Towards a full Spack / Spackdev – based build ecosystem for *art*-based experiments
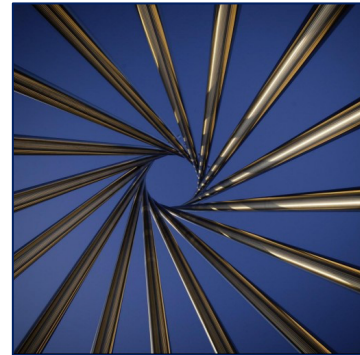
Chris Green, FNAL, 2 May 2018

Current Efforts

– Produce an "MVP" – Minimum Viable Product:

- Software stack with one OS / compiler / C++ standard / optimization level to allow experiments to, well, experiment.
- Keep track of issues along the way but achieve the narrow goal first and go back for the others later.
- "Pinnacle" of the software stack: Root.
- Everything built "our way" to maximize realism & compatibility for experiments.
- Minimize use of system-available packages via **packages.yaml** where possible.
- First demonstration of **cetmods**.
- NOT "release"-oriented.
- NOT a solution to every problem.
- NOT a guarantee that every remaining problem *can* be solved.
- NOT a collection of every piece of software every experiment is likely to need.

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Progress so far

- Packages:
  - **boost**, required Spack enhancement (PR in queue).
  - **mariadb, postgresql** with **–client** bases and virtual packages (PRs 1, 2 in queue).
  - **XRootD** (PR merged) – no C++ std specification yet.
  - **TBB** (PR under discussion) – no C++ std specification yet.
  - **Root** in progress, filling in other dependencies to minimize internally—built packages.
- Common threads:
  - Even when specs already exist, dependency connections often missing, other inadequacies (e.g. Python).
  - Existing specs not even close to flexible enough, in general.

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Problems

- Adding a variant changes the hash, even if the default setting is off.
- Significant problems with concretization, really obvious as variants are added / specified. Change in the works, but timescale and ability to solve our particular issues unknown at this time.
- No version specs: with current iteration of Spack, this will result in permanently-forked, *very* local specs and issues with concurrent release visibility / sharing.
- C++ standard a problem, especially with concretization: **cxxflags** a possibility, except for the fact that many packages (*e.g.* **boost**, **tbb**, **root**) need to be told explicitly.
- GPL encumbrance (**readline**, **gettext**, **gsl**).
- Not even thought about optimization levels.
- Not worrying about relocate-ability / buildcache yet.

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