE Desktop



Android Apps Linux Apps Unified

02

Architectural Deep Dive

技术核心与架构

Exploring the innovative technical architecture that enables seamless fusion of Linux and Android ecosystems.

Architecture

System Architecture Overview

整体架构

Unified Environment

Simultaneously supports both Android and Linux applications within the exact same desktop environment.

Android Apps + Linux Apps

Consistent UX

Unified window manager ensures no distinct difference in user experience

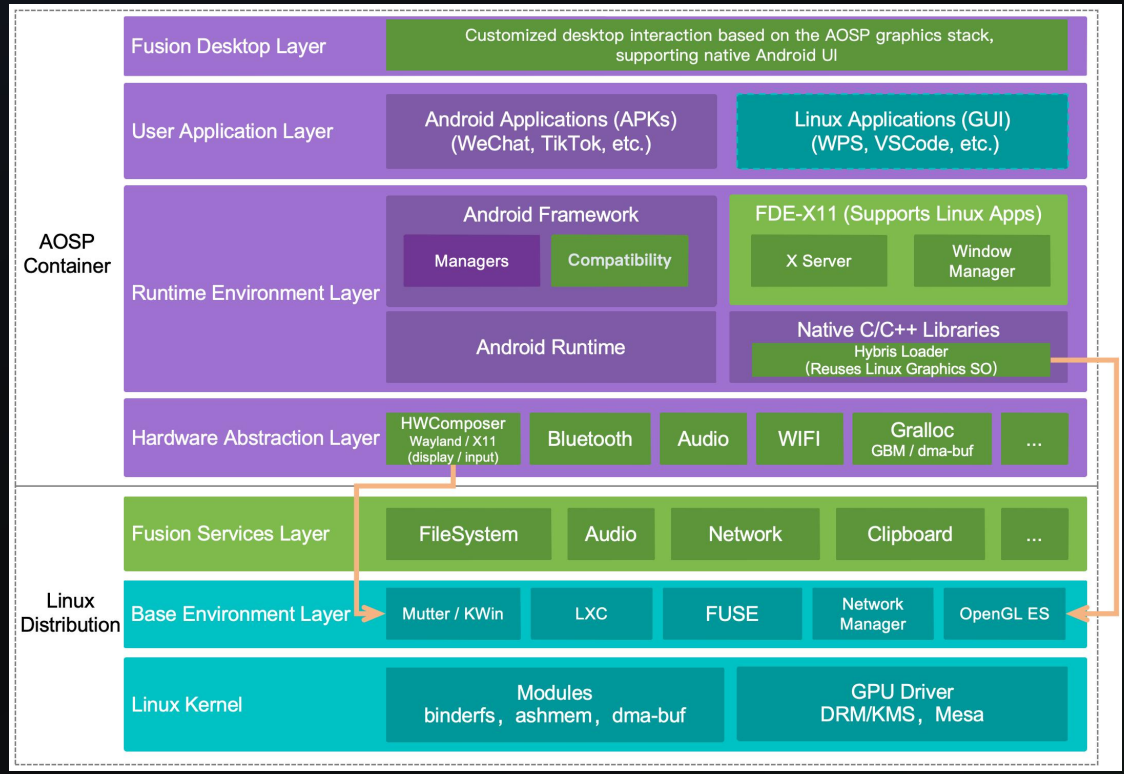
Universal Input

Shared input method works universally across all applications

Seamless Clipboard

Two-way clipboard communication for effortless copying and pasting between ecosystems

Architecture Diagram



Android Stack Linux Stack Fusion Layer

Core Innovation

The FDE-X11 Architecture

FDE-X11 机制 - Bridging X11 and AOSP Window Management

X Server Implementation

A **fully implemented X Window System server** seamlessly ported onto the AOSP framework.

