Collabora

LibreOffice
The Document Foundation

SUSE

openSUSE on ARM

What happened since the last openSUSE Conference

MySQL

LINUX MAGAZINE

datto

ADMIN Network & Security

fedora

TUXEDO COMPUTERS

.riessapplications

Required Magic
advanced technology

Agenda

- Who am I?
- Overview of openSUSE on ARM workflow
- Open Build service – OBS
- OpenQA
- Tumbleweed, Kubic/MicroOS and Leap/Jump
- openSUSE wiki
- The TODO list

Who am I?

Who am I?

- Guillaume GARDET
- Member of the openSUSE community for years guillaume@opensuse.org
- Engineer at Arm, part of the Distro Team (OSS Group), dedicated to SUSE/openSUSE, since 2018
- Member of the openSUSE Release Team, taking care of Arm architectures:
  - **AArch64:** 64-bit Armv8.x, Tumbleweed + Leap (+Jump)
  - Armv7: Tumbleweed + Leap
  - Armv6: Tumbleweed only

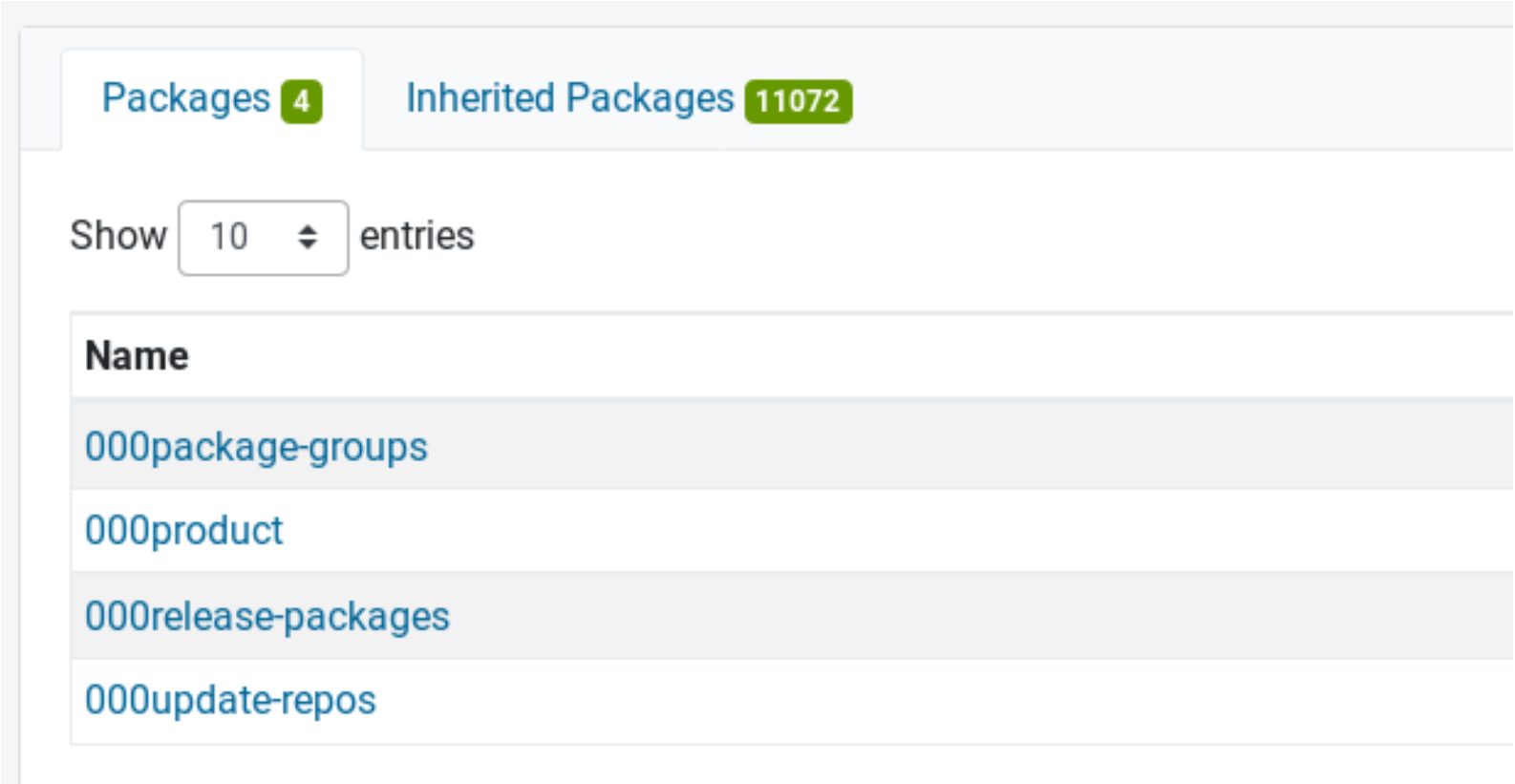
Overview of openSUSE on ARM workflow

