SYNCHRONIZATION AND CRASH RECOVERY IN DISTRIBUTED SYSTEMS

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DEDICATED TO MY PARENTS

CERTIFICATE

Certified that the thesis entitled ' SYNCHRONIZATION AND CRASH RECOVERY IN DISTRIBUTED SYSTEMS '

being submitted by Mr Subhash Bhalla, is a record of work carried out by him under my supervision. The matter embodied in this thesis has not been submitted for the award of any other degree.

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ABSTRACT

In this dissertation, a new approach to the study of concurrency control techniques used in distributed databases has been adopted. A representative concurrency control technique has been chosen for the above purpose. A mathematical model of the above scheme, based on a stochastic process has been developed. Based on the inferences drawn from the above model a new concurrency control scheme has been proposed. The proposed scheme relies upon 'detection of non-serializable schedules at runtime, and correction by backup'.

In the later part, the case of network partitions and site crashes has been studied and an optimum corrective strategy has been proposed. Also, studied in the thesis is the case of priority response requirement of certain important applications.

A qualitative study of the costs incurred by the proposed scheme has been presented in order to have an idea of range of applicability of this scheme.

It has been pointed out that the proposed scheme has various advantages associated with it, in addition to simplicity and ease of implementation. In addition to offerin flexibility the scheme is a unified approach where the same pool of information is used for various purposes, like concurrency control, recovery from site crashes and network partitions and for maintenance of accountbook-like logs.

C O N T E N T S