



LAVA federated testing

Testing with and by the community

Remi Duraffort

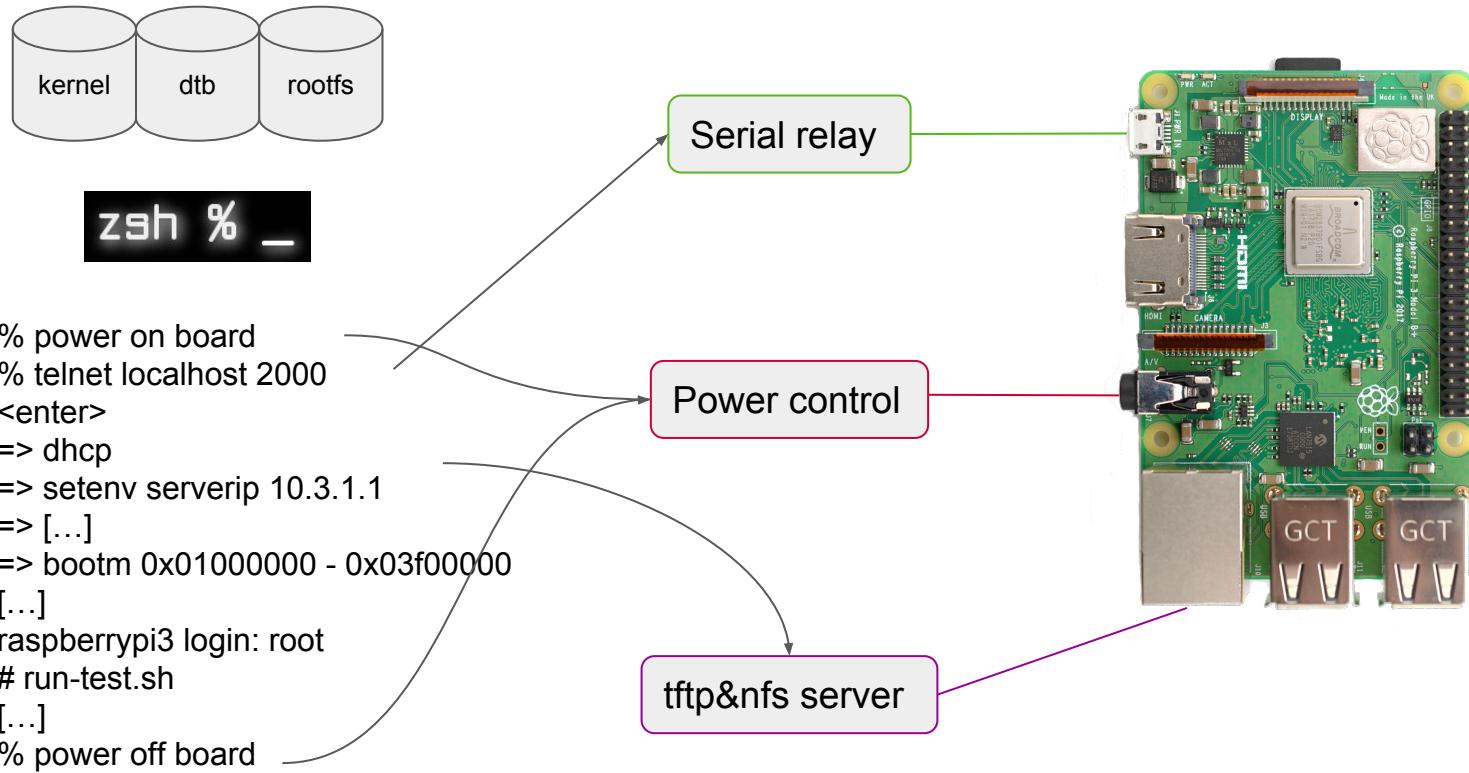


What's LAVA?

