Linux Distros on RISC-V

status update

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Wed, Jun 1, 2022 @ RISC-V Days Tokyo 2022 Spring

AGENDA

Fedora — **Fedora 36 on RISC-V**

Demo — **Run Fedora 36 on QEMU(riscv64)**

Distro — **Linux Distros on RISC-V**

Status — **The software component**

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Part I

Fedora 36 on RISC-V

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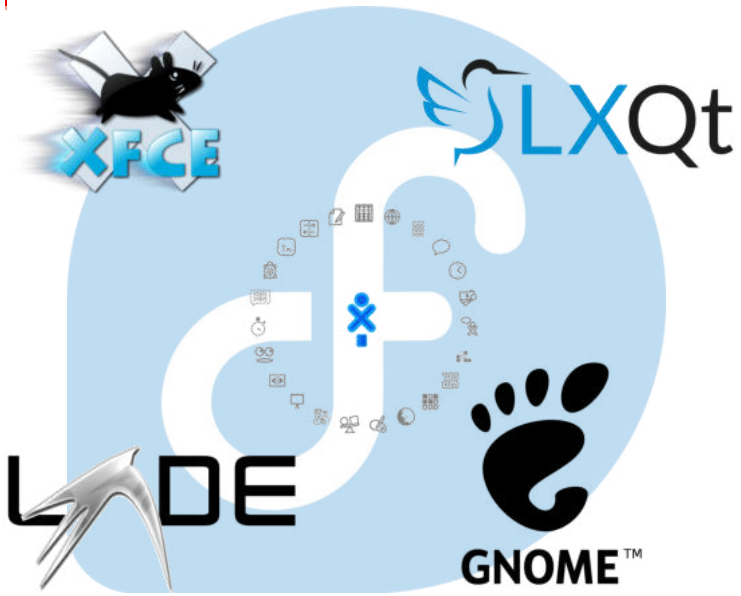
The Status of Fedora on RISC-V



Fedora

Bootable: Yes, OpenSBI + U-Boot on QEMU&Hardware
package management: dnf + rpm
Build system: Koji + Mock
Status: In maintenance , **Fedora 36**
REPO : 14400+ srpm have been built

