

Workshop Description:

We are entering a new era in computing where the size and complexity of scientific and engineering simulations is growing at a speed that has never been observed before. In order to satisfy the needs of these applications, parallel systems with an "extreme-scale" are being designed and deployed. Although the progress in hardware and architecture design has made it possible to build machines with tens of thousands of processors, the development of software tools for such systems is still lagging behind. To name just a few examples, new operating system level modifications are needed to efficiently utilize the massive computing and networking power. In addition, sophisticated fault-tolerant tools are in great need to minimize the performance loss under a faulty condition and to automate the recovery process which can further reduce management costs. The scale of the systems also demands advanced power management tools. For both commodity supercomputing clusters and custom-designed supercomputers, system maintenance, reliability, fault isolation, prevention and control pose huge challenges. There is a great need of research not only in terms of scale of the machine, but also in terms of their implications on system performance and utilization. This workshop is intended to bring together researchers and practitioners to begin identifying the new challenges imposed by this trend and investigating efficient software tools to improve the performance, reliability and operation of large scale parallel systems.

Topics of interest include but are not limited to:

- Scalable operating system design
- Scalable resource management tools

- Efficient failure diagnosis, failure prediction and failure recovery tools
- Scalable job scheduling tools
- Scalable parallel check-pointing tools
- Self-healing and self-management tools
- Power management for large scale machines
- System bring-up and control tools
- Ease of system maintenance, services including system management experiences
- Performance, system utilization implications
- Scalable I/O and file system management

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