

Linux Plumbers Conference

Richmond, Virginia | November 13-15, 2023



Linux
Plumbers
Conference | Richmond, VA | Nov. 13-15, 2023

RISC-V Patchwork CI

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Rationale

- Pre-merge hook
- “Is this patch good enough?”
- Remove burden from maintainers

History

- Patchwork CI – All subsystems have their own
- Forked netdev's NIPA infra
 - Python, mostly hacked by Jakub Kicinski
- Adapted for RISC-V
- Hosted by Conor/Microchip

Pain points

- Black box (-ish)
- One man army (Conor)
 - Administration – “No one wants to be the CI person”
 - Changes
- Enter RISE...

PW CI NG

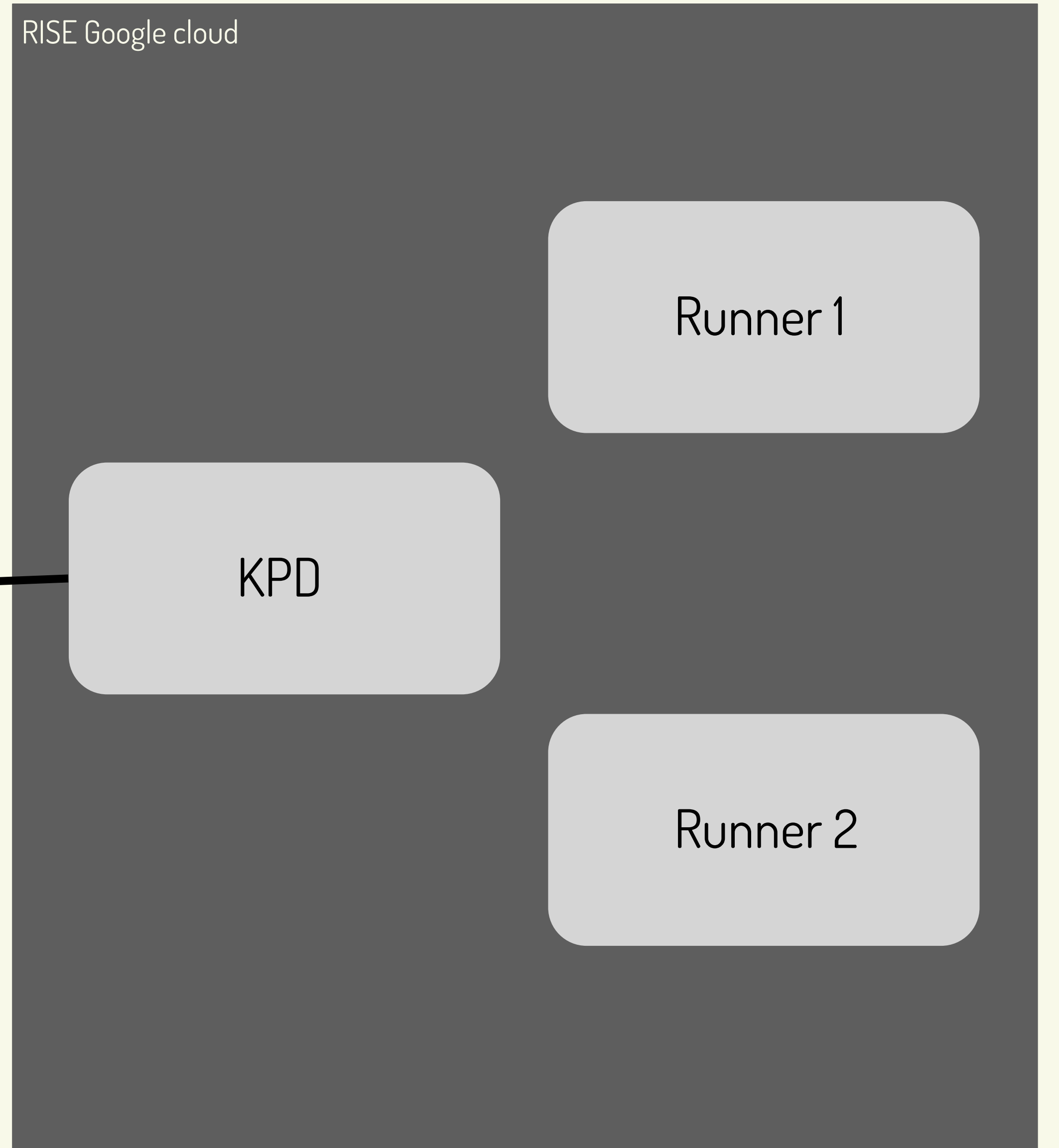
- RISE/Google provided VMs
- Move to Github
- ~~netdev~~ BPF! Fork Meta's KPD (Kernel Patches Daemon)
- (Hopefully)
 - Easier to maintain
 - Encourage community CI hacking
 - Easier to scale
- <https://github.com/linux-riscv>

for i in series 1

PW (REST API)

