Testing

A journey from Kernel to Sid

whoami

Sudip Mukherjee

irc: sudip

Emails:
sudipm.mukherjee@gmail.com
sudip.mukherjee@codethink.co.uk
sudip@debian.org
sudip@kernel.org

First test report

```
From: Sudip Mukherjee <sudipm.mukherjee@gmail.com>
To: Greg Kroah-Hartman <gregkh@linuxfoundation.org>
Cc: linux-kernel@vger.kernel.org, torvalds@linux-foundation.org,
        akpm@linux-foundation.org, linux@roeck-us.net,
        shuah.kh@samsung.com, stable@vger.kernel.org
Subject: Re: [PATCH 4.0 000/105] 4.0.6-stable review
Date: Sat, 20 Jun 2015 13:18:53 +0530   [thread overview]
Message-ID: <20150620074853.GC15195@sudip-PC> (raw)
In-Reply-To: <20150619203558.187802739@linuxfoundation.org>

On Fri, Jun 19, 2015 at 01:34:50PM -0700, Greg Kroah-Hartman wrote:
> This is the start of the stable review cycle for the 4.0.6 release.
> There are 105 patches in this series, all will be posted as a response
> to this one.  If anyone has any issues with these being applied, please
> let me know.
>
> Responses should be made by Sun Jun 21 20:35:34 UTC 2015.
> Anything received after that time might be too late.
Compiled and booted on x86_32.

regards
sudip
```

First test report.. contd.

```
From: Greg Kroah-Hartman <gregkh@linuxfoundation.org>
To: Sudip Mukherjee <sudipm.mukherjee@gmail.com>
Cc: linux-kernel@vger.kernel.org, torvalds@linux-foundation.org,
        akpm@linux-foundation.org, linux@roeck-us.net,
        shuah.kh@samsung.com, stable@vger.kernel.org
Subject: Re: [PATCH 4.0 000/105] 4.0.6-stable review
Date: Mon, 22 Jun 2015 08:42:43 -0700   [thread overview]
Message-ID: <20150622154243.GE16004@kroah.com> (raw)
In-Reply-To: <20150620074853.GC15195@sudip-PC>

On Sat, Jun 20, 2015 at 01:18:53PM +0530, Sudip Mukherjee wrote:
> On Fri, Jun 19, 2015 at 01:34:50PM -0700, Greg Kroah-Hartman wrote:
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> > let me know.
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> > Anything received after that time might be too late.
> Compiled and booted on x86_32.

And I guess it's working?  :)

Thanks for letting me know for all 3 of these.

greg k-h
```