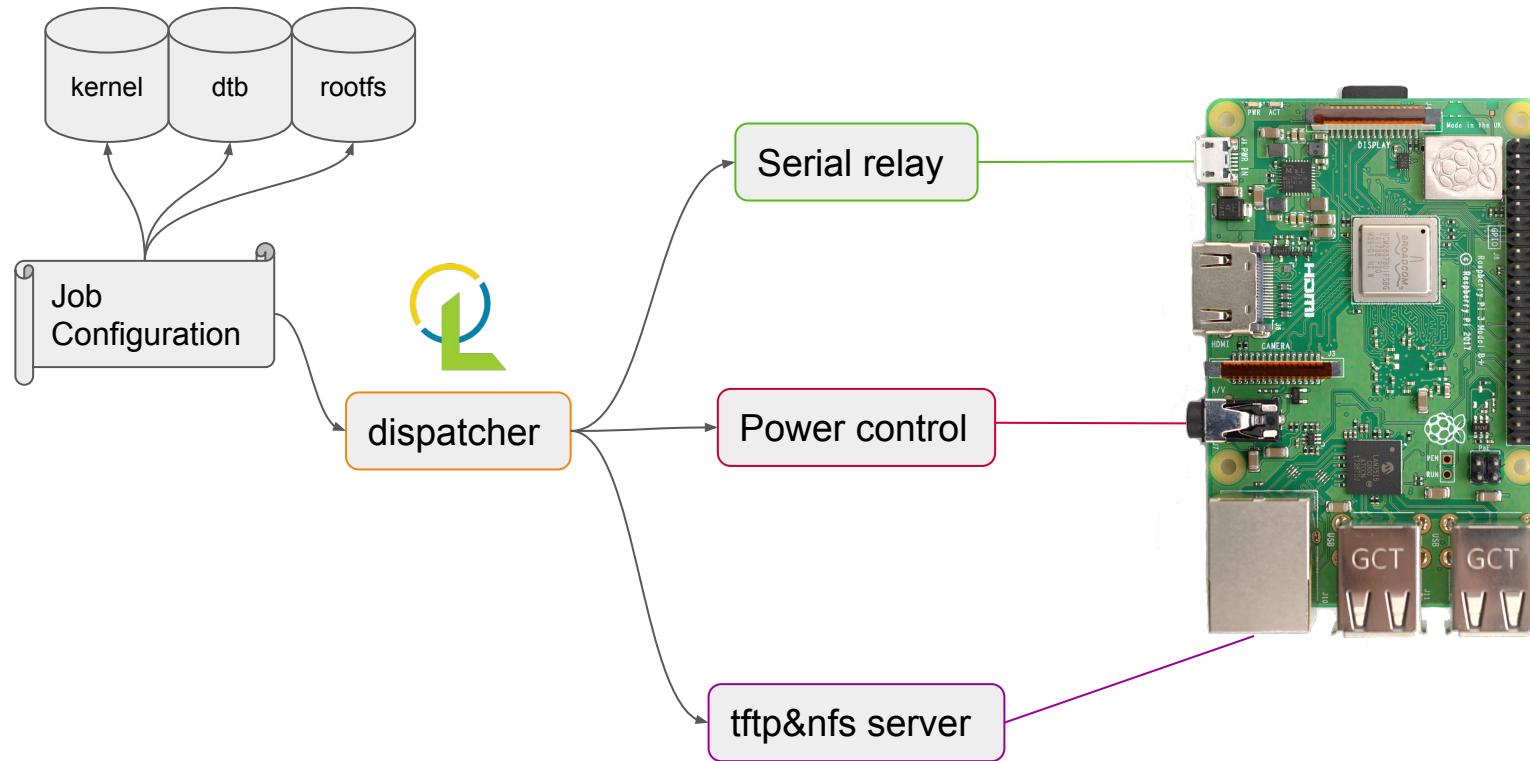
- Linaro Automated Validation Architecture
- CI system
 - Deploy (kernel, dtb, rootfs, raw image, ...)
 - Boot (linux, android, zephyr, ...)
 - Test
- On real hardware: rpi, juno, panda, imx8, ...
- Becoming the “de facto” standard