- Complete X11 protocol support

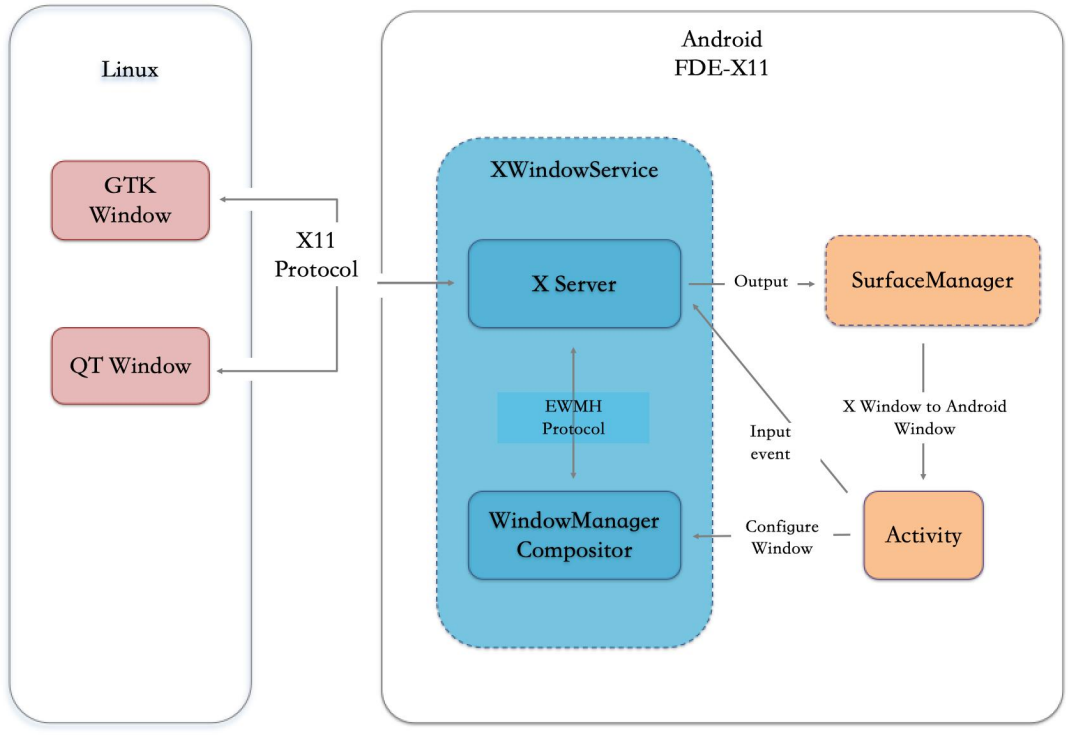
Window Manager

Maps X Window **layouts, appearance, and behavior** directly to AOSP's native window management.

- Layouts
- Appearance
- Behavior

Key Innovation: Linux apps behave exactly like Android apps in the unified environment.

Architecture Flow



X11 Protocol | Translation | Native WM

Performance

Graphics Rendering Acceleration

图形渲染加速 - Breaking the Bionic-Glibc Barrier

Technical Breakthrough

Modified the AOSP **Bionic C dynamic loader** to natively support loading Linux **GNU C versions** of OpenGL/ES, EGL, and related libraries.

Zero-Copy Execution

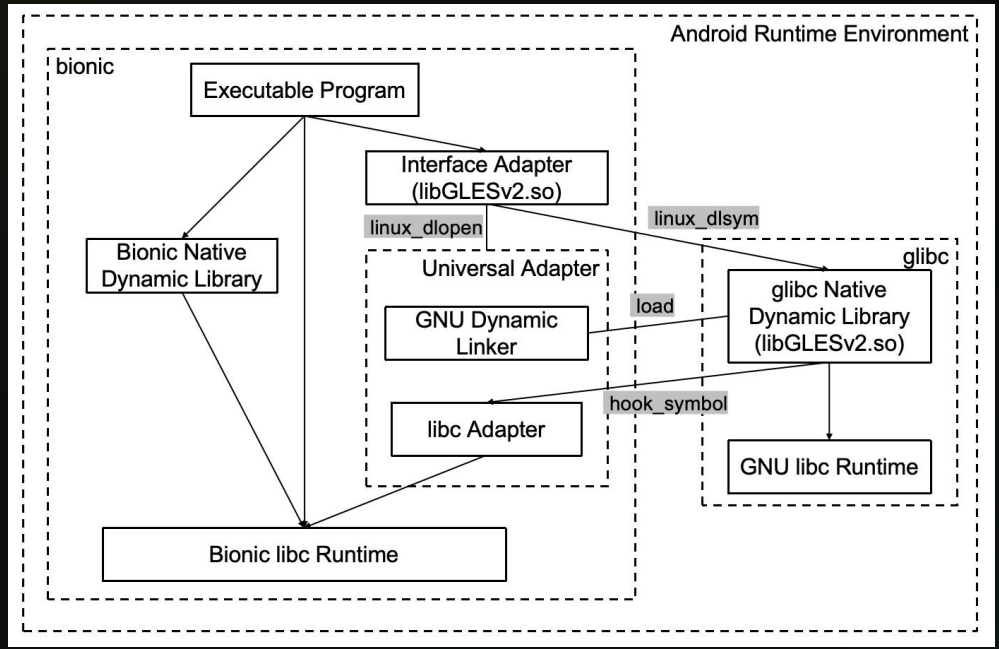
Enables a **direct, high-performance bridge** between the Android runtime environment and the native GNU glibc runtime.