Repositories in China

https://isrc.iscas.ac.cn/mirror/fedora-riscv/

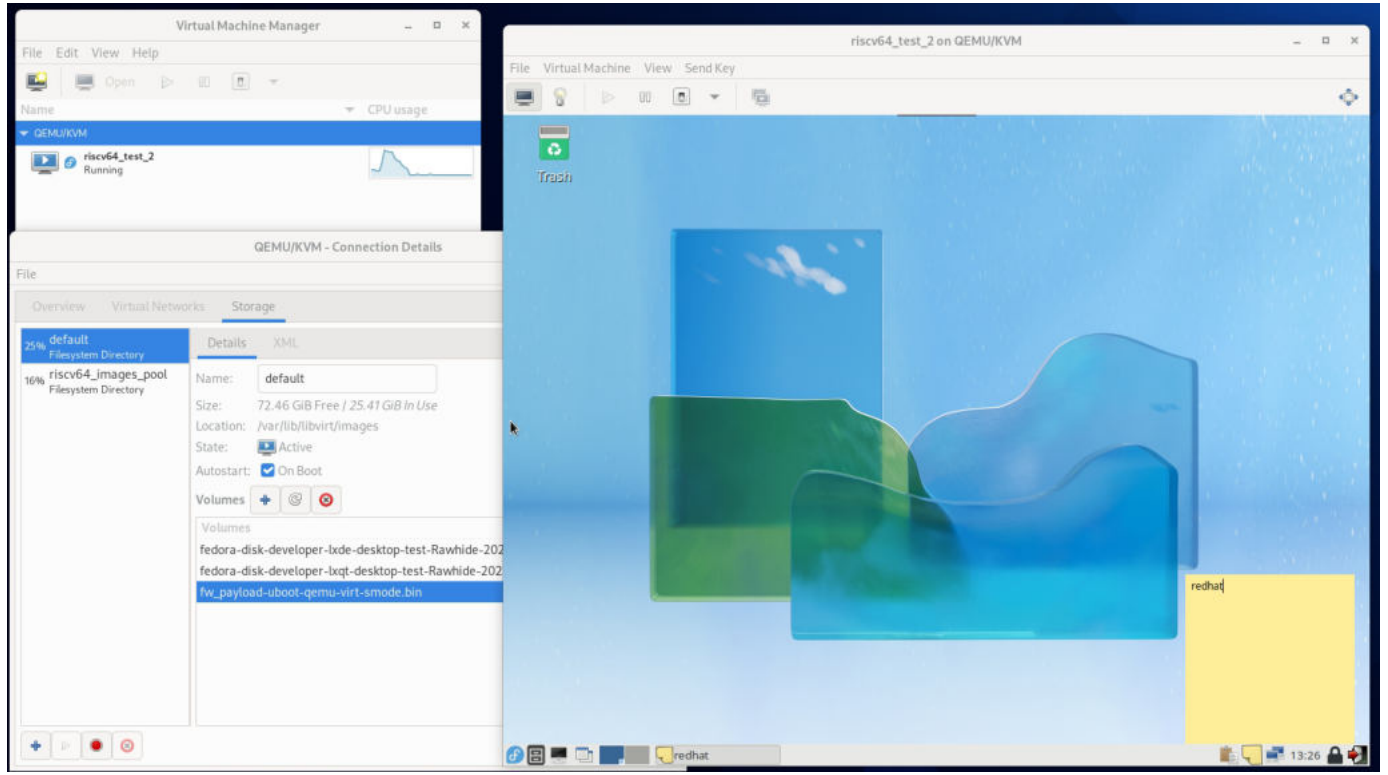
http://openkoji.iscas.ac.cn/pub/

Info Source:
https://dl.fedoraproject.org/pub/alt/risc-v/

Major test Targets

Virtual: QEMU and libvirt/QEMU

Fedora Images can run on the libvirt/QEMU with graphics parameters (Spice).



