

Runtime System Software Summit

Agenda:

- Starting from 8:30 a.m., discuss the summit steps in the presented order, ensuring that all steps are discussed.
- Break for lunch at 12:00 noon, resuming at 12:45 p.m.
- No scheduled coffee breaks
- End the summit at 5:30 p.m.

Sequence of Summit Steps

- 1) Opening Topic: Goal and Objectives for the summit
 - a) Develop a path towards a unified runtime architecture with common components
 - b) Roadmap for research program on runtime system software
 - c) Preparation for writing report
- 2) Motivation for runtime systems, success criteria from system viewpoint
 - a) Efficiency, scalability, productivity
 - b) Reliability, power management
 - c) Move from static control to dynamic control; introspection
 - d) Move programming burden from programmer to system
 - e) Heterogeneity
 - f) Strong scaling and greater generality
- 3) Challenges in the area of runtime systems design
 - a) Role and responsibilities
 - b) Interface and cooperation with programming interface and OS
 - c) Exposure and exploitation of parallelism
 - d) Overhead of task life cycle including context switching
 - e) Name space and address space management and memory allocation
 - f) Locality and affinity exploitation and management
 - g) Latency hiding/effect minimization and contention circumvention
- 4) Towards Unified runtime systems architecture
 - a) Major possible components
 - i) Thread manager and scheduling
 - ii) Message-passing and message-driven network manager
 - iii) Address allocation/translation
 - iv) Data distribution and locality
 - v) Synchronization and parallel control state
 - b) Interfaces
 - i) Intra-runtime system modules

- ii) Inter operation with programming interfaces and OS
 - c) Measures of success, quantified operational metrics
 - d) Introspection and policies
- 5) Set of detailed questions to be addressed by research
- 6) Roadmap for runtime research
 - a) Multiple research projects for exploring alternative approaches
 - b) Major milestones of accomplishment
 - c) Time-line Schedules
 - d) Insertion with experimentation for applications and systems
- 7) Preparation for Writing of Report
 - a) Outline
 - b) Message to be conveyed
 - c) Schedule
 - d) assignments