riscv trees + CI

GH linux-riscv.git

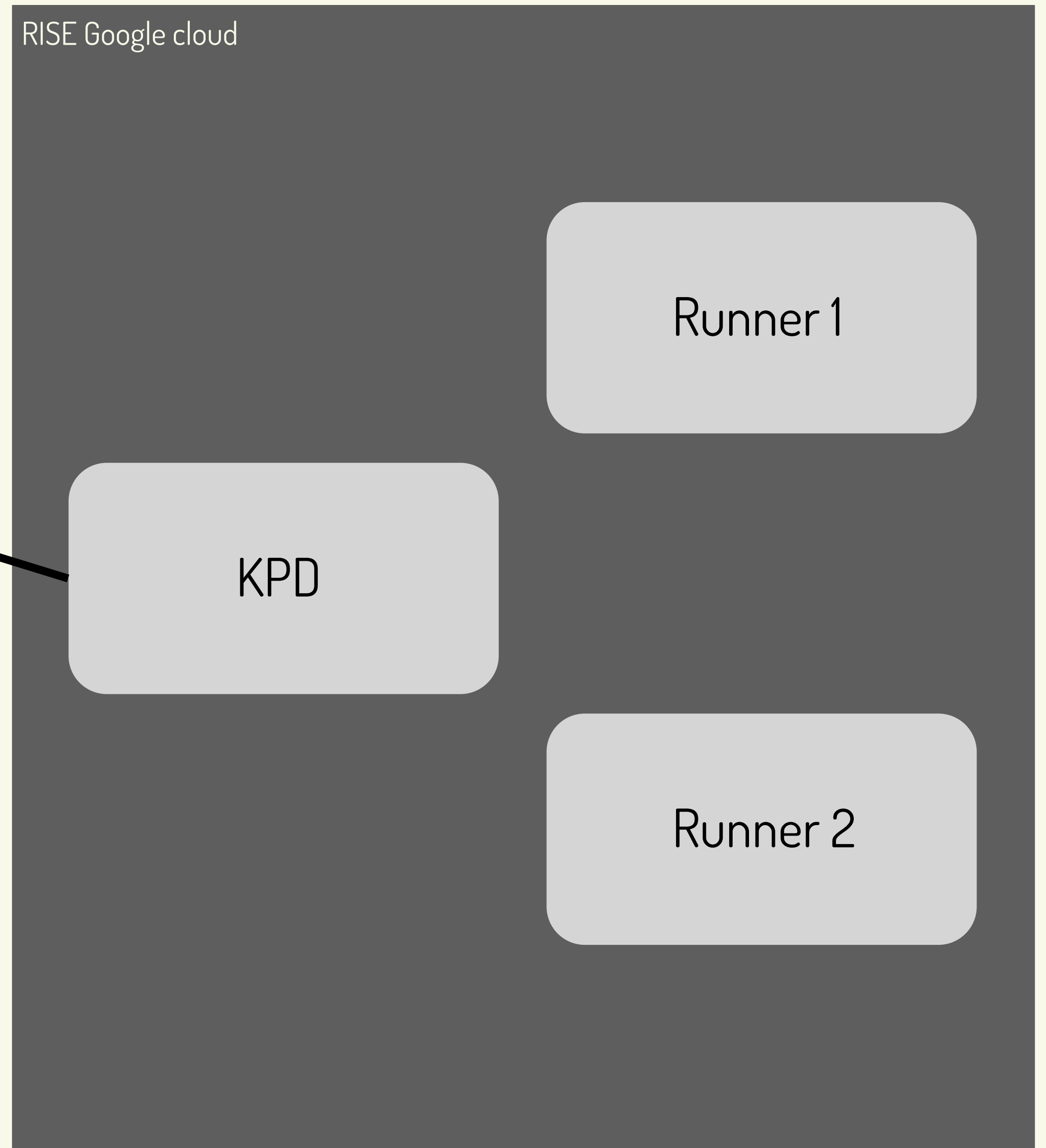


for i in series 2

PW (REST API)

