

EINLADUNG

Zeit: Donnerstag, 10. Dezember 2009, 10:00 Uhr
Ort: GRS Gebäude, Schinkelstrasse 2a, Raum 001
Referent: Dipl.-Ing. Daniel Becker
Titel: Timestamp synchronization of concurrent events

Abstract:

Supercomputing is a key technological pillar of modern science and engineering, indispensable for solving critical problems of high complexity. However, to effectively utilize today's supercomputing systems, scientists and engineers need powerful and robust software development tools. One technique widely used by such tools is event tracing. Recording time-stamped runtime events in event traces is especially helpful for understanding the performance behavior of parallel programs, since it enables the post-mortem analysis of communication and synchronization patterns.

The accuracy of such analyses depends on the comparability of timestamps taken on different processors and may be adversely affected by non-synchronized clocks. Inconsistent trace data may not only lead to false conclusions and confuse the user of trace-visualization tools but also may break tools if they rely on the correct event order to function properly. Although linear offset interpolation can restore the consistency of the trace data to some degree, time-dependent drifts and other inaccuracies may still disarrange the original sequence of events.

The already familiar controlled logical clock algorithm accounts for such violations in point-to-point communication. It is, however, not suitable for realistic applications because it ignores collective and shared-memory communication and - as a serial algorithm - offers only limited scalability. To address these shortcomings, the algorithm was (i) extended so that it also restores the event semantics of collective and shared-memory operations and (ii) parallelized to make it suitable for large-scale systems including computational grids. The extended and parallelized version was evaluated in practice by integrating it into the Scalasca trace-analysis framework and applying it to traces of realistic applications taken on single cluster systems and computational grids.

Es laden ein: Die Dozenten der Informatik