

Guix 在 RISC-V 下的状况介绍

郑俊杰

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2024/12/06

- 我是谁
- guix 是什么
- 在 RISC-V 的状况

me

- @Z572@mastodon.social
- github.com/Z572
- guix committer

guix 是什么

包数量在 repology 排名前五

Top repositories

By **total** number of packaged projects

1. nix ([nixpkgs unstable](#)) - 100250
2. [AUR](#) - 75588
3. Debian+derivs ([Raspbian Testing](#)) - 41799
4. [FreeBSD Ports](#) - 31380
5. [GNU Guix](#) - 28923
6. Fedora ([Fedora 40](#)) - 24070
7. Rosa ([Rosa 2021.1](#)) - 19598
8. [ALT Sisyphus](#) - 19454
9. Gentoo ([LiGurOS develop](#)) - 19239
10. [MacPorts](#) - 19153

特性

- 原生多版本软件支持
- 支持安装在其他发行版
- 自由软件发行版
- 目前唯一一款全源代码引导发行版 (on x86)

原理

/opt/python/

我们要使用一个其他版本的 python

原理

`/opt/python/`

依赖原系统包，但是在系统更新会受到影响

原理

/opt/python/

重新编译

原理

/opt/python/

把会更新的依赖也固定下来

原理

/opt/python/

/opt/openssl/

/opt/xz/

...

原理

/opt/python/

/opt/openssl/

/opt/xz/

...

/opt/glibc/

原理

我们想安装相同的软件包但是不同的配置项

原理

对每个包把所有输入算个 hash 值

原理

/opt/lp8ch4...-python/

/opt/xc98v8...-openssl/

/opt/70s4sq...-xz/

...

/opt/sz2byf...-glibc/

但是

这一切依赖编译器

编译器也是软件包，需要编译编译器

引导

gcc 14

^gcc 11

^gcc 8

....

^tcc-boot

....

gcc 14

^gcc 11

^gcc 8

....

^tcc-boot

....

tcc-boot

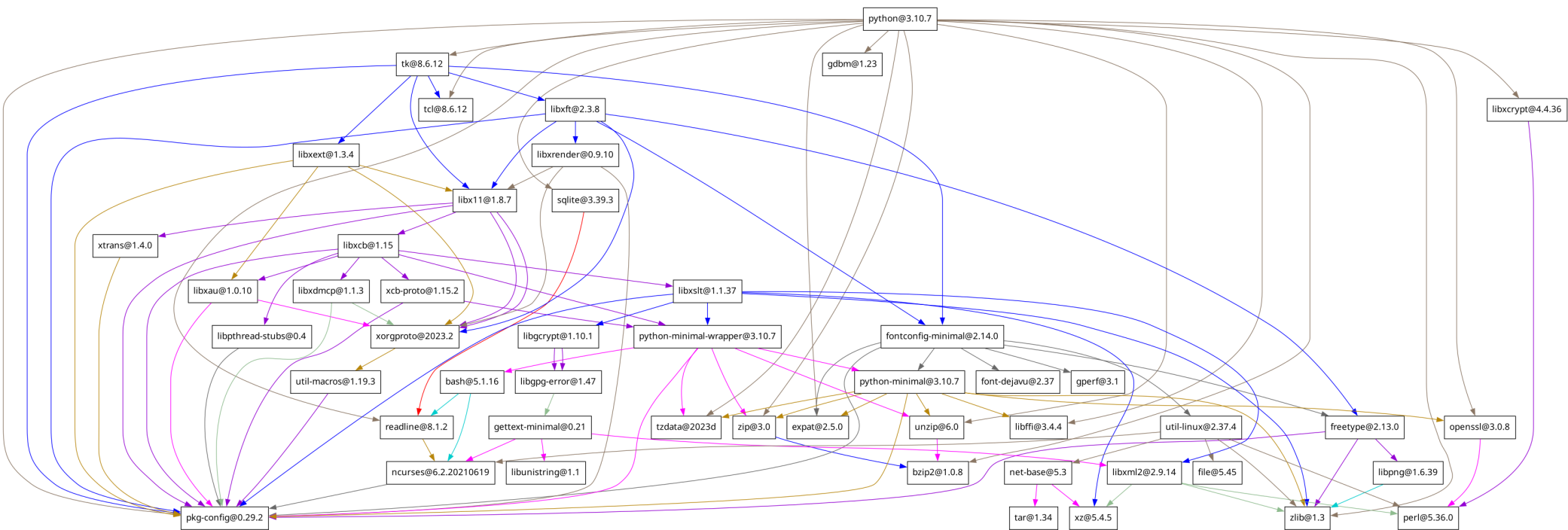
^mescc

^stage0

....