riscv trees + CI

GH linux-riscv.git

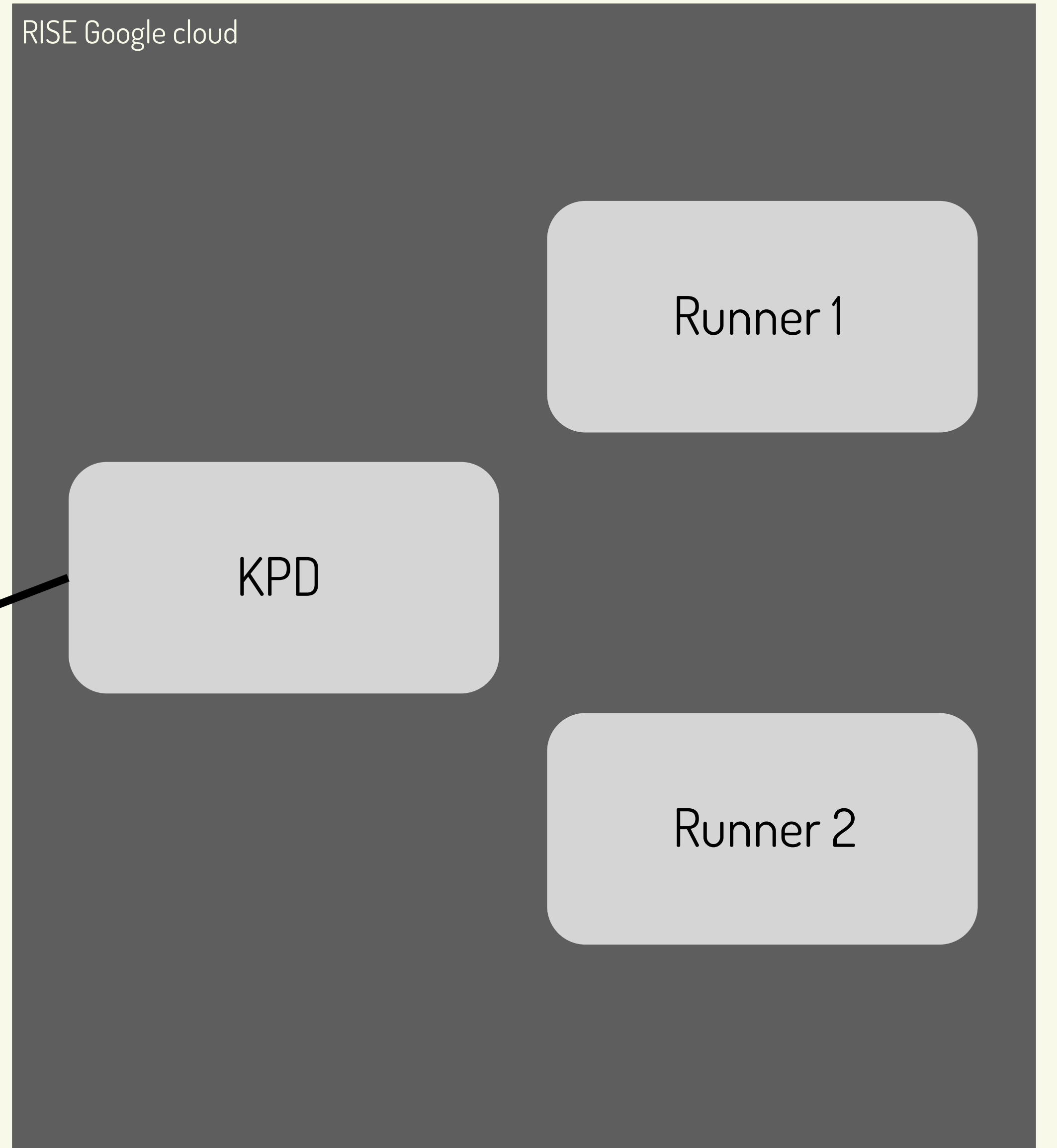


for i in series 3

PW (REST API)

riscv trees + CI

GH linux-riscv.git

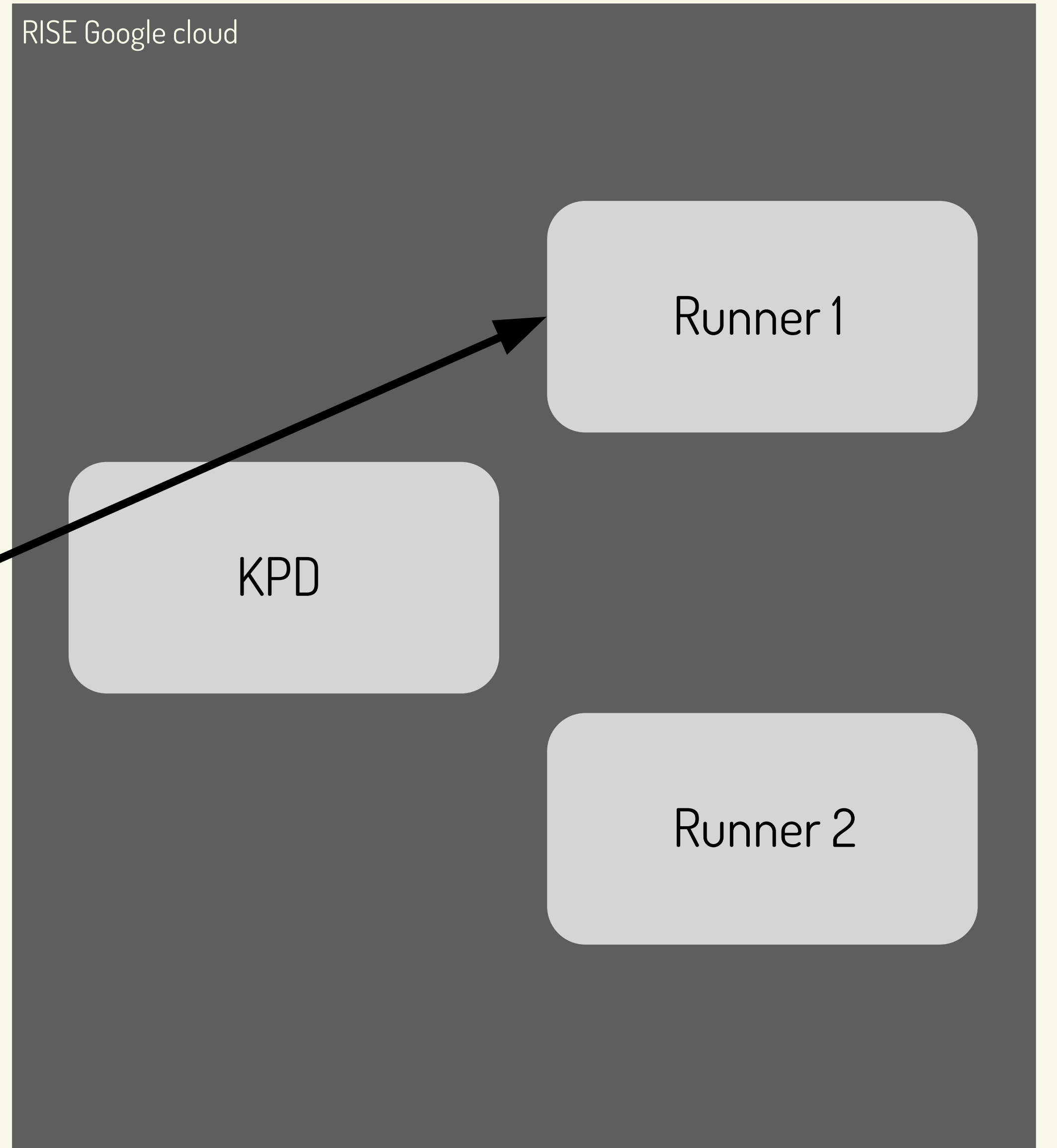


for i in series 4

PW (REST API)

