



CONTRIBUTING TO THE NIX HPC PACKAGES COLLECTION

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NIX^[1]: THE PURELY FUNCTIONAL PACKAGE MANAGER

- **Reliable** and **reproducible**
- Runs on Linux and MAC OS
- **Pure**: no deps outside the "Nix store"
- Users can install/create packages without root access



Nixpkgs repository^[2]:
6,500 packages

Try it ! → curl https://nixos.org/nix/install | sh

HPC GRICAD^[3] CLUSTER



Bull DLC (3236 cores)
Dell (918 cores)

EXPERIMENT: HPC & NIX

ADMINISTRATOR'S FEEDBACK



- Multi-user mode, shared and optimized binary cache
- Isolated development environment
- CIMENT's HPC channel linked to the nixpkgs channel ^[4]
- Contributions in Nixpkgs (Gildas, Intel Support, iRODS, cdo, OpenFoam..)

USER'S FEEDBACK

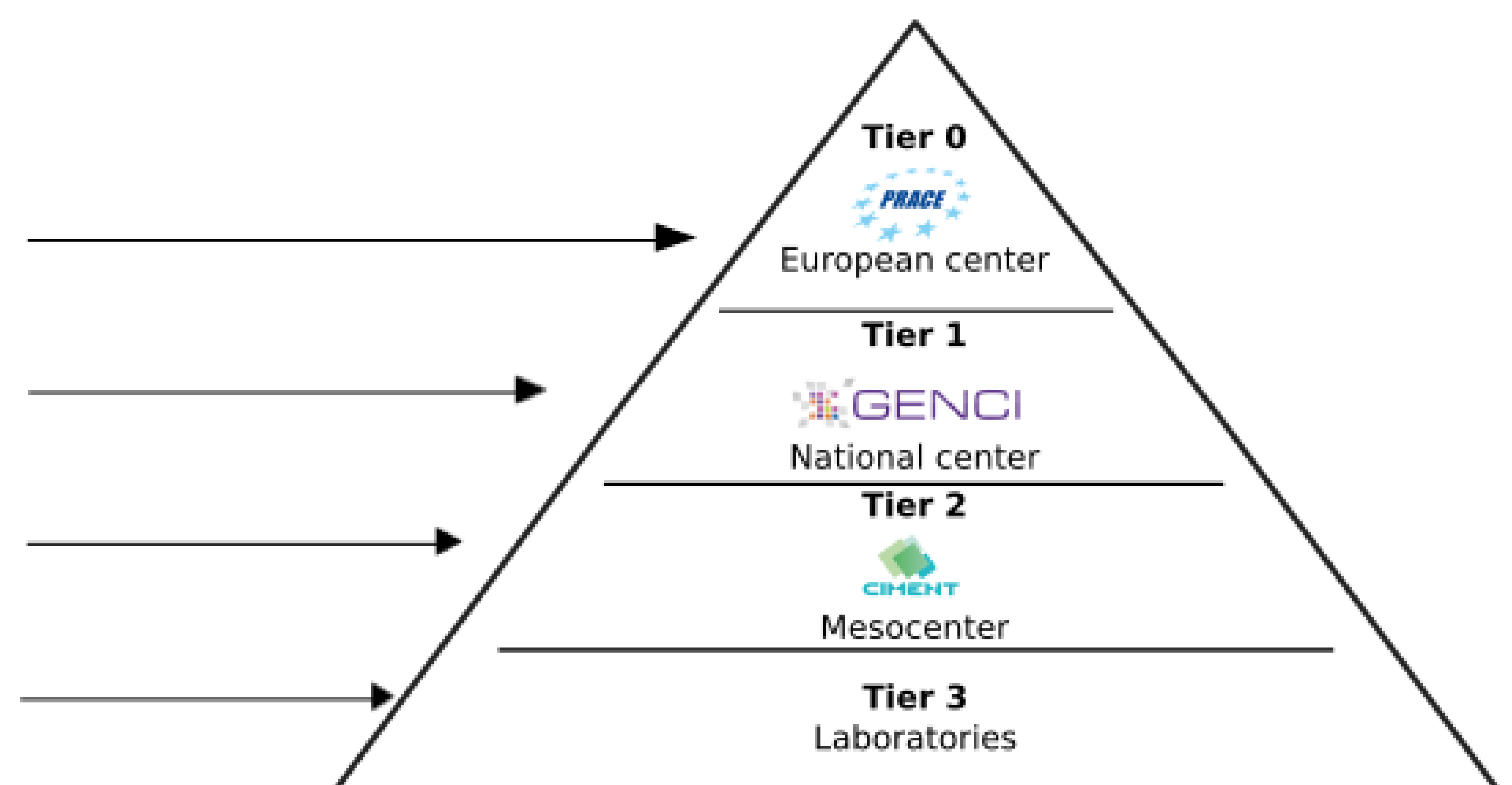
- Users can install the same environment on their workstation
- Power users can develop their own packages
- Upgrades without side effect
- Easy environment switching, rollbacks & updates.

DEVELOPMENT & PERSPECTIVES

Ex. of scientific Nix package application

```
{ stdenv, fetchurl, curl, hdf5, netcdf, enable_cdi_lib ? false
, enable_all_static ? false , enable_cxx ? false };

stdenv.mkDerivation rec {
  version = "1.7.2"
  name = "cdo-${version}";
  # Dependencies
  buildInputs = [ curl netcdf hdf5 ];
  src = fetchurl{
    url = "https://code.zmaw.de/attachments/download/12760/${name}.tar.gz";
    sha256= "4c43eba7a95f77457bfe0d30fb82382b3b5f2b0cf90aca6f0f0a008f6cc7e697";
  };
  # Configure phase
  configureFlags = [ " --with-netcdf = $ {netcdf} " " --with-hdf5 = $ { hdf5 } "
  ++ stdenv.lib.optional (enable_cdi_lib) " --enable-cdi-lib "
  ++ stdenv.lib.optional (enable_all_static) " --enable-all-static "
  ++ stdenv.lib.optional (enable_cxx) " --enable-cxx "
  meta = {
    description = "Collection of command line Operators to manipulate and
    analyse Climate and NWP model Data "
    homepage =https://code.zmaw.de/projects/cdo/;
    license = stdenv.lib.licenses.gpl2;
    maintainers = [ stdenv.lib.maintainers.ltavard ];
    platforms = stdenv.lib.platforms.linux;
  };
}
```



ADVANTAGES

- Reproducibility of the experiments
- Portability (optimization included)
- Sharing HPC packages
- International community for development

CONTACTS

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Frédéric Audra, Philippe Beys, Bruno Bzeznik,
Oliver Henriot, Franck Pérignon, Olivier
Richard, Françoise Roch, Laure Tavard

REFERENCES

- [1]: <http://nixos.org/nix/>
- [2]: <https://github.com/NixOS/nixpkgs>
- [3]: <https://gricad.univ-grenoble-alpes.fr/a-propos/pole-calcul>
- [4]: <https://gricad.github.io/calcul/>

