

DeepComputing

Solving Pre-silicon Kernel Upstream for RISC-V First Ever

Dec 2025



Agenda

- **Introduction**
- **Why Upstreaming?**
- **How to Achieve Pre-silicon Upstreaming?**
- **What to Improve!**

Yuning Liang

Founder

a core software guy

Java VM (J2ME) / Static Compiler (MIPS' Open64)

People who are really
serious about
software should make
their own hardware.

Alan Kay

Company Confidential: Please do not distribute.

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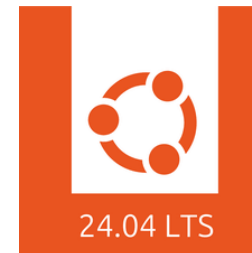
Who are we and What we do

RISC-V Premium Product Pioneer Focusing on

- Consumer Electronics
- Modern Personal Computing Devices
- And Some RISC-V Run & Fun Gadgets



DC-ROMA RISC-V Laptops/Pad



2023

**4-core 1.5GHz
8GDDR**



2024

**8-core 1.75GHz
16G DDR**



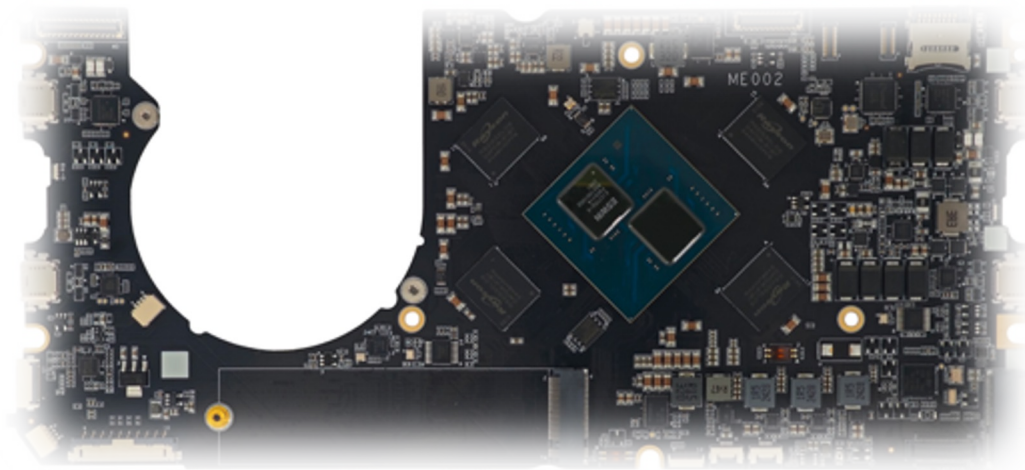
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Framework RISC-V AI-PC Product Portfolio



**Desktop and
Laptop 12"/13"/14"/16"**

Framework RISC-V AI-PC Product Portfolio



Laptop 13" RISC-V (Professional)

- 8-12 Core 2GHz, <64G LPDDR5
- 50 TOPS AI Local Compute
- **June, \$300+**

Why Upstreaming

- **RISC-V Business**
 - **Future NOT now, why?**
 - **Climbing Volume, why?**

Why Upstreaming

- **Vendor Kernel**
 - **Endless Rebasing Effort**
 - **Endless Integration**
 - **Endless Question and Answer**

How to Upstream: A Painful Example

- **JH7110**
 - **U74 SiFive IP: 2018**
 - **SoC: 2022**
 - **Product mainboard: 2024**
 - **Upstream**
 - **First PinCtrl: 9th Feb 2023**
 - **Last Display (DRM): still on going (stuck, Dec/2025)**
 - **Average Turn Around: 10+ resubmission**

How to Upstream: A Painful Example

- Painfully Slow and Long Process
- Painfully Unpredictable
- Painfully No Future Business
- **Something NOT right!**

How to Upstream: Asking Advice

Linux Kernel Fellows Support

- See if Linus and Greg Help Speeding



How to Upstream: Timing

A screenshot of a presentation slide. The slide has a blue background with white and yellow text. At the top left is the 'LF Live' logo, followed by 'MENTORSHIP SERIES'. The main title is 'Best Practices to Getting Your Patches Accepted'. At the bottom, the speaker's name 'Greg Kroah-Hartman' and email 'gregkh@linuxfoundation.org' are listed in yellow. On the right side of the slide, there is a small video feed showing a person in a blue shirt.