^hex0

....



在 RISC-V 状态

- guix 使用 guile 编写， guile 是 gnu 官方拓展语言
- lightening 是 guile 的 jit 库

lightening

• 2021/05/14

RISC-V Support

2021年5月14日 GMT-6 01:52:12

 开放中 Ekaitz 请求将 [ekaitz-zarraga/lightenin...](#) 合并到 [main](#) 3年前

概览 11

提交 20

流水线 62

变更 10

CURRENT STATUS (updated 2024-11-18):

- We are **passing ALL** tests in lightening
- We are **passing ALL** the tests in the Guile codebase. You can see the progress here: <https://github.com/ekaitz-zarraga/Guile>

I'd appreciate some review

由 Ekaitz 编辑于 2星期前



2



0

https://gitlab.com/wingo/lightening/-/merge_requests/14

2021/08/17

初始支持

[PATCH 00/21] Add riscv64 support

Open

QA

Unknown

> Details

E

Efraim Flashner wrote [on 17 Aug 2021 12:10](#)

This is the current tree for wip-riscv, which I rebase regularly on top of core-updates-frozen. I'm not in love with raw-build-guile3 in gnu/packages/bootstrap but I wasn't able to find another way to make it work. I'll add some comments in response to the patches.

Everything was built using a SiFive HiFive Unmatched board¹. As a comparison, my pine64 passed the build phase in mesa in 89 minutes, and this board built it in 66 minutes.

¹ <https://www.sifive.com/boards/hifive-unmatched>

Efraim Flashner (21):

- utils: Define 'target-riscv?' predicate.

- gnu: bootstrap: Add support for riscv64-linux.

- gnu: gcc-boot0: Use libstdc++-boot0-gcc7 on riscv64-linux.

- gnu: %boot3-inputs: Add missing input.

2021-12 — 2022-09

 <https://nlnet.nl/project/GNUMes-RISCV/>

Send in your ideas. Deadline February 1, 2025



Funding ▾Projects ▾News & events ▾Resources ▾

 Projects > GNUMes-RISCV



GNU Mes RISC-V

Bringing the trustworthy bootstrap to RISC-V

GNU Mes was created to address the security concerns that arise from bootstrapping an operating system using large, un-auditable binary blobs, which is common practice for all software distributions.

Mes is a Scheme interpreter written in a simple subset of C and a C compiler written in Scheme that comes with a small, bootstrappable C library. The final goal is to help create a full source bootstrap for any interested UNIX-like operating system.

This funding will enable GNU Mes to work on the RISC-V platform, an instruction set architecture (ISA) that is provided under open licenses.

Combining GNU Mes with an open ISA will provide an extra level of security and trust by extending the audibility of the system from the software to also the hardware.

RISC-V is a relatively new architecture so this effort requires the backport of

<https://nlnet.nl/project/GNUMes-RISCV/>

2022/07/17

thepowersgang / mrustc

Issues (25) Pull requests (5) Actions Projects Wiki Security Insights

covery codes have not been saved in the past year. Make sure you still have them stored somewhere safe by viewing and downloading them again.

Add support for riscv64 #276

Merged thepowersgang merged 1 commit into thepowersgang:master from Millak:riscv64 on Jul 17, 2022

Conversation (2)

Commits (1)

Checks (0)

Files changed (2)



Millak commented on Jul 10, 2022

Contributor ...

This was tested on a HiFive Unmatched board with rust-1.54.



Add support for riscv64 ...

Verified

6017504



thepowersgang commented on Jul 11, 2022

Owner ...

Did that "Just Work" doing a full bootstrap on a riscv64 machine? (I.e. `./build-1.54.sh` and `make -C run_rustc RUSTC_VERSION=1.54.0`)



Mutabah's Rust Compiler

In-progress alternative rust compiler. Capable of building a fully-working copy of rustc, but not suitable for everyday use (due to terrible error messages).

build passing C/C++ CI passing

Intro

This project is a "simple" rust compiler written in C++ that is able to bootstrap a "recent" rustc, but may eventually become a full separate re-implementation.