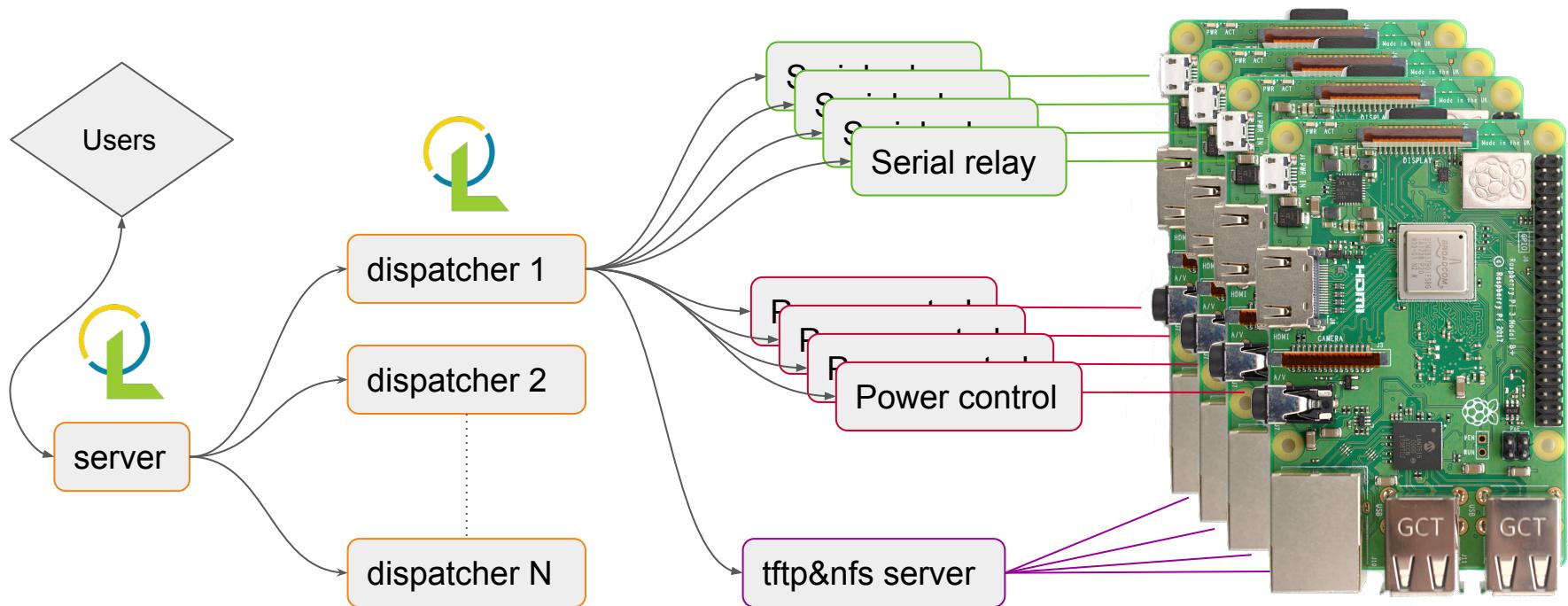
Testing without LAVA



Testing with LAVA



Testing with LAVA (full lab)



Testing with LAVA (user side)

- `lavacli jobs submit <job-definition.yaml>`



- YAML file

- device_type: rpi3-b
- urls:
 - kernel
 - dtb
 - rootfs
- auto_login:
 - prompt
 - username
- test repository (git)
 - <https://git.linaro.org/qa/test-definitions.git/>

- android
- ltp
- kselftest
- linpack
- v4l2
- ...



Testing with LAVA (admin side)

- Server
 - Web UI and API
 - Submit jobs
 - Results, logs, ...
 - Access control
 - Scheduling
 - Priority
 - Private boards
 - Multinode jobs
 - Notifications
- Dispatcher
 - Check boards health
 - Parse logs
 - Kernel panic
 - Bootloader error
 - Classify errors
 - Infrastructure, Job, Test, Bug, ...
 - Reproducible

```
tftp 0x42000000 3885/tftp-deploy-0iwx1zj1/kernel/vmlinuz
Speed: 1000, full duplex
Using dwmac.1c50000 device
TFTP from server 10.15.0.34; our IP address is 10.15.0.130
Filename '3885/tftp-deploy-0iwx1zj1/kernel/vmlinuz'.
Load address: 0x42000000
Loading: *T T T T T T T T T T
Retry count exceeded; starting again
matched a bootloader error message
```

Supported methods (some)

- Deploy:
 - tftp
 - nbd
 - flasher
 - fastboot
 - mps
 - ssh
 - docker
 - tmpfs
 - Vexpress ums
 - iso
 - ...
- Boot:
 - cmsis
 - dfu
 - uboot
 - pyocd
 - fastboot
 - docker
 - qemu
 - grub
 - gdb
 - ssh
 - iso installer
 - ...
- Test:
 - git repository
 - interactive
 - minimal
 - multinode

Supported boards (142)