Test reports now

```
Build test (gcc version 13.2.1 20230827):
mips: 52 configs -> no failure
arm: 70 configs -> no failure
arm64: 3 configs -> no failure
x86_64: 4 configs -> no failure
alpha allmodconfig -> no failure
csky allmodconfig -> no failure
powerpc allmodconfig -> no failure
riscv allmodconfig -> no failure
s390 allmodconfig -> no failure
xtensa allmodconfig -> no failure

Boot test:
x86_64: Booted on my test laptop. No regression.
x86_64: Booted on qemu. No regression. [1]
arm64: Booted on rpi4b (4GB model). No regression. [2]
mips: Booted on ci20 board. No regression. [3]

[1]. https://openqa.qa.codethink.co.uk/tests/5364
[2]. https://openqa.qa.codethink.co.uk/tests/5365
[3]. https://openqa.qa.codethink.co.uk/tests/5371

Tested-by: Sudip Mukherjee <sudip.mukherjee@codethink.co.uk>
```
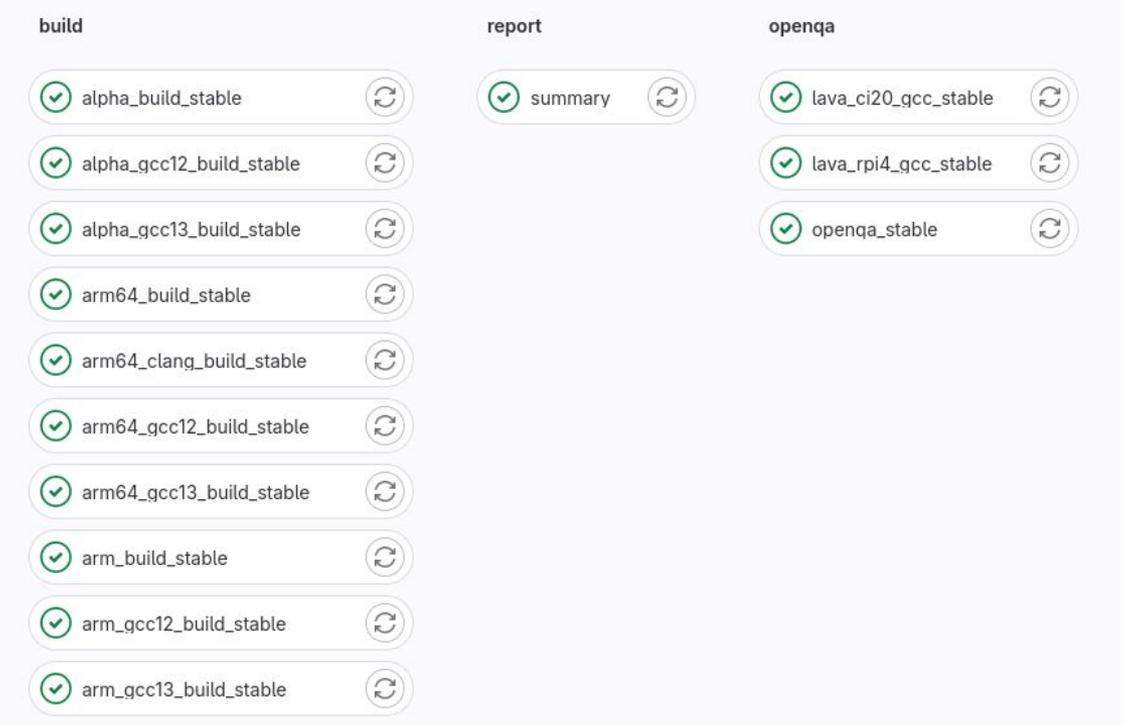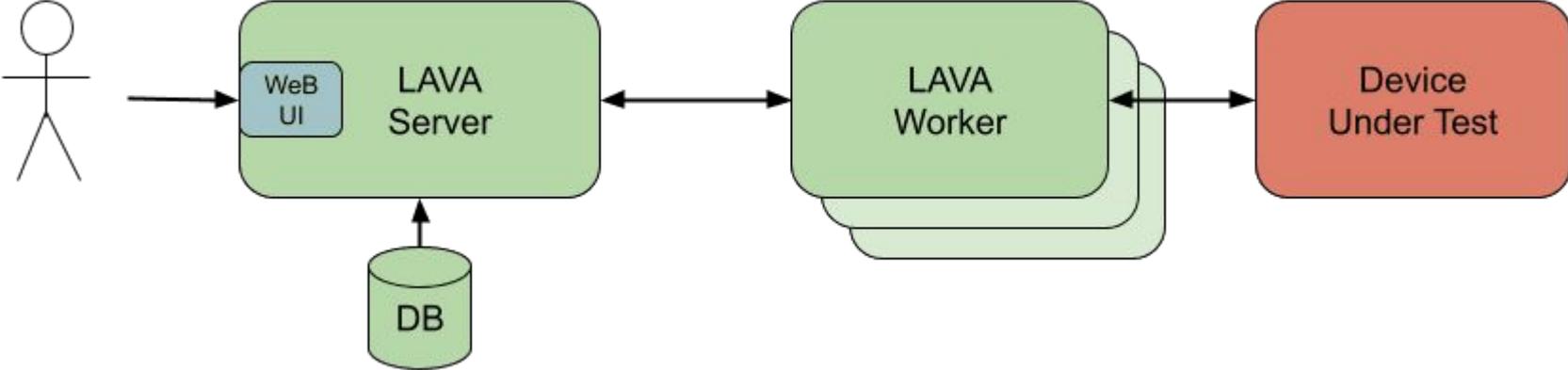
Part of gitlab pipeline