Overview of openSUSE (~~on ARM~~) workflow

Overview of openSUSE on ARM workflow

- *openSUSE:Factory:ARM* project is a project link to *openSUSE:Factory* project
- *openSUSE:Leap:15.2:ARM* project is a project link to *openSUSE:Leap:15.2* project
  - all sources are reused and updated in real-time
  - a small overlay is available to handle the snapshot version and the content of ISO and FTP trees

Overview of openSUSE on ARM workflow



Overview of openSUSE on ARM workflow

Open Build Service - OBS

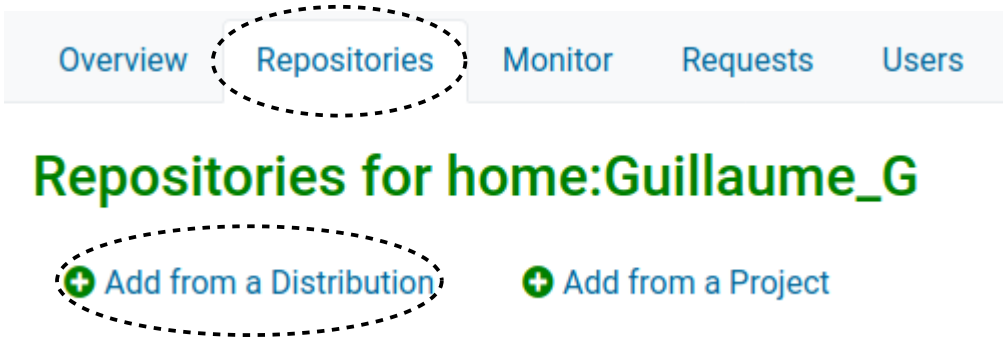
OBS

- No additionnal build power since February 2019
- Still a bit short for 32-bit Arm (armv6/armv7)
- Enough to build AArch64 on time and to enable **Rings** rebuilds:
  - openSUSE:Factory:ARM:Rings:0-Bootstrap
  - openSUSE:Factory:ARM:Rings:1-MinimalX
- Not enough to enable **staging** for Aarch64
- Lots of build failures fixed

