Fedora 37 on SG2042

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Thu, Feb 02, 2023 @ RISC-V Dev Boards Meeting - East-friendly

陆吉年

广东 深圳

扫一扫上面的二维码图案，加我为朋友。

Sophgo

Jinian Lu

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lu.jinian@icloud.com

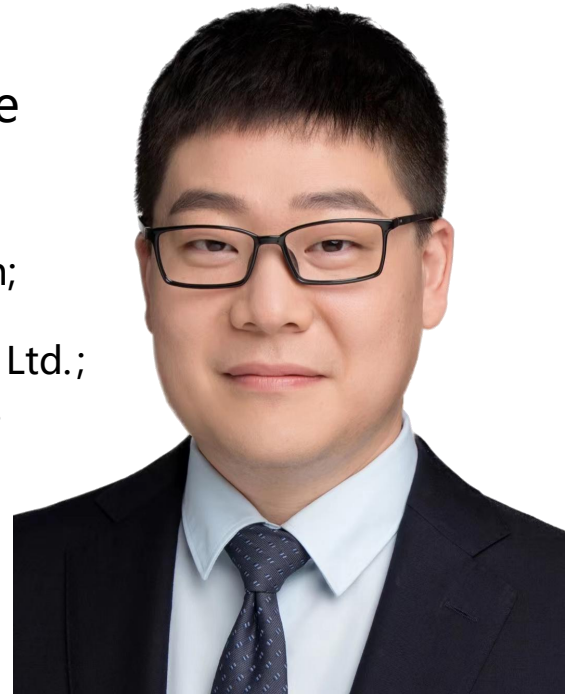
SOPHGO 算能

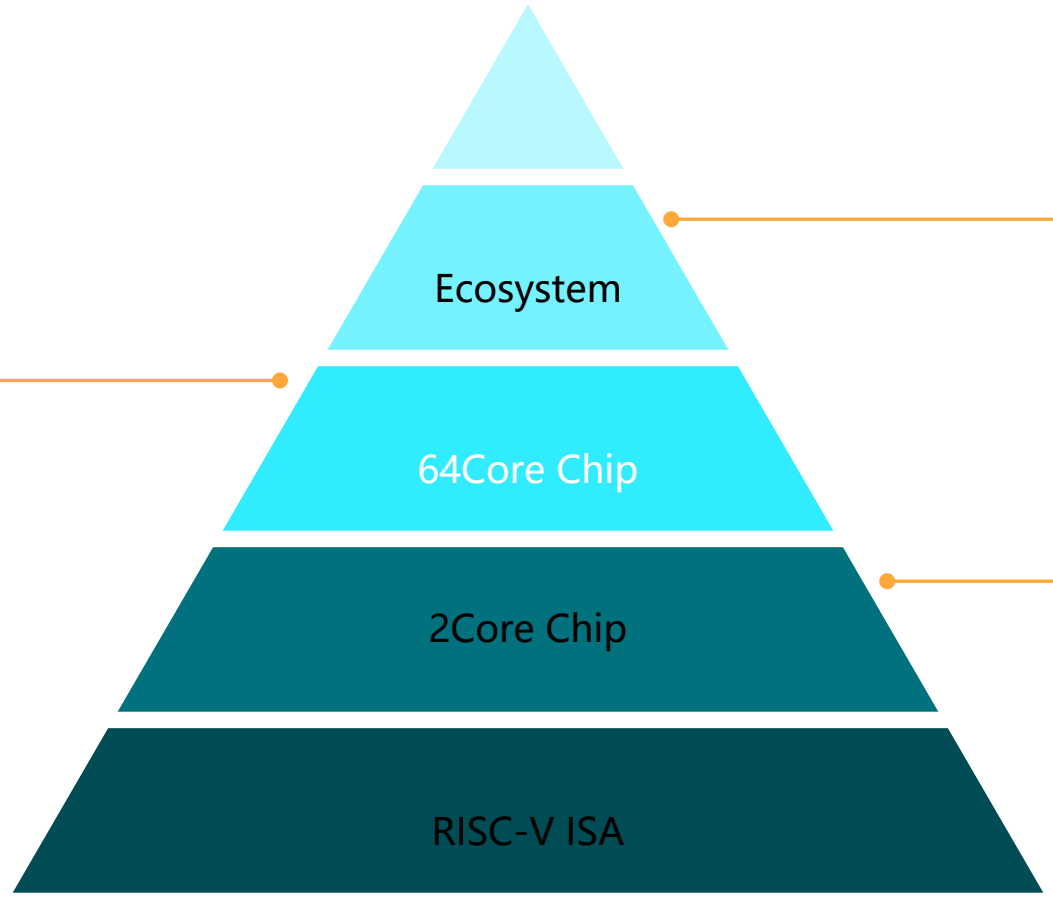
20 years of semiconductor work experience

BD Manager @ Sophgo Technologies

General Manager of Chip Market Center @ intellifusion;
Director Of Business Development @ StarFive;
VP of Marketing & Sales @ Goke Microelectronics Co., Ltd.;
Sales and Marketing Director @ Allwinner Technology。

2003-2015 focus on Storage，DRAM and FLASH。
After 2015, focus on SOC field,
in 2018, also focus on RISC-V IP and Soc.

