Fault Tolerance and Dynamic Process Control Working Group

LEADERSHIP COMPUTING FACILITY
NATIONAL CENTER FOR COMPUTATIONAL SCIENCES

presented by

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Scope

The focus of this group is to create additions and clarifications to the MPI standard so that an MPI application may be able to run to completion in the presence of faults in its environment. MPI provides communications services and some process control services ==> the FT aspects are aimed at restoring the state of these services to a well defined state, so that applications may continue to use these services. MPI will enable FT algorithms and applications, not provide this.

The closely related topic of dynamic communicators is also being considered.

The goal is change the standard such that an implementation can provide this support for applications that require it, and not impact those that do not want to use these services.

Activities

- Barely off the ground
- Con calls every 2 weeks (except for weeks in which the Forum meets)
- Participants
  - HP
  - Indiana University
  - Intel
  - LLNL
  - Microsoft
  - ORNL
  - Sun
  - University of Houston
  - University of Wisconsin

Items being considered

- FT-MPI “like” process fault-tolerance
- Dynamic communicators
  - Size may change with time
  - Communicators may have sparse ranks
  - Communicator “traits” may be used to set communicator type
- Data piggy backing
  - OSU and LLNL are working up a prototype with a new API (collectives ?)
  - Proposal to change data-type handling to make it simple and cheap to piggyback data on the application payload

Items being considered - Cont'd

- API addition to bring network traffic to a well defined state in support of Checkpoint/Restart
- Transactional messages (adding return codes)
- Defining fault/change handling mechanisms