As `mrustc`'s primary goal is bootstrapping `rustc`, and as such it tends to assume that the code it's compiling is valid (and any errors in the generated code are `mrustc` bugs). Code generation is done by emitting a high-level assembly (currently very ugly C, but LLVM/cretone/GIMPLE/... could work) and getting an external tool (i.e. `gcc`) to do the heavy-lifting of optimising and machine code generation.

Progress

- Builds working copies of `rustc` and `cargo` from a release source tarball
 - Supports (and can bootstrap) rustc 1.19.0, 1.29.0, 1.39.0, and 1.54.0

z572@m ~\$ guix build rust -s riscv64-linux --dry-run --no-substitutes

The following derivations would be built:

```
/gnu/store/m3858750vxwivdlw763jrp78vwas5m9z-rustc-1.81.0-src.tar.gz.drv
/gnu/store/8rvpkpkxb9z2l0qdvhhainyry414y90y-rustc-1.81.0-src.tar.zst.drv
/gnu/store/fzp9a1m3w7p6q275isw2izkjyzqzff91-llvm-17.0.6.drv
/gnu/store/zdhqrgmidzsy420m2rfi4g1yj3bq3fb-rustc-1.80.1-src.tar.gz.drv
/gnu/store/rgx5af8fqh0qqyfsg8sjhcwx901jy51b-rustc-1.80.1-src.tar.zst.drv
/gnu/store/2y1ncry9f3sf604rgss1mw6dp631w0pm-rustc-1.79.0-src.tar.gz.drv
/gnu/store/i070ak2adg56qay94wlaiaxzlivn767s-rustc-1.79.0-src.tar.zst.drv
/gnu/store/q94y7nxmzy7j3ywdl9rzbiz6cj71cyvj-rustc-1.77.1-src.tar.gz.drv
/gnu/store/hj23825sqc2mqnn466nsn2f73cby4a0h-rustc-1.77.1-src.tar.zst.drv
/gnu/store/jxafngmc98bv2vkgkki4xi7aaa9yv83h-llvm-15.0.7.drv
/gnu/store/q9i3vr8wxjv0q9gwv79c0j63njwxvplf-llvm-13.0.1.drv
/gnu/store/dz01bb9m7ng4p2kdgj18ici6z7v42vs3-mrustc-0.10.1-checkout.drv
/gnu/store/30y57qk68b4dnbnwhp05yw05h4rszzrc-mrustc-0.10.1-checkout.drv
/gnu/store/72lbcqibg9njklwl4fp1lqfsjg07m0z-clang-runtime-13.0.1.drv
/gnu/store/3ncwcvy3vkcw0m1qh83jwdk67cawnnnp-clang-13.0.1.drv
/gnu/store/fmr750wkbbfnmwkxhbsv6h5nnnxbp89k-rust-1.54.0.drv
/gnu/store/4w58kbn4h744pp00ssgaghryb3l1rrbc-rust-1.55.0.drv
/gnu/store/0wkm1dd77vxahgpj11y0x5i3cg43nhbv-rust-1.56.1.drv
/gnu/store/6izv2nzzn9v0qs1q3df7pjpmgzlmh0sk-rust-1.57.0.drv
/gnu/store/szcyjsr6hswkadhi0rzw4q33i5ymq2c5-rust-1.58.1.drv
/gnu/store/8d81nkyxvvp412s3gfp6bw4mk15ic834-rust-1.59.0.drv
