



## **Climate tools in mainstream Linux distributions**

Alastair McKinstry

NUI Galway, Irish Centre for High-End Computing, Galway, Ireland (alastair.mckinstry@ichec.ie)

Debian/meteorology is a project to integrate climate tools and analysis software into the mainstream Debian/Ubuntu Linux distributions. This work describes lessons learnt, and recommends practices for scientific software to be adopted and maintained in OS distributions.

In addition to standard analysis tools (cdo., grads, ferret, metview, ncl, etc.), software used by the Earth System Grid Federation was chosen for integration, to enable ESGF portals to be built on this base; however exposing scientific codes via web APIs enables security weaknesses, normally ignorable, to be exposed. How tools are hardened, and what changes are required to handle security upgrades, are described.

Secondly, to enable libraries and components (e.g. Python modules) to be integrated requires planning by writers: it is not sufficient to assume users can upgrade their code when you make incompatible changes. Here, practices are recommended to enable upgrades and co-installability of C, C++, Fortran and Python codes.

Finally, software packages such as NetCDF and HDF5 can be built in multiple configurations. Tools may then expect incompatible versions of these libraries (e.g. serial and parallel) to be simultaneously available; how this was solved in Debian using "pkg-config" and shared library interfaces is described, and best practices for software writers to enable this are summarised.