



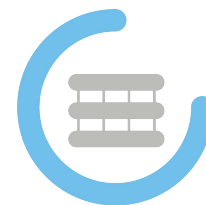
[Presentation Link]

<https://bit.ly/OHPC-ISC21-bof>

OpenHPC Community BoF

Karl W. Schulz, David Brayford, Adrian Reber
OpenHPC Technical Steering Committee Members

ISC BoF
June 28, 2021 ♦ Virtual Conference



openhpc

<https://github.com/openhpc/ohpc>

Outline

Part I: Presentation (~10 min)

- Community members and growth snapshots
- OpenHPC 2.x highlights
- CentOS 8 end of life announcement

Part II: Open Forum (~25 min)

- Please feel free to start submitting questions (and upvoting) in the Live discussion tool
- We also have several poll questions there...



Current Project Members



Mixture of academics, labs, and industry

OpenHPC: two multi-distro branches

VERSION
1.3.X

CentOS7 / RHEL7
SUSE Linux Enterprise Server 12

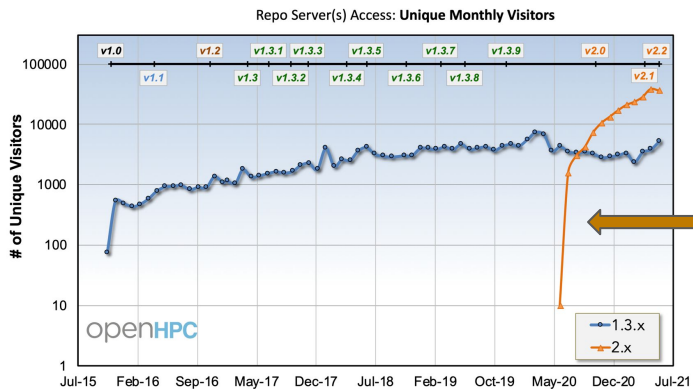
(2016 - now)

VERSION
2.X

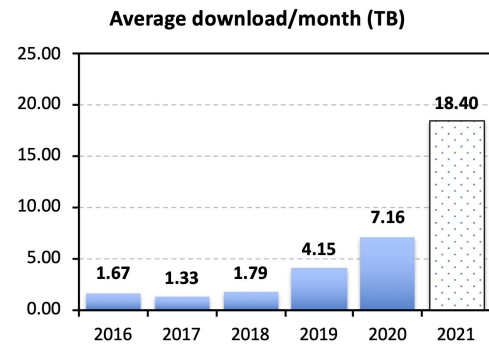
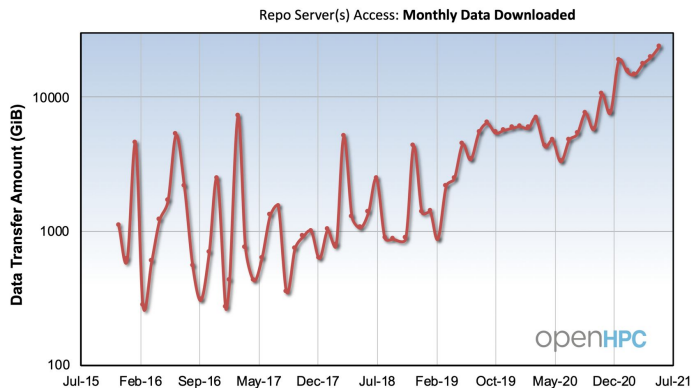
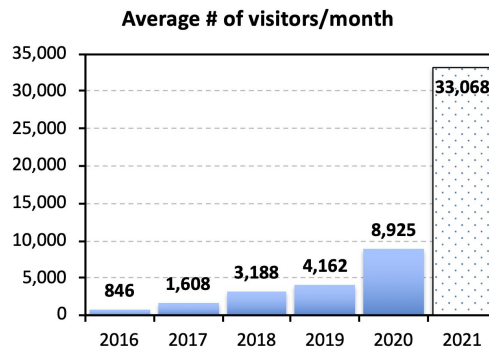
CentOS8 / RHEL8
openSUSE Leap 15 / SLES 15

(introduced Oct. 2020)

Project Usage Growth History



*significant
uptick with
2.x series*



Highlights from changes in 2.x branch...