/gnu/store/a60cv68y6icq6pr54fixdd6jx20z0waw-rust-1.60.0.drv
/gnu/store/7y2zx3spnzxhl8jfsabqj3xw5lxvsl37-rust-1.61.0.drv
/gnu/store/zgydmsimjlrp5b6554cg6c256dryk823-rust-1.62.1.drv
/gnu/store/8i4fs6dachj6sxlq3mckj12l2r3wgwq-rust-1.63.0.drv
/gnu/store/9y23shhih0cw5bs2y8bmfvngl1rpsmcy-rust-1.64.0.drv
/gnu/store/0jlcck0ns9j9zr0zihpwc9lgkgvsfcvsj-rust-1.65.0.drv
/gnu/store/3173pwwr41aza1cvwihhbqdz6lwkb5hs-rust-1.66.1.drv
```

```
/gnu/store/d00cv0y0icq6p1541x000jx20z0waw-rust-1.60.0.drv
/gnu/store/7y2zx3spnzxhl8jfsabqj3xw5lxvsl37-rust-1.61.0.drv
/gnu/store/zgydmsimjlrp5b6554cg6c256dryk823-rust-1.62.1.drv
/gnu/store/8i4fs6dachj6sxlq3mckj12l2r3wgwq-rust-1.63.0.drv
/gnu/store/9y23shhih0cw5bs2y8bmfvngl1rpsmcy-rust-1.64.0.drv
/gnu/store/0jlcck0ns9j9zr0zihpwc9lgkgvsfcvsj-rust-1.65.0.drv
/gnu/store/3173pwwr41aza1cvwihhbqdz6lwkb5hs-rust-1.66.1.drv
/gnu/store/9jd80300rckh2q9kbbhykbq4my1l53cv-rust-1.67.1.drv
/gnu/store/768x2k829n8hpybp366g7n52wr2zla6y-rust-1.68.2.drv
/gnu/store/64g8n5qld0wlfzccrlsmgfgw3ivhljc9-rust-1.69.0.drv
/gnu/store/fa32axd9hscwrl2aiq3ir4q2n81lqx35-rust-1.70.0.drv
/gnu/store/32qj4bsrvw02h6gsxfb80drjgwcfxyv6-rust-1.71.1.drv
/gnu/store/857kaxwdyac2h6p9c4kn66j303k4cq0x-rust-1.72.1.drv
/gnu/store/n3q3h1f7l938f067mrwsj1179gvvg7fq-rust-1.73.0.drv
/gnu/store/cv8mb1wd7hxhyhlwlnz7f39ink2kjnsj-rust-1.74.1.drv
/gnu/store/wzdfq1hggicdpr1byscrnq0wnh13fj8z-rust-1.75.0.drv
/gnu/store/znxm41q8mm7wlsanisb0jpvwk02mbd9n-rust-1.76.0.drv
/gnu/store/9my3c18rfcc1m6xdgwrdd6a2ilxg4k3ph-rust-1.77.1.drv
/gnu/store/kbagvgc24s8n4by60xqlay6gi8cc6qhr-rustc-1.78.0-src.tar.gz.drv
/gnu/store/bkhnd9b34miaa2fp2l14akkpznga0qg-rustc-1.78.0-src.tar.zst.drv
/gnu/store/yvf5xjz1d3cmr1d8600hngncghs66d4x-rust-1.78.0.drv
/gnu/store/spcl28gbki88mwnr8d8rm0hrlqybb018-rust-1.79.0.drv
/gnu/store/mka9ng7xv1jvws1l131ak29m3rzpcpfi-rust-1.80.1.drv
/gnu/store/aaynrayj2iy4xabdylk08q2akxggszrb-rust-1.81.0.drv
/gnu/store/bwlih4bbj16ysvjvaih4pyznx19mjwpr-rustc-1.82.0-src.tar.gz.drv
/gnu/store/l07mydqqgzmaw0m5yxfmhqgfcyr3fbzs-rustc-1.82.0-src.tar.zst.drv
/gnu/store/wd2hbljsviljhwhfbjikkhs648716b1v-rust-1.82.0.drv
```

