Programming Language and Runtime System: Early Prototype

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1 EXECUTIVE SUMMARY

This document describes the core functionality of the VINEYARD programming model and runtime system for accelerated data centres. We describe our approach to creating an abstract representation of accelerated kernels, such that application programmers can use these kernels without needing to worry about accelerator-specific calling conventions, or about the specific versions available in the VINEYARD accelerator library.

The second key contribution of this document is the description of our approach to virtualizing accelerators. We assume that accelerators are assigned to jobs only when they are really needed, and not at job allocation time. This raises issues that need to be addressed in the virtualization layer and also in the application's runtime. We describe these issues and our approach to solving.

Finally, we present an overview on the current state of the VINEYARD accelerator library.