



ARM BOF

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SUSE and the High Performance Computing Ecosystem

Partnerships
with HPE, Arm,
Cavium, Cray,
Intel, Microsoft,
Dell, Qualcomm
and others

SUSE Linux
with the
HPC Module
for Supported
HPC packages

OpenHPC
Community



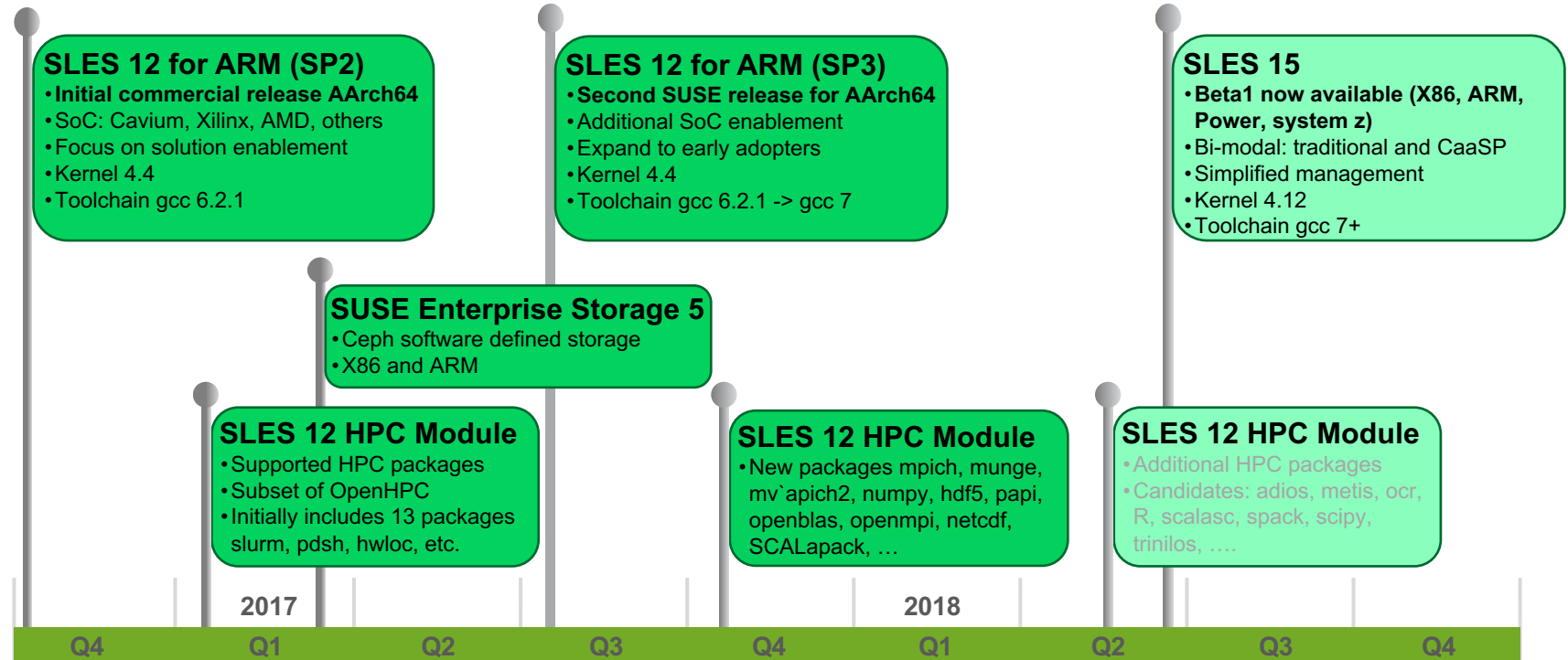
Half of the Top 100 systems are running SUSE Linux*

At 13.8%, SUSE Linux is the leader in paid Linux on the Top 500

* Includes CLE which is based on SLES, CentOS has ~18%, RHEL has ~5%

SUSE Linux Enterprise Server ARM Roadmap*

Offering commercial Linux support for ARM AArch64 since November 2016



*All statements regarding future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only

SUSE Linux Enterprise 12 for ARM

SP3 includes enablement for these SoC vendors and chips*

- Advanced Micro Devices (AMD) – Opteron A1100
- Applied Micro - X-Gene 1, X-Gene 2
- Cavium - ThunderX
- **Cavium - ThunderX2 CN99 (SP3)**
- **Cavium - Octeon TX (SP3)**
- HiSilicon - Hi1616 (SP3)
- Marvell - Armada 7K/8K (SP3)
- **New Co / MACOM / Applied Micro - X-Gene 3 (SP3)**
- NXP - QorIQ LS2085A / LS2045A, LS2080A / LS2040A
- **NXP - QorIQ LS1043A (SP3)**
- **Qualcomm - Centriq 2400 (SP3)**
- **Rockchip - RK3399 (SP3)**
- Xilinx – Zynq UltraScale+ MPSoC

Raspberry Pi 3 Model B images are also available with free, one year self-support
<http://tinyurl.com/slespi>



- Upstream kernel version: 4.4
- KVM with libvirt
- GCC 6.2.1 -> GCC 7 (3Q17)
- HPC module

** Please check with your specific hardware vendor. Due to the rapidly evolving availability of ARM System on a Chip hardware, not all platforms have undergone the same degree of hardware testing*