New build/release infrastructure

- Starting with 2.0 release, we have separated the build system (OBS) and final package repository
- New OBS build system at:
 - <https://obs.openhpc.community>
- New repository for 2.x packages at:
 - <http://repos.openhpc.community>
- Note: different **ohpc-release** RPMs provided for 1.3.x and 2.x trees
 - see <https://github.com/openhpc/ohpc> for more info



Rebuilding an OpenHPC RPM

- If you want to rebuild OpenHPC packages locally, you can skip OBS and use src RPMs directly
- Starting with 2.x, we introduced additional macros to better facilitate changing optimization flags:
 - `OHPC_CFLAGS`
 - `OHPC_CXXFLAGS`
 - `OHPC_FCFLAGS`
- Can optionally specify `OHPC_CUSTOM_DELIM` to have a distinct RPM and modulefile

Prep dependencies for FFTW rebuild

```
[test@sms ~]$ sudo yum -y install rpm-build yum-utils
[test@sms ~]$ sudo yum-builddep fftw-gnu9-openmpi4-ohpc
```

Download SRPM from OpenHPC repository and install locally

```
[test@sms ~]$ yumdownloader --source fftw-gnu9-openmpi4-ohpc
[test@sms ~]$ rpm -i ./fftw-gnu9-openmpi4-ohpc-3.3.8-5.1.ohpc.2.0.src.rpm
```

Rebuild binary RPM and override C compiler flags

```
[test@sms ~]$ cd ~/rpmbuild/SPECS
[test@sms ~]$ rpmbuild -bb --define "OHPC_CFLAGS '-O3 -mtune=native'" \
--define "OHPC_CUSTOM_DELIM zippy" fftw.spec
```

Install the new package

```
[test@sms ~rpmbuild/SPECS]$ sudo yum -y install \
../RPMS/x86_64/fftw-gnu9-openmpi4-zippy-ohpc.2.0-3.3.8-5.1.x86_64.rpm
```

The new module file appears alongside the default

```
[test@sms ~]$ module avail fftw
-----/opt/ohpc/pub/moduledeps/gnu9-openmpi4 -----
fftw/3.3.8-zippy fftw/3.3.8 (D)
```


“Configless” SLURM

- The latest version of SLURM in OpenHPC 2.x introduces a “configless” option:
 - reduces the burden to have to keep the `slurm.conf` file synchronized across the cluster after making changes
 - `slurm` daemons can request the latest config from the master controller
- Current recipes use this option on compute nodes. Primary changes needed to accomplish:
 - Include `SlurmctldParameters=enable_configless` in `slurm.conf`
 - Make sure `/etc/slurm/slurm.conf` is not present on computes
 - Augment `slurm` startup on computes to query controller for config:
e.g. `echo SLURMD_OPTIONS="--conf-server 192.168.0.100" > /etc/sysconfig/slurmd`
- To push changes after updating `slurm.conf` on controller, issue:

```
# scontrol reconfig
```

Updated list of MPI variants - Network support

Available MPI Variants

	Ethernet (TCP)	InfiniBand	Intel® Omni-Path
MPICH (ofi)	✓	✓	✓
MPICH (ucx)	✓	✓	✓
MVAPICH2		✓	
MVAPICH2 (psm2)			✓
OpenMPI (ofi/ucx)	✓	✓	✓

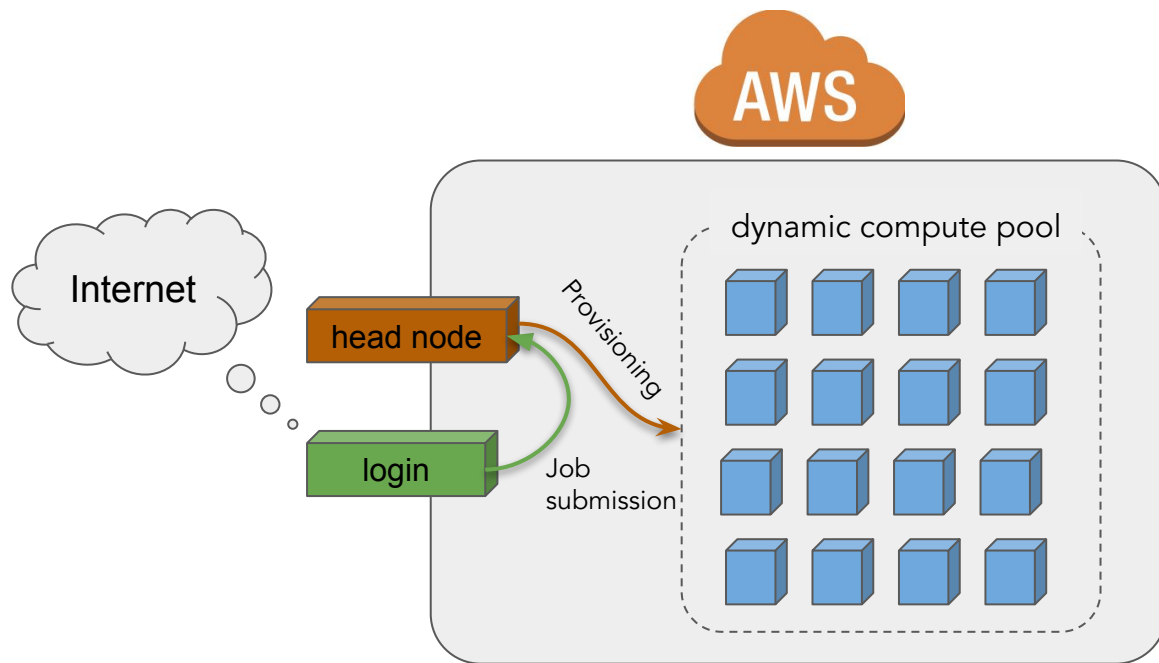
- MPI builds now leverage **libfabric** and **UCX**
- Sysadmin can decide which MPICH variant to install (or can do both)
- End user can choose via modules

```
[test@sms201 ~]$ module avail mpich
```

```
----- /opt/ohpc/pub/moduledeps/gnu9 -----  
mpich/3.3.2-ofi    mpich/3.3.2-ucx (D)
```