riscv trees + CI

GH linux-riscv.git

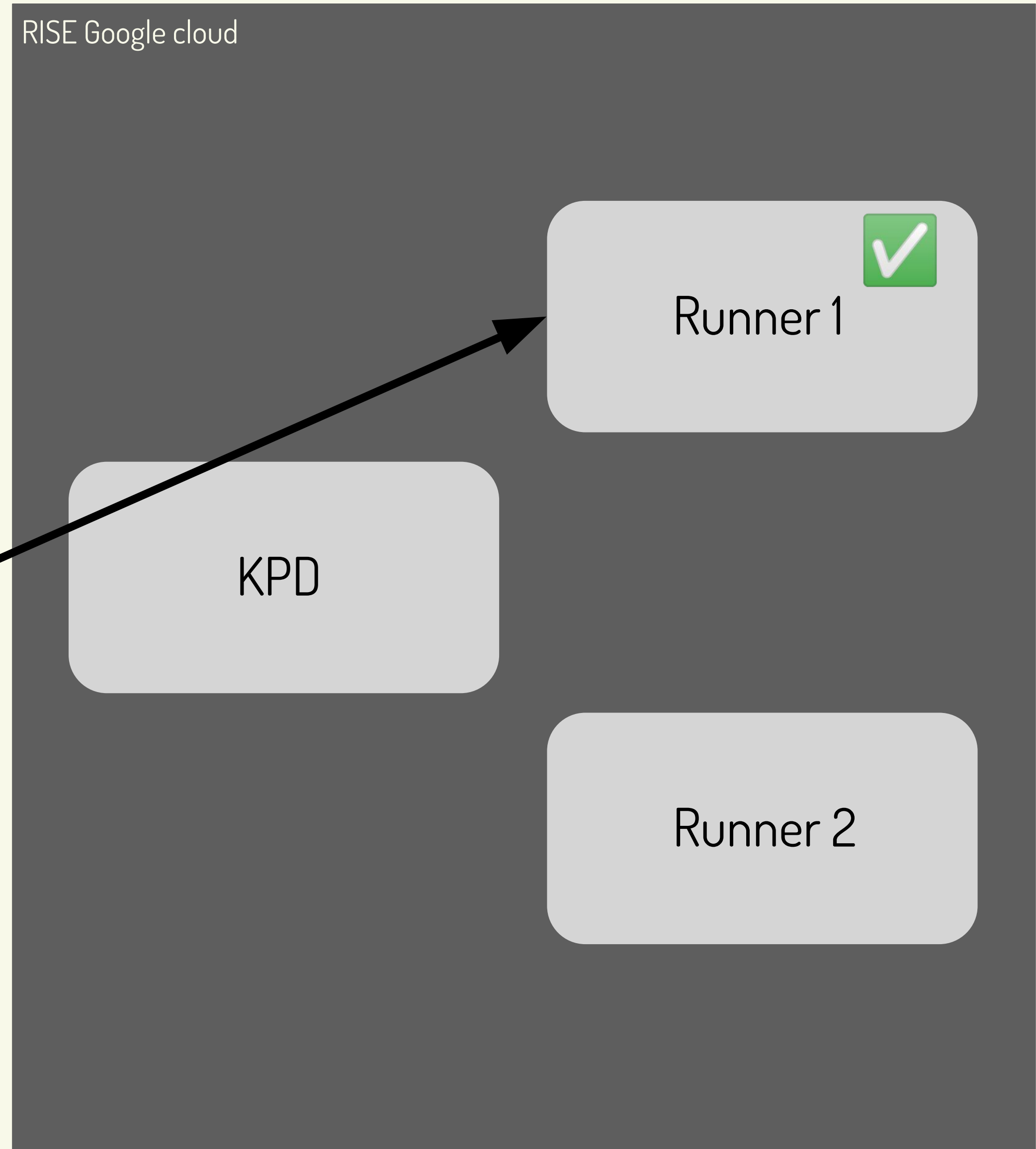
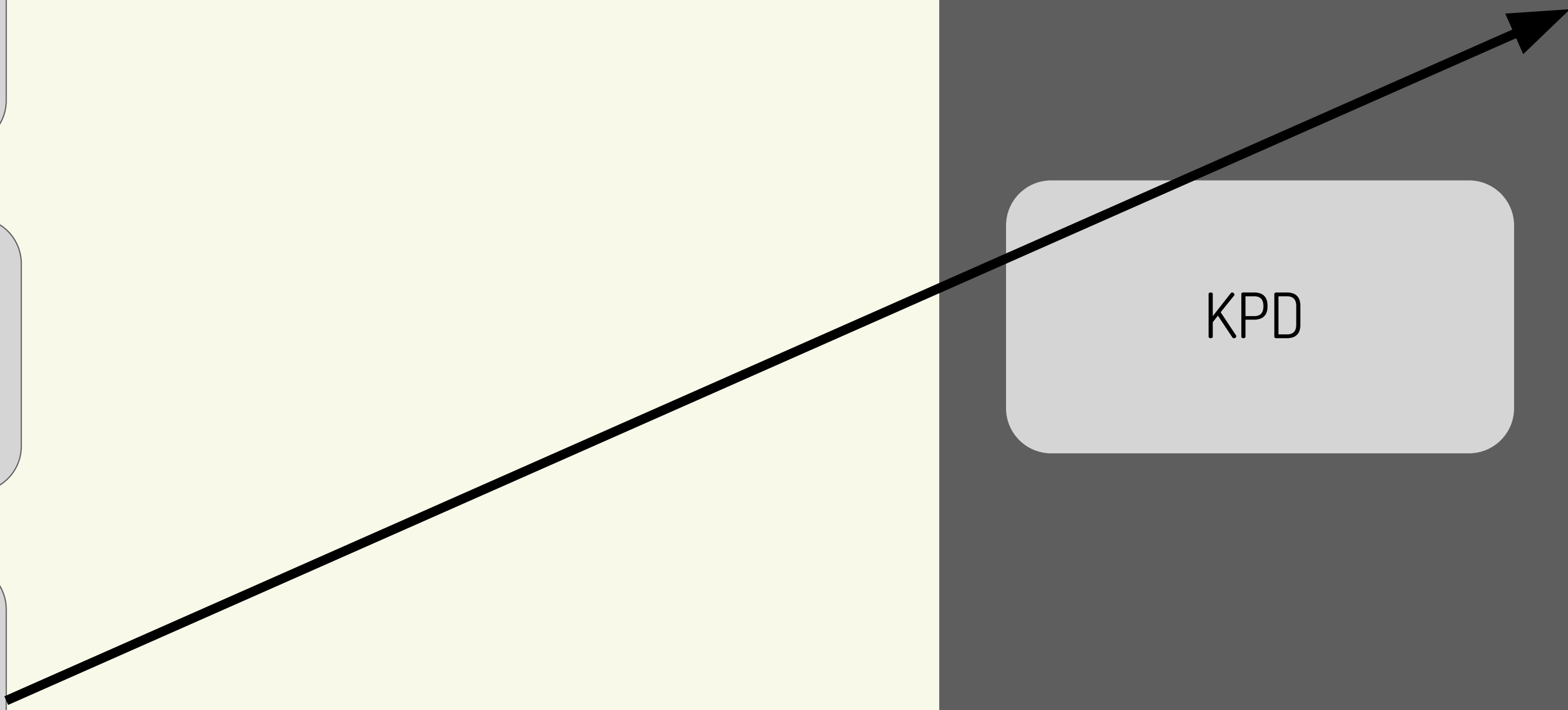