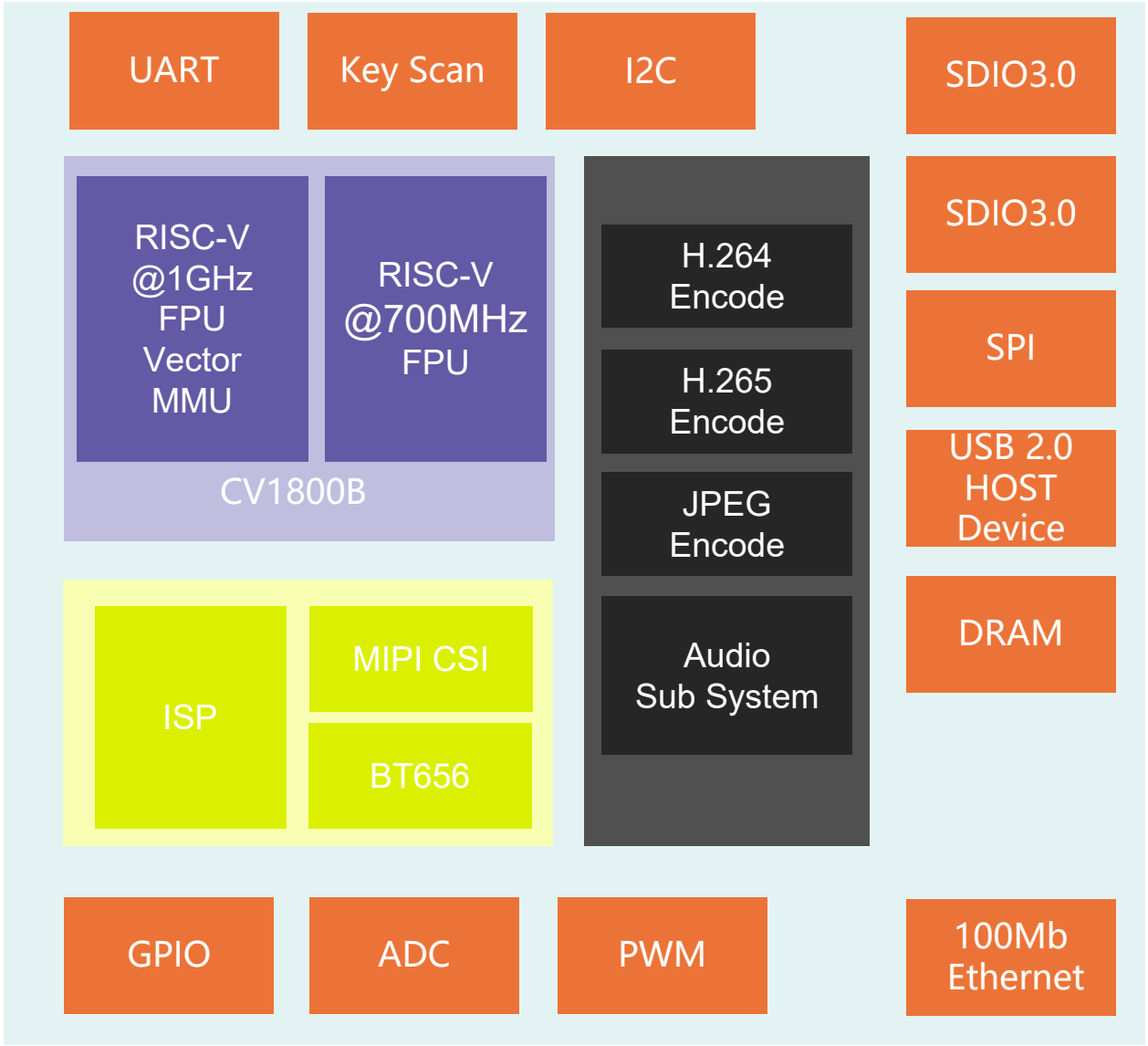




Development board:
Various development board partner

SG2042
RISC-V 64Core

CV1800B
RISC-V 2Core



package	QFN 7X7mm 0.35Pitch
Frequency	906@1Ghz; 906@700Mhz
L1 Cache	I:64KB and D:64KB
DRAM	DDR2 512Mb SIP
Typical Power Consumption	1080P+Video Codec +AI 500mW
Linux Kernel	5.10

Jan 2023: Mass production and delivery

milkV Duo

SOPHGO 算能

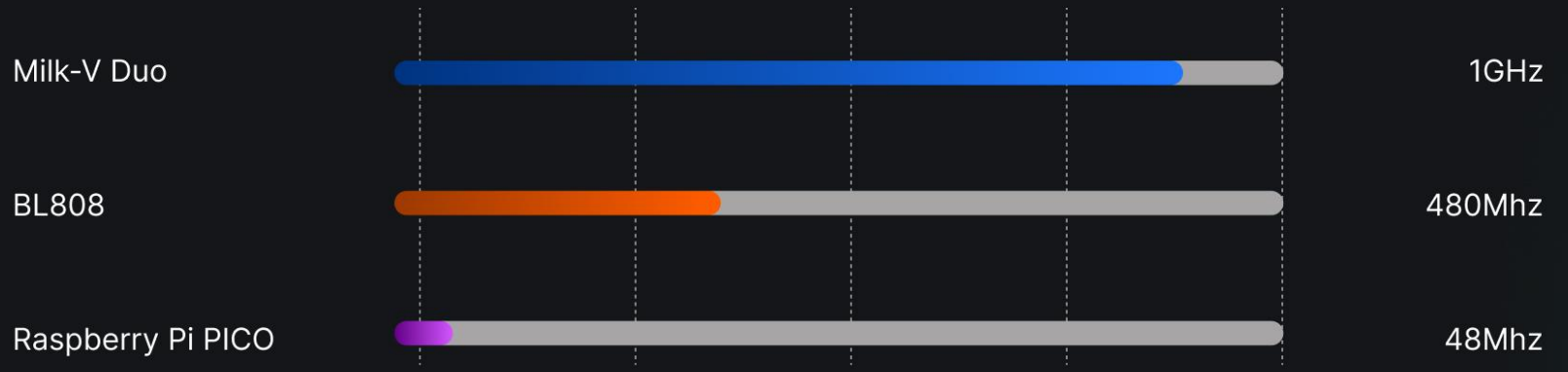
https://forum.radxa.com/t/risc-v-riscv64/5684

More powerful than others

Dual Core RISC-V CPU up to

1G hz

Vector Acceleration



milkV Duo

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Incredible, it's a AMP computer !

