



# **Spack in Shared Environment**

**2018 Scalable Tools Workshop**

**LANL Programming and Runtime Environments Team  
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# The Program Runtime Env. Team

We support:

- 4 Compilers (GCC, Intel, PGI, cray)
- 4 MPI libraries (openmpi, mvapich2, intel-mpi, cray-mpich)
- ~64 packages total in production
- Continuous release schedule
- Package Life = System Life

No root access

**Multiple Customers, Shared Environment**

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# About our Environment

- > 12 systems
- 25000 Compute Nodes
- 3 OS's
- 5 Interconnects
- Many CPU architectures
- GPU clusters
- Lmod and Env Mod module systems



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# It's all under control

- Solid, readable build scripts for everything
- Smart modules
  - Hide and manage the dep chain automatically, even under Env. Mod
- Shared builds (when it's easy)

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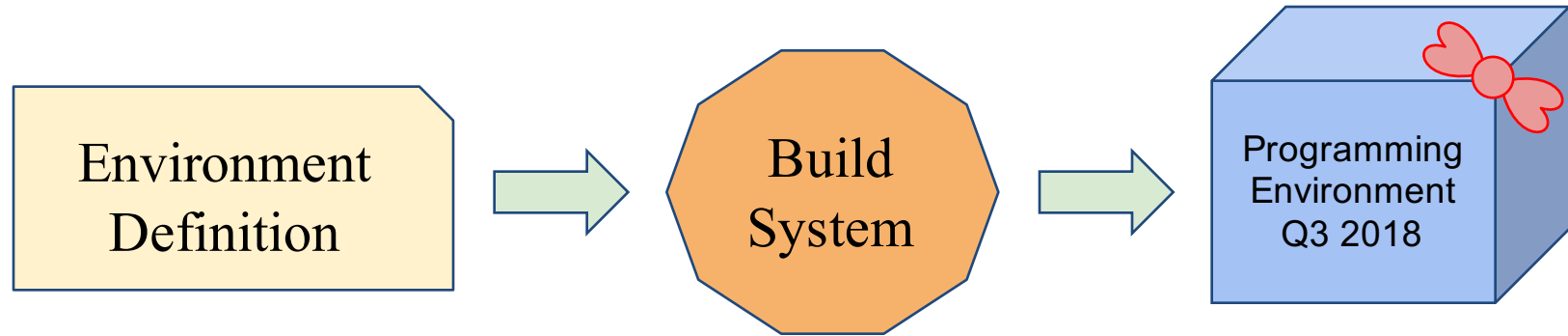
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# What Do We Lack?

- No automated inventory
- Each project is an island.
- Many (mostly) identical builds
- **No definition of what 'should be'**

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# What Should be in our Environment?

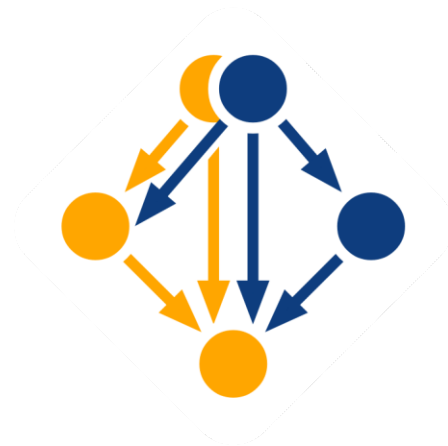


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# Spack Package Manager

- Automated building
  - Multiple configurations of the same thing
- Dependency management
- Module management/auto-generation
- Comes with a large library of packages.



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# Does Spack Actually Help?

