

## ATLAS software stack on ARM64

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The ATLAS experiment explores new hardware and software platforms that, in the future, may be more suited to its data intensive workloads. One such alternative hardware platform is the ARM architecture, which is designed to be extremely power efficient and is found in most smartphones and tablets.

CERN openlab recently installed a small cluster of ARM 64-bit evaluation prototype servers. Each server is based on a single-socket ARM 64-bit system on a chip, with 32 Cortex-A57 cores. In total, each server has 128 GB RAM connected with four fast memory channels. This paper reports on the port of the ATLAS software stack onto these new prototype ARM64 servers. This included building the “external” packages that the ATLAS software relies on. Patches were needed to introduce this new architecture into the build as well as patches that correct for platform specific code that caused failures on non-x86 architectures. These patches were applied such that porting to further platforms will need no or only very little adjustments. A few additional modifications were needed to account for the different operating system, Ubuntu instead of Scientific Linux 6 / CentOS7. Selected results from the validation of the physics outputs on these ARM 64-bit servers will be reported. CPU, memory and IO intensive benchmarks using ATLAS specific environment and infrastructure have been performed, with a particular emphasis on the performance vs. energy consumption.

### Tertiary Keyword (Optional)

High performance computing

### Secondary Keyword (Optional)

Processor architectures

### Primary Keyword (Mandatory)

Software development process and tools

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