Support Asymmetric multiprocessing

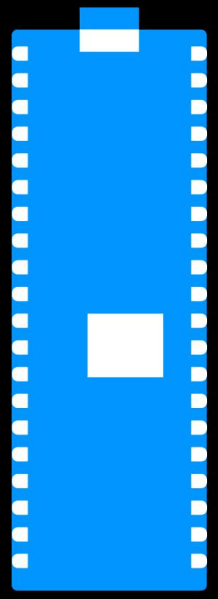
... Task Task | Task Task ...

Linux | RTOS

CPU1 | CPU2

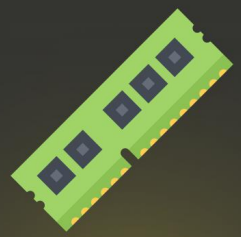
Sharing Memory

10/100Mbps Ethernet thru optional add-on board

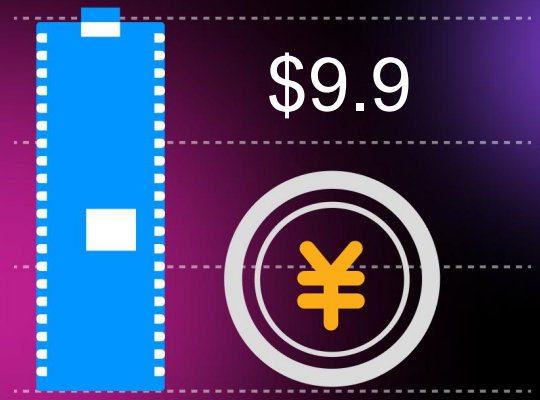


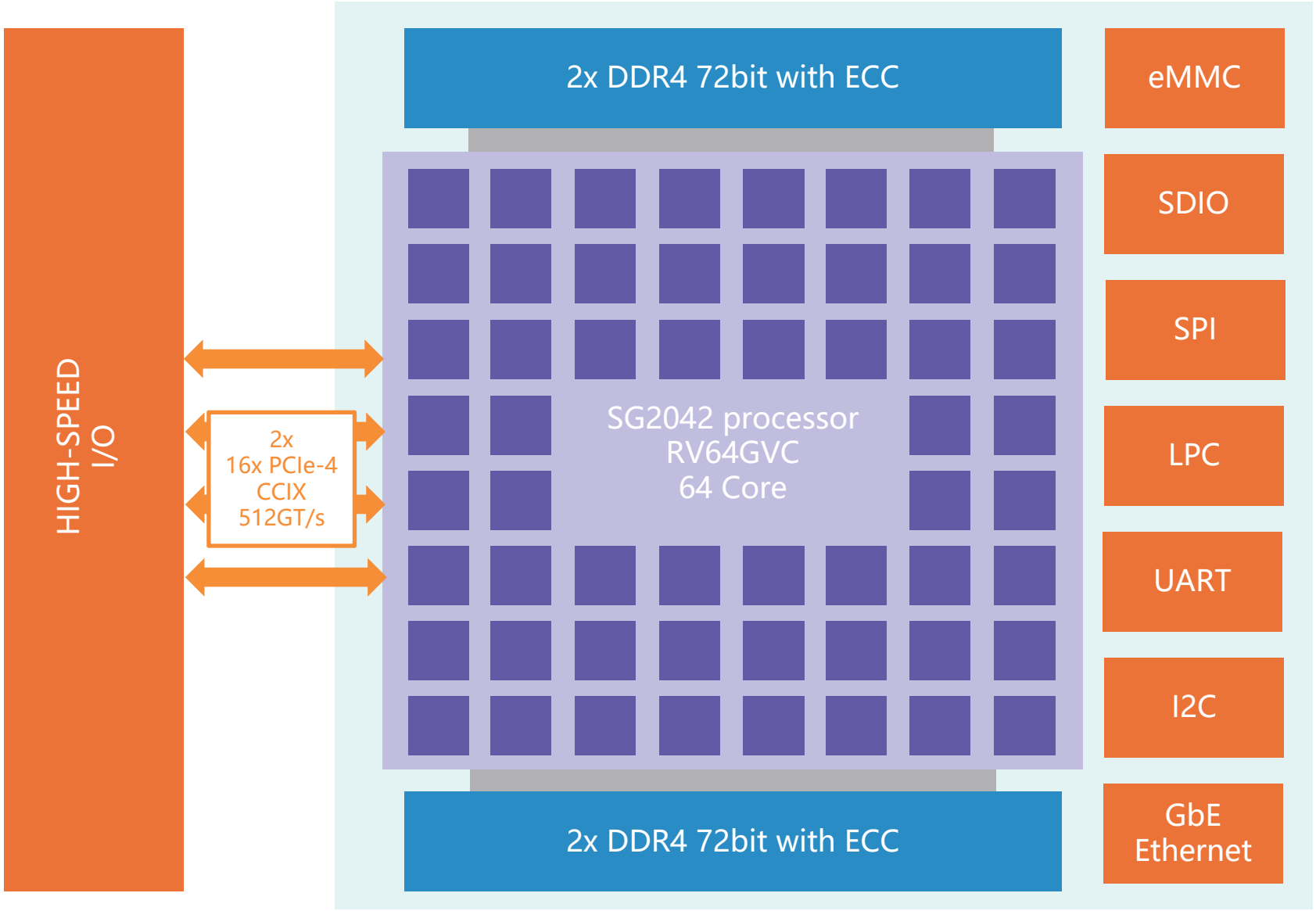
40P GPIO

MicroSD support



64MB RAM





package	FCBGA 57x57 1mm
Frequency	2GHz
L1 Cache	I:32KB and D:32KB
L2 Cache	1MB/Cluster
L3 Cache	64MB System Cache
Typical Power Consumption	120W
DDR	4 channel 3200Mhz ECC RDIMM/UDIMM/SODIMM
PCI-e	2个16x Gen4，CCIX supported

March 2023: Mass production and delivery

RISC-V Server

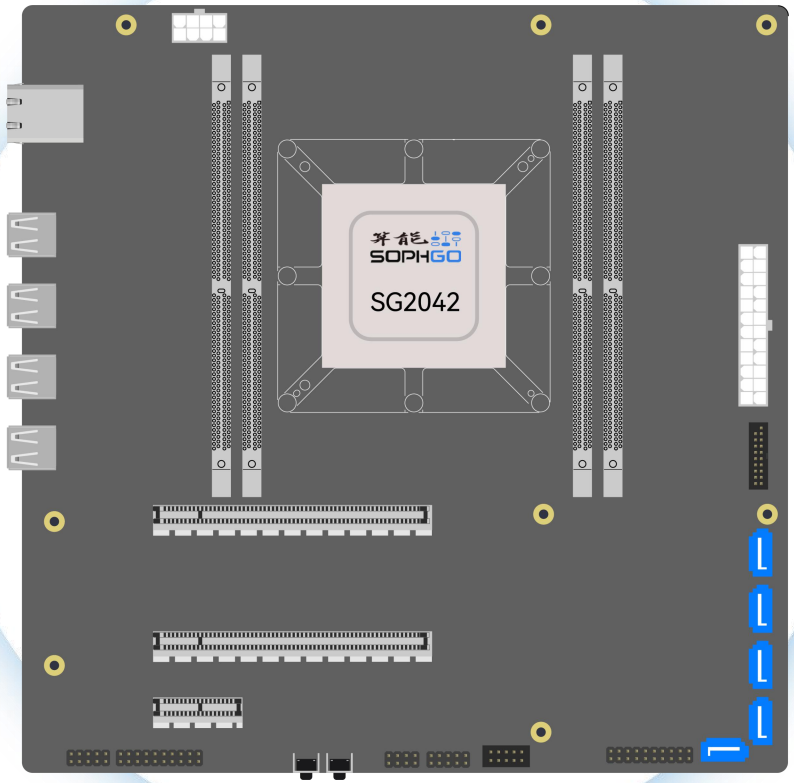
Spec

two-socket server
8 channel DDR4-3200 RDIMM，Max 512GB
7个PCI-e x16 slot
RAID: 12Gb Mini-SAS
ASPEED AST2600 display controller
support up to 8x SAS/SATA 3.5HD
BMC：AST2600
3x USB3.0
2x USB2.0
Dual network ports：1x 10Gb，1x 1Gb

Sample Delivery Time：Apr 2023

Pioneer Board

SOPHGO 算能



Size

- Form factor: microATX 244 x 244mm
- Support Standard PC enclosure

Power

- Standard 24P ATX Power connector

Interface

4x 2400Mhz DIMM Slot
8x USB 3.2 Gen2 10Gbps
4x USB 3.0 internal header for front panel
5x SATA 3.0
2x M.2 M key for NVMe SSD(PCIe 3.0 x4 lanes)
1x M.2 E Key support WiFi 6/6E
2x 2.5G RJ45
1x PCIe x16 slot for 10G/40G Network Card or others(PCIe x8 lanes)
1x PCIe x16 slot for Graphics Card or others(PCIe x8 lanes)
1x PCIe x8 slot for general purpose(PCIe x8 lanes)
1x SD card for OS or recovery
SPI Flash for BIOS, UEFI BIOS support

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Pioneer Box

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- 1X SG2042 CPU
- 1x Developer Board
- 250W ATX Power supply
- Intel AX210 WiFi 6E / BT5.2 card
- Dual 10G SFP Network Card
- Graphice Card AMD Radeon RX550 4GB
- Nice and compact enclousre with carrying handle
- 1TB Nvme SSD
- 2x 16G DDR4
- Powerful RGB CPU cooler

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The world FIRST RISC-V Server development platform

