

Spack-Based Packaging and Development for HEP Experiments

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Since its inception in 2010, the art event-based analysis framework and associated software have been delivered to client experiments using a Fermilab-originated system called UPS. Salient features valued by the community include installation without administration privileges, trivially-relocatable binary packages and the ability to use coherent sets of packages together (such as those compiled with a particular C++ standard or compiler, or a particular MPI implementation). These features have also been useful to a related system (Multi Repository Build, MRB) allowing simultaneous development of multiple related packages in a consistent environment.

The field-wide shift to start looking to leverage flagship HPC systems, and the need to support experiments using modern MacOS systems with SIP security measures restricting the use of dynamic load paths to provide relocatability, have led us to search for other ways of providing experiments with a packaging and build system that meets their needs.

One such candidate packaging system is Spack, in conjunction with an environment module system such as Lmod. We describe our efforts to develop a packaging system and protocol using these tools that provides the binary relocatability and package-set consistency that our clients require, and a development system ("Spackdev") to allow the straightforward development of HEP software packages in a consistent environment. These efforts include enhancements to the underlying tools where necessary, and the development of higher-level utilities to provide the required functionality and consistency safeguards.

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