

PAPI-C: Collecting Performance Data beyond the CPU

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High performance computer systems continue to increase in size and complexity. Tools that measure application performance in these environments must evolve and keep pace with the changes, taking advantage of new sources of performance data as they become available. PAPI (the Performance API) has provided platform and operating system independent access to CPU hardware performance counters for nearly a decade. Recent trends toward massively parallel multi-core systems present new challenges for the measurement of hardware performance information, which now not only comes from the CPU core itself, but from sources scattered across the chip and system. We discuss the evolution of PAPI into Component PAPI, or PAPI-C, in which multiple sources of performance data can be measured simultaneously via a common software interface. We explore the challenges found in existing multi-core architectures, as well as exploring the future direction of the PAPI interface.