2023-04—2024-07



[Projects](#) > [GNUMes-RISCV-bootstrap](#)



Guix



RISC-V bootstrapping effort via GNU Mes

Allow bootstrapping Guix on RISC-V via GNU Mes

This project is a continuation of several previous modest effort that each made good steps in bringing the GNU Mes project to the quickly growing ecosystem of RISC-V.

RISC-V is a relatively new instruction set architecture (ISA) for computer chips, and because it obviously has its own variant of the very lowest level of instructions, adopting this new hardware platform for practical use cases requires porting of some software and tools that were already available in other architectures.

Such "chip agility" makes the overall technology ecosystem more robust, creating more diversity and consumer choice.

One aspect of working towards chip agility in a trustworthy manner is aiming for a "full source bootstrap", as pioneered by GNU Mes and others on other architectures.

<https://nl.net.nl/project/GNUMes-RISCV-bootstrap>

git index : guix.git

GNU Guix and GNU Guix System

Summary refs log tree commit diff

Age	Commit message (Expand)
12 days	gnu: binutils-mesboot: Update to 2.30. wip-riscv-bootstrap
12 days	gnu: glibc-headers-mesboot: Remove unused C macro.
12 days	gnu: ed: Update to 1.20.2.
12 days	gnu: gawk-boot0: Remove pre-generated source file.
12 days	gnu: Add byacc-boot0.
12 days	gnu: %boot0-inputs: Remove duplicate packages.
12 days	gnu: %boot0-inputs: Use newly built *-boot0 packages on riscv64-linux.
12 days	gnu: file-boot0: Fix building on riscv64-linux.
12 days	gnu: findutils-boot0: Adjust the skipped tests on riscv64-linux.
12 days	gnu: gnu-make-boot0: Adjust configure-flags on riscv64-linux.
12 days	gnu: %bootstrap-inputs+toolchain: Switch riscv64-linux to full bootstrap.
12 days	gnu: %boot-mesboot6-inputs: Adjust for riscv64-linux.
12 days	gnu: mesboot-package: Adjust for riscv64-linux builds.
12 days	gnu: Add %boot-muslboot3-inputs.
12 days	gnu: Add mawk-mesboot.
12 days	gnu: gawk-mesboot: Remove pre-generated source file.
12 days	gnu: gawk-mesboot: Support building on riscv64-linux.

<https://ekaitz.elenq.tech/>

2023/05/28

[PATCH 0/4] Image for HiFive Unmatched

Done

QA

Unknown

> Details

E

Efraim Flashner wrote [on 28 May 2023 11:41](#)

I've gotten an image built for the HiFive Unmatched board and it's currently the image I'm running for that machine. The unformatted partition and the specific UUID for the first two partitions in the unmatched.scm are apparently necessary for the bring-up of the board, and likely will be necessary for other riscv64 boards in the future.

Efraim Flashner (4):

gnu: bootloader: Add u-boot-sifive-unmatched-bootloader.

gnu: image: Add support for unformatted partitions.

system: images: Add unmatched module.

gnu: glibc-2.33: Fix building for riscv64-linux.

2024/03/19

```
root@komputilo ~# neofetch
.Xdefaults          .config/          guix-home-config.scm
.bash_profile       .guile
.bashrc             .zprofile
root@komputilo ~# neofetch
```

[illegible]

```
root@komputilo
-----
OS: Guix System riscv64
Host: riscv-virtio,qemu
Kernel: 6.7.9-riscv64-generic
Uptime: 32 secs
Packages: 49 (guix-system)
Shell: bash 5.1.16
Terminal: /dev/ttyS0
CPU: (1)
Memory: 66MiB / 466MiB
```



```
root@komputilo ~#
```

<https://mastodon.social/@Z572/112123034011923189>

2024/05/12

[PATCH 0/6] Add visionfive2 support.

Done

QA

Unknown

> Details

Z

Zheng Junjie wrote on 12 May 13:00 +0200



for visionfive2.

ot and set fdtfile to starfive/jh7110-starfive-

7110-starfive-visionfive-2-v1.3b.dtb

config.

n grub-efi* bootloader and not gpt

riscv64, use guile-fibers-1.1.

five2.

-visionfive2-bootloader.

module.

root@visionfive2 ~# neofetch

```
..
.-:////-:..
  ://:
-///:
  ://:
  ://:
-///- ://:
-+++-.:..
  :+//:-
  -.....
```

OS: Guix System riscv64

Host: StarFive VisionFive 2 v1.3B

Kernel: 6.8.9-gnu

Uptime: 4 mins

Packages: 50 (guix-system)

Shell: bash 5.1.16

Terminal: /dev/ttyS0

CPU: (4)

Memory: 93MiB / 3932MiB

root@visionfive2 ~#

<https://mastodon.social/@Z572/112423783569463106>

<https://issues.guix.gnu.org/70892>

2024/05/22

https://issues.guix.gnu.org/71104

[PATCH] ci: Build visionfive2-barebones-raw-image.

[PATCH] ci: Build visionfive2-barebones-raw-image.

Done

QA

Unknown

> Details

Z

Zheng Junjie wrote on 22 May 07:43 +0200

```
* gnu/ci.scm (%guix-system-images): Add visionfive2-barebones-raw-image.
```

```
Change-Id: I0a0edccf00119d6b23b864bb0123be6ca7b01d34
```

```
---
```

```
gnu/ci.scm | 4 +++-
```

```
1 file changed, 3 insertions(+), 1 deletion(-)
```

images Evaluation 1850333

search for

Evaluation #1850333, [images](#) jobset


Completed 26 Nov 12:07 +0100 in 7 minutes.