for i in series 5

PW (REST API)

riscv trees + CI

GH linux-riscv.git

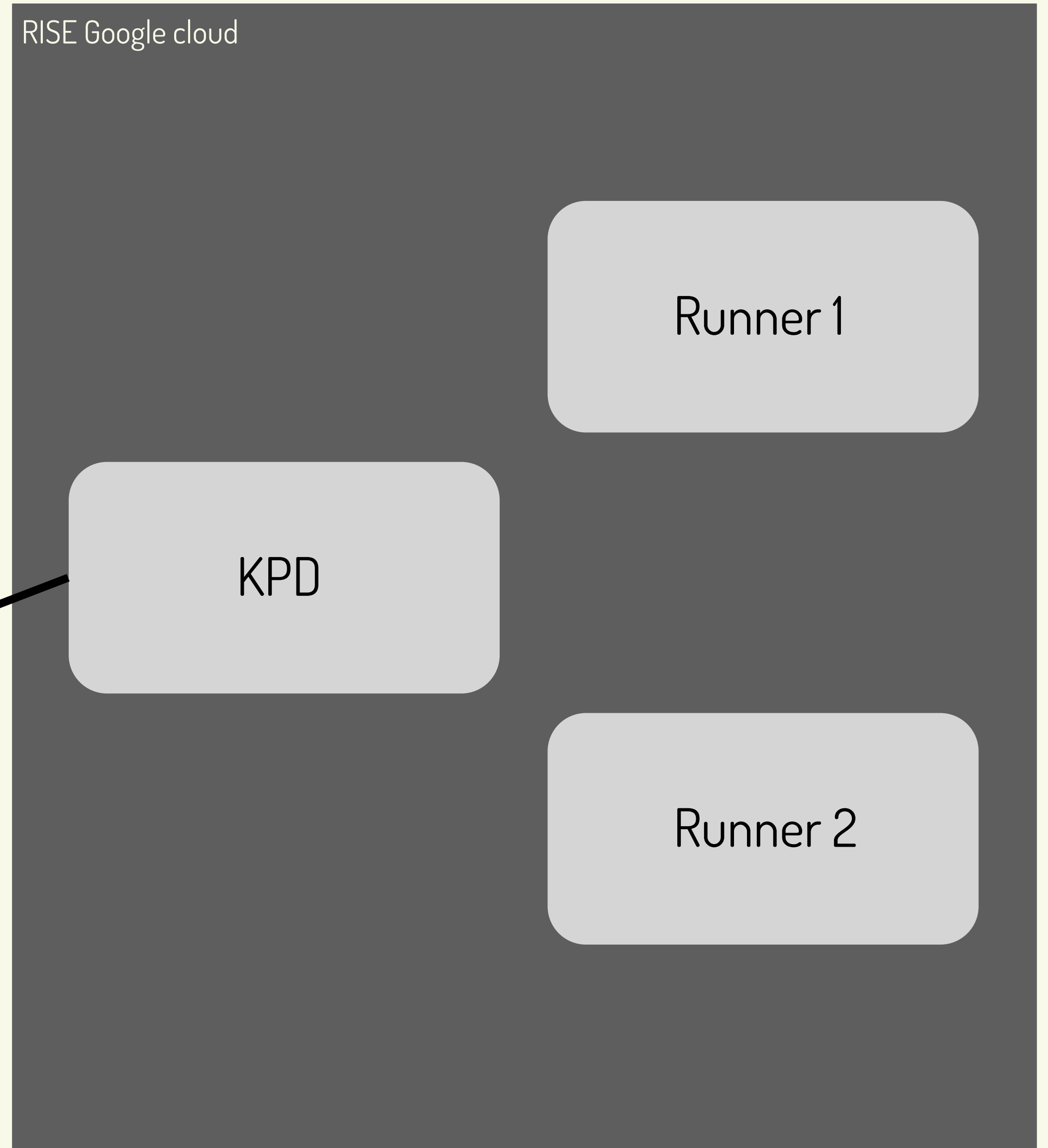


for i in series 6

PW (REST API)