SUSE Linux Enterprise HPC Module

Simplifying access to supported HPC software

- All packages supported by SUSE
 - Support included in the SLES Subscription
- Available for X86 and ARM platforms beginning with SLES 12 SP2
- Includes high demand packages for HPC workloads – more to come
- Flexible release schedule. Releases are independent of Service Pack schedule

| <i>Package</i> | <i>HPC Module 1Q17</i> | <i>HPC Module 4Q17</i> |
|--------------------|----------------------------|----------------------------|
| conman | 0.2.7 | 0.2.8 |
| cpuid (X86 only) | 20151017 | 20170122 |
| fftw | | 3.3.6 |
| hdf5 | | 1.10.1 |
| hwloc | 1.11.5 | |
| luafilesystem | 1.6.3 | |
| lua-lmod | 6.5.11 | 7.6.1 |
| lua-luaterm | 0.7 | |
| lua-luaposix | 33.2.1 | |
| memkind (X86 only) | 1.1.0 | |
| mpiP | | 3.4.1 |
| mrsh | 2.12 | |
| munge | 0.5.12 | |
| mvapich2 | | 2.2 |
| netcdf | | 4.4.1.1 |
| netcdf-cxx | | 4.3.0 |
| netcdf-fortran | | 4.4.4 |
| numpy | | 1.13.3 |
| openblas | | 0.2.20 |
| openmpi | | 1.10.7 |
| papi | | 5.5.1 |
| pdsh | 2.31 | 2.33 |
| petsc | | 3.7.6 |
| phdf5 | | 1.10.1 |
| powerman | 2.3.24 | |
| prun | 1.0 | |
| rasdaemon | 0.5.7 | |
| ScaLAPACK | | 2.0.2 |
| slurm | 16.05.8 | 17.02.09 |

SUSE Linux Enterprise HPC Module

Potential HPC packages to be added in 2018



| <i>Package</i> | <i>Category</i> |
|----------------|--------------------|
| adios | IO Library |
| hypre | Parallel Libraries |
| imb | Perftools |
| metis | Serial Libraries |
| mumps | Parallel Libraries |
| ocr | Runtime |
| R | Devtools |
| scipy | Devtools |
| superlu | Serial Libraries |
| superlu_dist | Parallel Libraries |
| tau | Perftools |
| trilinos | Parallel Libraries |

Packages included in PackageHub (Community Support) <https://packagehub.suse.com/>

| <i>Package</i> | <i>Category</i> |
|----------------|-----------------|
| clustershell | Administrative |
| robinhood | Administrative |
| singularity | Runtime |

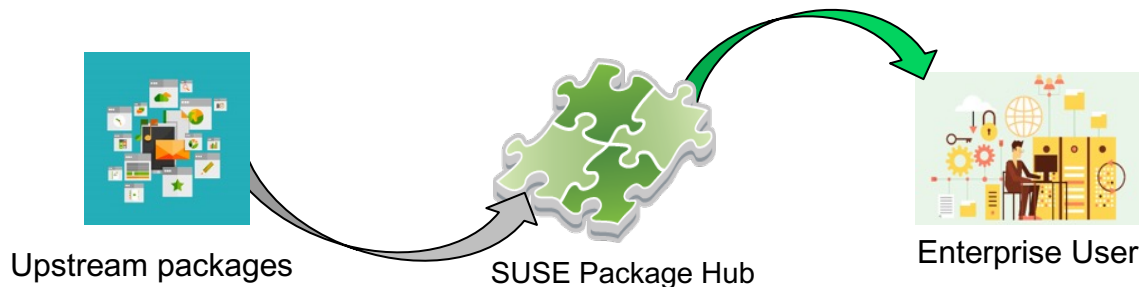
SUSE Package Hub

Community Packages for SLES for ARM

- Built and maintained by the community of users
- Approved and supported by SUSE
- High-quality, up-to-date packages delivered by openSUSE Factory
- No additional charge to use packages
- Packages available for the life of the product, including multiple releases

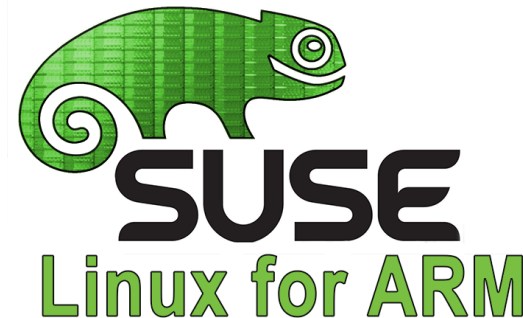


**Over 474 packages
available for ARM**



SUSE Linux Enterprise for ARM for HPC Continuum

- **SUSE Linux Enterprise for HPC (X86 and ARM)**
 - Fully supported by SUSE
- **HPC Module (part of SUSE Linux)**
 - Fully supported through your SUSE Linux subscription
 - Content inspired by OpenHPC
- **PackageHub**
 - SUSE curated, community supported packages <https://packagehub.suse.com/>
 - Over 474 packages available for AArch64
- **OpenSUSE LEAP**
 - Free, community supported Linux



Other ARM related SUSE Products

SUSE Enterprise Storage

Available for X86 and ARM since 1Q17



SUSE Manager



SUSE OpenStack Cloud

Technology Demonstration