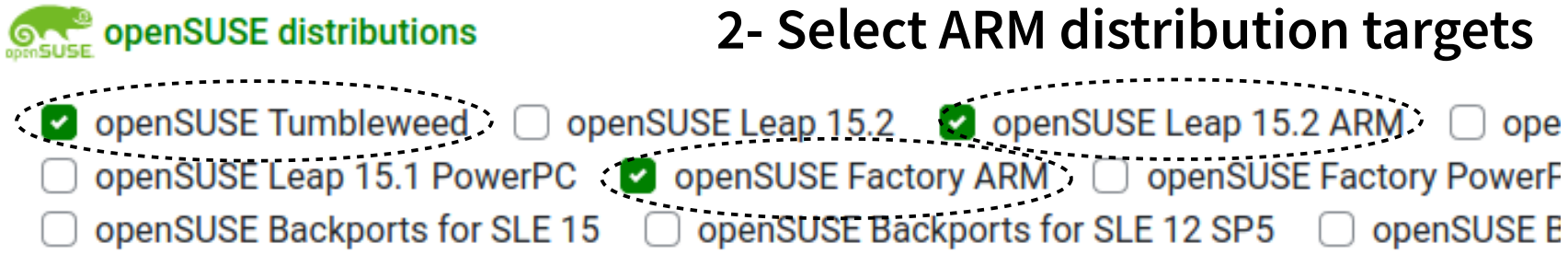
OBS – Build statistics for openSUSE Tumbleweed

Pkg state	AArch64	x86_64	i586
Succeeded	13 739	13 843	13 545
Failed	143	159	161
Unresolvable	35	32	32

OBS - How to enable ARM build in a devel project



1- Click on *Add from a Distribution*



2- Select ARM distribution targets

openQA

openQA

- How openQA works?
  - *1* server (shared for all architectures), with a web interface + API:
    - hold files (ISO, HDD images, repositories, etc.)
    - hold test suites informations (tests scenarios, needles, etc.)
    - control test runs
    - store test results
  - *X* machines: workers
    - Running multiple VM (qemu) to run tests inside
    - Or real hardware
    - Each test runs some actions and checks if the results are expected