adb-nuc alpine-db apq8016-sbc-uboot arduino101 armada-370-db armada-370-rd armada-3720-db
armada-3720-espressobin armada-375-db armada-385-db-ap armada-388-clearfog armada-388-gp armada-398-db
armada-7040-db armada-8040-db armada-xp-db armada-xp-gp armada-xp-linksys-mamba armada-xp-openblocks-ax3-4
arndale at91rm9200ek at91sam9261ek at91sam9m10g45ek at91sam9x25ek at91sam9x35ek at91-sama5d2_xplained
at91-sama5d4_xplained b2120h410 b2260 bcm2836-rpi-2-b bcm2837-rpi-3-b-32 bcm2837-rpi-3-b beaglebone-black
beagle-xm cc3220SF cubietruck d02 d03 disco-l475-iot1 docker dra7-evm dragonboard-410c dragonboard-820c frdm-k64f
frdm-kw41z hi6220-hikey-bl hi6220-hikey hi6220-hikey-r2 hi960-hikey highbank hip07-d05 ifc6410 imx6q-nitrogen6x
imx6q-sabrelite imx7s-warp imx8m jetson-tk1 juno juno-uboot juno-uefi kirkwood-db-88f6282 kirkwood-openblocks_a7 kvm
lxc mediatek-8173 meson8b-odroidc1 meson-gxbb-nanopi-k2 meson-gxbb-p200 meson-gxl-s805x-p241
meson-gxl-s905x-khadas-vim meson-gxl-s905x-libretech-cc meson-gxm-khadas-vim2 minnowboard-max-E3825
minnowboard-turbot-E3826 moonshot-m400 mps mustang-grub-efi mustang mustang-uefi nexus10 nexus4 nexus5x nexus9
nrf52-nitrogen nucleo-l476rg nxp-ls2088 odroid-x2 odroid-xu3 orion5x-rd88f5182-nas overdrive panda peach-pi pixel poplar
qcom-qdf2400 qemu-aarch64 qemu r8a7791-porter r8a7795-salvator-x r8a7796-m3ulcb rk3288-rock2-square
rk3288-veyron-jaq rk3328-rock64 rk3399-gru-kevin rk3399-puma-haikou rzn1 sama53d sama5d34ek sama5d36ek
sdm845-mtp sharkl2 snow ssh stm32-carbon sun50i-h5-libretech-all-h3-cc sun5i-gr8-chip-pro sun5i-r8-chip
sun6i-a31-app4-evb1 sun8i-a23-evb sun8i-a33-sinlinx-sina33 sun8i-a83t-allwinner-h8homlet-v2
sun8i-h2-plus-bananapi-m2-zero sun8i-h2-plus-libretech-all-h3-cc sun8i-h2-plus-orangepi-r1 sun8i-h2-plus-orangepi-zero
sun8i-h3-libretech-all-h3-cc sun8i-h3-orangepi-pc synquacer-acpi synquacer-dtb synquacer tc2 tegra124-nyan-big thunderx
vexpress x15-bl x15 x86-atom330 x86-celeron x86 x86-pentium4 x86-x5-z8350 xilinx-zcu102

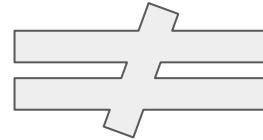
How to test LAVA?

INCEPTION

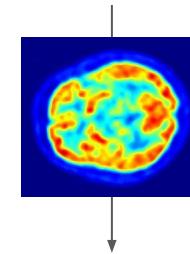
How to test LAVA?

Being lazy

142 boards



Being smart



lavafed

meta-lava

DummySys

LAVA Federated testing

lavafed

lavafed principles

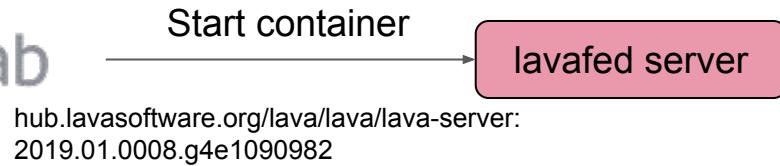
- Test docker build of
 - lava-server
 - lava-dispatcher
- Boards **YOU** care about
 - Community labs
 - staging.validation.linaro.org
 - lava.codehelp.co.uk
 - ...
- Use cases **YOU** care use
- Use LAVA features
 - LAVA jobs
 - notifications
 - API



LAVA features used by lavafed

- Docker device-type
 - normal lava test job
 - deploy: docker pull
 - boot: docker run
 - test: run the test script
 - Notifications
 - HTTP GET or POST
 - given url
 - results
 - logs
- deploy:
image: debian/stretch-backports
- boot:
command: bash
- notify:
- criteria:
- status: finished
- callback:
- url: <https://federation.l.org/api/v0.1/jobs/>
- method: POST

lavafed architecture

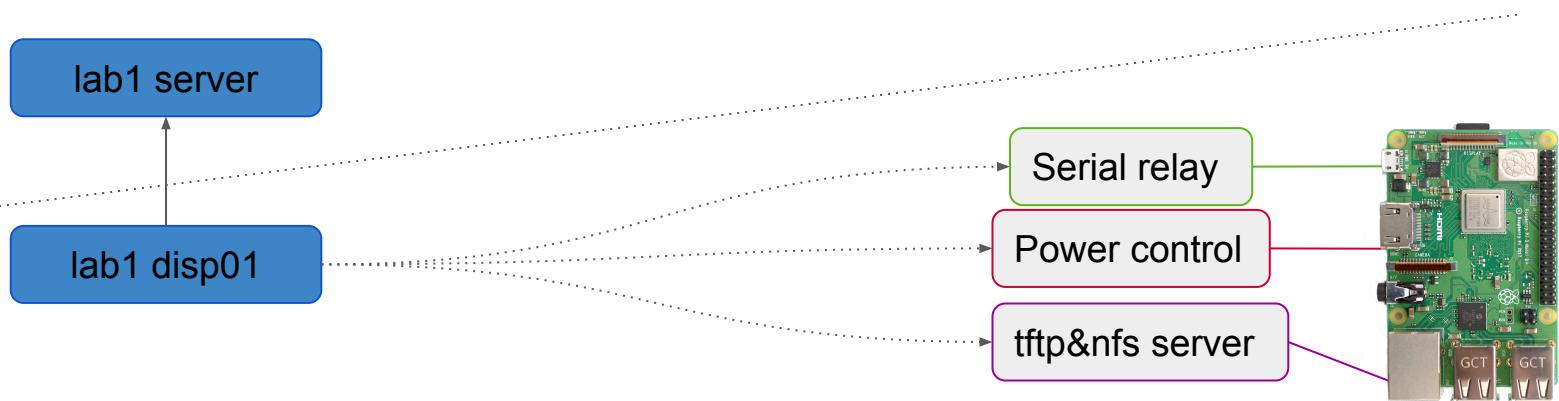


Acquire:

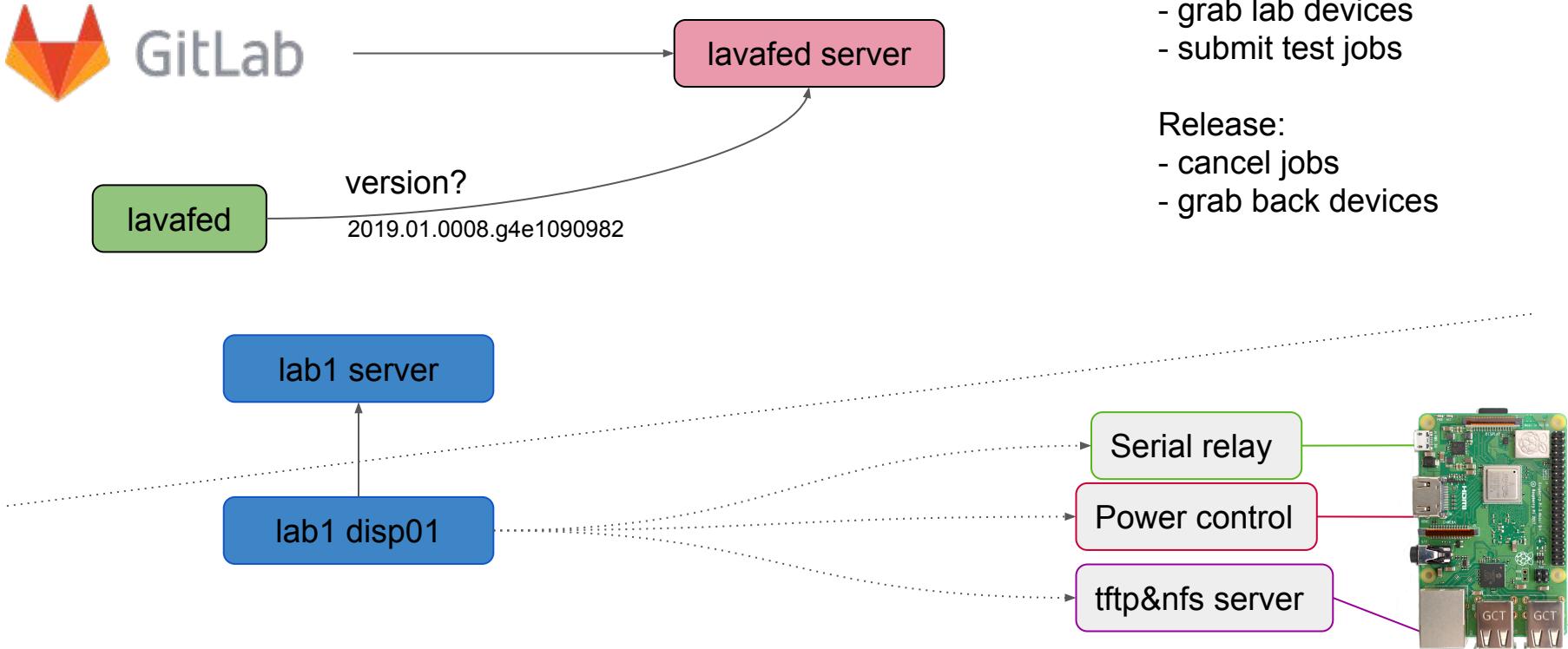
- master version
- submit docker job
- grab lab devices
- submit test jobs

Release:

- cancel jobs
- grab back devices



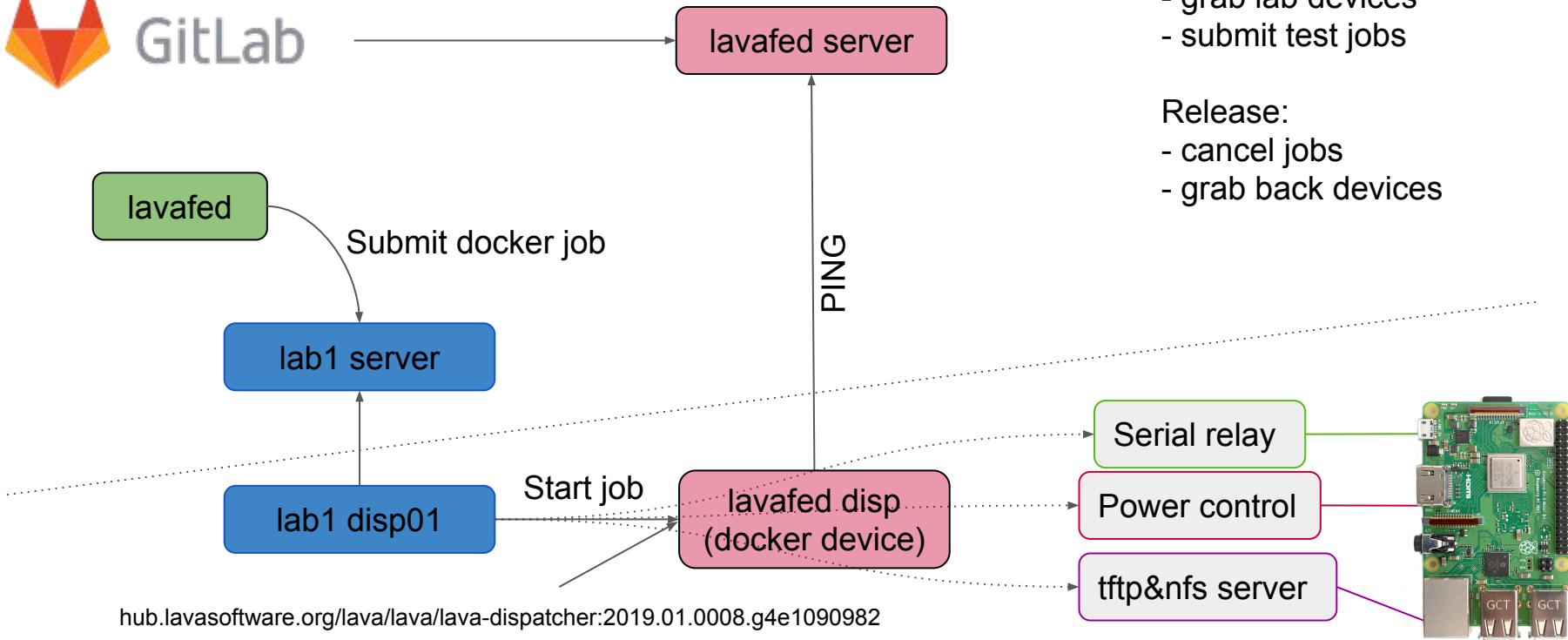
lavafed architecture



lavafed architecture



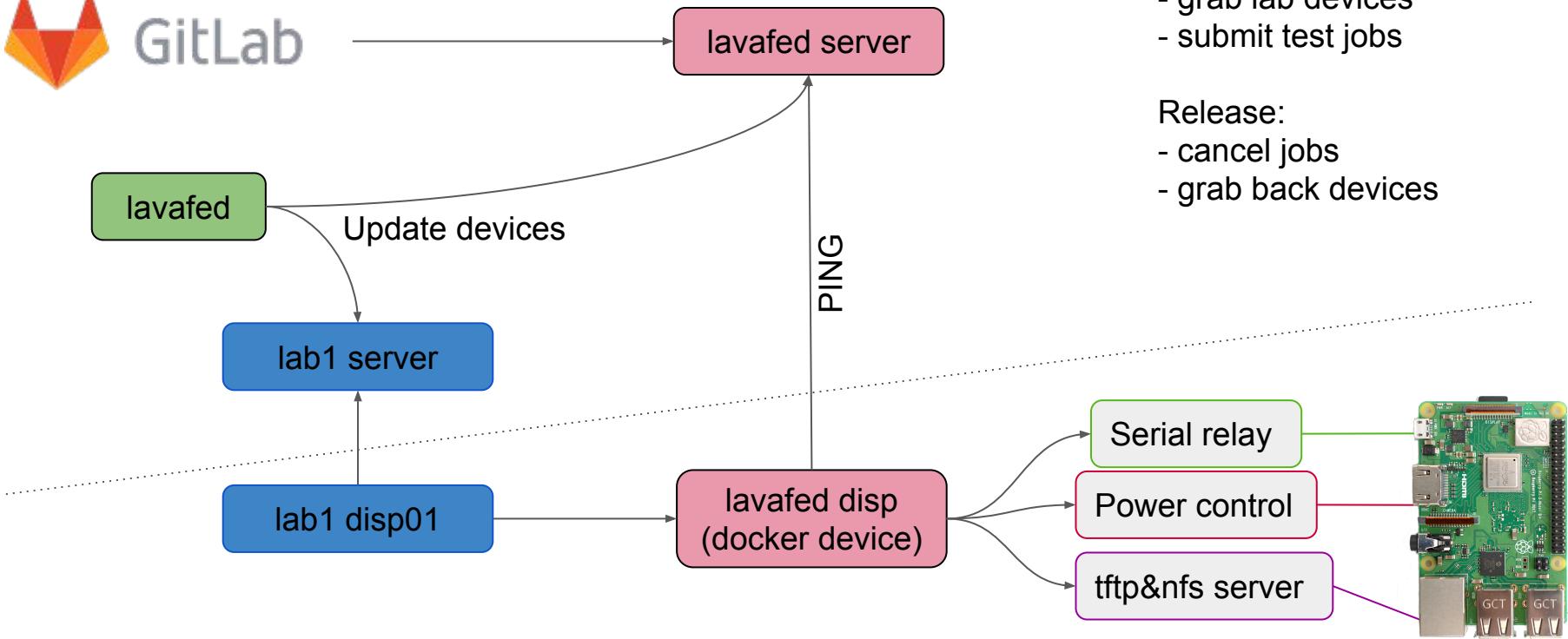
GitLab



