



# openSUSE on ARM

What happened since the last  
openSUSE Conference



# 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

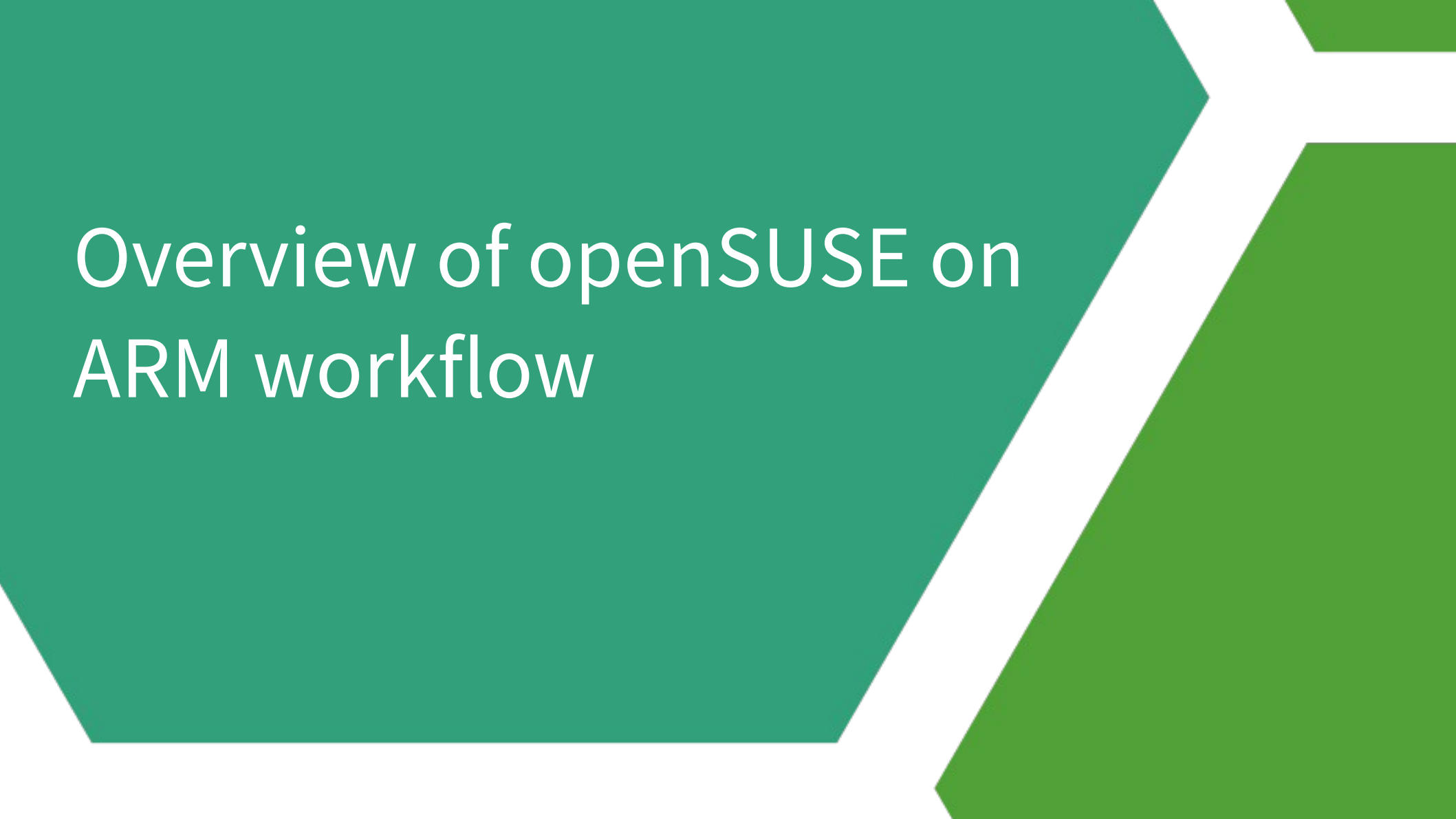
The background features abstract geometric shapes in two shades of green. A large teal shape occupies the left and top portions, while a bright green shape is on the right. A white border separates the two green areas.

Who am I?