openQA

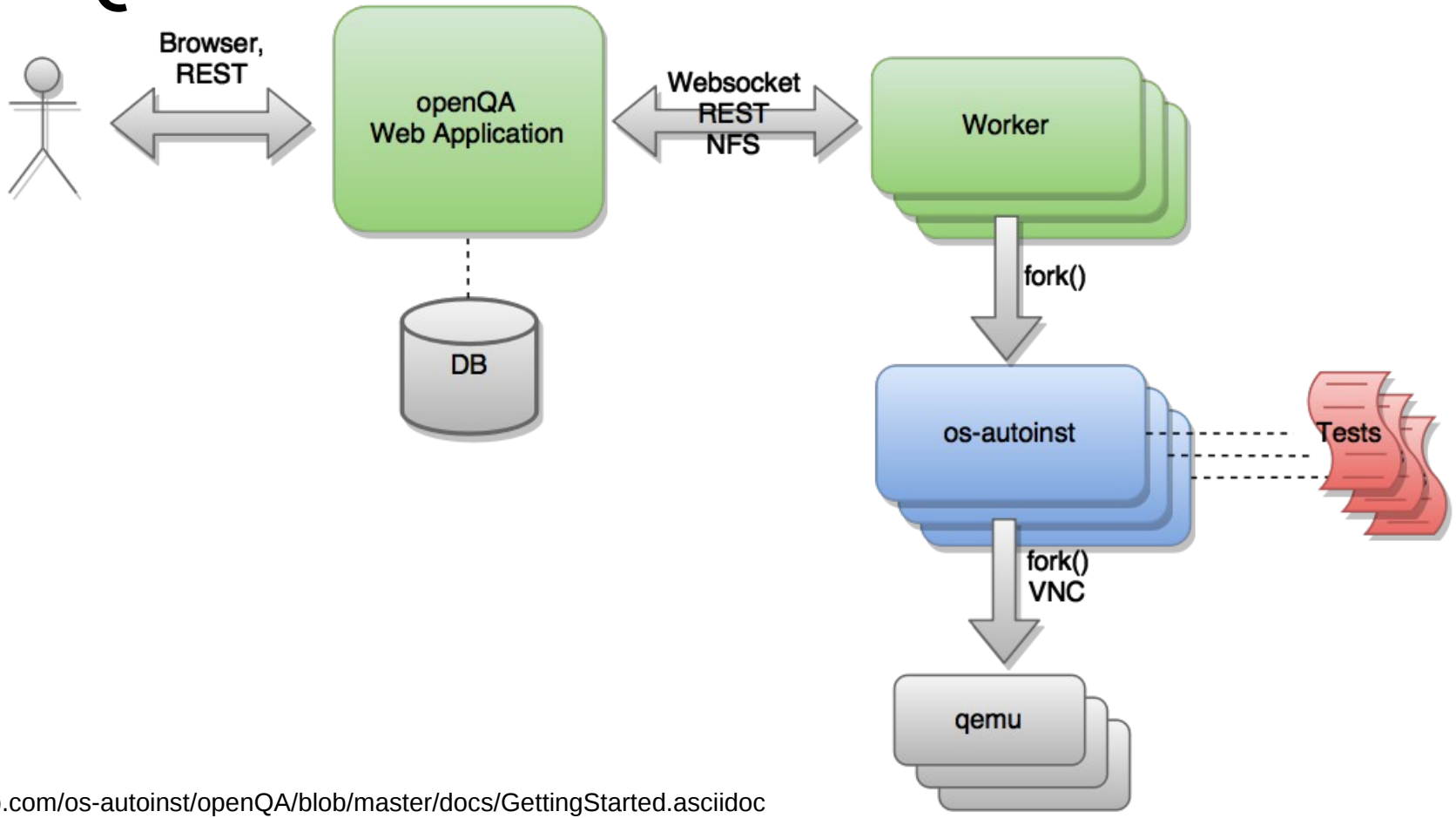


Image from:
https://github.com/os-autoinst/openQA/blob/master/docs/GettingStarted.asciidoc

openQA

- *Mediacheck* test:
  - Boot on ISO and start the *Check installation media*
  - Make sure no errors are found

openQA

- Mainly for AArch64, few openQA tests for armv7 targets in Tumbleweed

- Since fall 2018: a **D05** machine - with 64x Cortex-A72, 128GB RAM, 480GB SATA SSD: *16* workers

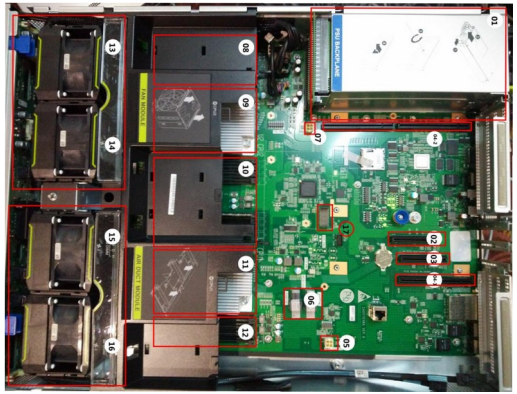


Image from: http://open-estuary.org/d05/

openQA

- **Remote workers** have been **added**:
  - A ThunderX2 machine (*LSE-enabled* hardware): 2 qemu workers
  - Amazon A1 (bare metal, 16x Cortex-A72): 3 qemu workers
  - Amazon m6g (bare metal, 64x N1 cores): 6 qemu workers (will be extended later)
  - Part-time workers:
    - HoneyComb LX2K (16x Cortex-A72): 3 qemu workers
    - N1SDP (4x Neoverse N1, *LSE-enabled* hardware): 1 qemu worker
- **Real hardware** (generalhw backend):
  - Raspberry Pi 2 (armv7)
  - Raspberry Pi 3 and 4 (aarch64)

openQA

- On 16/10/2020:
  - On **Tumbleweed**: **149** tests (+ 70 tests for kernel *ltp* and *trinity*)
    - Kubic/MicroOS: 15 tests
    - DVD: 93 tests
    - NET: 18 tests
    - JeOS: 13 tests (including 2 on RPi2 and 4 on RPi3)
    - Live: 10 tests
  - On **Leap 15.2**: **82** tests
    - DVD: 68 tests
    - NET: 14 tests
    - JeOS: 4 tests (including 2 on Rpi3)
    - Live: 8 tests