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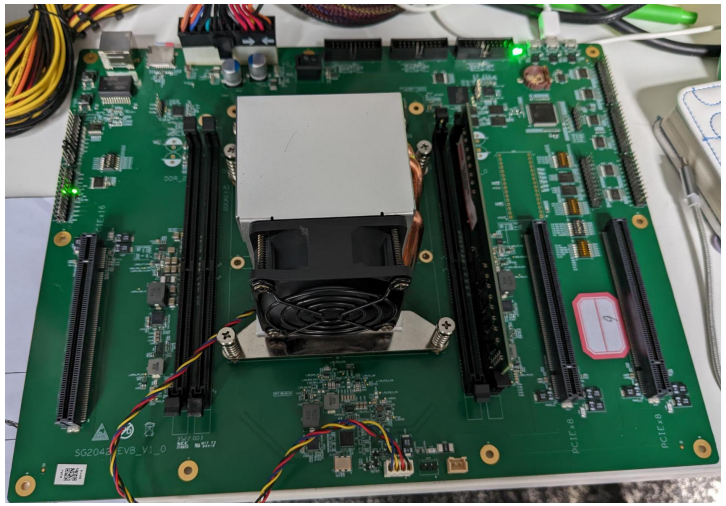
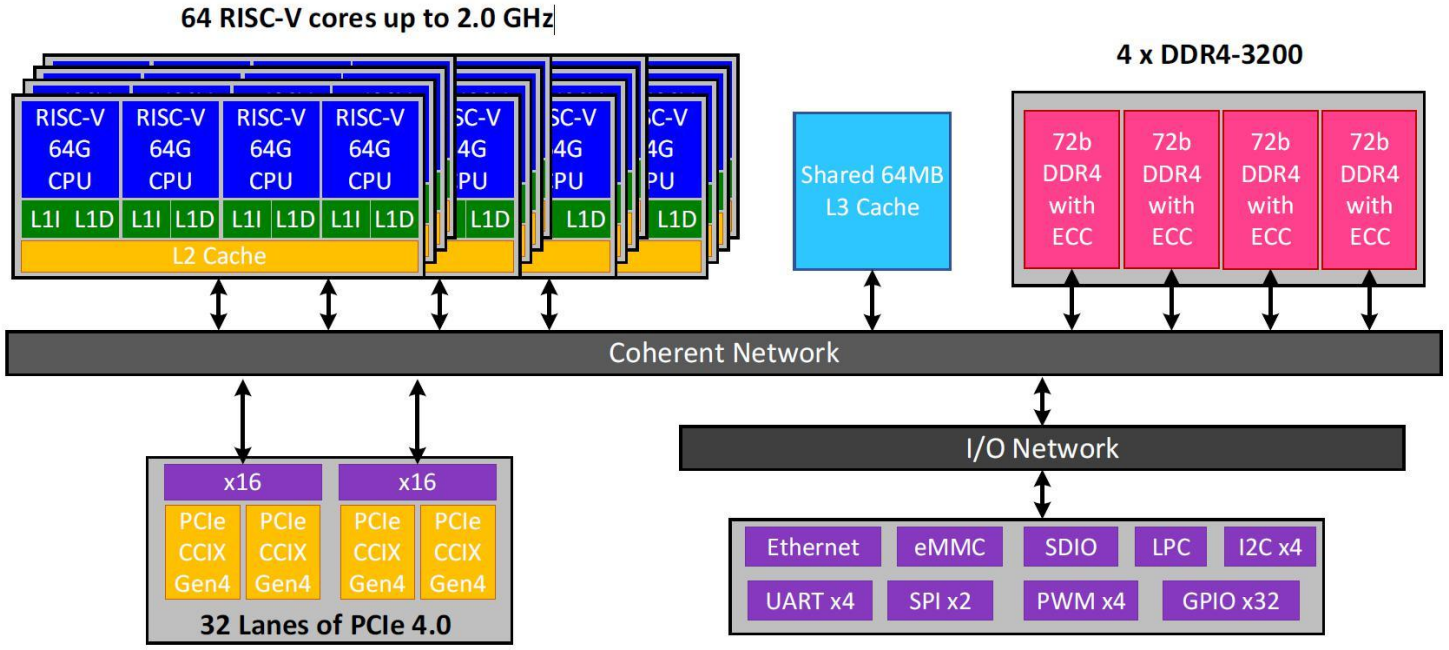