# Who am I?

- Guillaume GARDET
- Member of the openSUSE community for years [guillaume@opensuse.org](mailto: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

The background features a large teal shape on the left and a green shape on the right, separated by a white diagonal line. The teal shape has a white arrow-like cutout on its right side pointing towards the green shape.

# 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

Packages **4**    Inherited Packages **11072**

Show  entries

Name
<a href="#">000package-groups</a>
<a href="#">000product</a>
<a href="#">000release-packages</a>
<a href="#">000update-repos</a>



# Overview of openSUSE on ARM workflow



# Open Build Service - OBS

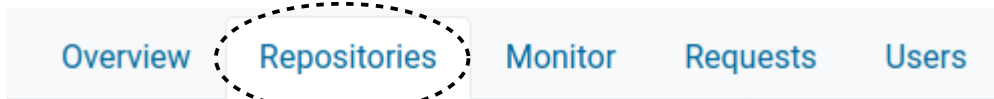
# OBS

- No additional 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

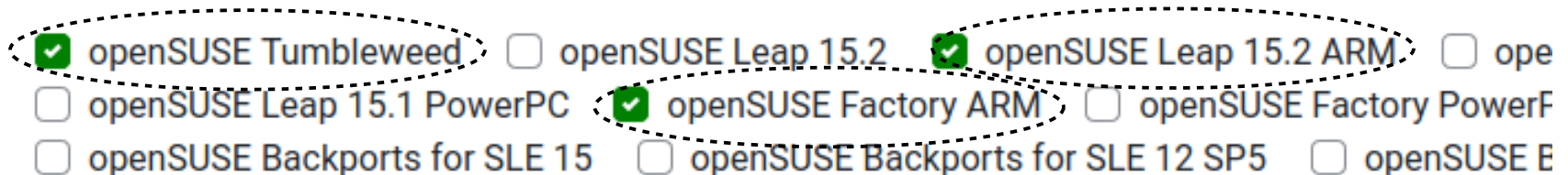


1- Click on *Add from a Distribution*

## Repositories for home:Guillaume\_G



## 2- Select ARM distribution targets



The background features abstract geometric shapes in two shades of green. A large, dark teal shape occupies the left and top portions of the frame. To its right, a lighter green shape is partially visible, separated by a white, angular border that creates a sense of depth and movement. The overall composition is clean and modern.

