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Reading Assignment

1 Time, Clocks, and the Ordering of Events in a Distributed System

Most important points:

(i) The basic contribution of the paper is to produce a total ordering of events in a distributed system. It defines the 'happens before' relation between two events as follows: $a \to b$ if either a occurs before b in the same process or a causally affects b.

(ii) Using logical clocks which are incremented at each event occurrence and using timestamped messages, a consistent partial order on events is achieved by the 'happens before' relation. This can be extended to a total order using any arbitrary ordering of "concurrent" events.

(iii) Using the total ordering of events, a truly distributed algorithm for process synchronization is presented - which is a really significant achievement! Amazingly, the algorithm can be implemented as a simple finite state machine.

Deficiency: From a theoretical viewpoint, proofs of the results presented are not very deep - the results themselves, though, are of high theoretical and practical significance. As such, I could not find any deficiency in the paper.

Conclusion: For me, the take-home point is: a deep theoretical understanding of any system takes us a long way towards solving problems rather than using hacks/tricks every other time.