riscv trees + CI

GH linux-riscv.git



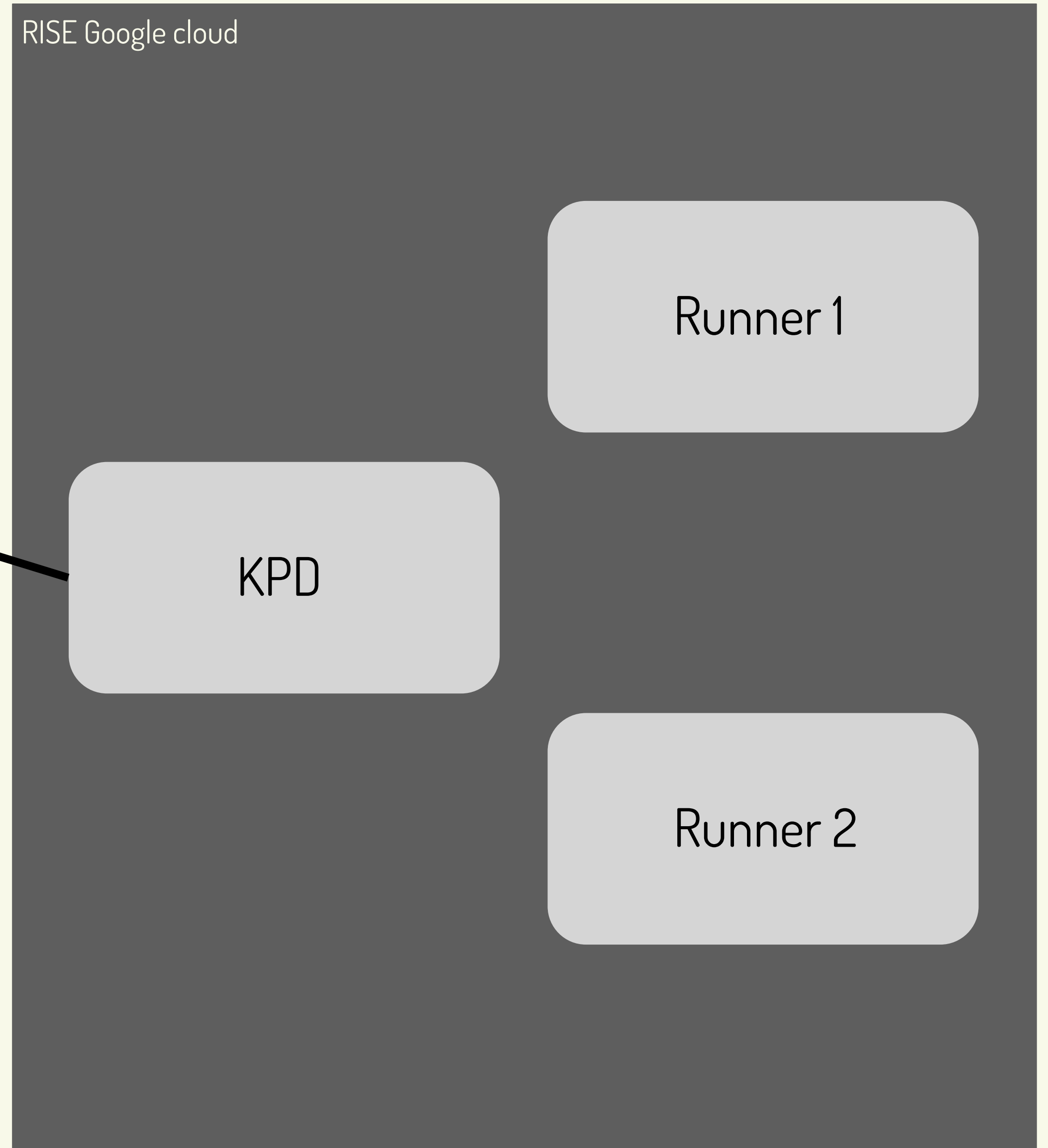
for i in series 7

PW (REST API)

S	W	F
10	1	2
10	-	3
12	-	1

riscv trees + CI

GH linux-riscv.git



KPD

- Meta's KPD forked: <https://github.com/linux-riscv/kernel-patches-daemon>
- Synchronizes with upstream: for-next, fixes
- Applies series from PW onto upstream
 - Github CI files (.github): <https://github.com/linux-riscv/github-ci>
 - Actual patches
- Creates GH pull requests
- Scrapes results from GH and publishes to PW (RV specific)

CI “.github”

- Direct port of NIPA-RV
- Per-patch builds/tests
- Bash + YAML glue (“easy to run locally”)
- .github/scripts/patches
 - build_rv32_defconfig.sh
 - build_rv64_clang_allmodconfig.sh
 - build_rv64_gcc_allmodconfig.sh
 - build_rv64_nommu_k210_defconfig.sh
 - build_rv64_nommu_virt_defconfig.sh
 - checkpatch.sh
 - dtb_warn_rv64.sh
 - header_inline.sh
 - kdoc.sh
 - module_param.sh
 - verify_fixes.sh
 - verify_signedoff.sh