lavafed architecture



GitLab



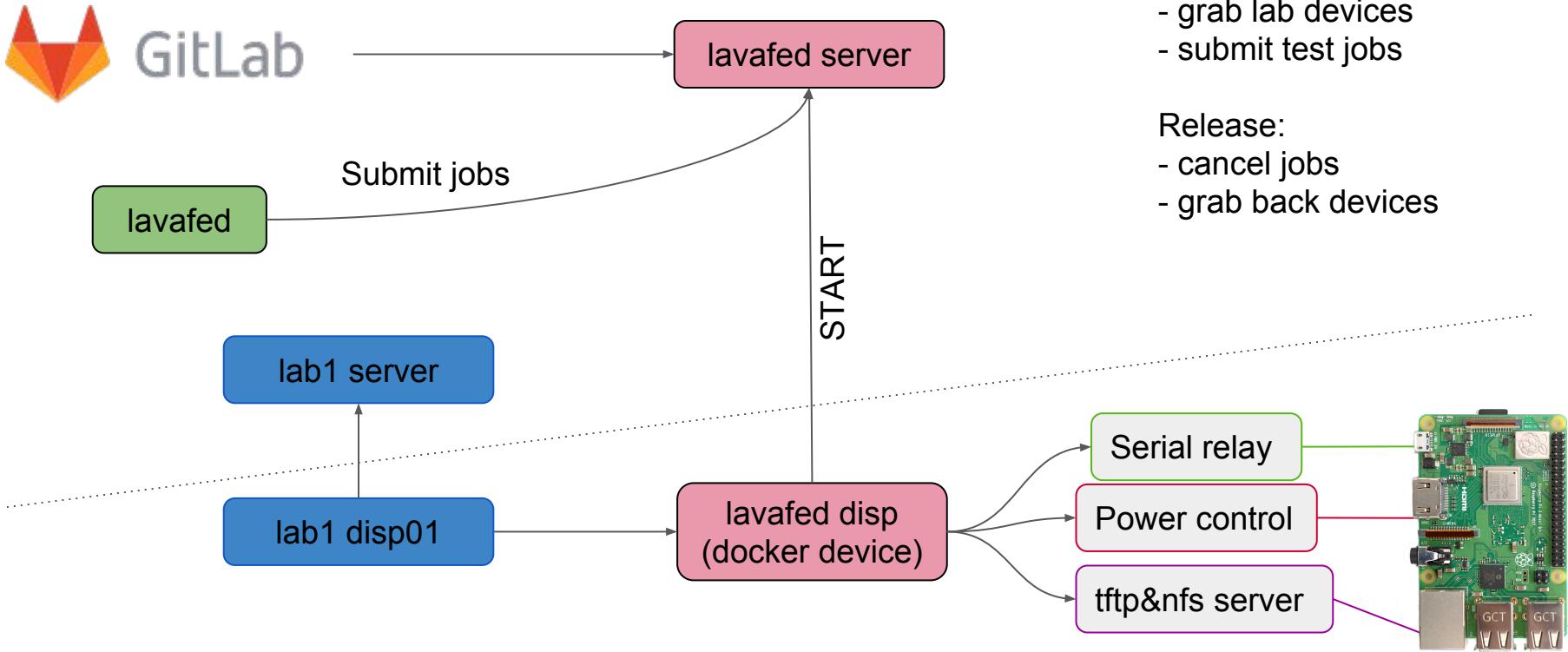
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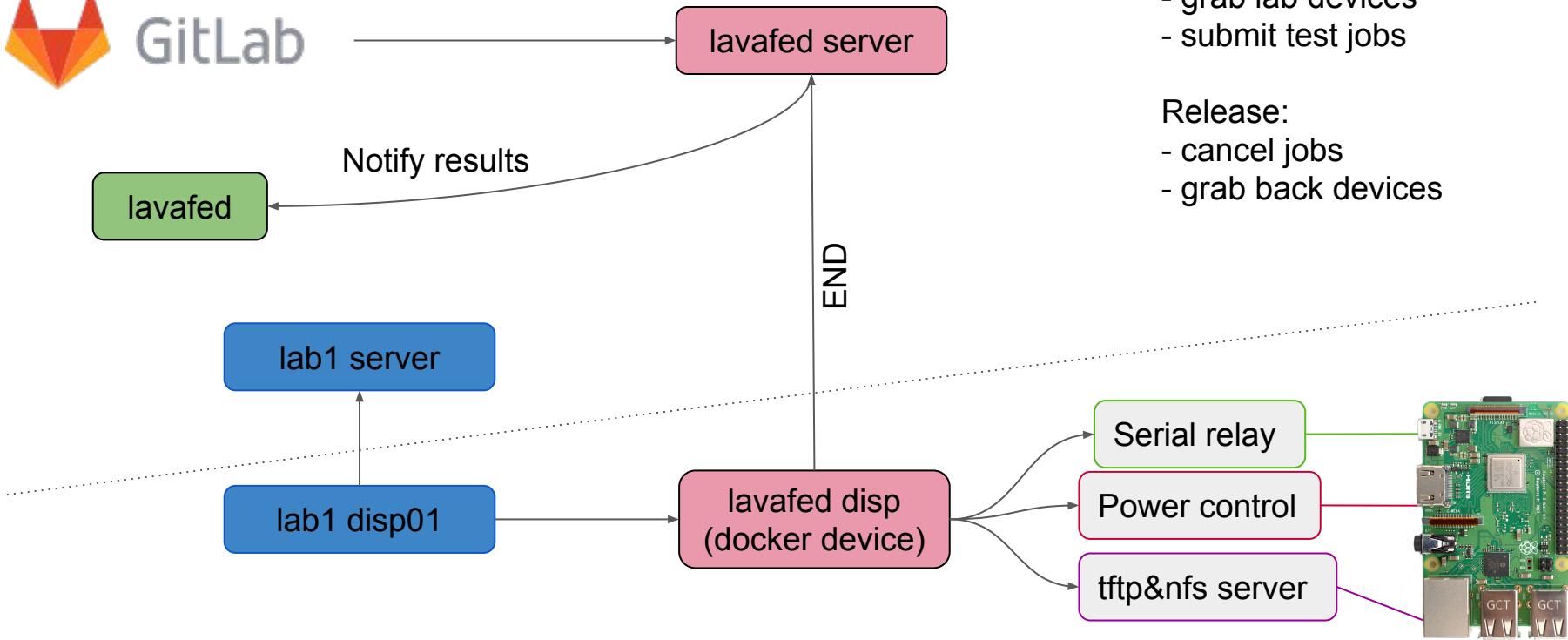
lavafed architecture