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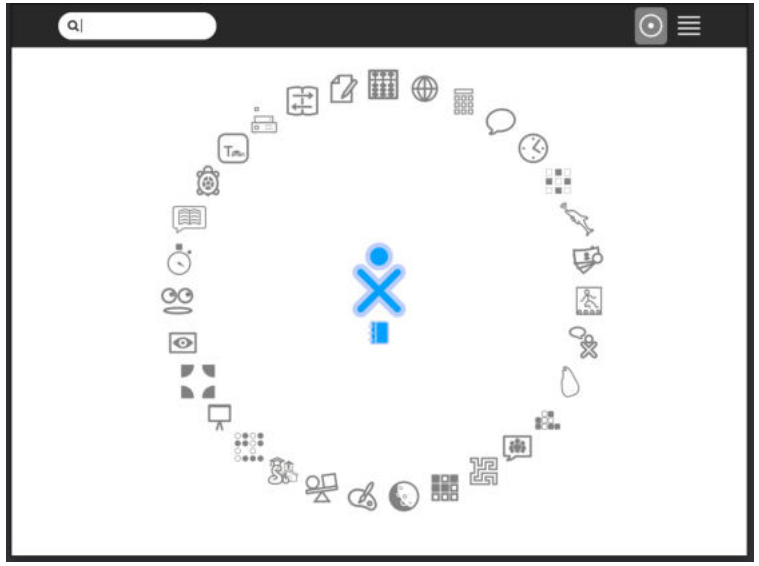
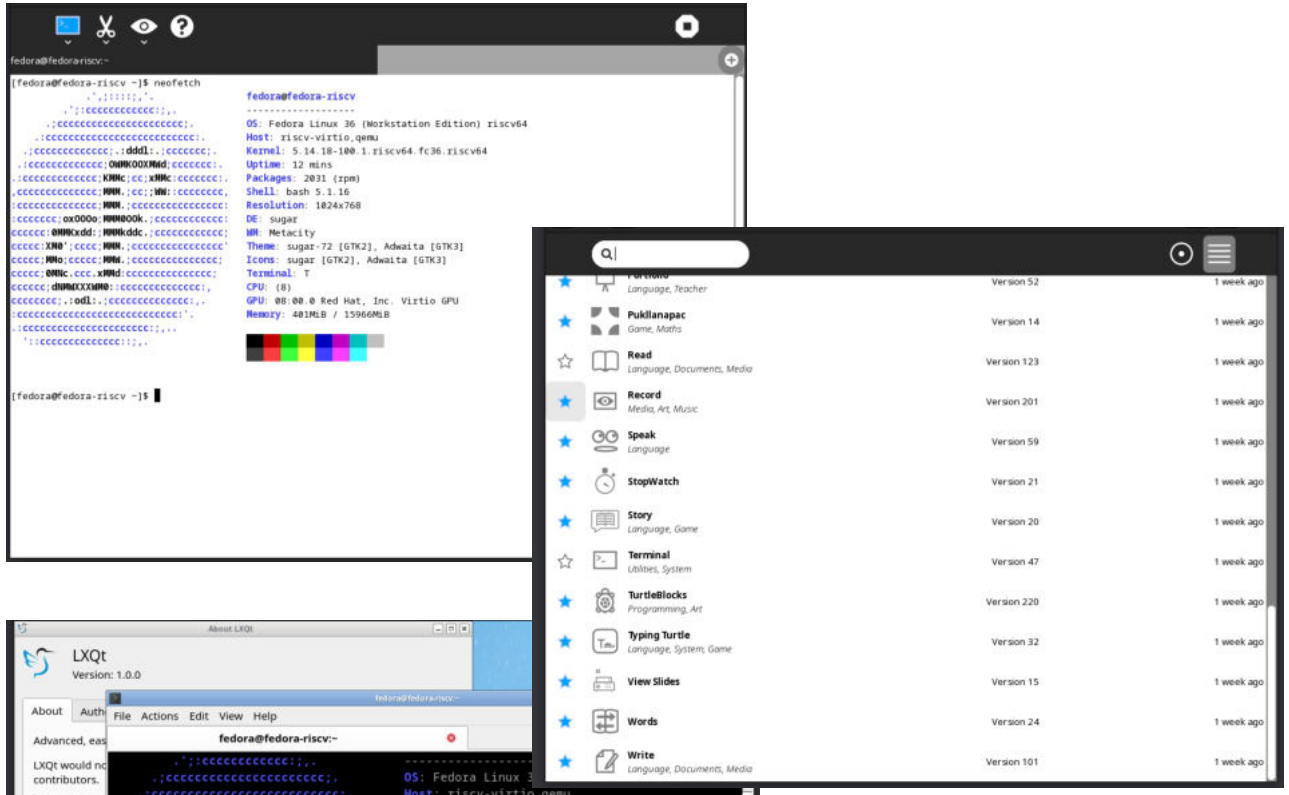
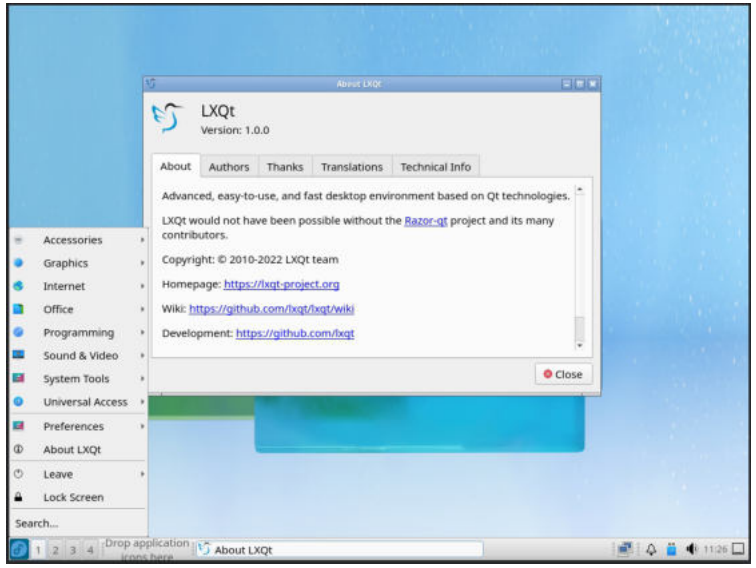
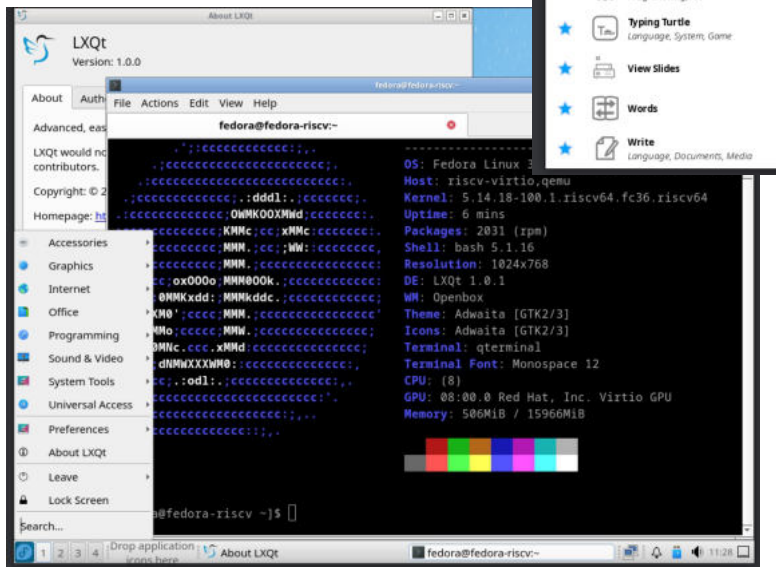
Run Fedora 36 on QEMU(riscv64)