New Tutorials Site Available

<https://openhpc.github.io/cloudwg/>



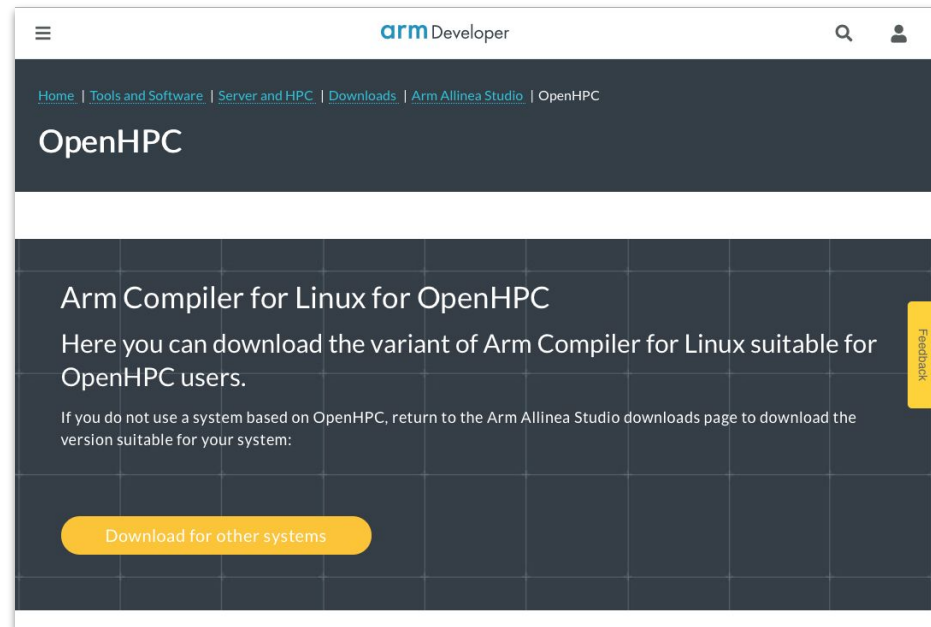
The screenshot shows the OpenHPC website interface. The top navigation bar includes the 'openhpc' logo, a search bar, and a link to 'OpenHPC on GitHub'. The main content area is titled 'WELCOME TO THE OPENHPC TUTORIALS AREA' and contains a list of tutorial links on the left and a welcome message on the right. A highlighted box on the right side of the page contains the following text:

*Latest SC'20 Tutorial discusses using OpenHPC on **cloud-based resources** (AWS)*

- *compute nodes are launched on-demand by resource manager*

Arm HPC Compiler

- 2.x introduces initial 3rd party builds against the Arm Linux compiler
 - Requires site to obtain vendor compiler separately (for use w/ ohpc)
 - Once installed, a compiler compatibility package (`arm1-compilers-devel-ohpc`) is provided to enable the arm1 compiler variant
 - See Appendix E in the aarch64 recipes for details on which builds are available



```
# Install 3rd party libraries/tools meta-packages built with Arm vendor toolchain
[sms]# yum -y install ohpc-arm1-serial-libs
[sms]# yum -y install ohpc-arm1-io-libs
[sms]# yum -y install ohpc-arm1-perf-tools

[sms]# yum -y install ohpc-arm1-mpich-parallel-libs
[sms]# yum -y install ohpc-arm1-openmpi4-parallel-libs
```