build	report	openqa
✓ alpha_build_stable	✓ summary	✓ lava_ci20_gcc_stable
✓ alpha_gcc12_build_stable		✓ lava_rpi4_gcc_stable
✓ alpha_gcc13_build_stable		✓ openqa_stable
✓ arm64_build_stable		
✓ arm64_clang_build_stable		
✓ arm64_gcc12_build_stable		
✓ arm64_gcc13_build_stable		
✓ arm_build_stable		
✓ arm_gcc12_build_stable		
✓ arm_gcc13_build_stable		

Lava

- Linaro Automated Validation Architecture
- Tests can be simple boot testing, bootloader testing and system level testing
- single *server* - one or multiple *worker*
- Worker - devices

Lava

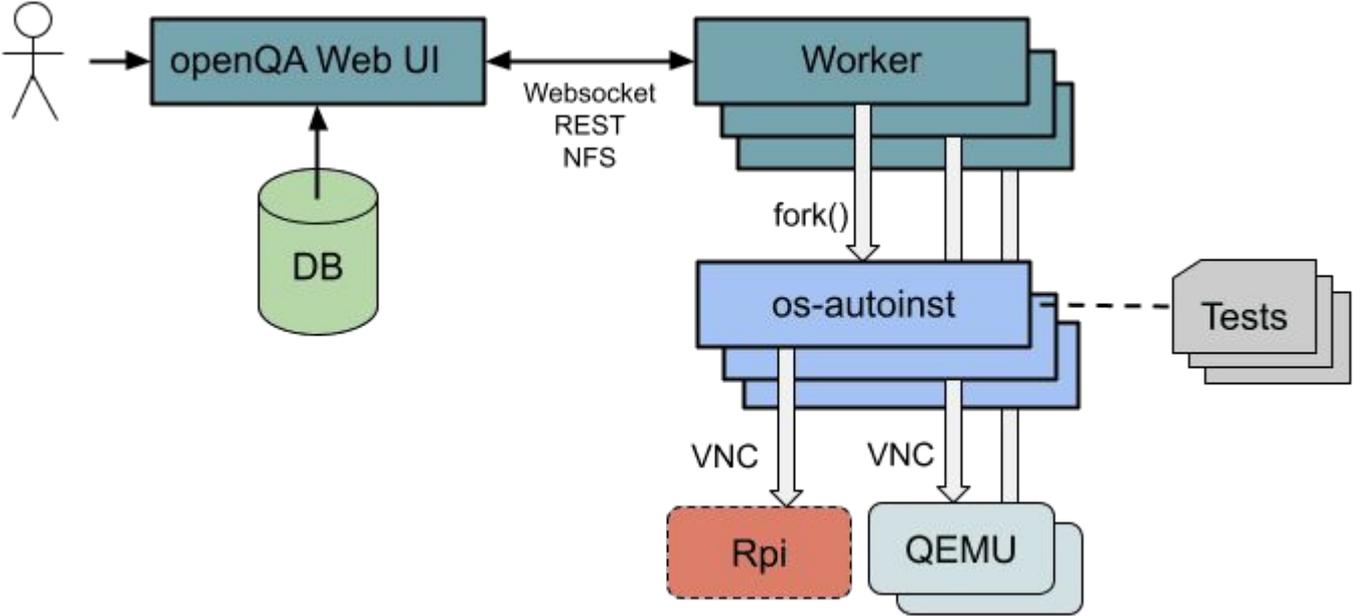Source: https://www.codethink.co.uk/articles/2021/automated-linux-kernel-testing/

