
Spack Tutorial
RIKEN R-CCS, Kobe, Japan
April 23 – 24, 2019

On April 23–24, a team from Lawrence Livermore National Laboratory will visit RIKEN R-CCS to give a tutorial on Spack (<https://spack.io>), a package manager rapidly becoming popular in HPC. Spack automates and accelerates the process of building and installing software, and it provides a convenient way to distribute scientific software for others to use. All are welcome to attend!

Schedule:

April 23:

9:00 – 10:00: High-level introductory talk on Spack
10:30 – 5:00: Spack tutorial

April 24:

In-depth meetings with interested teams (by request)

If you are interested in joining, please sign up using this link:

<https://bit.ly/spack-riken-tutorial>

This tutorial has been given before at SC16, SC17, and SC18.

Detailed Description:

HPC software is growing increasingly complex, and building and installing software on supercomputers can consume many hours of engineers' and researchers' time. The modern scientific software stack includes thousands of packages, from C, C++, and Fortran libraries, to packages written in interpreted languages like Python and R. A single HPC application may depend on libraries from all of these ecosystems, as well as hard-to-build libraries like MPI, BLAS, and LAPACK. Integrating these packages can be very time consuming, and this complexity is a major barrier to software reuse.

Spack is an open source package manager that automates the process of building and installing software on HPC systems. With Spack, users can automatically install over 3,000 built-in packages with simple commands. Rather than building HDF5 and all of its dependencies by hand, users can simply type ``spack install hdf5``. Spack will fetch the necessary source code, build it, and install it.

Spack users can also write their own packages for others to use. Packages are simple scripts written in an embedded Python DSL. Packages are templated, and they can be installed with many different versions, compilers, options, and MPI or BLAS implementations. Spack can easily automate the build of software packages with hundreds of dependency libraries.

Spack has recently grown popular worldwide. It is used by end-users, application developers, cluster administrators, and by the world's largest HPC centers, including 6 of the top 10 centers on the Top500.

It is also being used as the official software deployment tool of the U.S. Exascale Project (ECP). HPC staff and researchers use Spack to easily deploy hundreds of software packages. Spack has been used on the #1 Summit supercomputer to reduce software deployment times from 2 weeks (building manually) to 12 hours for a completely automatic build.

This tutorial provides a thorough introduction to Spack's capabilities: installing and authoring packages, integrating Spack with development workflows, and using Spack for deployment at HPC facilities. Attendees will leave with foundational skills for using Spack to automate day-to-day tasks, along with deeper knowledge for applying Spack to advanced use cases.

If you are interested in looking at the tutorial in advance, the tutorial will be based on the materials here:

<https://spack.readthedocs.io/en/latest/tutorial.html>

And more information on Spack can be found at these links:

<https://github.com/spack/spack>

<https://spack.readthedocs.io>

Please sign up, and we look forward to seeing you at RIKEN!