LXQt

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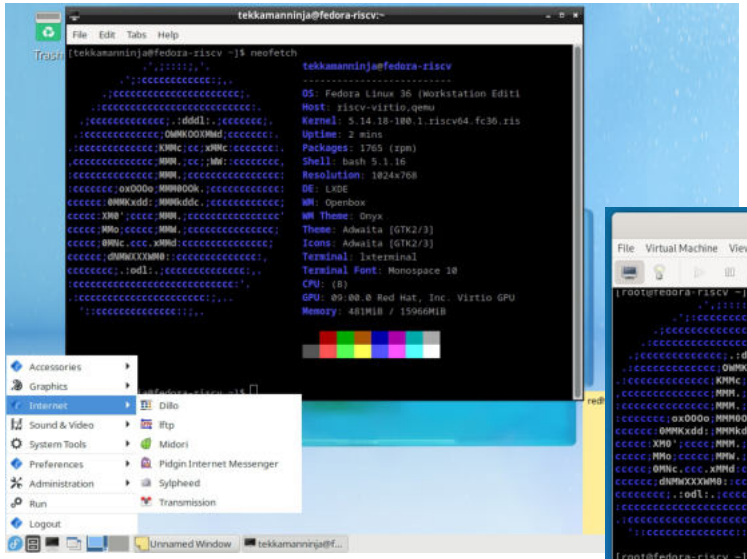
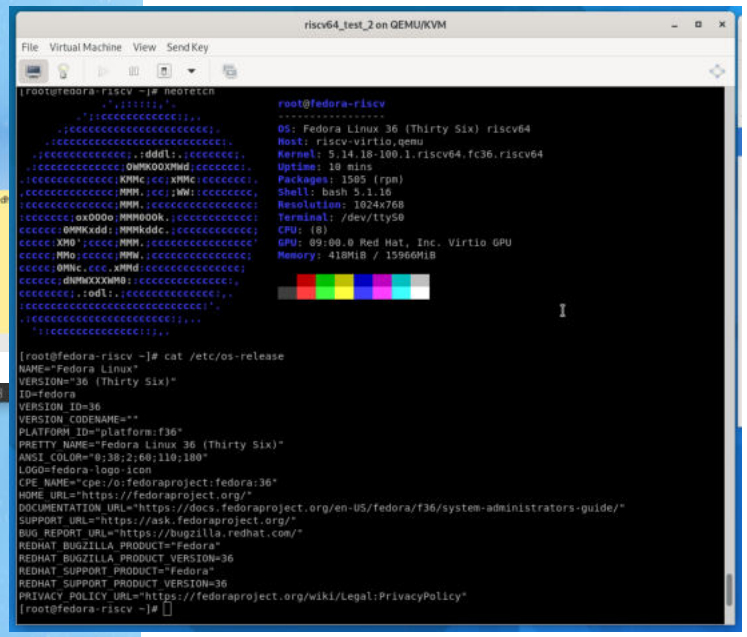
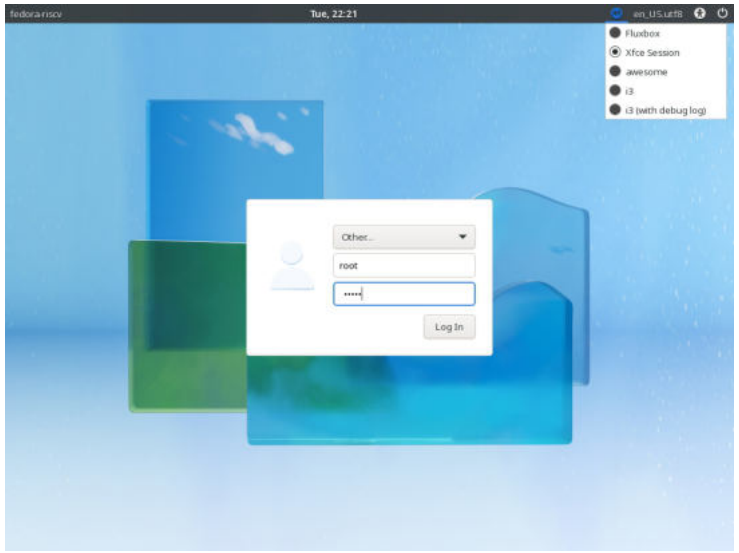
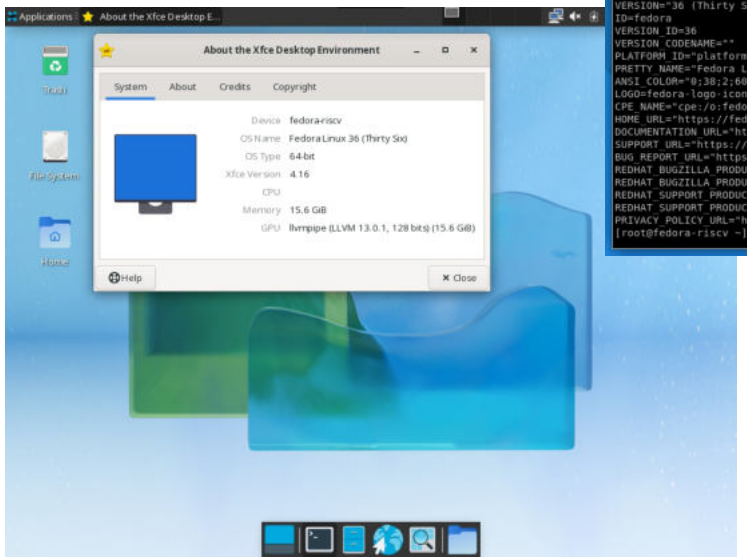
Run Fedora 36 on QEMU(riscv64)









Supported Targets

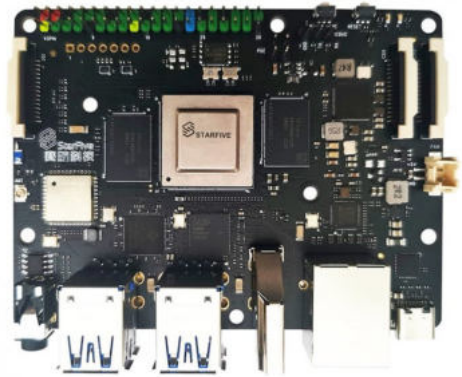
StarFive 赛昉科技

LIBERTAD AMIGOS RASGOS PRIMERO

JingHong Platform - JH71X0

Fedora Images can run on VisionFive.

OpenSBI+U-Boot+Linux kernel are upstreaming.