LAVA in kernel tests

- https://lava.qa.codethink.co.uk/scheduler/job/2511
- Interrupts u-boot and boots kernel via tftp

```
actions:
- deploy:
    timeout:
      minutes: 10
    to: tftp
    kernel:
      url: https://gitlab.codethink.co.uk/api/v4/projects/1160/jobs/470590/artifacts/artifacts/Image.gz
      compression: gz
      type: image
      headers:
        JOB-TOKEN: 64_2kvk-vsouLUejRbGYxkM
    dtb:
      url: https://gitlab.codethink.co.uk/api/v4/projects/1160/jobs/470590/artifacts/artifacts/bcm2711-rpi-4-b.dtb
      headers:
        JOB-TOKEN: 64_2kvk-vsouLUejRbGYxkM
    ramdisk:
      url: https://gitlab.codethink.co.uk/api/v4/projects/1160/jobs/470590/artifacts/artifacts/initrd.gz
      compression: gz
      headers:
        JOB-TOKEN: 64_2kvk-vsouLUejRbGYxkM
    modules:
      url: https://gitlab.codethink.co.uk/api/v4/projects/1160/jobs/470590/artifacts/artifacts/modules.tar.xz
      compression: xz
      headers:
        JOB-TOKEN: 64_2kvk-vsouLUejRbGYxkM
    os: debian
```

openQA

- openQA is an automated test tool for operating systems
- Similar to lava
- One server, multiple worker
- Interacts via vnc
- Test results in server

openQA

Source: https://www.codethink.co.uk/articles/2021/automated-linux-kernel-testing

Openqa in kernel test with VM

- Uses vnc to control VM
- Boot vm, install kernel and reboots

https://openqa.qa.codethink.co.uk/tests/5376

Objective:

Test new kernel and confirm it works

Lava + openQA

```
gitlab  →  Kernel build  →  lava  →  openQA
```
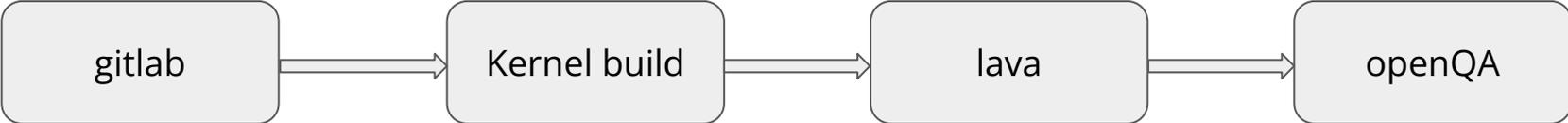
openQA rpi4 jobs

Last Builds for linux-rpi4-mainline

- Build-20231122 (about 10 hours ago) ✅   `1 passed`
- Build-20231121 (a day ago) ✅   `1 passed`
- Build-20231120 (2 days ago) ✅   `1 passed`
- Build-20231119 (3 days ago) ✅   `1 passed`
- Build-20231118 (4 days ago) ✅   `1 passed`
- Build-20231117 (5 days ago) ✅   `1 passed`
- Build-20231116 (6 days ago) ✅   `1 passed`
- Build-20231115 (7 days ago) ✅   `1 passed`
- Build-20231114 (8 days ago) ✅   `1 passed`
- Build-20231113 (9 days ago) ✅   `1 passed`

Limit to **10** / 20 / 50 / 100 / 400 builds, only tagged / **all**
Set mode to full screen

rpi4 job on openQA

Sid - unstable

How?