Github Runner

- Docker based build: <https://github.com/linux-riscv/docker>
 - arm64 cross-builder
 - kernel.org GCC/LLVM
 - Bleeding edge dt-schema
 - tuxmake for building kernels
- “Ephemeral runners”

Grokking traffic lights

Patch	Series	A/R/T	S/W/F	▲ Date	Submitter	Delegate	State
[v7,3/3] riscv: Add tests for riscv module loading	riscv: Add remaining module relocations and tests	- - -	10 1 2	2023-10-31	Charlie Jenkins		New
[v7,2/3] riscv: Add remaining module relocations	riscv: Add remaining module relocations and tests	- - -	10 - 3	2023-10-31	Charlie Jenkins		New
[v7,1/3] riscv: Avoid unaligned access when relocating modules	riscv: Add remaining module relocations and tests	- - -	12 - 1	2023-10-31	Charlie Jenkins		New

[v7,3/3] riscv: Add tests for riscv module loading

Message ID 20231031-module_relocations-v7-3-6f4719b64bf7@rivosinc.com (mailing list archive)
State New
Headers [show](#)
Series [riscv: Add remaining module relocations and tests](#) | [expand](#)

Checks

Context	Check	Description
conchuod/vmtest-for-next-PR	fail	PR summary
conchuod/patch-3-test-1	success	.github/scripts/patches/build_rv32_defconfig.sh
conchuod/patch-3-test-2	success	.github/scripts/patches/build_rv64_clang_allmodconfig.sh
conchuod/patch-3-test-3	fail	.github/scripts/patches/build_rv64_gcc_allmodconfig.sh
conchuod/patch-3-test-4	success	.github/scripts/patches/build_rv64_nommu_k210_defconfig.sh
conchuod/patch-3-test-5	success	.github/scripts/patches/build_rv64_nommu_virt_defconfig.sh
conchuod/patch-3-test-6	warning	.github/scripts/patches/checkpatch.sh
conchuod/patch-3-test-7	success	.github/scripts/patches/dtb_warn_rv64.sh
conchuod/patch-3-test-8	success	.github/scripts/patches/header_inline.sh
conchuod/patch-3-test-9	success	.github/scripts/patches/kdoc.sh
conchuod/patch-3-test-10	success	.github/scripts/patches/module_param.sh
conchuod/patch-3-test-11	success	.github/scripts/patches/verify_fixes.sh
conchuod/patch-3-test-12	success	.github/scripts/patches/verify_signedoff.sh

Grokking GH PRs

The screenshot shows the GitHub interface for the linux-riscv/linux-riscv repository. The 'Pull requests' tab is active, showing a list of 67 open pull requests. The filters are set to 'is:pr is:open'. The list includes:

- riscv: Optimize bitops with Zbb extension** (for-next, new, V5) - #196 opened 4 hours ago by bjoto
- RISC-V: Remove duplicated include in smpboot.c** (for-next, new, V1) - #195 opened 10 hours ago by bjoto
- leds: Allwinner A100 LED controller support** (for-next, new, V8) - #194 opened 2 days ago by bjoto
- dt-bindings: riscv: Document cbop-block-size** (for-next, new, V1) - #193 opened 2 days ago by bjoto

The screenshot shows the GitHub Actions workflow run for the 'build-patches' job. The job failed 4 days ago in 48m 59s. The workflow file is located at `.github/scripts/patches.sh`. The run details show the following steps:

- Set up job (2s)
- Initialize containers (1s)
- Configure git (0s)
- Checkout git (1s)
- Run checks (48m 52s)

The 'Run checks' step contains the following commands:

```
1 ▶ Run bash .github/scripts/patches.sh
4 ▶ Patch 1/3: Test 1/12: .github/scripts/patches/build_rv32_defconfig.sh
5 Notice: OK Patch 1/3: Test 1/12: .github/scripts/patches/build_rv32_defconfig.sh
6 ▶ Patch 1/3: Test 2/12: .github/scripts/patches/build_rv64_clang_allmodconfig.sh
13 Notice: OK Patch 1/3: Test 2/12: .github/scripts/patches/build_rv64_clang_allmodconfig.sh
14 ▶ Patch 1/3: Test 3/12: .github/scripts/patches/build_rv64_gcc_allmodconfig.sh
21 Notice: OK Patch 1/3: Test 3/12: .github/scripts/patches/build_rv64_gcc_allmodconfig.sh
22 ▶ Patch 1/3: Test 4/12: .github/scripts/patches/build_rv64_nommu_k210_defconfig.sh
23 Notice: OK Patch 1/3: Test 4/12: .github/scripts/patches/build_rv64_nommu_k210_defconfig.sh
24 ▶ Patch 1/3: Test 5/12: .github/scripts/patches/build_rv64_nommu_virt_defconfig.sh
25 Notice: OK Patch 1/3: Test 5/12: .github/scripts/patches/build_rv64_nommu_virt_defconfig.sh
26 ▶ Patch 1/3: Test 6/12: .github/scripts/patches/checkpatch.sh
34 Notice: OK Patch 1/3: Test 6/12: .github/scripts/patches/checkpatch.sh
35 ▶ Patch 1/3: Test 7/12: .github/scripts/patches/dtb_warn_rv64.sh
253 Notice: OK Patch 1/3: Test 7/12: .github/scripts/patches/dtb_warn_rv64.sh
254 ▶ Patch 1/3: Test 8/12: .github/scripts/patches/header_inline.sh
255 Notice: OK Patch 1/3: Test 8/12: .github/scripts/patches/header_inline.sh
256 ▶ Patch 1/3: Test 9/12: .github/scripts/patches/kdoc.sh
259 Notice: OK Patch 1/3: Test 9/12: .github/scripts/patches/kdoc.sh
260 ▶ Patch 1/3: Test 10/12: .github/scripts/patches/module_param.sh
262 Notice: OK Patch 1/3: Test 10/12: .github/scripts/patches/module_param.sh
263 ▶ Patch 1/3: Test 11/12: .github/scripts/patches/verify_fixes.sh
265 Notice: OK Patch 1/3: Test 11/12: .github/scripts/patches/verify_fixes.sh
```

