

An Approach to the Multi-Core Dilemma

Ct: C for Throughput Computing

Presented By: Marcello Brito

George Mason University, ECE Department, Fairfax, VA 22030, USA

Advisor: Dr. Kris Gaj

Location: Room 3202, The Engineering Building

Time: 12pm

Date: Friday November 20th, 2009

ABSTRACT:

The performance on software applications has a very high significant impact on today's organization's success. Faster software performance is the key to staying on top of the competition. New and growing applications are requiring an order of magnitude of improvement. Until now developers have been able to rely on hardware technological advances to match the required software performance. But due to physical constraints, multi core architectures are now on the rise and software developers need to exploit these future designs to meet software performance expectations.

This scholarly paper focuses on Ct: C for Throughput computing which is a new programming model that researchers at Intel's Microprocessor Technology Lab are developing. Ct will tackle the challenges of multi-core software development; One of them being the significant particular burden of parallel programming. Parallelizing applications already developed to effectively scale with new core counts and the evolution of the instruction set. Most software applications have the benefit of backward compatibility between present and past hardware architectures. This is not the case with the new multi-core micro architectures. In fact in some cases it may even regress. Forward scaling is an essential requirement for new programming models such as Ct.

Throughout the discussion of this paper we are going to describe Ct's design and how it approaches the challenges mentioned above. The basics of Ct, an example and some common operators will be explained. Also we will see some common applications and how these are compared to plain C in terms of performance.