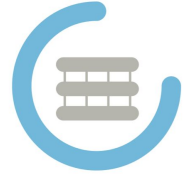
Other potential items of note

VERSION
2.X

- Switch from PBS Professional to OpenPBS
- `ip` is now used in place of `ifconfig` in documentation recipes
- Installation recipes have been updated to use `chrony` instead of `ntpd` for time synchronization
- Deprecated several ohpc builds:
 - `nagios` (rely on distro version instead)
 - `munge` (rely on distro version instead)
 - `ganglia`
 - `mpiP`
 - `ocr`
 - `mrsh`
- Community carried out first internship program in Fall 2020
 - Expect to support this again in Summer 2022

OpenHPC v2.3 - Latest Release

- v2.3 was just released last week (June 25, 2021)
 - targets support for CentOS 8.4
 - note that hwloc distro change affected both SLURM and OpenPBS
- Also introduced a recipe for use with one of the newer RHEL8 clones ([Rocky](#))
 - example Warewulf recipe same as CentOS except uses a different image template name
 - no issues detected in our testing with Rocky RC or 8.4 release



OpenHPC (v2.3)
Cluster Building Recipes

Rocky 8.4 Base OS
Warewulf/SLURM Edition for Linux* (x86_64)



Document Last Update: 2021-06-26
Document Revision: 411abc72d

CentOS 8 Announcement

CentOS Project shifts focus to CentOS Stream

Tuesday, 8, December 2020 Rich Bowen Uncategorized 700 Comments

The future of the CentOS Project is CentOS Stream, and over the next year we'll be shifting focus from CentOS Linux, the rebuild of Red Hat Enterprise Linux (RHEL), to CentOS Stream, which tracks just *ahead* of a current RHEL release. CentOS Linux 8, as a rebuild of RHEL 8, will end at the end of 2021. CentOS Stream continues after that date, serving as the upstream (development) branch of Red Hat Enterprise Linux.

Meanwhile, we understand many of you are deeply invested in CentOS Linux 7, and we'll continue to produce that version through the remainder of the [RHEL 7 life cycle](#).

CentOS Stream will also be the centerpiece of a major shift in collaboration among the CentOS Special Interest Groups (SIGs). This ensures SIGs are developing and testing against what becomes the next version of RHEL. This also provides SIGs a clear single goal, rather than having to build and test for two releases. It gives the CentOS contributor community a great deal of influence in the future of RHEL. And it removes confusion around what "CentOS" means in the Linux distribution ecosystem.

When CentOS Linux 8 (the rebuild of RHEL8) ends, your best option will be to migrate to CentOS Stream 8, which is a small delta from CentOS Linux 8, and has regular updates like traditional CentOS Linux releases. If you are using CentOS Linux 8 in a production environment, and are concerned that CentOS Stream will not meet your needs, we encourage you to contact Red Hat about options.

- Like most folks, we were caught off guard by this announcement and have since been tracking multiple developments for RHEL8 binary-compatible alternatives and CentOS Stream
- Have a working Rocky-based recipe
 - would expect other binary compatible distros to cooperate as well
- *We are particularly keen to hear feedback on your plans going forward*
- Potential approach going forward: the community project has RHEL8 entitlements and we are trying to embed these into our OBS build system:
 - build directly against RHEL8
 - test recipes with binary-compatible clones

Open Discussion

- Please fill out poll questions...
- Remaining discussion guided by your questions and feedback

Live discussion

Chat Questions **Polls**

If you are currently using CentOS 8, what do you plan to use as a replacement going forward?

- 0% CentOS 8 Stream
- 0% RHEL 8
- 0% AlmaLinux
- 0% openSUSE Leap
- 0% Oracle Linux
- 0% Other

0 votes

ISC'21 BoF Poll results

OpenHPC Community BoF

Chat

Questions

Polls

If you are currently using CentOS 8, what do you plan to use as a replacement going forward? ⋮

3 hours ago

- 9% CentOS 8 Stream
- 11% RHEL 8
- 13% AlmaLinux
- 7% openSUSE Leap
- 4% Oracle Linux
- 49% Rocky Linux
- 7% Other

36 votes · 21 hours left

What architecture do you use with OpenHPC? ⋮

3 hours ago

16% aarch64

84% x86_64

33 votes · 21 hours left

You can not reply to this quiz