Channel

Commit

↑ <https://git.savannah.gnu.org/git/guix.git>

[5ff9e51e2c4dae0dc74f5c85ec553e89fe1824fd](#)

Builds  

All 9

🕒 Scheduled 0

✅ Succeeded 9

❌ Failed 0

ID	Completion time	Job	Name	System
✅ ↑ 6636568	26 Nov 13:04 +0100	novena-barebones-raw-image.x86_64-linux	novena-barebones-raw-image	x86_64-linux
✅ ↑ 6636567	26 Nov 12:37 +0100	pinebook-pro-barebones-raw-image.x86_64-linux	pinebook-pro-barebones-raw-image	x86_64-linux
✅ ● 6636571	26 Nov 12:36 +0100	iso9660-image.i686-linux	image.iso	i686-linux
✅ ↑ 6636569	26 Nov 12:34 +0100	visionfive2-barebones-raw-image.x86_64-linux	visionfive2-barebones-raw-image	x86_64-linux

standalone Guix System on Linux.

Download options:

x86_64-linux

Build details: [x86_64-linux](#)

GNU Hurd

Virtual machine image of the standalone Guix System on GNU Hurd.

Download options:

qcow2

Build details: [qcow2](#)

to be installed on top of your Linux-based system.

Download options:

x86_64-linux

Build details: [x86_64-linux](#)



GNU Guix System on Linux for Pinebook Pro

Guix System on Linux barebones bootable raw image for Pinebook Pro.

Download options:

raw

Build details: [raw](#)



GNU Guix System on Linux for VisionFive2

Guix System on Linux barebones bootable raw image for VisionFive2.

Download options:

raw

Build details: [raw](#)

<https://guix.gnu.org/en/download/latest/>

2024/06/05

https://issues.guix.gnu.org/71372

[PATCH] gu: linux-libre: Add 6.9-riscv.conf

[PATCH] gu: linux-libre: Add 6.9-riscv.conf

Done QA Unknown

> Details

Z Zheng Junjie wrote on 5 Jun 08:16 +0200

```
* gu/packages/aux-files/linux-libre/6.9-riscv.conf: New file.  
* Makefile.am (AUX_FILES): Register it.
```

Change-Id: I1f5e24726c3a59bec73805068548ce5916b427f8

Makefile.am

| 1 +

https://issues.guix.gnu.org/71372

bordeaux 编译农场

https://bordeaux.guix.gnu.org/activity

risv64-linux

kupang Load: 102% Plan size: 256

openvdb-11.0.0

branch: master category: package revision: 0376420e

rangung Status unknown Plan size: 256

mes-0.27

branch: master category: package revision: 40b6729f

trilinos-for-dealii-openmpi-12.18.1

branch: master category: package revision: 1affd2b5

rochor Load: 9% Plan size: 256

ocaml-piqilib-0.6.16

branch: master category: package revision: b2bd56f8















rumbia Load: 102% Plan size: 256

clang-11.1.0








branch: master category: package revision: 0376420e

i586-gnu

<https://qa.guix.gnu.org/branch/master>

Substitute availability					
https://ci.guix.gnu.org/			https://bordeaux.guix.gnu.org		
aarch64-linux	17.5%		aarch64-linux	64.5%	
armhf-linux	0.4%		armhf-linux	32.2%	
i586-gnu	0.0%		i586-gnu	0.0%	
i686-linux	85.4%		i686-linux	86.8%	
powerpc64le-linux	86.4%		powerpc64le-linux	7.2%	
riscv64-linux	0.0%		riscv64-linux	24.3%	
x86_64-linux	97.0%		x86_64-linux	88.2%	

Package reproducibility

System	Package reproducibility			
	Matching	Not matching	Unknown	
aarch64-linux	5690	401	28711	
armhf-linux	116	3	28213	
i586-gnu	1	0	21601	
i686-linux	24072	1251	5940	
powerpc64le-linux	1942	47	26635	
riscv64-linux	0	0	34080	
x86_64-linux	30675	1644	5014	

打个广告

- #guixcn:matrix.org
- <https://t.me/guixcn>