StarFive VisionFive V1 (JH7100)

StarFive VisionFive V2 (JH7110)

fedora remix GNOME XFCE LXDE LXQt Red Hat

Info Source:

https://www.starfivetech.com/site/newsdetail/568

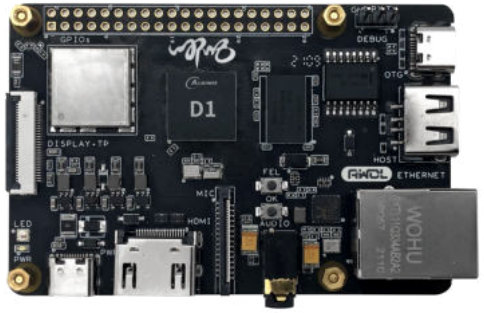
Supported Targets （ On Going ）

SiFive Unmatched

XIANGSHAN

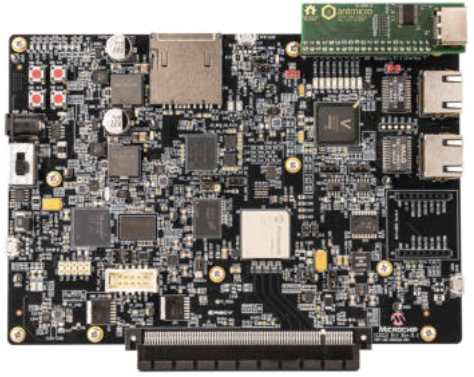
SiFive Unleashed

Canaan Kendryte K510 CRB



Allwinner D1

BeagleV™



PolarFire SoC Icicle Kit

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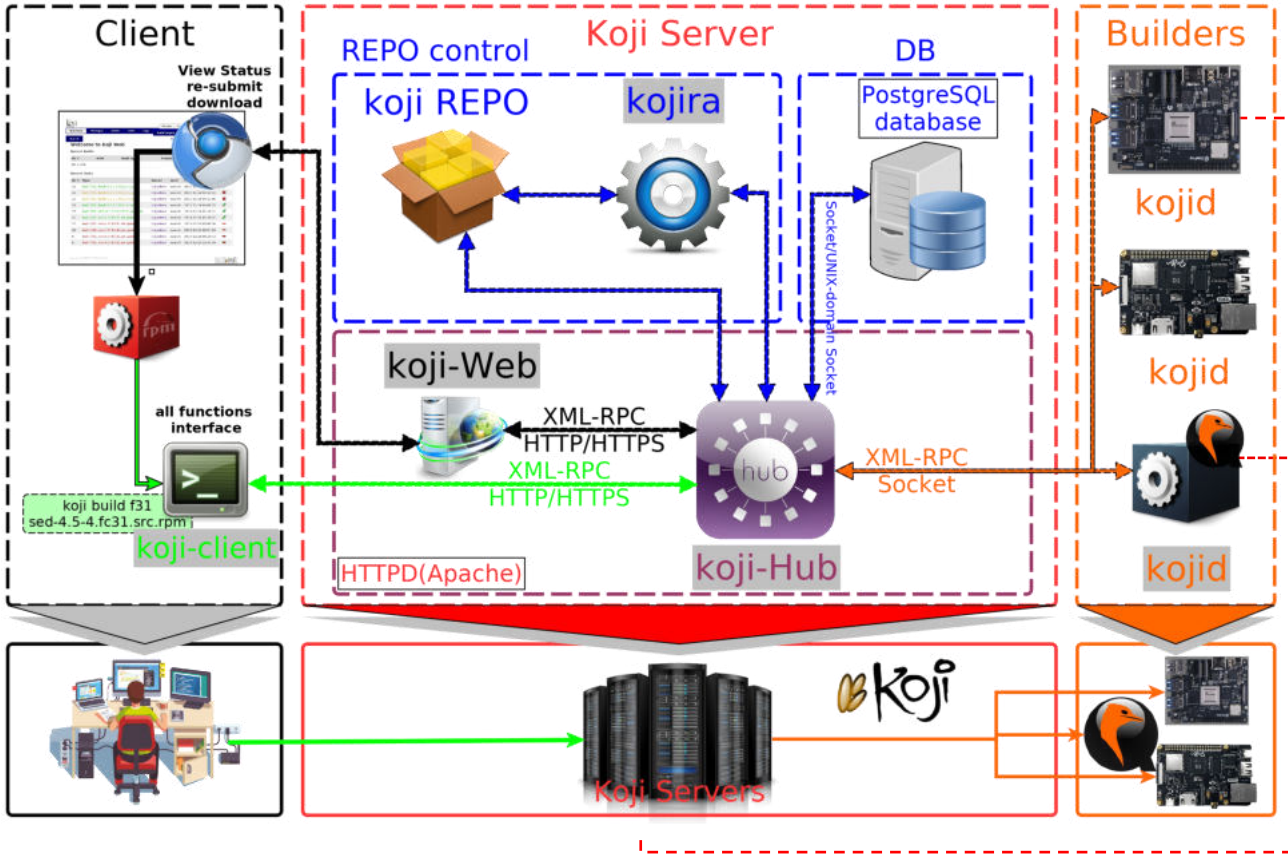
Koji Build System for RPMs & Image

Koji builds RPMs for the Fedora Project and EPEL.



We will have MORE ...