No Overhead
Direct library loading

GPU Native
Full acceleration

Performance Gain: Eliminates 30-40% emulation tax for graphics-intensive applications.

Library Bridge



Direct Bridge

Integration

Comprehensive Device Bridging

设备硬件桥接 - Hardware Reuse & Unified Access

Hardware Reuse

Reuses hardware devices that are already adapted for the Linux system.

- No additional drivers needed

Network Bridging

Shares the same network configuration. VPN enabled in Android is usable by Linux apps.

- Unified VPN access

Audio Bridging

Shares all audio input/output devices with unified volume control.

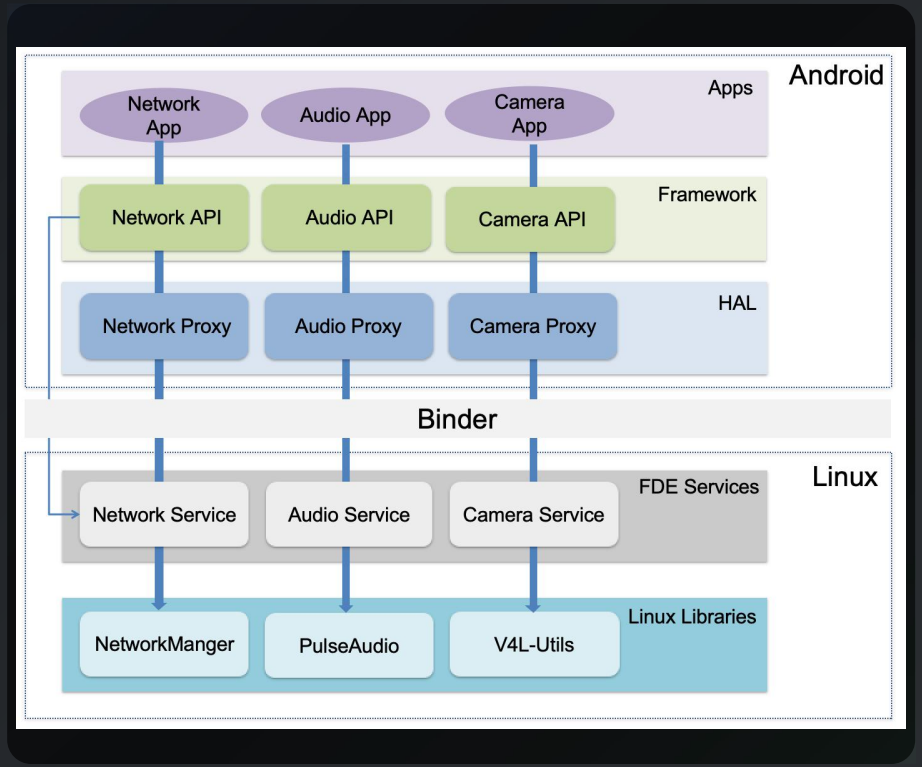
- Single volume control

Peripheral Fusion

Complete integration for Camera and Bluetooth functionality.

- Camera
- Bluetooth

Device Integration



- ✓ No isolation
- ✓ Native access

Compatibility

Compatibility Framework

兼容性框架 - User-Configurable Solutions

User Configurable

Provides **user-configurable compatibility solutions** that adapt to different application requirements.