LF Live MENTORSHIP SERIES

Best Practices to Getting Your Patches Accepted

Greg Kroah-Hartman
gregkh@linuxfoundation.org

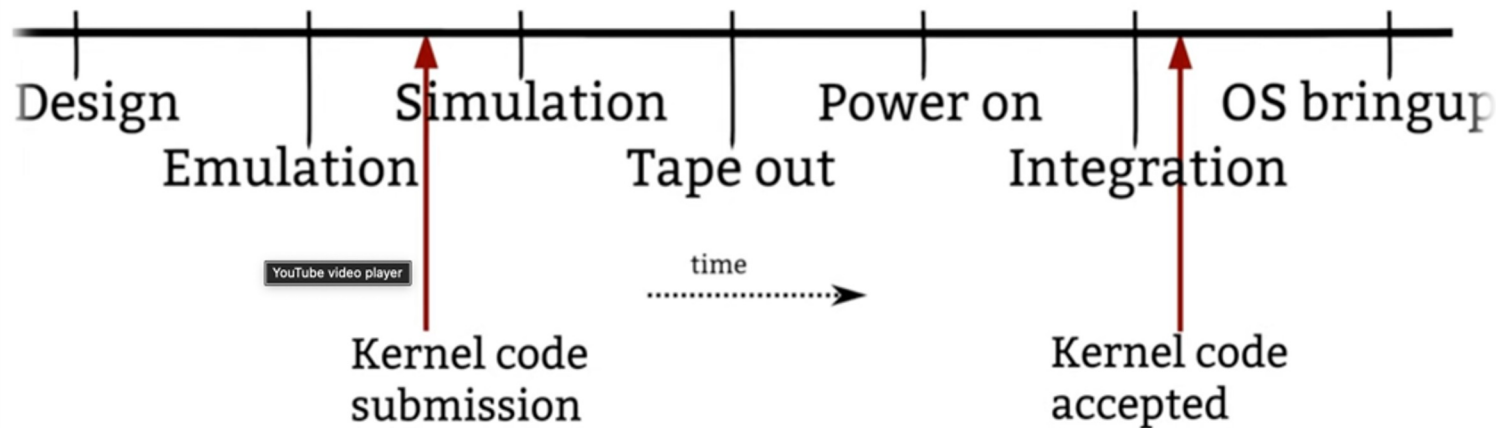
Greg Kroah-Hartman

Fellow,
Linux
Foundation



How to Upstream: Timing

Development Process



Greg Kroah-Hartman

Fellow,
Linux
Foundation



How to Upstream: Pre-silicon

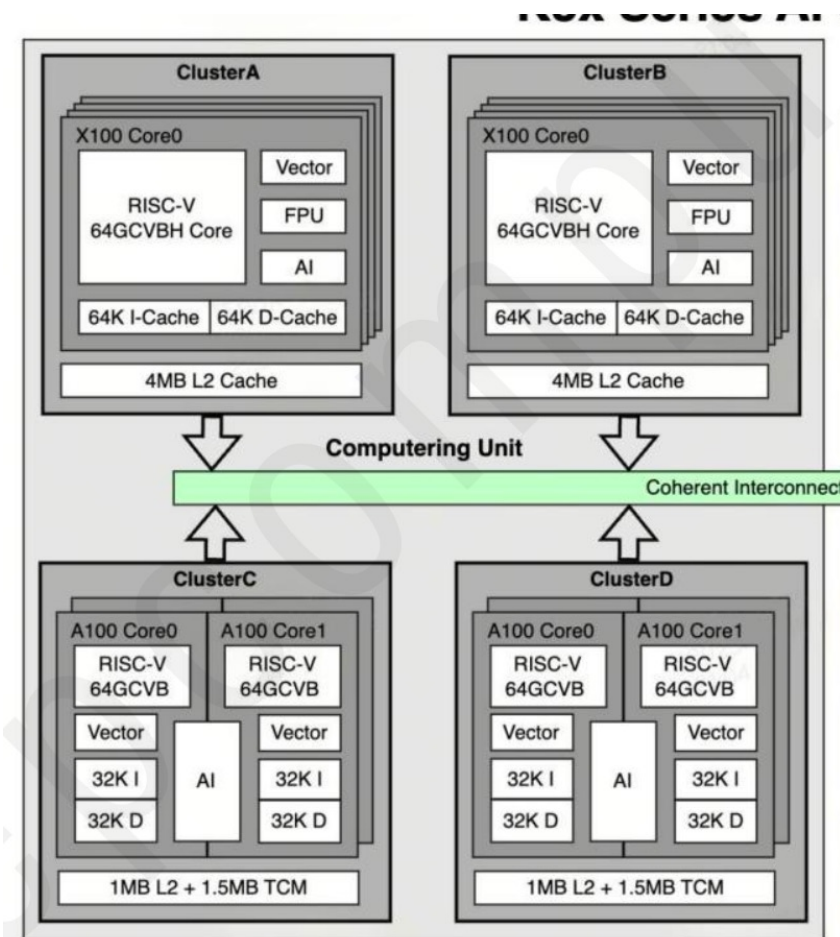
- **Willingness Check**
 - **Hardware Close-Minded!!!**
- **Inheritance**
 - **Commonality**
- **Planed Order**
 - **Easy**
 - **Difficult**
 - **Virtually Impossible (Display)**

