Abstract

A checkpoint algorithm for mobile computing systems needs to handle many new issues like: mobility, low bandwidth of wireless channels, lack of stable storage on mobile nodes, disconnections, limited battery power and high failure rate of mobile nodes. These issues make traditional checkpointing techniques unsuitable for such environments. Minimum-process coordinated checkpointing is an attractive approach to introduce fault tolerance in mobile distributed systems transparently. This approach is domino-free, requires at most two checkpoints of a process on stable storage, and forces only a minimum number of processes to checkpoint. But, it requires extra synchronization messages, blocking of the underlying computation or taking some useless checkpoints. In this paper, we propose a minimum-process coordinated checkpointing algorithm for deterministic mobile distributed systems, where no useless checkpoints are taken, no blocking of processes takes place, and anti-messages of very few messages are logged during checkpointing. We try to reduce the loss of checkpointing effort when any process fails to take its checkpoint in coordination with others. We also address the related issues like: failures during checkpointing, disconnections, concurrent initiations of the algorithm.
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Index Terms

Computer Science  Distributed Systems

Key words

Anti-message

Mobile Computing Systems