10 Pre-built Configurations

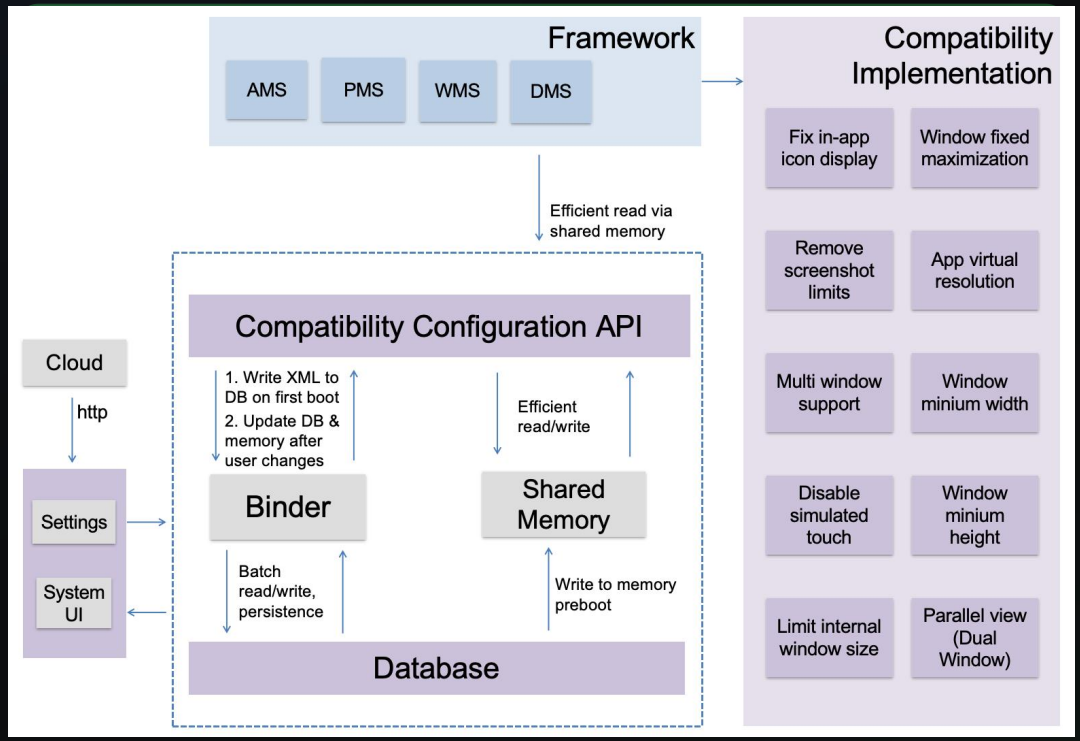
Compatibility Items

Currently implements **10 distinct compatibility configuration items** covering common app issues.

Problem Resolution

Successfully resolves **widespread application compatibility issues** out-of-the-box.

Configuration Framework



Out-of-the-box Compatibility

03

Real-World Scenarios

效果展示

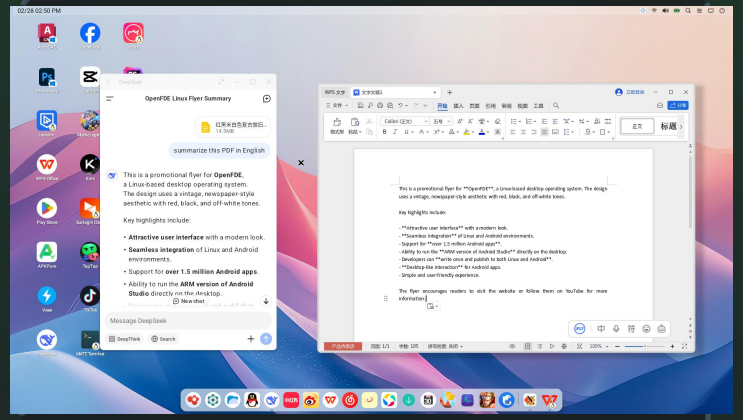
Visual demonstrations of OpenFDE in action across daily productivity, entertainment, gaming, and development scenarios.