- Get rpi4 image from unstable
- Flash it to rpi4
- Boot it
- Test gui with openQA

Create new image from unstable

- vmdb2 and yaml
- https://salsa.debian.org/raspi-team/image-specs.git

Duration: 40 minutes 0 seconds
Finished: 1 week ago
Queued: 0 seconds
Timeout: 3h (from project) ⑦

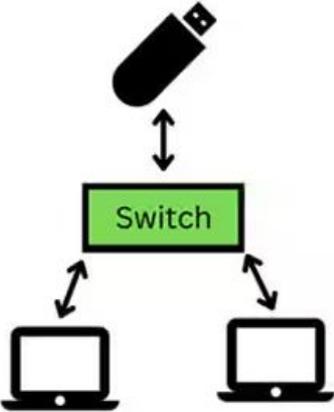**Duration:** 9 minutes 13 seconds
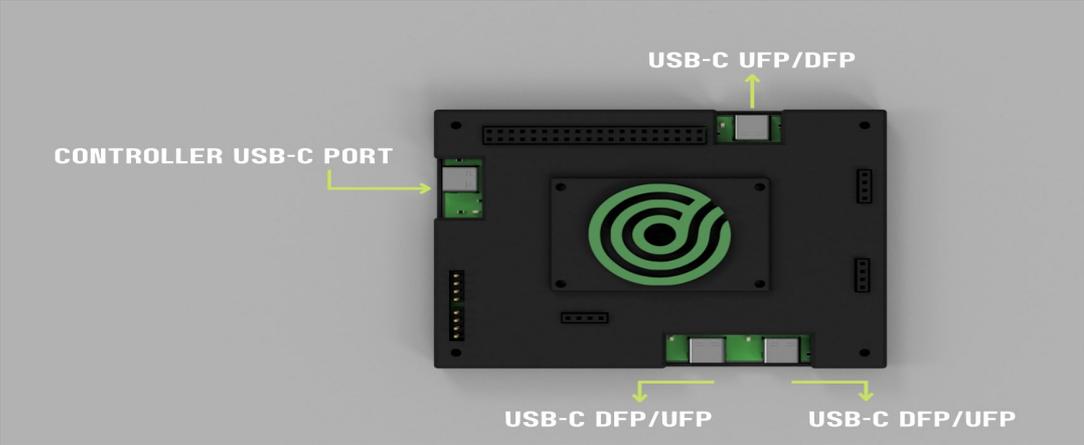**Finished:** 7 hours ago
Queued: 0 seconds
Timeout: 3h (from project) ⑦

Sid - unstable

How?

- Create new image from unstable - ✓
- Flash it to rpi4
- Boot it
- Test gui with openQA

Usb switch

echo "AT+PORT=1" > /dev/ttyACM0
echo "AT+PORT=2" > /dev/ttyACM0

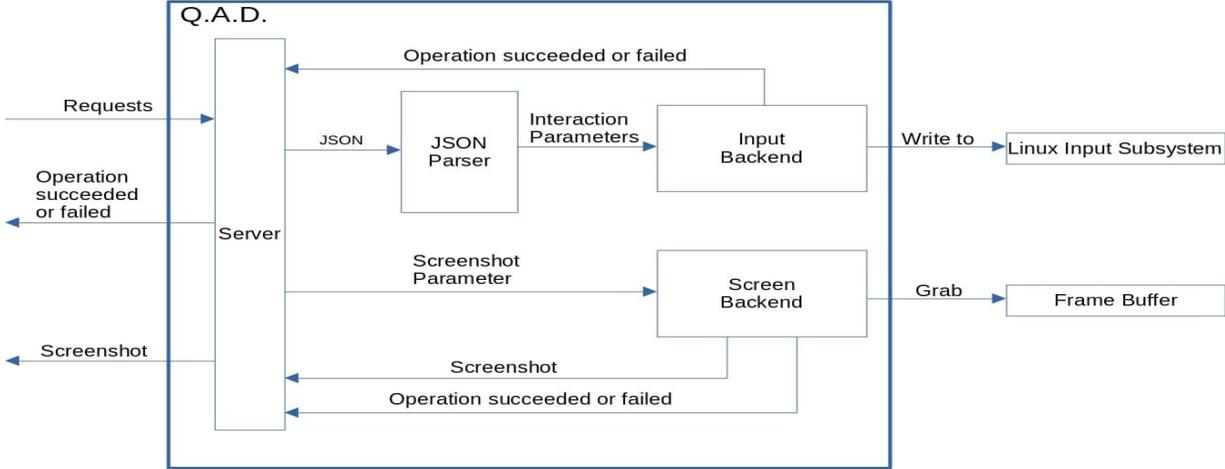https://www.digikey.co.uk/en/blog/introducing-the-ultimate-usb-type-c-switch

Sid - Unstable

How?

