PAPI (Performance Application Programming Interface) provides the tool designer and application engineer with a consistent interface and methodology for use of the performance counter hardware found in most major microprocessors. In addition, it provides access to a collection of components that expose performance measurement opportunities across the hardware and software stack.
WORKING TO BUILD MEASUREMENT TOOLS FOR CHANGING HARDWARE AND SOFTWARE PARADIGMS
AN IN-PROGRESS PROJECT WHICH WILL EXTEND THE PAPI PARADIGM FOR THE NEAR FUTURE

SYSTEM-WIDE MEASUREMENTS
The ability to measure inter-core resource counters (e.g., memory hierarchy, network, GPUs, PCI bus, power) with PAPI will greatly broaden the understanding of application performance on modern hardware. In addition, PAPI will incorporate a counter inspection toolkit designed to improve understanding of low-level events. We aim to define an accurate mapping between particular high-level concepts of performance metrics and underlying low-level hardware events.

QUICK ACCESS TOOL
PAPI-EX will develop an easy-to-use tool providing quick access to PAPI measurements by building on an open source version of a performance measurement and testing tool—papiex—created by an industry collaborator. An updated high-level API containing community requested improvements will support this tool.

DATA-FLOW RUNTIME SYSTEMS
In contrast to the traditional control flow model, dataflow-based programming models have become increasingly popular, especially on distributed heterogeneous architectures. Consequently, there is a growing demand on performance measurement tools for task-based, dataflow-driven runtimes. PAPI-EX will support integration with task-based runtime systems, enabling hardware performance counter measurements at true task granularity, as opposed to the thread/process granularity achievable today.

SAMPLING INTERFACE
PAPI-Ex is being extended to provide a portable, easy-to-use interface to sampling data, enabling the tools community to provide advanced performance analysis and optimization capabilities to the user.