Use Cases

Daily Scenarios

日常使用场景 - Productivity, Entertainment & Gaming

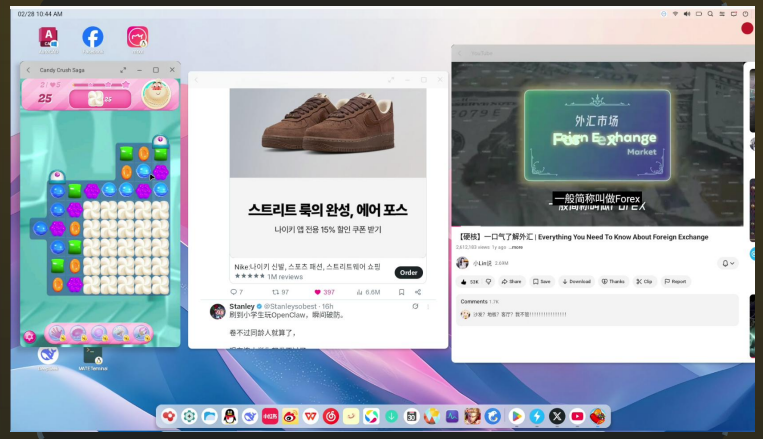
Office Productivity



Use the DeepSeek Android app to analyze a PDF

Seamlessly copy and edit results into LibreOffice natively on Linux

Entertainment



Flawlessly streaming short-form video on TikTok

High-definition content on YouTube without any emulation lag

Gaming

Utilizing key-mapping assistants for desktop gaming

Play intense mobile games like "Honor of Kings" (王者荣耀) directly on desktop

- Native Performance
- Unified Experience
- Seamless Integration

For Developers

Developer Empowerment

开发者赋能 - Native Android Development on Linux

Native Android Development

Develop and natively debug applications using **Android Studio** directly on the Linux desktop.

The Milestone

OpenFDE is the **first platform** to publicly support compilation for the **ARM Linux version of Android Studio** and its **full toolchain**.

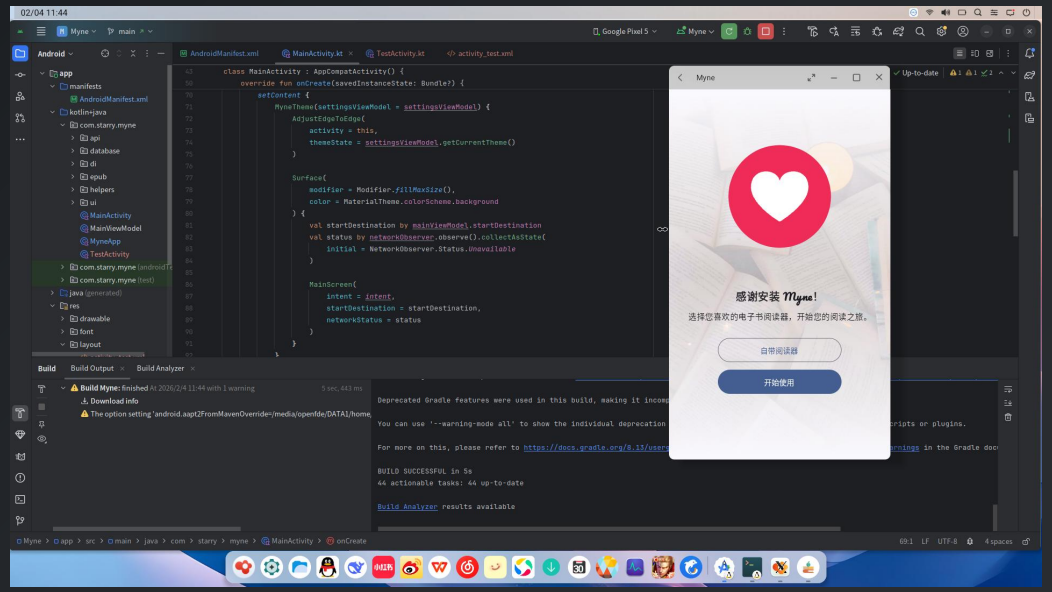
First in Industry
ARM Linux Android Studio

Full Toolchain
Complete compilation support

Developer Benefit: Build, test, and deploy Android apps without leaving the Linux environment.

Android Studio on ARM Linux

MILESTONE



ARM Architecture

Linux Native

Full Toolchain

Build · Debug · Deploy

04

Roadmap & Community

未来与协作

Future development plans and community collaboration opportunities for OpenFDE.

Looking Ahead

Future and Plans

未来规划 - What's Next for OpenFDE

Multi-Monitor Setup

Native multi-display support

Implementation of native multi-display support for enhanced productivity workflows.

- Extended desktop experience

Hardware Acceleration

Expanding GPU support

Expanding GPU support through Hybris for broader hardware compatibility.

- More GPU vendors supported

System Upgrades

AOSP 17 Adaptation

Adapting the core to AOSP 17 for latest Android features and security updates.

- Latest Android features

Continuous Polish

Ongoing optimization

Ongoing optimization of user experience and feature set based on community feedback.

- Community-driven improvements

Active Development Community Driven Regular Releases

Community Introduction

Join the OpenFDE Community

Official Website

openfde.com

Visit for documentation, downloads, and detailed information.

GitHub Repository

github.com/openfde

Access source code, contribute, and report issues.

twitter

@openfde123

Follow for detailed information and updates in Chinese.

YouTube Channel

@OpenFDE

Watch running effects and live demonstration videos.

Contact

wunan0951@phytium.com.cn

OpenFDE

Open Fusion Desktop Environment