



HPC Packaging Expert

Overview

We are looking for a candidate with a Master's degree, Engineer's degree or PhD in computer science, junior or senior, to join a team responsible for the packaging, deployment, and testing of supercomputing libraries for supercomputers.

The position is located at Maison de la Simulation team (<https://mdls.fr>), in Saclay (near Paris), but our team is distributed in the following other locations:

- Inria Datamove team (<https://team.inria.fr/datamove>), located near Grenoble, in the French Alps
- Inria SED team (<https://sed-bso.gitlabpages.inria.fr>), located near Bordeaux, close to the Atlantic Ocean

This work is part of the NumPEX project (<http://www.numpex.fr>) which is endowed with more than 40 million euros over 6 years, starting from 2023. This project aims to build a software stack for Exascale supercomputers related to the arrival in Europe of the first Exascale machine. The French supercomputer is expected for 2025. These machines will be among the most powerful in the world (<https://top500.org>), used for traditional scientific applications and artificial intelligence workloads.

Our role in NumPEX is to design and implement an innovative packaging, deployment and testing strategy. Commonly used solutions show their limits in front of the complexity of supercomputers and applications, as well as the need for reproducibility for open science. Our goal is to build a solution based on a new generation of promising packaging tools: Guix, Nix, Spack, ...

- Contact: Benoît Martin (bmartin@cea.fr) & Bruno Raffin (bruno.raffin@inria.fr)
- Duration: 3 years
- Start date: ASAP

Assignment

You will contribute to the design and implementation of the packaging and continuous integration strategy. You will participate in the deployment and testing of the infrastructure. Furthermore, you will also participate with user support and training activities around all these aspects.

Our packaging strategy is centered on the open source tools Guix (<https://hpc.guix.info>), Nix (<https://nixos.org>) and Spack (<https://spack.io>). In direct contact with the development teams of these tools, with the supercomputer administration teams, and with our foreign counterparts (European, Japanese, American, etc.), you will participate in:

1. the design of the packaging strategy of the NumPEX project
2. the effort of packaging these libraries with the proposed tools
3. the design of a package test and validation solution taking into account the specificities of supercomputers
4. the development of a solution allowing non-administrator users to deploy NumPEX libraries on supercomputers
5. training around all of these aspects for researchers and engineers

Skills

Master's degree, Engineer's degree or PhD, beginner or confirmed (salary adjusted according to experience) in computer science.

The essential expected skills are:

- Good practice of Unix/Linux system and system administration
- Good programming experience (C/C++, Python)
- Experience with software compilation and installation chains, version management tools, testing and continuous integration (CMake, Git, GitHub, GitLab, ...)
- The work being performed in an international context, a good practice of technical English (written and oral) is expected (proficiency in French is not compulsory), as is a taste for team work.

Any additional skill related to package managers (Guix, Nix, Spack, apt, rpm, pip, ...), containers (Singularity/Apptainer, Docker, ...) or open source development are a plus. An initial training time will be provided to complement the missing skills. You will integrate an academic research environment which will give you, throughout your contract, the opportunity to complete your training on cutting-edge technologies.

Application

To apply, please send the following elements to Benoît Martin and Bruno Raffin:

- a curriculum vitae
- a motivation letter
- references from people we can contact to certify your qualities
- a recent internship or thesis report
- links to software contributions

Salary and benefits

The CEA offers salaries based on your degrees and experience. This position provides several advantages:

- The possibility of joining collaborations with other European laboratories, the United States, and Japan
- Numerous opportunities to travel internationally (exchanges, conferences, workshops and more)
- 5 weeks of paid vacation and 4 weeks of RTT per year, and up to 2 days of remote work per week.
- Reimbursement of up to 75% of public transport cards and a free transport network throughout the Ile-de-France region
- Complimentary health insurance and several company savings plans