
# UL HPC School 2017

## PS3b: Software Build and Customization using Easybuild on the UL HPC Platform

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http://hpc.uni.lu

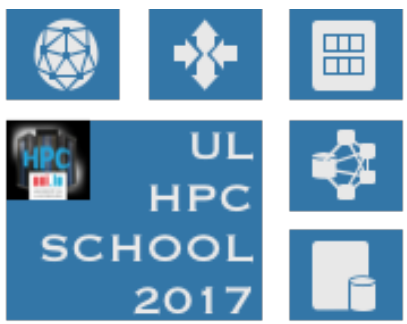
## Latest versions available on Github:

UL HPC tutorials: https://github.com/ULHPC/tutorials

UL HPC School: http://hpc.uni.lu/hpc-school/

PS3b tutorial sources:

https://github.com/ULHPC/tutorials/tree/devel/advanced/easybuild



# Summary

# Main Objectives of this Session

- Understand LMod / Environment `module`
- Discover Easybuild
- Build you own software on top of the provided software set

# Summary

# Software/Modules Management

https://hpc.uni.lu/users/software/

- Based on Environment Modules / LMod
  - ↪ convenient way to dynamically change the users' environment `$PATH`
  - ↪ permits to easily load software through `module` command
- Currently on UL HPC:
  - ↪ **133 software packages**, in *multiple* versions, within **18 categories**
  - ↪ hierarchical organization **Ex**: `toolchain/ictce`

```
$> module avail                                    # List evailable modules
```

```
$> module load <category>/<software>[/<version>]
```

# Software/Modules Management

http://hpcugent.github.io/easybuild/

- Easybuild: open-source framework to (automatically) build scientific software
- **Why?**: *"Could you please install this software on the cluster?"*
  - ↪ Scientific software are often **painful** to build
    - ✓ non-standard build tools / incomplete build procedure
    - ✓ hardcoded parameters and/or poor/outdated documentation
  - ↪ EasyBuild helps to facilitate this task
    - ✓ consistent software build and installation framework
    - ✓ automatically generates LMod modulefiles

```
$> module use /path/to/easybuild
$> module load tools/EasyBuild  toolchain/intel
$> eb -S HPL    # Search for recipes for HPL software
$> eb HPL-2.2-intel-2017a.eb # Install HPC 2.2 w. Intel toolchain
```

# Software/Modules Management

- **RESIF**: Revolutionary EasyBuild-based Software Installation Framework
  - ↪ Automatic Management of **software sets**
  - ↪ Fully automates software builds and supports all available toolchains
  - ↪ Clean (hierarchical) modules layout to facilitate its usage
  - ↪ **Versioning** of software set builds
  - ↪ Easyconfig files from multiple sources
  - ↪ Define options and software in easy to read **yaml** files
  - ↪ Targeted at ULHPC sysadmins use case to build many softwares in one go

# Available software sets

- Gaia
  - ↪ **core**: available by default
  - ↪ **lcsb**: load with

```
module use $RESIF_ROOTINSTALL/lcsb/modules/all
```

- Iris
  - ↪ **default**: available by default
  - ↪ **bioinfo**: load with

```
module use /opt/apps/resif/data/stable/bioinfo/modules/all
```

# Policies

- **We provide** software that is used by many users on the cluster
- What the **users** should install themselves:
  - ↪ Python packages
  - ↪ R packages
  - ↪ Perl modules
  - ↪ software only used by 1 or 2 persons

# DIY

We provide several how-tos and tutorials for installing software as a user on the ULHPC website and in our HPC school tutorials:

- Installation with **EasyBuild**
- Installation from source with `configure` and `make`
- Installation of Python packages and usage of virtual environments
- Installation of Perl modules and how to set up a local library

Or just download precompiled binaries (see Bioinformatics tutorial) ;-)

# Questions?

http://hpc.uni.lu

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