“Demo”

<https://github.com/linux-riscv>

Resources

- RISC-V GH landing page: <https://github.com/linux-riscv/>
- CI WIKI: <https://github.com/linux-riscv/github-ci/wiki>
- RISE: <https://wiki.riseproject.dev/display/HOME/Developer+Infrastructure+WG>
- BPF CI slides from LSFMM '22 '23:
http://vger.kernel.org/bpfconf2022_material/lsfmmbpf2022-bpf-ci.pdf
http://vger.kernel.org/bpfconf2023_material/BPF_CI_a_year_later.pdf

Next steps

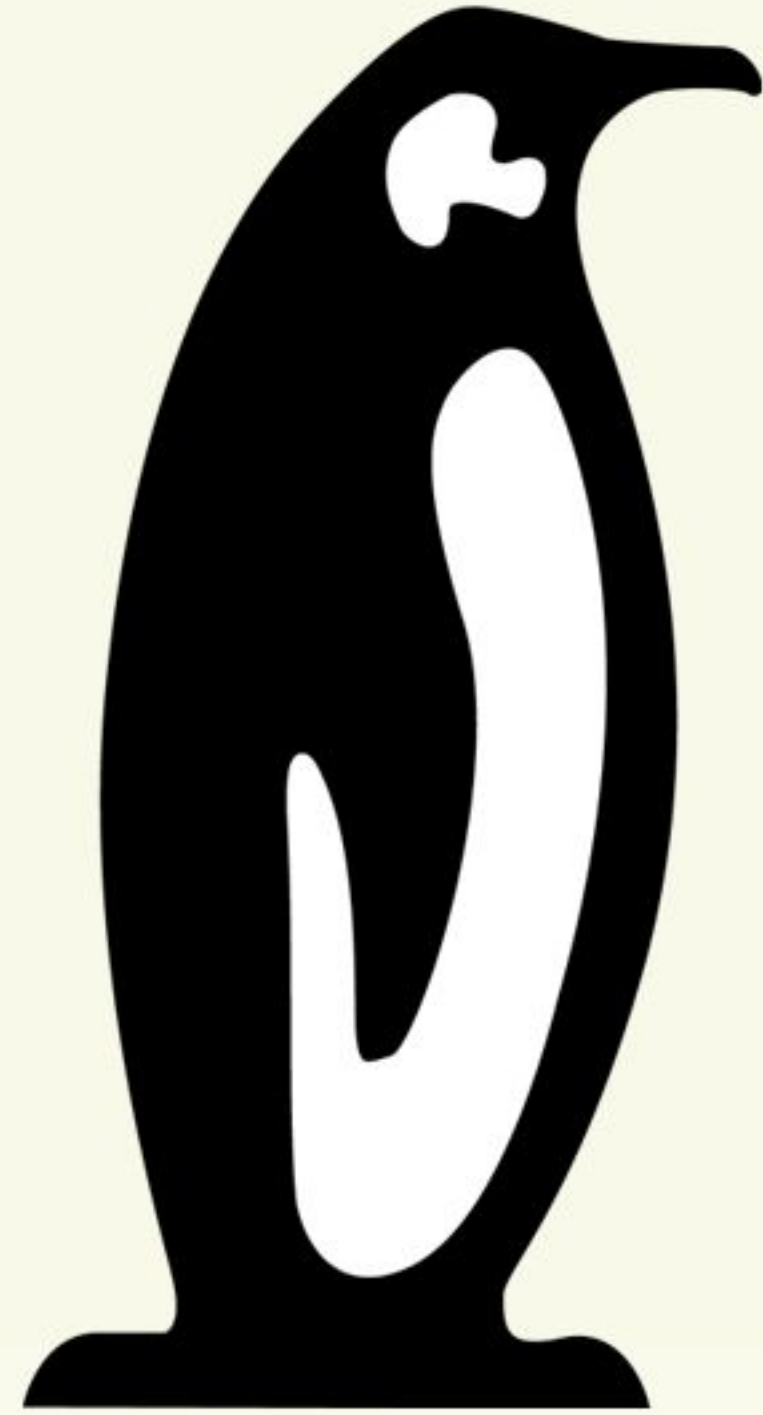
- Add per-series tests ~"Palmer's release tests"
 - 144 build configs (rv32,rv64, GCC, LLVM)
 - 216 qemu "boots" (buildroot-rv32, ubuntu, alpine)
 - Each boot (DT, ACPI, UEFI-uboot, UEFI-EDK2, non-UEFI)

Next steps

- CI performance
 - Utilize all cores (compilation vs linking vs booting)
 - On-demand Runners (web_hooks)?
 - Spot/preemptible Runners?

Discussion

- Next steps build/boot
 - What's missing? Email contributors?
 - Too much?
- UI?
- Overlap with kernel-ci et al?
- Native builds?
- Native boots! (Boards...)
- PRs re-triggered on base change. Too much?



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