Quantitative
Modeling
In
Parallel
Systems

Modelling and Evaluation of Cache Coherence Protocols in Multiprocessor Systems

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DW2.T1.9-1.v1

September 27, 1994

Distribution Level: All partners

Approved by: I. Mitrani

Abstract The object of interest in this paper is the long–term performance of a shared memory multiprocessor system with snooping caches. Two variants of the *R4000* cache coherence protocol, referred to as *Invalidate* and *Update*, are evaluated and compared. The analysis is based on a Markov chain model of line accesses and a fixed–point approximation of interactions between processors. The "sytem power", defided as the average number of processors engaged in comutation, is used as the measure of comparison. Which protocol is better depends, in general, on the values of all parameters; however, when the number of processors is large, *Update* tends to outperform *Invalidate*.

The QMIPS Project: The QMIPS project is a collaborative research project supported by the CEC as ESPRIT-BRA project no 7269. It is being carried out by the following organisations: CWI (Amsterdam), EHEI (University of Paris V), Imperial College (London), INRIA (Sophia-Antipolis), University of Erlangen, University of Newcastle, University of Torino and University of Zaragoza.