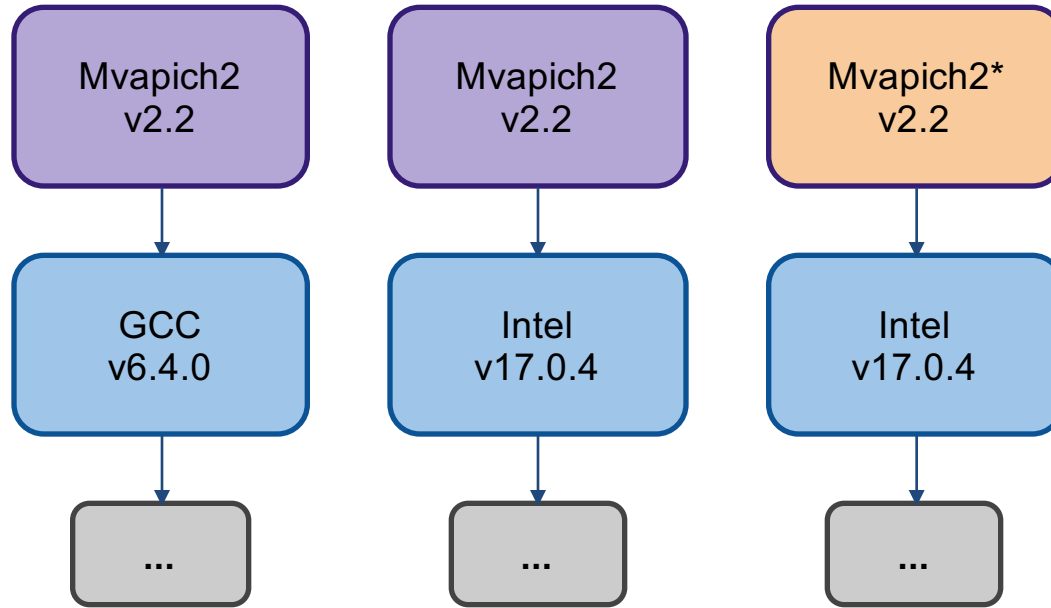
- ✓ Automated inventory → Awareness
- ✓ Each project is an island → Uniformity
- ✓ Many (mostly) identical builds → Efficiency
- ✗ No definition of what 'should be' →

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# The Problem with Spack...



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# Non-Conflicting Environments?

It's Multiplicative:

12 systems

\* 3 compilers

\* 3 MPI's

\* (assorted versions)

\* (other oddities)

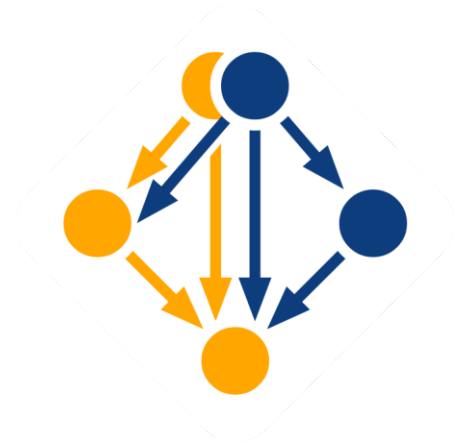
= Just too much

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# Spack, as the Foundation

Spack is good at what it does.

Build everything else around it.



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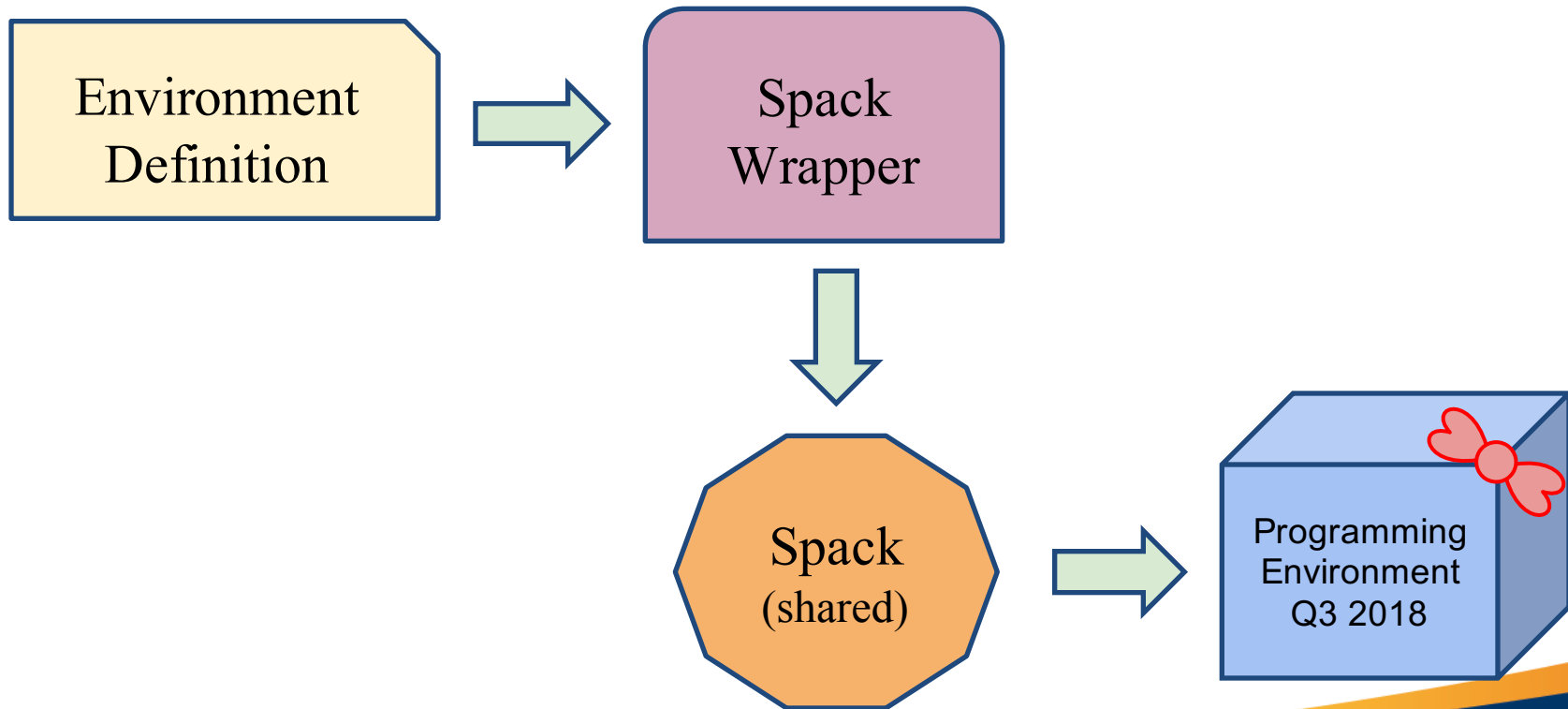
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# Wrapping Spack, Requirements