VisionFive 1 & 2

QEMU VMs(on x86_64) 72+

An x86_64 server for all central infrastructure

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

We are working on some Koji server for RV64 in China:

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

Oepkgs: https://oepkgs.net/

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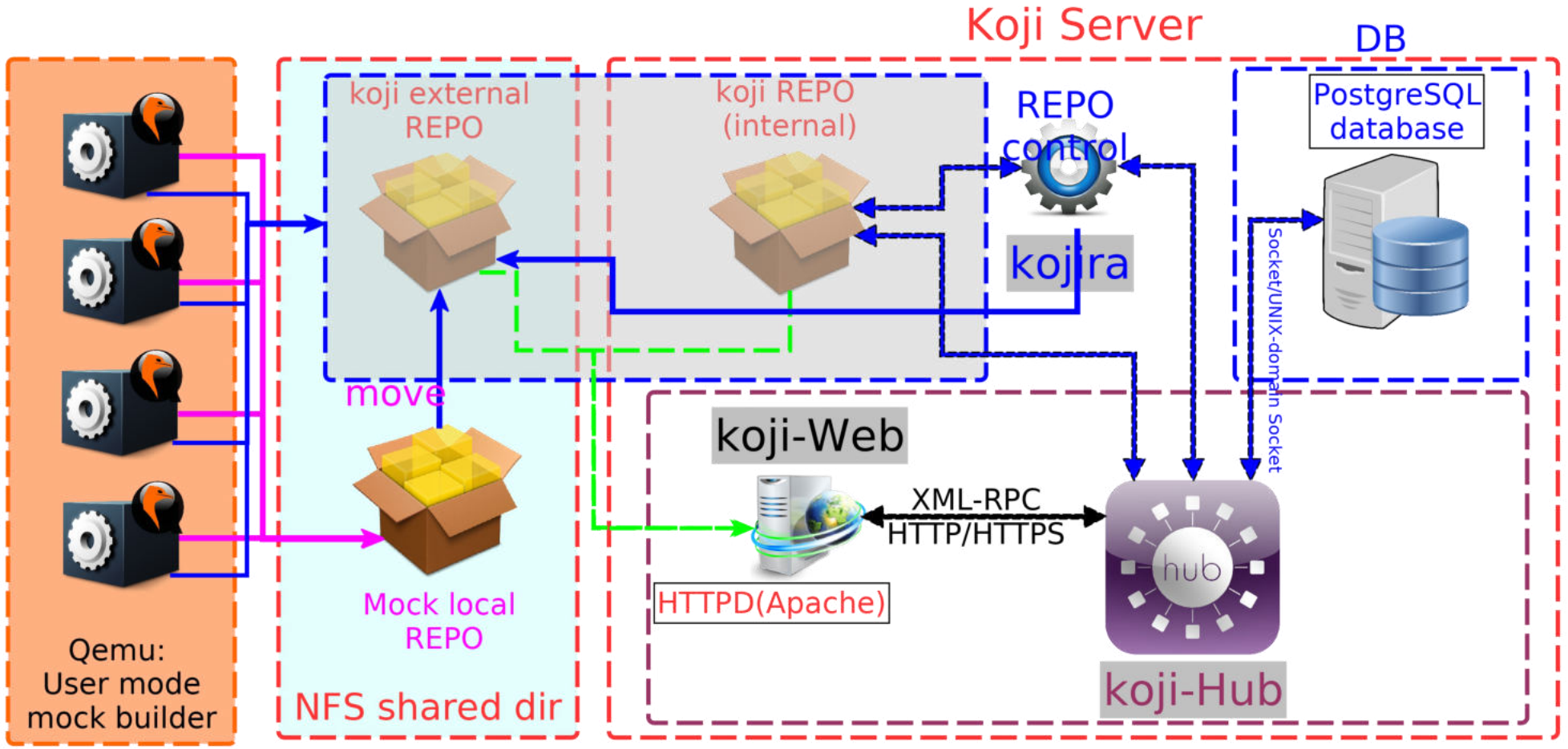
mock builder(user mode) with Koji Build System



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Part II

Linux Distros on RISC-V

Debian

Arch-Linux

Gentoo

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The Status of Linux Distro on RISC-V

Gentoo

Bootable: Yes, OpenSBI + U-Boot on QEMU&hardware
package management: emerge + portage
Build system: portage
Status: **bootable Image**

Chromium OS

Bootable: stage3 rootfs, need to be tested with FW
package management:
Build system: cros_sdk
Status: **stage3(console)，in reproduce, then moving forward**

Info Source:

Gentoo: https://github.com/dlan17 ， 蓝一勋， 曹野@RIOS

Chromium OS: 曹野@RIOS

The Status of Linux Distro on RISC-V

Arch-Linux

Bootable: yes, OpenSBI + U-Boot on QEMU and Hardwares
package management: pacman + bsdtar
Build system: Arch Build System(ABS) , but currently using devtools (systemd-nspawn)
Status: **bootable Image**

Debian

Bootable: Yes, on QEMU and Hardware
package management: apt + deb
Build system: buildd
Status: In maintenance

Info Source:

Arch: Felix Yan(晏然), Sequencer(刘玖阳)
Debian: https://wiki.debian.org/RISC-V
https://riscv.org/exchange/software/

The Status of Linux Distro on RISC-V

openEuler

Bootable: Yes, OpenSBI + U-Boot on QEMU and Hardwares
package management: dnf + rpm
Build system: OBS, Koji or oepkg
Status: **bootable Image**

