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Enabling Alternative Architectures in the ALICE Grid

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The ALICE Collaboration has begun exploring the use of ARM resources for the execution of Grid payloads. This was prompted by both their recent availability in the WLCG, as well as their increased competitiveness with traditional x86-based hosts in terms of both cost and performance. With the number of OEMs providing ARM offerings aimed towards servers and HPC growing, the presence of these resources in the Grid is anticipated to rise further. Consequently, it becomes a priority to ensure the underlying middleware is capable of running across architectures, ensuring available resources in the Grid are fully utilised.

This contribution outlines a reworked middleware stack, now used in production within ALICE, capable of running jobs across both Amd64 and Aarch64 ISAs, and the initial findings when used to execute Grid jobs compiled for the latter. Furthermore, it will examine how the middleware stack is able to dynamically match packages and binaries depending on the host. In turn, making both the selection process and executing architecture transparent from the end-user. At the same time, an overview is provided on how the middleware remains agnostic to the underlying architecture, allowing it to scale across various other types of CPUs - enabling support for additional architectures beyond ARM if needed, such as RISC-V.

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