

Reconfigurable Supercomputing means to brave the Paradigm Chasm*

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Reconfigurable Computing, mainly by using FPGAs, has been successful in embedded systems already for many years. Due to sufficient hardware expertise available in these communities astonishing speed-ups have been achieved in a variety of areas such as signal and image processing, bio-informatics, cryptology, communications processing, data and text mining, global optimization, and others. An interesting side effect having been observed accidentally is going to be a national strategic issue: the speed-up by software to configware migration coming along with a drastic reduction of the electricity bill.

More recently Reconfigurable Computing also attracts an increasing number of experts from supercomputing and other high performance computing scenes where, however, software perspectives are dominant, leading to a clash of paradigms. For many applications growing conventional MPP (massively parallel processing) parallelism does not scale well and reduces the programmer productivity so that „The Law of More“ is the problem, and not the Law of Moore. Will Reconfigurable Supercomputing solve these problem? Can portability be combined with very high performance? Is further progress limited by fundamental misconceptions of algorithmic complexity theory, instead of hitting physical limits? For both paradigms, configware and software, and for proper partitioning of dual paradigm solutions, we have to re-think all basic assumptions behind computing. We need a new roadmap.

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