- Per (Environment Version) environment definitions
- Automated building of each environment
  - Host awareness
  - Scheduler awareness
- Separation of User Modules from Spack Modules

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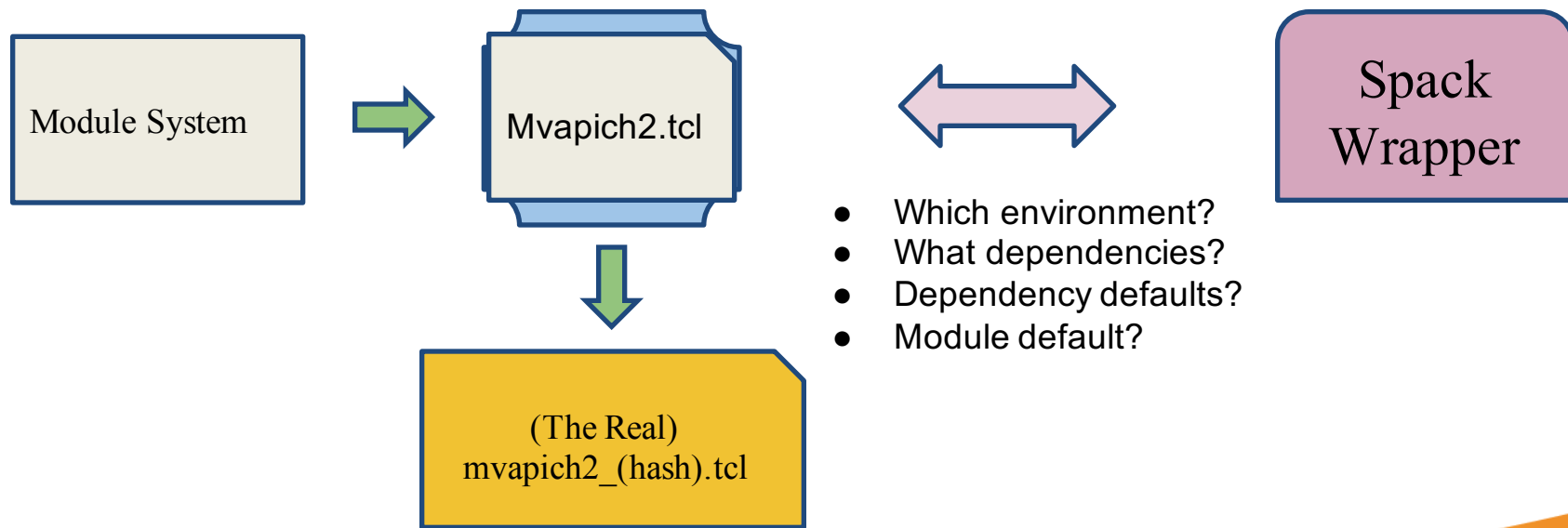
# Spack Environment Wrapper



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# Module Separation

```
bash $ module load mvapich2
```



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# Famous Last Words

- This should be easy!

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# Questions

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