



Podman containers and HPC

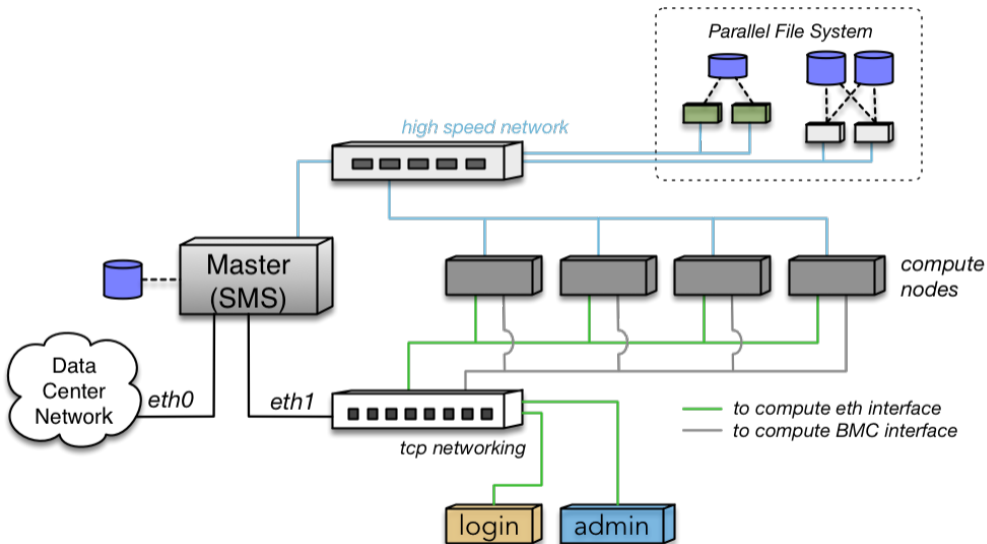
CentOS HPC SIG, OpenHPC 2.0, Podman

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CentOS Dojo, January 31

HPC

High Performance Computing



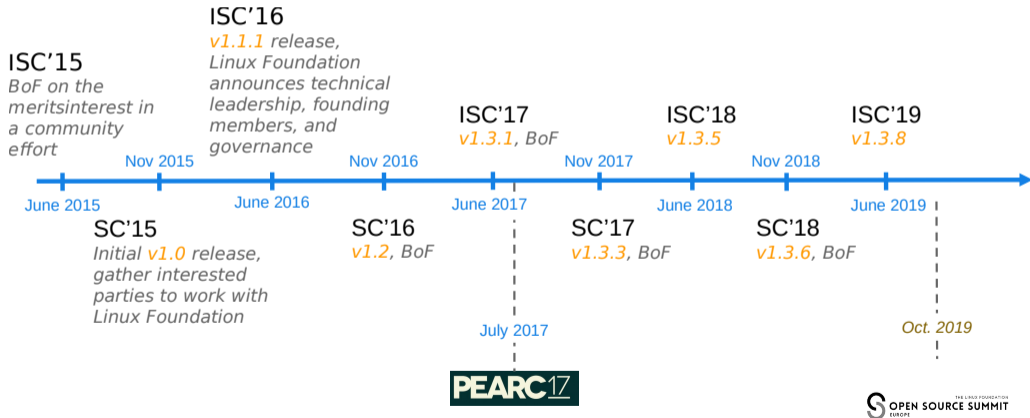
CentOS HPC SIG

OpenHPC: Mission and Vision

Vision: OpenHPC components and best practices will enable and accelerate innovation and discoveries by broadening access to state-of-the-art, open-source HPC methods and tools in a consistent environment, supported by a collaborative, worldwide community of HPC users, developers, researchers, administrators, and vendors.

Mission: to provide a reference collection of open-source HPC software components and best practices, lowering barriers to deployment, advancement, and use of modern HPC methods and tools.

OpenHPC: Project History



OpenHPC: Current Project Members



Functional Areas	Components
Base OS	CentOS 7.6, SLES12 SP4
Architecture	x86_64, aarch64
Administrative Tools	Conman, Ganglia, Lmod, LosF, Nagios, NHC, pdsh, pdsh-mod-slurm, prun, EasyBuild, ClusterShell, mrsh, Genders, Shine, Spack, test-suite
Provisioning	Warewulf, xCAT
Resource Mgmt.	SLURM, Munge, PBS Professional, PMix
Runtimes	Charliecloud, OCR, Singularity
I/O Services	Lustre client (community version), BeeGFS client
Numerical/Scientific Libraries	Boost, GSL, FFTW, Hypre, Metis, MFEM, Mumps, OpenBLAS, OpenCoarrays, PETSc, PLASMA, Scalapack, Scotch, SLEPc, SuperLU, SuperLU_Dist, Trilinos
I/O Libraries	HDF5 (pHDF5), NetCDF/pNetCDF (including C++ and Fortran interfaces), Adios
Compiler Families	GNU (gcc, g++, gfortran), Clang/LLVM
MPI Families	MVAPICH2, OpenMPI, MPICH
Development Tools	Autotools, cmake, hwloc, mpi4py, R, SciPy/NumPy, Valgrind
Performance Tools	Dimemas, Extrae, GeoPM, IMB, Likwid, mpiP, msr-safe, OSU Micro-Benchmarks, PAPI, Paraver, pdtoolkit, Scalasca, ScoreP, SIONLib, TAU

OpenHPC: A Building Block Repository

- Supports multiple operating systems
- Supports multiple architectures
- Software Repository with software packages common in HPC
- Pick relevant software packages for your site
- Detailed documentation
- Quarterly releases

OpenHPC 2.0

- Switch to newer versions of supported distributions
- Once OpenHPC 2.0 is available 1.3.x will be maintenance mode
- Switch to SLURM 19.x
- Update gcc variant - gcc9 (from gcc8)
- Update Open MPI variant - openmpi4 (from openmpi3)
- Provide ARM HPC compiler based builds

Containers and HPC

Podman

Podman
Rootless
Daemonless

mpirun podman run

podman build

Container Live Migration

FOSDEM containers devroom, Saturday



Thank you