

Is Debian suitable for running an HPC Cluster ?

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About 15 years ago, Linux became the dominating operating system in High Performance computing (HPC). One indicator is the number of machines in the top500 [1] (Fig 1). Since 2004, more than 50% of all systems run Linux, since Jun 2017, all systems in the top500 are running a Linux-based operating system.

A variety of Linux distributions are available, some from big vendors providing commercial solutions, some originated from an academic environment, and there are these large numbers of Debian-based or Debian-derived distributions, like Ubuntu, Mint etc.

Debian is known for its large number of software packages (it claims to have 51000 software packages [2]), its package management system (apt), its support for over 10 different hardware platforms and cpu families. Debian is maintained by volunteers. Debian is a widely accepted distribution for server-based tasks. The legal foundation of Debian is based on a non-profit organization "Software-for-Public-interest" (SPI). There is no single company backing its operations, but one can get support through consultants [3].

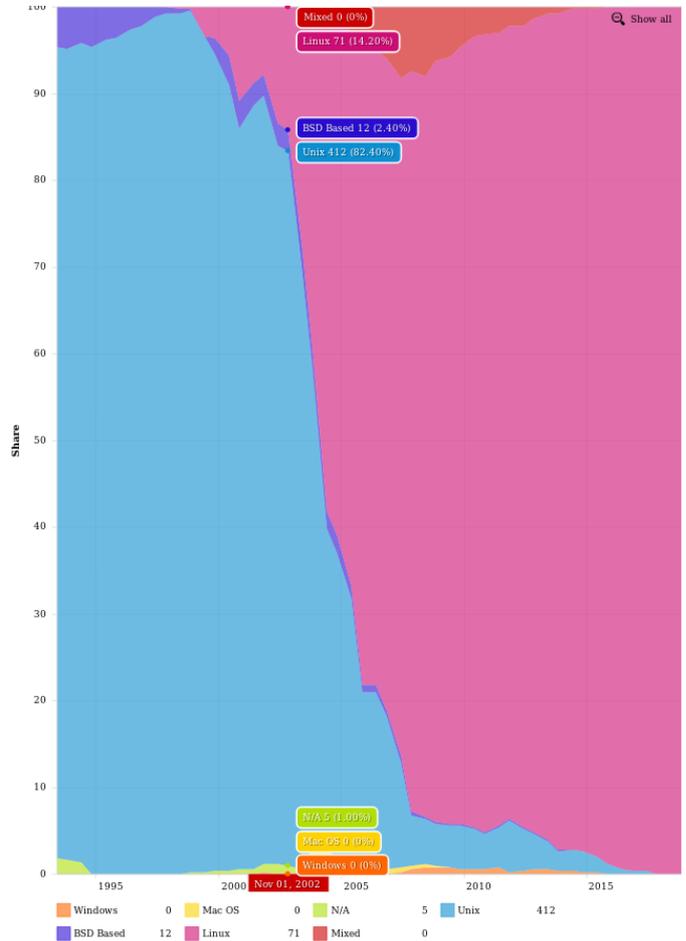


Fig. 1: Operating system family - system shares of top500 supercomputer from Jun 1993 to Nov 2018.

Occasionally, Debian is perceived of being slow in adapting current software, lacking drivers for the most recent hardware, and not supported by hardware and software vendors. We'll present our experience on the continuous integration of various new systems. We'll report past challenges (e.g. EDR Infiniband, GPU/Cuda computing) and the current challenges (e.g. the CryoEM facility, parallel distributed filesystem), and how we used Debian to achieve our goals (e.g. implementing General Data Protection Regulation (GDPR) rules for handling of human genome data).

References

- [1] <https://top500.org/statistics/overtime/>, screenshot obtained on 2018-Nov-29
- [2] <https://www.debian.org/>
- [3] <https://www.debian.org/consultants/>