Extreme scale computing requires that power and energy budgets be carefully managed. While much of the work of achieving this goal is performed by dedicated power and energy management systems and components, the job is not complete until the entire system is designed to be aware of and able to control its energy consumption.

Details of the Power API

Overview of the Power API

API Design

The Power API provides an abstraction layer for measuring and controlling power and energy at various points in stack. Each element in the stack (e.g., node, rack, or server) can use the Power API to request and control power and energy usage at various levels. Power, energy, voltage, and current can be measured at various levels of the stack, and the API provides a consistent interface for accessing this data. The API is designed to be extensible, allowing new layers to be added as new power and energy management capabilities emerge.

Prior Experience with Top Supercomputers

MITS is currently designing the 200Tordon system, a 15-petaFLOPS machine, that will use an almost completely different architecture than the current generation of the world’s top supercomputers. The architecture of the Power API is being developed to accommodate these new systems.

Interface Example

The Power API provides an abstracted layers for measuring and controlling power and energy at various points in the stack. Each element in the stack (e.g., node, rack, or server) can use the Power API to request and control power and energy usage at various levels. The Power API is designed to be extensible, allowing new layers to be added as new power and energy management capabilities emerge. Power, energy, voltage, and current can be measured at various levels of the stack, and the API provides a consistent interface for accessing this data. The API is designed to be extensible, allowing new layers to be added as new power and energy management capabilities emerge.

Power and Reliability

The abstraction of power and energy across various levels of the stack is critical for enabling efficient and effective power management. The Power API provides an abstraction layer for accessing power and energy data at various levels of the stack, allowing developers to make informed decisions about power allocation and usage.

Progress, Partners, and, Extreme Scale Deployment

Partner organizations, such as Intel, have joined forces to drive progress in developing and deploying power awareness at the node level. The Power API provides an abstraction layer for accessing power and energy data at various levels of the stack, allowing developers to make informed decisions about power allocation and usage.

Associated R & D Efforts

Network Power Management

Concurrency Throttling

The Power API enables the management of concurrency by allowing the easy access to component-level measurement and control mechanisms. The API is designed to be extensible, allowing new layers to be added as new power and energy management capabilities emerge. Power, energy, voltage, and current can be measured at various levels of the stack, and the API provides a consistent interface for accessing this data. The API is designed to be extensible, allowing new layers to be added as new power and energy management capabilities emerge.

References