A Damage Assessment Model in a Distributed System

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Abstract

Contaminated Check-points; Error Propagation; Nonlinear Integer Programming; Damage Assessment Model; Global Checkpoint; Rollback Recovery; Index-based Check-pointing

Index Terms

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Keywords

Error propagation is unavoidable due to imperfect detection mechanisms and random inter-process communications; it could give rise to contaminated checkpoints which in turn result in unsuccessful rollbacks. To encounter the problem of error propagation a damage assessment model is discussed to optimize the correctness of saved checkpoints under various circumstances. The algorithm is based on an equivalence classes between pairs of successive checkpoints of a process which allows us in some cases to advance the recovery line of the computation without forcing checkpoints in other processes. This is well-suited for autonomous and heterogeneous environments where each process does not know any private information about other processes and private information of the same type of distinct processes is not related.