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Integration of Meteorology and Climate software in Debian and at ICHEC: The Debian/meteorology experience

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Debian/meteorology is part of "Debian Science": an initiative to integrate and package (all) freely available science software within the Debian (Linux) distribution. Here I report on the results of this work, and advocate that FOSS scientific program developers should plan to have their programs included in such a distribution, regardless of whether they think their audience is too small to justify.

Distributions such as Debian do the *systems integration* engineering: beyond simply packaging and publishing the software, the distribution developers do engineering work that the original author may not be able to do, or available to do. Such work includes upgrading applications to latest versions of libraries; engineering shared libraries so they can be upgraded without requiring applications to be recompiled or upgraded; "Hardening" code that may be used in web interfaces, to avoid hacking attacks; Portability: building and testing on multiple platforms helps find bugs in the code. Additionally, "whole distribution" testing of new compilers and tools before they are released helps ensure that updated compilers will work reliably on your code. Solutions were also devised to avoid "version proliferation": e.g. to ensure that python code works with all versions of Python; MPI code with all installed MPI versions, etc.

This work has relevance to computing centres such as ICHEC (the Irish Centre for High-End Computing), which have an identical integration task in providing the computing environment for their users. Re-using the work of packaging and testing for Debian reduced the workload at ICHEC, and resulted in identical environments being available for users on their own workstations and on our HPC clusters.