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

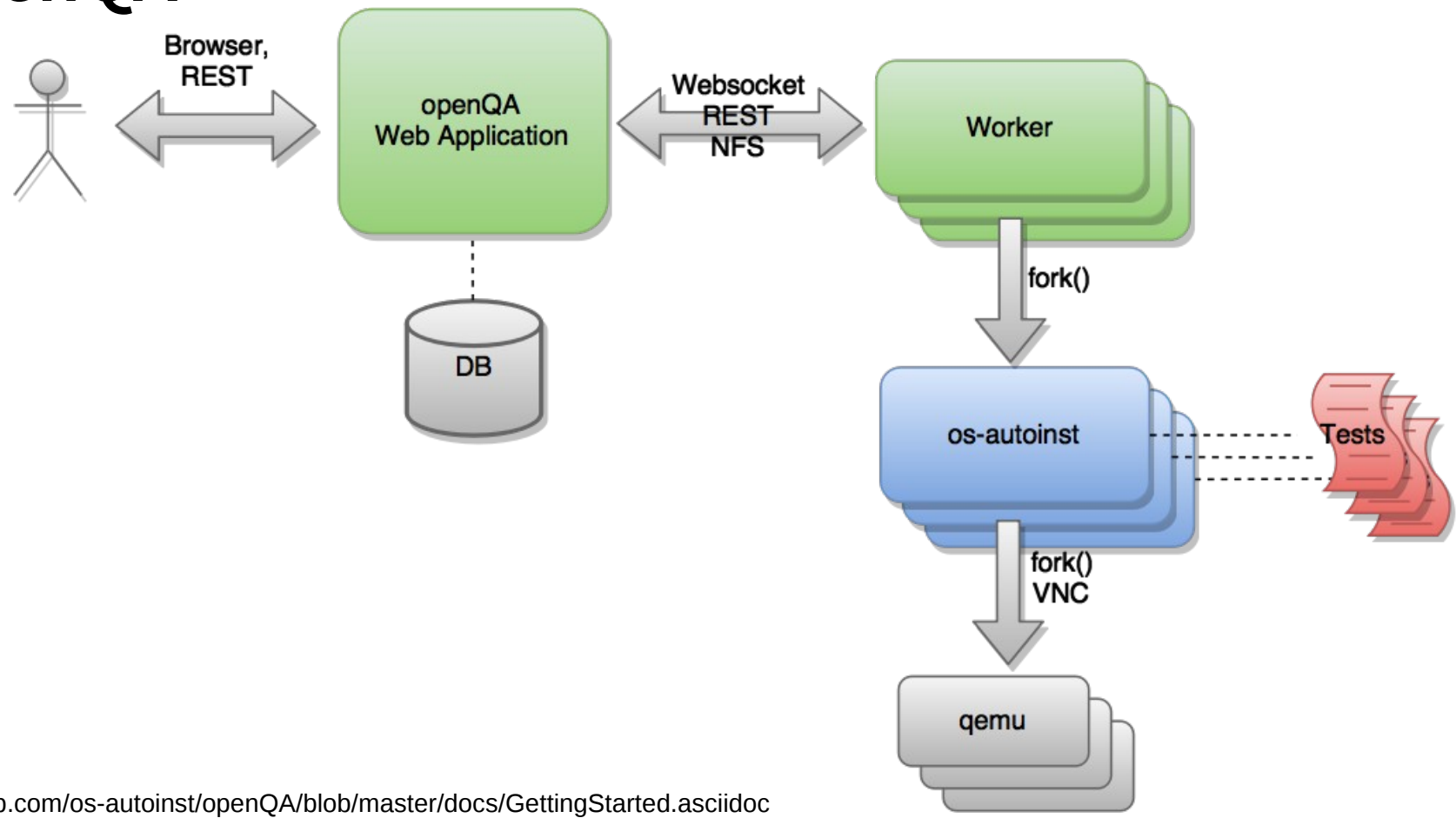


Image from:  
<https://github.com/os-autoinst/openQA/blob/master/docs/GettingStarted.asciidoc>



# openQA

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

mediacheck  
3m 16s ↓



# 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

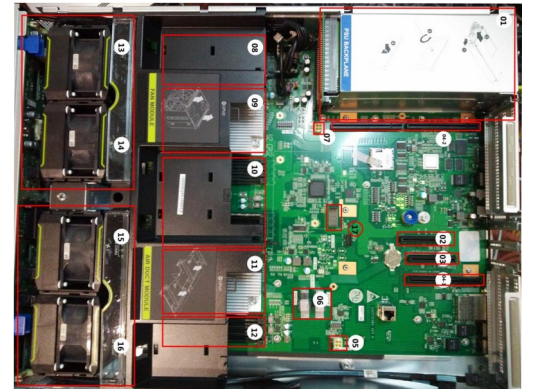



Image from: <http://open-estuary.org/d05/>

# 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

The background features abstract geometric shapes in two shades of green. On the left, a large teal shape with a white border on its right side contains the text. On the right, a bright green shape is partially visible, separated from the teal shape by a white border.

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](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)

The background features a large teal shape on the left and a green shape on the right, separated by a white diagonal line. The teal shape is a large, irregular polygon with a pointed top and a pointed bottom. The green shape is a large, irregular polygon with a pointed top and a pointed bottom, mirroring the teal shape's form. The white diagonal line runs from the top right towards the bottom left, creating a clear division between the two colors.

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](https://en.opensuse.org/ARM_architecture_support)

# The TODO list

The background features a large teal shape on the left and a green shape on the right, separated by a white diagonal line. The teal shape is a large, irregular polygon with a pointed top and a flat bottom. The green shape is a large, irregular polygon with a pointed top and a flat bottom, mirroring the teal shape's form. The white diagonal line runs from the top right towards the bottom left, creating a clear division between the two colored areas.

# 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 bottleneck 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](mailto:opensuse-arm@opensuse.org)*

The background features a large teal shape on the left and a green shape on the right, separated by a white diagonal line. The text "Questions?" is centered in the teal area.

Questions?

2020



Thank You



All text and image content in this document is licensed under the Creative Commons Attribution-Share Alike 4.0 License (unless otherwise specified). "LibreOffice" and "The Document Foundation" are registered trademarks. Their respective logos and icons are subject to international copyright laws. The use of these thereof is subject to trademark policy.