- Create new image from unstable - ✓
- Flash it to rpi4 - ✓
- Boot - ✓
- Test gui with openQA

Q.A.D.

- Quality Assurance Daemon
- Can take screenshot and send it back

Gitlab ci

rpi4_unstable_build job

```
rpi4_unstable_build:
  stage: build
  image: debian:bookworm-slim
  tags:
    - arm64.runner
  script:
    - apt-get update
    - apt-get install -y vmdb2 dosfstools debootstrap time kpartx bmap-tools python3 zerofree
    - vmdb2 -v --rootfs-tarball=raspi_4_unstable.tar.gz --output raspi_4_unstable.img raspi_4_unstable.yaml --log raspi_4_unstable.log
    - gzip raspi_4_unstable.img
  artifacts:
    expire_in: 1 day
    when: always
    paths:
      - raspi_4_unstable.img.gz
      - raspi_4_unstable.log
```

rpi4_flash job

```
rpi4_flash:
  stage: flash
  image: usbswitch:latest
  tags:
    - usbswitch
  needs: ["rpi4_unstable_build"]
  script:
    - mkdir -p ~/.config
    - sed "s/TOKEN/${LAVA_TOKEN}/" lava/lavacli.yaml > ~/.config/lavacli.yaml
    - lavacli -i codethink devices update --health MAINTENANCE rpi-01
    - |
      cat /dev/ttyACM0 &
      echo "AT+PORT=2" > /dev/ttyACM0
    - sleep 10 && lsblk
    - zcat raspi_4_unstable.img.gz | dd of=/dev/sdb bs=500M status=progress
    - sync && sync && sync
    - echo "AT+PORT=1" > /dev/ttyACM0
    - sleep 10 && lsblk
```

rpi4_test job

```
rpi4_test:
  stage: test
  image: usbswitch:latest
  tags:
    - usbswitch
  script:
    - mkdir -p ~/.config
    - sed "s/TOKEN/${LAVA_TOKEN}/" lava/lavacli.yaml > ~/.config/lavacli.yaml
    - lavacli -i codethink devices update --health GOOD rpi-01
    - LAVA_JOB_ID=$(lavacli -i codethink jobs submit ./lava/rpi_debian.yaml)
    - echo $LAVA_JOB_ID
    - scripts/job_state.sh ${LAVA_JOB_ID}
    - rpi_ip=`scripts/qad-ip.sh ${LAVA_JOB_ID}`
    - mkdir -p /etc/openqa
    - echo "[openqa.qa.codethink.co.uk]" > /etc/openqa/client.conf
    - echo "key = ${OPENQA_KEY}" >> /etc/openqa/client.conf
    - echo "secret = ${OPENQA_SECRET}" >> /etc/openqa/client.conf
    - DATE=`date +%Y%m%d`
    - sed "s/DATE/$DATE/" openqa/rpi-qad.py.source > rpi-qad.py
    - sed -i "s/IPADDR/${rpi_ip}/g" rpi-qad.py
    - cat rpi-qad.py
    - chmod a+x rpi-qad.py
    - ./rpi-qad.py
```