SG2042 RISC-V General Server



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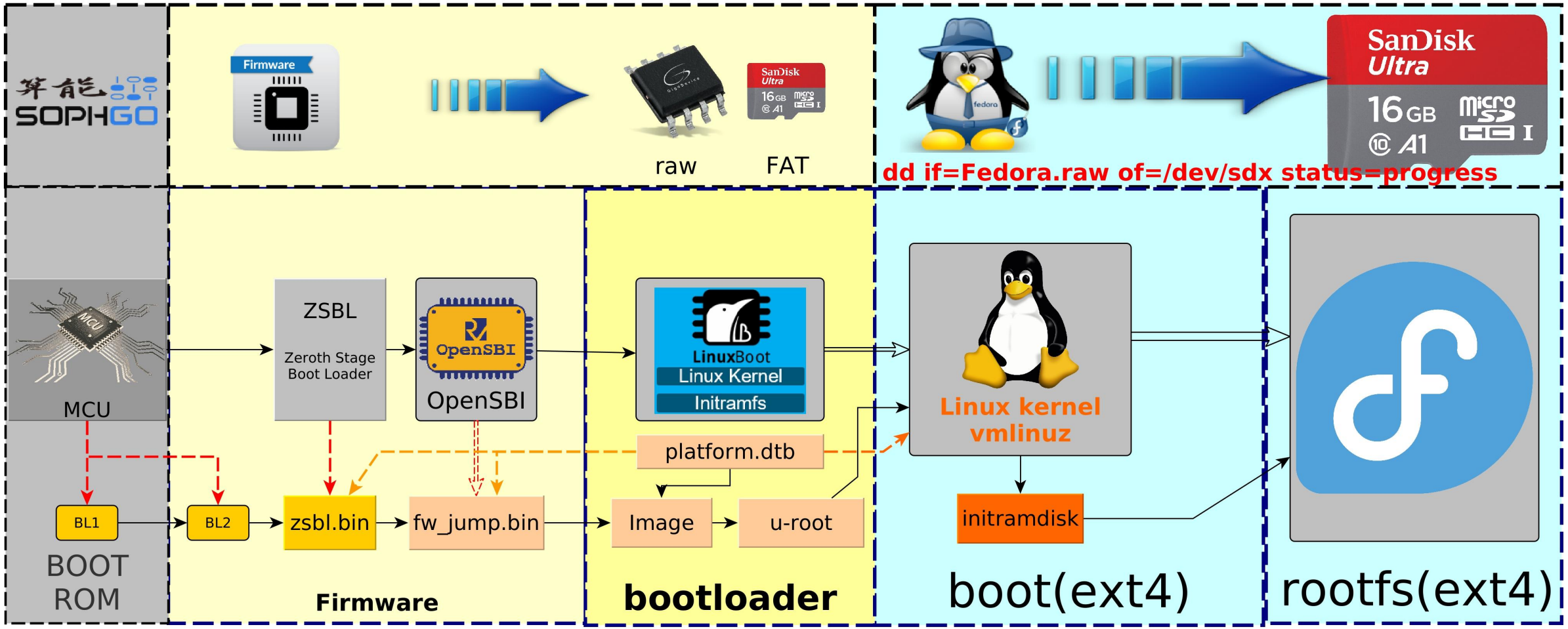
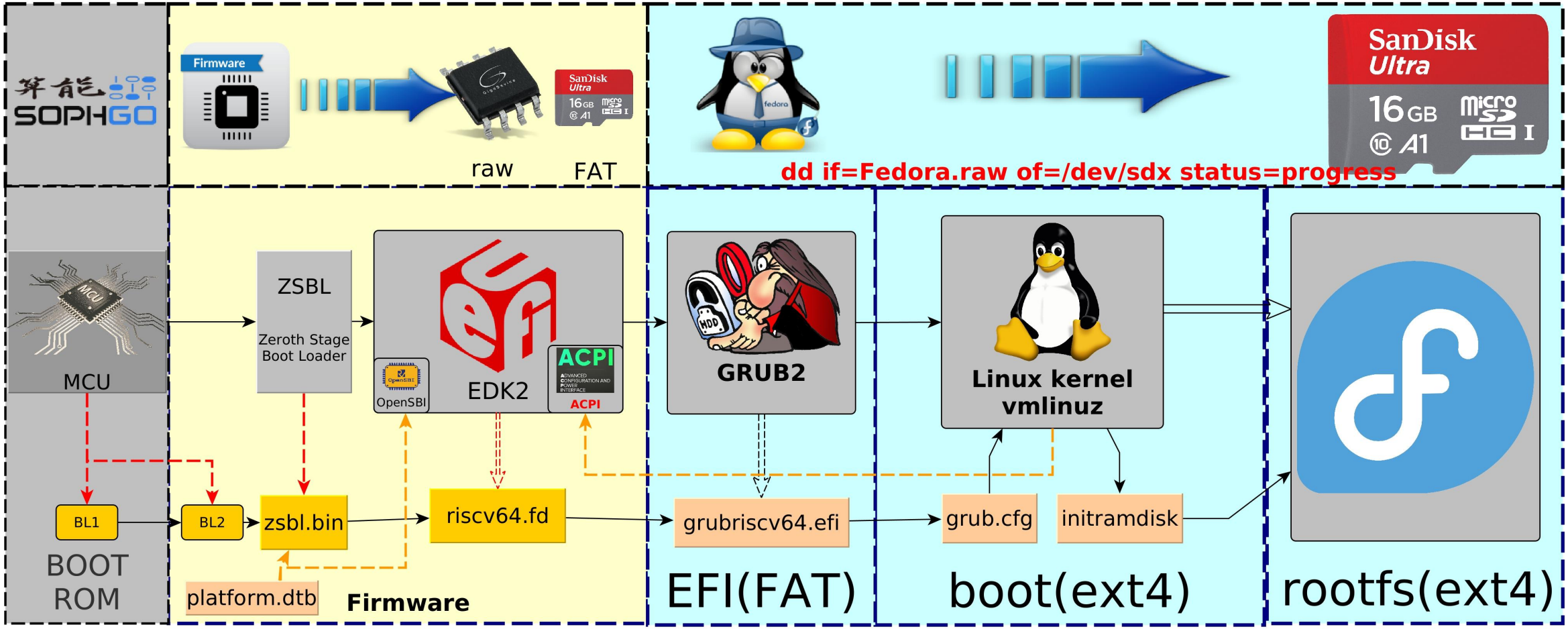
The current boot flow for SG2042