Android

Bootable: Yes, OpenSBI + U-Boot on QEMU and C910
package management: apk
Build system: Android Studio
Status: demo can run on C910, ART is underdevelopment

Info Source:

openEuler: openEuler RISC-V SIG， 中科院软件所

Android： https://github.com/T-head-Semi/aosp-riscv

https://plctlab.github.io/aosp/create-a-minimal-android-system-for-riscv.html

The Status of Embedded Linux on RISC-V

Slackware

Bootable: No, chroot from Fedora Image
package management: slackpkg+pkgtools
Status: under development

OpenWRT, Buildroot Yocto/OpenEmbedded

Bootable: yes, BBL or U-boot
package management: buildtime or Opkg
Build system: Cross-compilation
Status: In maintenance

Info Source:

Slackware: https://github.com/fede2cr/slackware_riscv
https://riscv.org/exchange/software/

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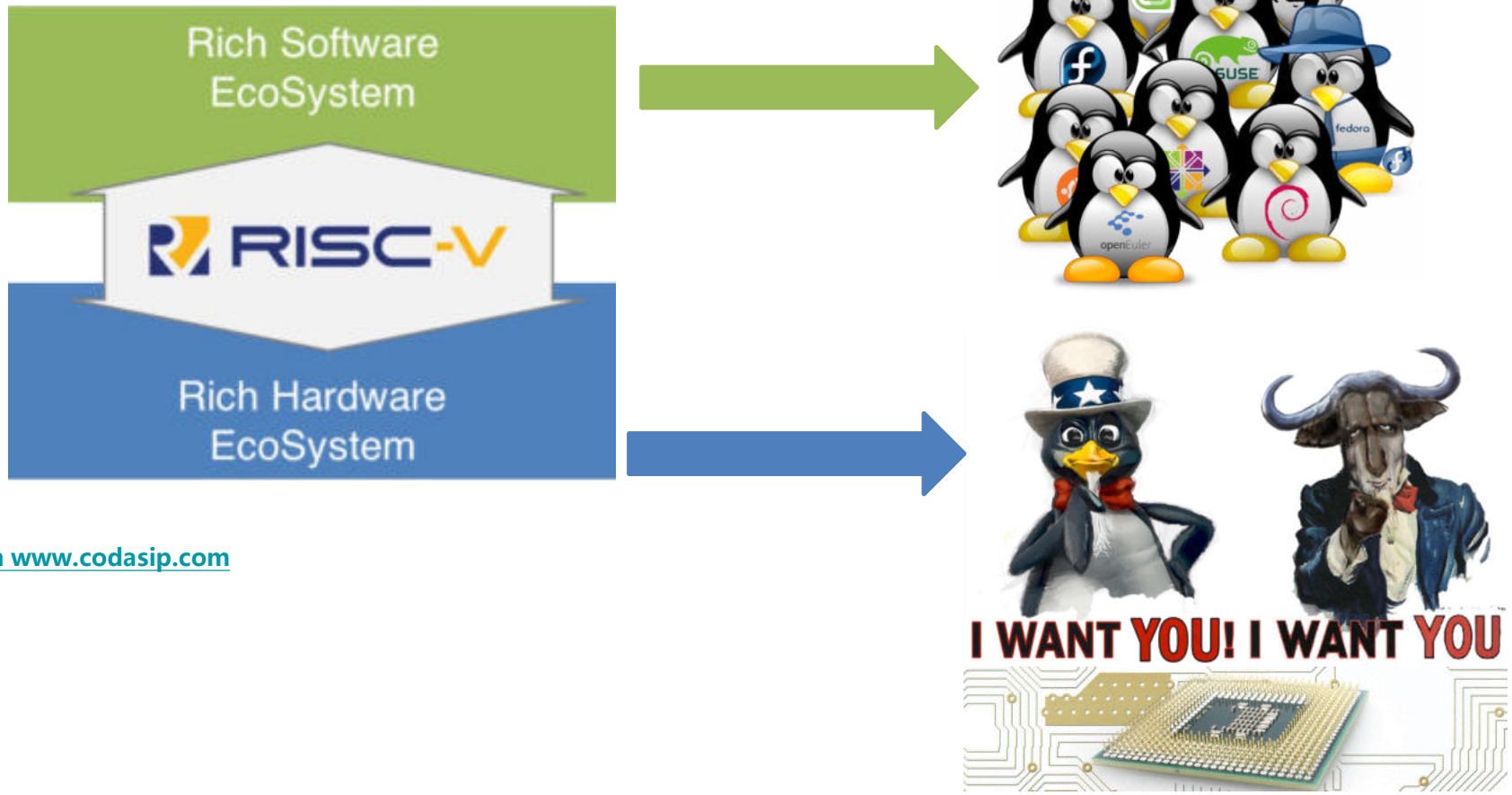
Linux distribution on RISC-V

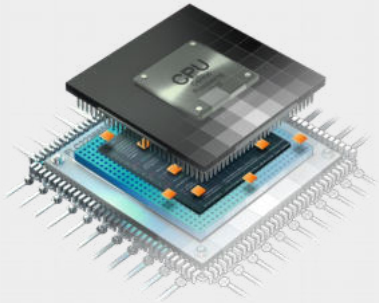


From www.codasip.com

We would like to support more targets based on standard RISC-V Spec.