rpi4_restore job

```
rpi4_restore:
  stage: restore
  image: usbswitch:latest
  tags:
    - usbswitch
  script:
    - mkdir -p ~/.config
    - sed "s/TOKEN/${LAVA_TOKEN}/" lava/lavacli.yaml > ~/.config/lavacli.yaml
    - lavacli -i codethink devices update --health MAINTENANCE rpi-01
    - sleep 300
    - |
      cat /dev/ttyACM0 &
      echo "AT+PORT=2" > /dev/ttyACM0
    - sleep 10 && lsblk
    - zcat /rpi-backup/rpi.backup.gz | dd of=/dev/sdb bs=500M status=progress
    - sync && sync && sync
    - echo "AT+PORT=1" > /dev/ttyACM0
    - sleep 10 && lsblk
    - lavacli -i codethink devices update --health GOOD rpi-01
  when: always
```
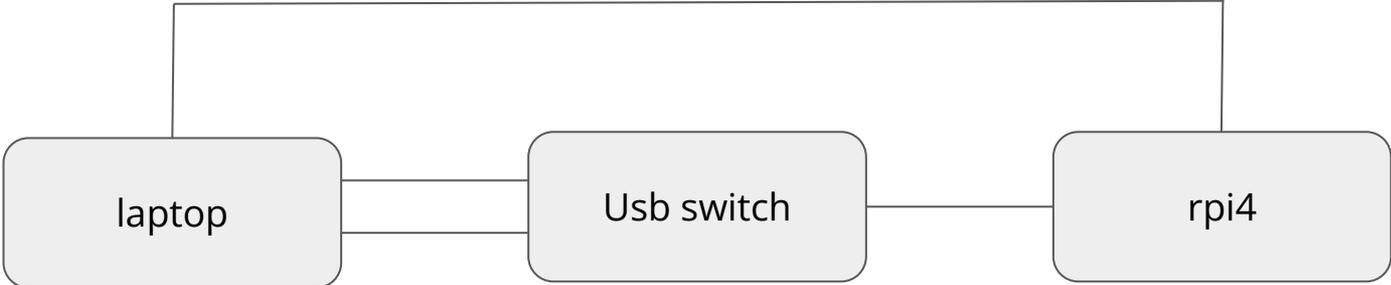
openQA