Red Hat

The future boot flow for SG2042



Red Hat

The cooperation between Sophgo and Perf-V

SOPHGO 算能

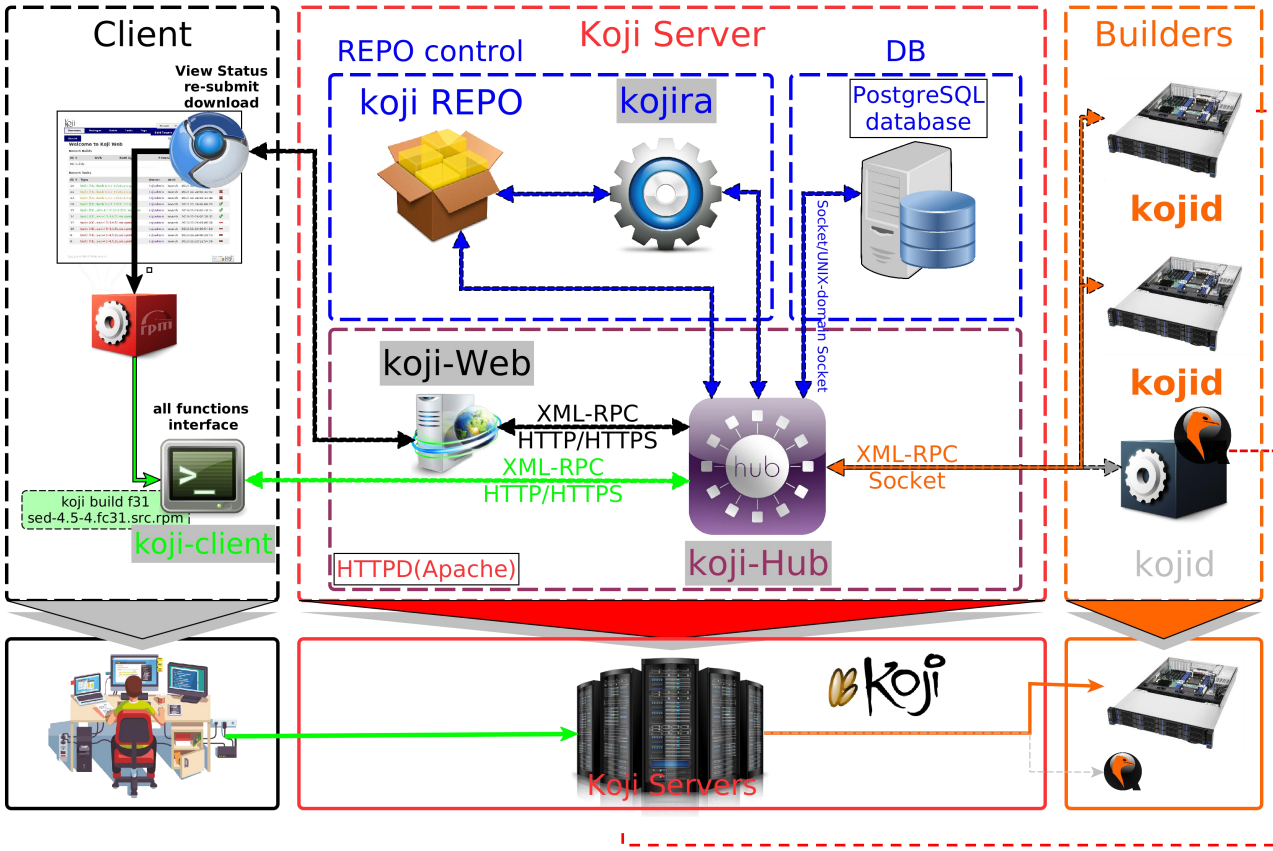
- Jun 2023, SG2042 support will be merged into OpenBLAS mainline。
- Sep 2023, will release the RVCL ® high-performance mathematical computing library (RISC-V Computing Library) which is optimized for SG2042.
- RVCL includes mathematical computing libraries such as PerfBLAS, PerfMath, VML, PerfFFT, PerfIPP, and LAPACK.
- Oct 2023, will release the PerfXPy ® high-performance Python Computing Platform which is optimized for SG2042. Free, SaaS and cluster version are available.

PerfXLab

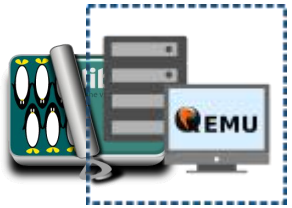
- Sophgo is more OPEN, welcome to become our partner.
- Sophgo will start a series of open source projects,
  will announce them one after another.
- Come from Open Source，give back to Open Source。

Koji Build System for RPMs & Image

Koji builds RPMs for the Fedora Project and EPEL.



RISC-V Server Builder
REAL Hardware



QEMU VMs(on x86_64)
For testing

An x86_64 server
for all central infrastructure

Main sever, repository creation and VMs with backup(separate NVMe).

We are working on Koji server for RV64 in China:

ISCAS support: https://openkoji.iscas.ac.cn/

David is working on ROCKS server

http://fedora.riscv.rocks/koji/

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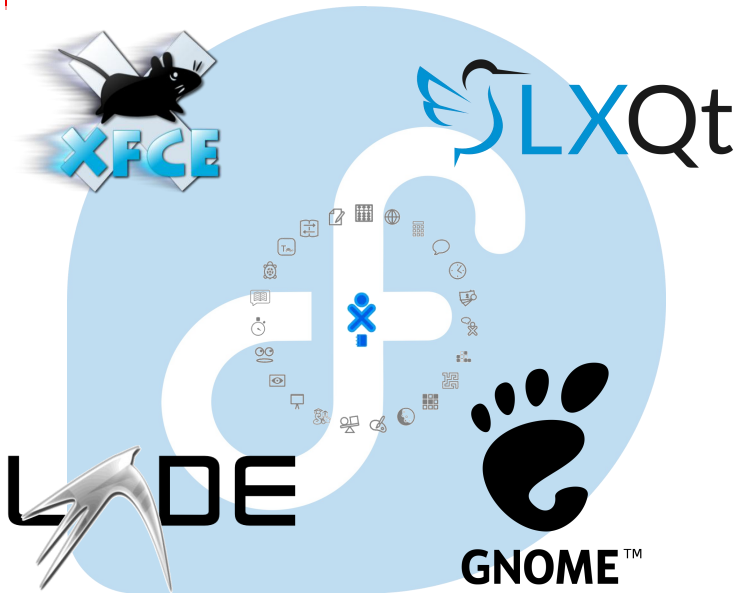
The Status of Fedora on RISC-V



Fedora

Bootable: Yes, OpenSBI + **UEFI/ACPI** + GRUB on QEMU&Hardware
package management: dnf + rpm
Build system: Koji + Mock
Status: Fedora 37， then upgrade to **Rawhide**
REPO：15200+ srpm have been built.

