Pisit Makpaisit 2014: The Framework and Compilation Techniques for Directive-based GPU Cluster Programming. Master of Engineering (Computer Engineering), Major Field: Computer Engineering, Department of Computer Engineering.
Thesis Advisor: Assistant Professor Putchong Uthayophas, Ph.D. 62 pages.

GPU cluster is an important architecture being used for large scientific and engineering applications. However, manually developed GPU cluster application is still a very difficult task. To alleviate this problem, we adopt the OpenACC standard for directive-based approach and proposed some extension to support GPU cluster programming. The extensions are clauses used to define the memory distribution and dependency of tasks on cluster nodes. We propose framework and technique used to implement a source-to-source compiler to support the proposed extension. We also propose a kernel split technique for automatic optimization in our compiler, The experiment conducted on the source code translation tool developed in this work show that the speedup close to hand code can be achieved on commonly used scientific application with much less programming effort.

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