Part III

The software component



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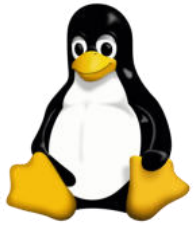
The Status of RISC-V Firmware and Linux



OpenSBI

Firmware for RISC-V, upstream **main** branch,
generic platform with the right **dtb** file.
NO patch required for most of platforms

U-boot

The latest u-boot(upstream, **main)**with **some patches** works fine on RISC-V, can boot some **Linux** distros.

GRUB2

The GRUB(mainline)with a few patches works well on riscv64, can boot Linux distros.

Linux kernel

The **upstream main** branch of Linux works well on RISC-V.
We are working with opensource community together on upstreaming the patches for some platform.

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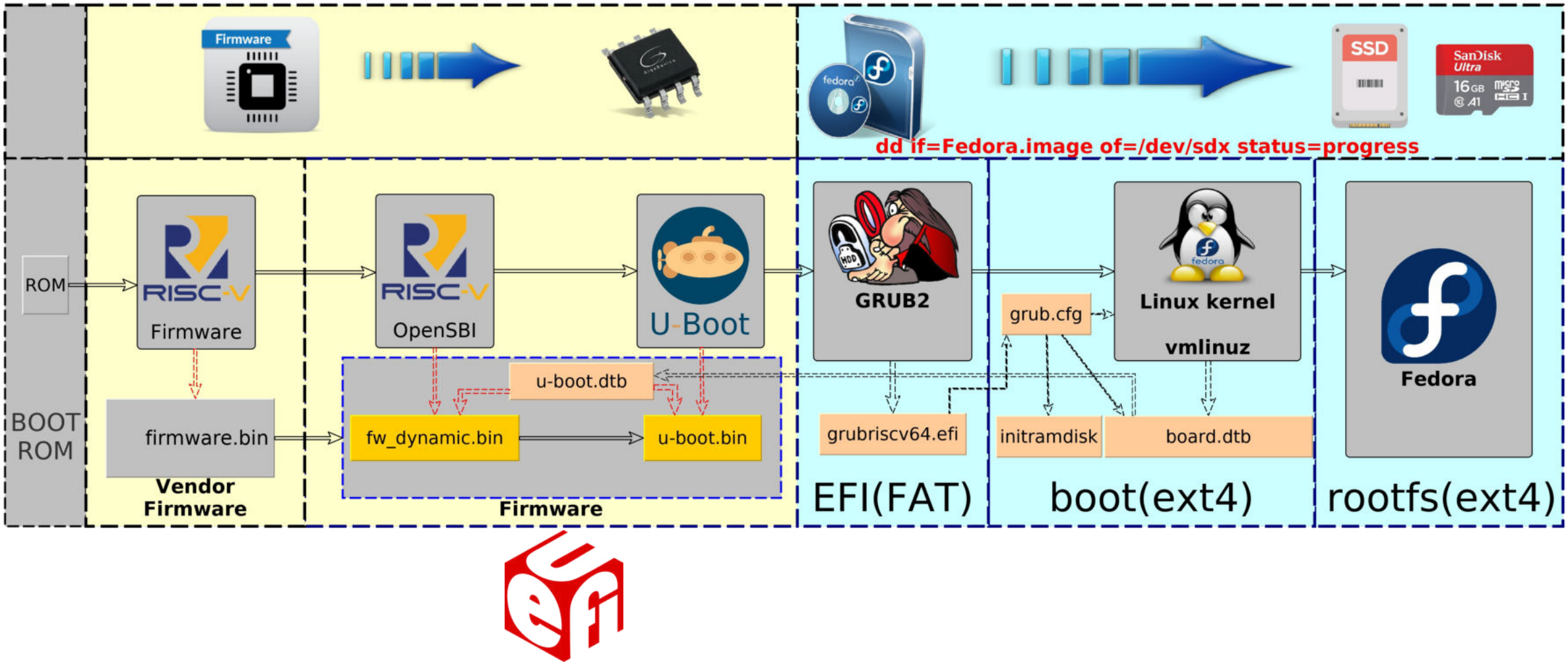
Standard boot flow for Linux on riscv64



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The Status of RISC-V Firmware for PC & Server

UEFI: Unified Extensible Firmware Interface.

HPE is currently working on the next RISC-V edk2 port release which incorporates with OpenSBI v0.9 that supports the firmware domains for HSM.
HPE is also working on RISC-V EDK2 OVMF and Starlight platforms. Contributors from HPE :

Abner Chang
Daniel Schaefer

ACPI: Advanced Configuration and Power Interface

Static tables provided by system firmware to the standard ACPI compliant OS for system info and configuration。
Contributors from Ventana Micro Systems:

Sunil V L
Rahul Pathak
Kumar Sankaran
Mayuresh Chitale

https://linuxplumbersconf.org/event/11/sessions/114/#20210921

Acknowledgments

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Atish Kumar Patra

Akira Tsukamoto
Drew Fustini
Mikael Frykholm
Stefan O'Rear

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

Alphabetical Listing by Company Name

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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