Repositories

Openkoji
https://openkoji.iscas.ac.cn/repos/
Rocks
http://fedora.riscv.rocks/repos/

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The Status of Fedora on RISC-V

- **RPM packaging**
  - **[F37-->rawhide] 【On Going】 [https://openkoji.iscas.ac.cn/repos/fc36dev/] as REPO**
- **main package version:**
  - **Toolchain(up-to-date)**
    - **gcc-12.2.1-4 -->** gcc-13[on going]
    - **glibc-2.36-9**
    - **Binutils 2.38-25[F37] -->** 3 2.39-3[rawhide]
  - **libffi-3.4.3-1.1(up-to-date)**
  - **java-latest-openjdk-19.0.1.0.10-3(up-to-date)**
  - **perl-5.36.0-492(up-to-date)**
  - **Python 3.11.1(up-to-date)**
  - **LLVM/Clang 15.0.7-1(up-to-date)**
  - **Go 1.19.4-1(up-to-date)**
  - **Rust 1.66.0-1(up-to-date)**

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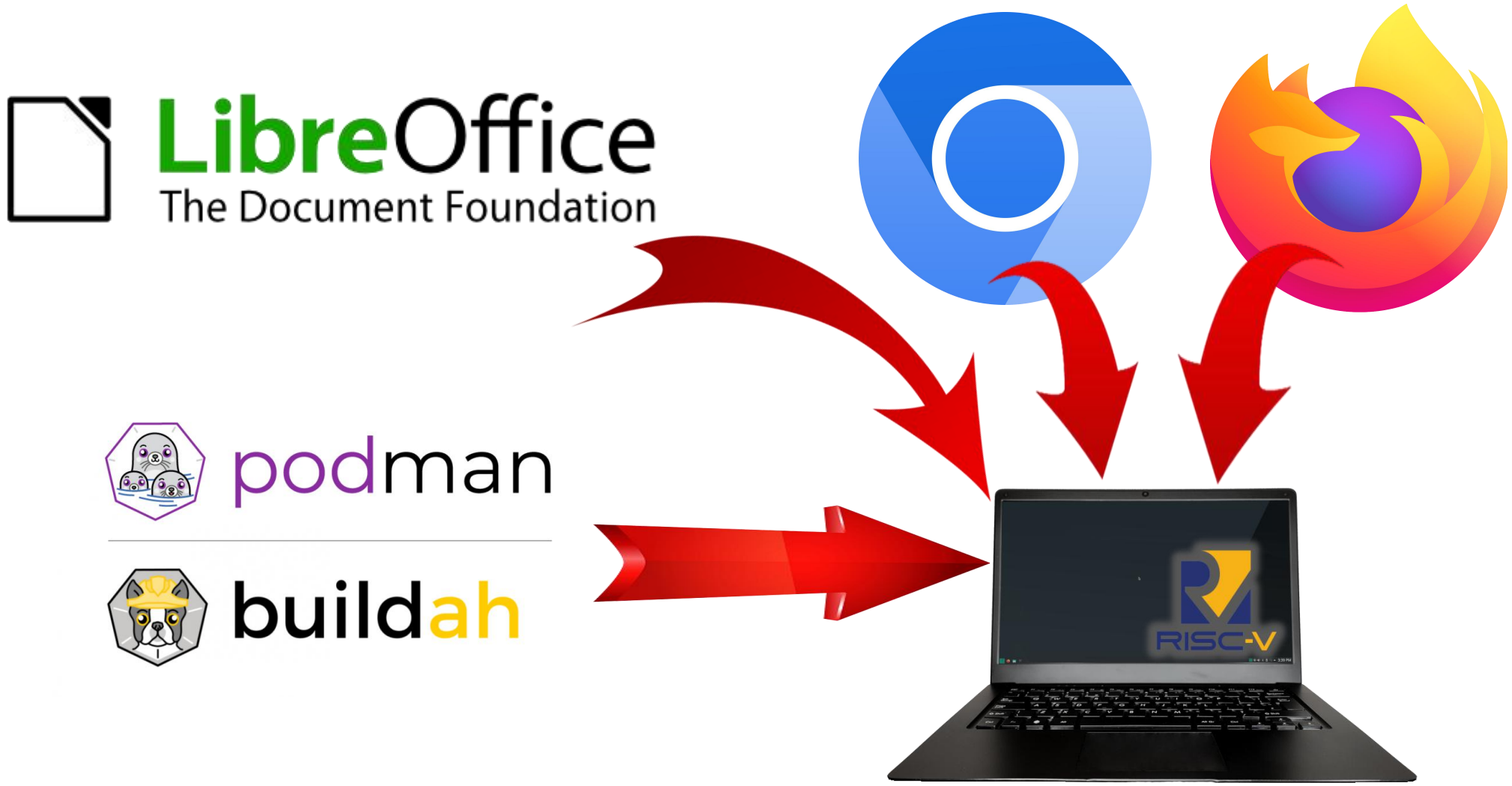
The Status of Linux Application on RISC-V



Acknowledgments

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WD

Alistair Francis
Anup Patel
Atish Kumar Patra

Akira Tsukamoto
Drew Fustini
Mikael Frykholm
Stefan O'Rear

radxa ROCKPI ISCAS 中国科学院软件研究所 Institute of Software Chinese Academy of Sciences

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RISC-V® AMBASSADOR

... and countless other individuals and companies, who have contributed to RISC-V specifications and software eco-system!

Red Hat

Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.

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