How to Upstream: Pre-silicon

- **Shift-Left As Much As Possible**
 - **Work on mainline**
 - **Backport to LTS**
 - **Pre-submission review for shorter turnarounds**
 - **Inviting Busy Maintainers**

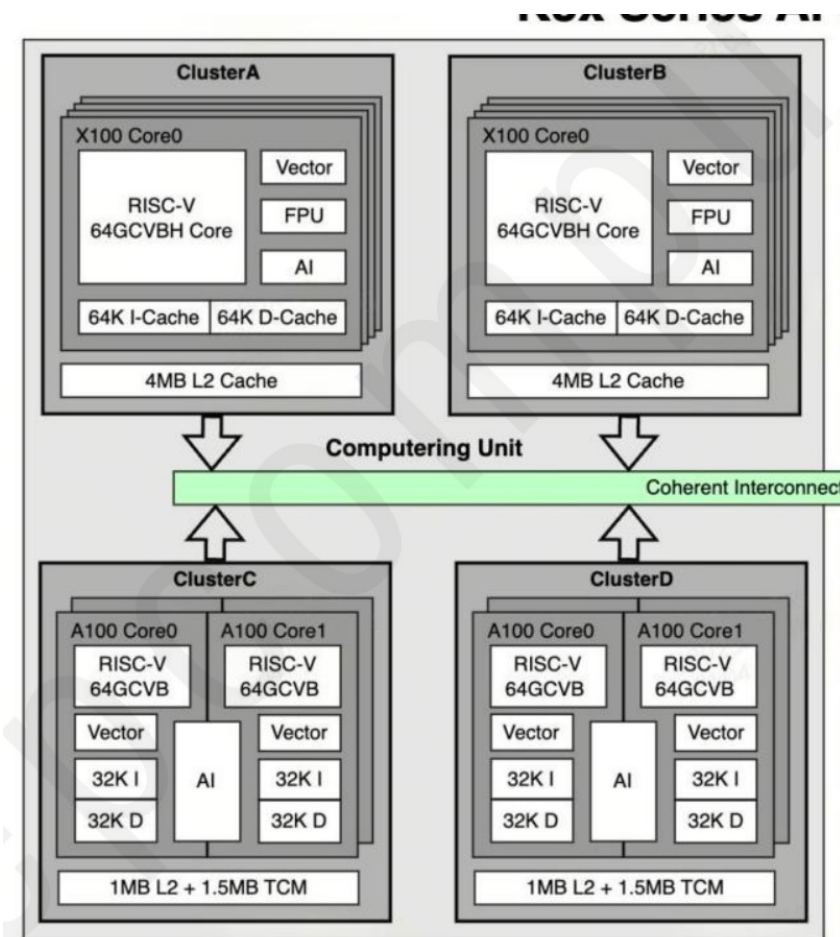
How to Upstream: Pre-silicon

- **Any Surprises?**
 - **OMG, Asymmetric**
 - RVA23 vs Non RVA23
 - RVV different vlen
 - **OMG, PCIe**
 - Not on 32bit DMA Zone
 - **OMG, Public matters**
 - Private Repository to Public
 - Avoid IP issues



How to Upstream: Pre-silicon

- **Breaking Rules?**
 - **FPGA target?**
 - Short-life Target, NO!
 - **Any Testing?**
 - No Hardware!
 - **Any Reputation Ruin?**
 - What happen bugs!!



What to Improve?

- **Consider Upstream in Design Stage**
- **Consistent Design**
 - **With less Upstreaming effort in mind**
- **Be brave and not shy**
 - **Nothing more harmful than not upstreaming**

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Thank You

