

High-performance Signal and Data Processing: Challenges in Astro- and Particle Physics and Radio Astronomy Instrumentation



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Optimising Linux Operating System on Arm Architecture

Optimising the linux environment for higher performance usually takes place once a working system is running to specification and unforeseen bottlenecks or bugs occur. However, once a system is up and running, it is frequently difficult to differentiate between application specific problems and operating system problems. Ideally, tuning any given system should start early in the development stage. This investigation into tuning the Linux Linaro 13.05 release based on Linaro Stable Kernel (LSK) preview 3.9.4-2013.0 running on ARM architecture is focused on the I/O intensive environment of high throughput computing. Four areas under consideration are CPU usage, memory, disk I/O and GPU usage. The choice of parameters best suited for each area will differ as the default system tools under the /proc directory offer wide variety of process specific tools for profiling and tweaking the system, and choosing the correct tool will be critical. Benchmark tools for an I/O process for use are Oprofile, Nice, VMStat and IOSTAT. Using Oprofile to analyze and evaluate the basic configuration system, a simple disk copying test will identify relevant processes and parameters to provide a solid baseline. Since optimizing the operating system for an I/O intensive application, it is noted that poor performance will be observed for different workload characteristics; hence a change management process will be required

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