Best Practice Guide - Modern Processors

Processor manufacturers are continuously pushing the performance limits for delivering more computational capabilities to the end users. These efforts, however, typically imply new architectural modifications requiring corresponding guidance for the efficient utilization of the underlying platform by application developers.
Recently, PRACE (Partnership for Advanced Computing Europe) released its “Best Practice Guide – Modern Processors” that extends the previously developed series of BPGs (https://prace-ri.eu/training-support/best-practice-guides/) by providing an update on a selection of recent processors, namely: ARM64 (Huawei/HiSilicon and Marvell) and x86-64 (AMD and Intel). More specifically the guide provides information on the available programming models and development environment as well as outlines guidelines on application performance analysis and improvement, accompanied with examples tailored for scientists not deeply involved into the art of HPC programming.

This guide also provides an overview on recently deployed European flagship supercomputing systems that rely on the discussed processor architectures, namely:

- **Fulhame** at Edinburgh Parallel Computing Centre (EPCC), UK
- **MareNostrum** at Barcelona Supercomputing Center (BSC), Spain
- **SuperMUC-NG** at Leibniz Supercomputing Centre (LRZ), Germany
- **Hawk** at High-Performance Computing Center Stuttgart (HLRS), Germany
- **Betzy** at SIGMA2, Norway

The complete PRACE “**Best Practice Guide - Modern Processors**” can be accessed via the following link:

- https://prace-ri.eu/training-support/best-practice-guides/modern-processors/

KEYWORDS: processors; ARM64; Huawei/HiSilicon; ThunderX2; Marvell; Intel Skylake; AMD; x86-64