https://openqa.qa.codethink.co.uk/tests/5598

https://lava.qa.codethink.co.uk/scheduler/job/2689

setup

laptop — Usb switch — rpi4
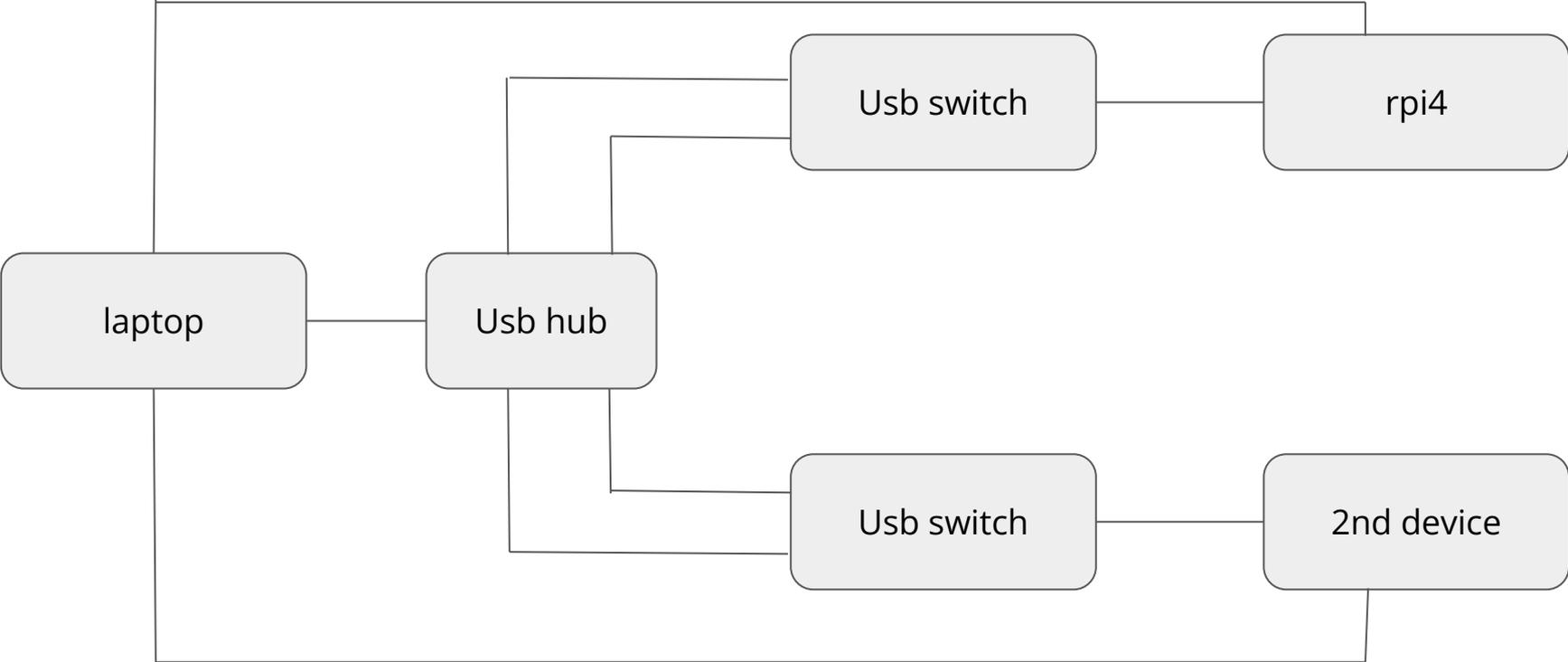
setup

TIAB - Testing in a box

setup

tiab

rpi4

2nd device
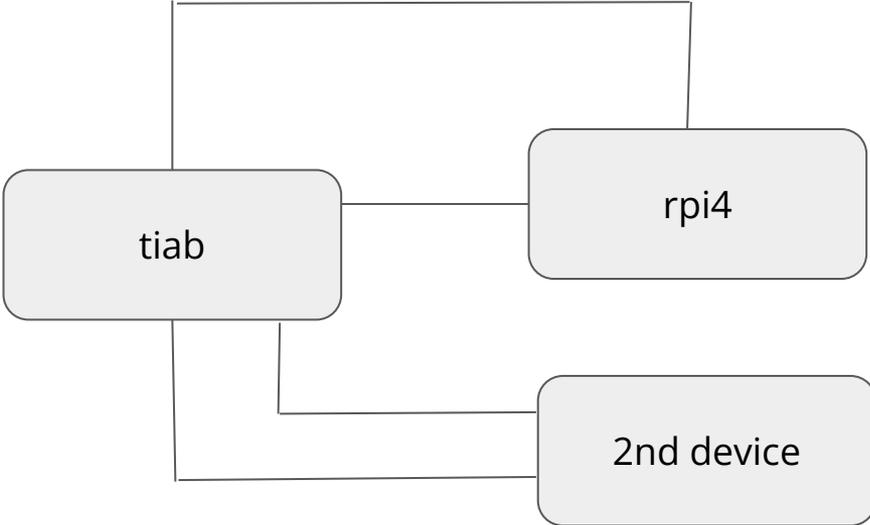
limitations

- Usb boot

Links summary

- https://lore.kernel.org/stable/ZTeGtz7cTimKctug@debian/
- https://lore.kernel.org/lkml/ZUNsmJGbYwgPaUpY@debian/
- https://lava.qa.codethink.co.uk/scheduler/job/2511
- https://openqa.qa.codethink.co.uk/tests/5376
- https://openqa.qa.codethink.co.uk/tests/5630
- https://gitlab.com/CodethinkLabs/testing-in-a-box
- https://gitlab.com/CodethinkLabs/usb-switch
- https://www.digikey.co.uk/en/blog/introducing-the-ultimate-usb-type-c-switch

Questions?