AN APPROACH TO DISTRIBUTED TRANSACTION MANAGEMENT IN LIGHTWEIGHT CONTAINERS BY LEVERAGING RELIABLE GROUP COMMUNICATION

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MASTER OF SCIENCE IN COMPUTER SCIENCE

P. G. D. S. KARUNASENA

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This Dissertation was Submitted to the Department of Computer Science and Engineering of the University of Moratuwa in Partial Fulfillment of the requirements for the Degree of MSc in Computer Science.

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I here by declare that the work included in this thesis in part or whole, has not been submitted for any other academic qualification at any institution.

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This is to certify that the work included in this thesis is carried out by the candidate and this in part or whole, has not been submitter for any other academic qualification at any institution.

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Abstract

In this thesis, we propose an approach to enable distributed transaction handling capability within a lightweight container without necessitating its deployment in a fully-fledged J2EE application server (or in a servlet container). This distributed transaction handling capability is facilitated by leveraging a reliable group communication framework.

To evaluate the feasibility of this approach a prototype implementation, Mahatittha was developed using the Spring Framework as the lightweight container and Java Groups [9] as the underlying reliable group communication framework. The Mahatittha execution model is asynchronous and hence exploits parallelism to a great extent. The virtual synchrony and reliable multicast provided by the underlying reliable group communication framework, are used to simplify the standard algorithms used in distributed transaction management within the Mahatittha implementation.

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