lavafed architecture



GitLab



Acquire:

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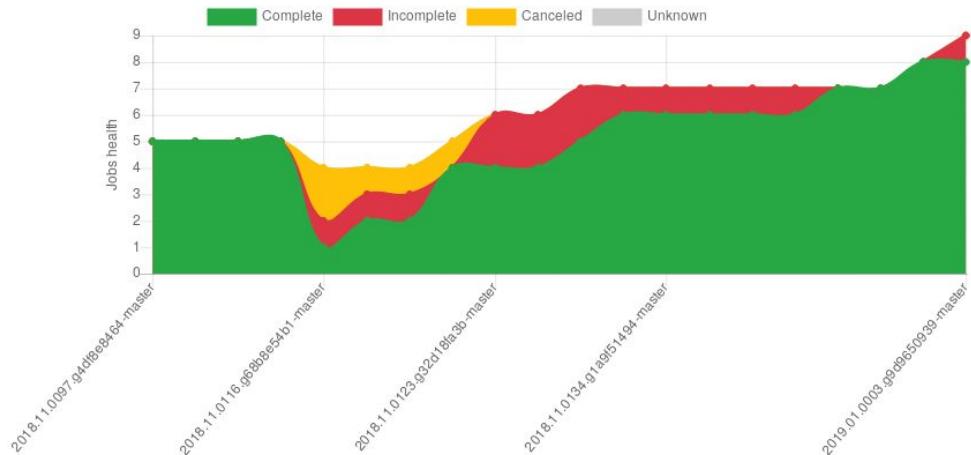
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What's next?

Iavafed current status

- Starting small
 - 3 labs
 - 5 devices
 - 9 jobs/day
- Growing slowly
 - New device-types
 - New jobs
 - Functional tests?



lavafed next step

- Give lavafed access to:
 - boards you care about
 - 1 hour a day
 - Less if needed
 - Your jobs
- Contact me
 - remi.duraffort@linaro.org
 - <https://federation.lavasoftware.org>



Thanks