Tumbleweed, Kubic/MicroOS and Leap/Jump

Tumbleweed, Kubic, MicroOS

- Automated **e-mail notification** sent when a new snapshot is released
- Lots of **packages fixed**: build time (OBS) and runtime (openQA)
- **New packages**/builds: Tensorflow, Tensorflow2, TVM, ArmNN, etc.
- **New systems and new devices supports** thanks to the up-to-date kernel and up-to-date user-space: Mali GPU (lima and panfrost), etc.
- New system support thanks to Contrib:
  - **Pinephone**: devel:ARM:Factory:Contrib:PinePhone

Tumbleweed, Kubic, MicroOS

- Some Arm specific feature additions
  https://en.opensuse.org/ARM_architecture_support
  - Armv8.1 **LSE-atomics** enabled since snapshot **20200602**
  - Armv8.3 **Pointer Authentication**
    - **Kernel-space** support: since snapshot **20200612**
    - **User-space** support: **WIP**, target is October 2020
  - Armv8.5 **Branch Target Identification** (**BTI**):
    - **Kernel-space** support: since snapshot **20200821**
    - **User-space** support: **WIP**, target is October 2020 (with PAuth)

Leap 15.2

- How is Leap built?
  - Inherit (and rebuild) SLE15-SP2 packages for core packages: *gcc, kernel, qemu*, etc.
  - Inherit (and rebuild) Leap 15.1 packages for other packages
  - If package maintainers want to, they can push updates from Tumbleweed
- Packages fixed (builds and runtime)

Jump 15.2

- Jump project : Close the gap between openSUSE Leap and SUSE SLE: https://en.opensuse.org/Portal:Jump
- How is Jump built?
  - Get SLE15-SP2 binaries rpm packages for core packages: *gcc, kernel, qemu*, etc.
  - Get PackageHub binaries rpm packages for other packages
  - Few packages added on top (mainly for branding)
- All supported architecture from SLE are included (includes *aarch64*)
  - But what about **armv7**?
- Packages fixed (builds and runtime)

openSUSE wiki

Wiki - https://en.opensuse.org/Portal:ARM

- ARM pages have been updated on the openSUSE wiki:
  - *Portal:ARM* and HCL pages updated
  - openSUSE:JoyPi - openSUSE Demo Kit
  - New HCL pages: *HoneyComb LX2K*, *N1SDP*, ...
  - Page with latest status of Arm architecture extensions enablement: https://en.opensuse.org/ARM_architecture_support

The TODO list

The TODO list

- Coming soon:
  - Pointer Authentication (PAC) and Branch Target Identification (BTI) in Tumbleweed
- To be fixed soon:
  - D05 machine performances issues in openQA

The TODO list

- Improve continuously the wiki with:
  - new information
  - up-to-date information
- Improve OBS:
  - enable ARM build on more *devel* projects to catch failures ASAP
  - Speed-up armv7 build: current bootleneck which slow down Tumbleweed a bit

The TODO list

- Improve openQA:
  - Add more aarch64 tests?
  - Extend generalhw backend:
    - Add support for *HDMI-to-USB* sticks to check screen output
    - Add USB gadget support to send mouse/keyboard events
- Monitor continuously build failures and test failures and fix them ASAP
- Report and/or fix bugs on openSUSE bugzilla

The TODO list

- Need some **help** to:
  - Test and get feedback on systems (boards / servers) people use: *even if all is fine*
  - Update software
  - Add new features
  - Get WSL support in OBS for aarch64:
    - WIP project: home:Guillaume_G:WSL

The TODO list

- Please join us:
  - IRC: *#opensuse-arm* on Freenode
  - ML: *opensuse-arm@opensuse.org*

Questions?

Thank You