One OpenCL to Rule Them All?

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# Introduction:

This paper is about the portability of OpenCL on various hardware platforms. It is a well-known fact that OpenCL is an open source language that supports various architectures. It means that a single code can run on multiple architectures with ease, provided the code should be portable. This is what the authors discussed in this paper. They studied how unique should the OpenCL code should be to support architectures like NVIDIA K20C, Intel Xeon Phi and AMD 7970 GPU. OpenCL is widely accepted by all major architectures and it makes sense to develop a code that suites all the platforms. The authors used CAPS compiler open ACC technology to compare the code on various hardware architectures. The tests have been performed using a sample code called “The Hydro”, which is based large scale structures and galaxy formations. The best thing with the code sample is it contains the real time data and can be trusted for comparison. After various Performance analysis it is observed that, there are several differences in Vectorization, maximum workgroup size etc.

# Conclusion:

It is great that OpenCL supports multiple architectures and it is always good to have such open source platforms. However, the critical thing is auto tuning based on the architectures. After all, every optimization is essential, because it is the one that help in optimizing the performance. But portability of code comprises on performance of the hardware accelerator. The paper shows that the performance reduces by 43 % on using generalized code. Here, the performance would have been a lot better if the code has been written keeping the architecture of hardware platform in mind. I would like to conclude that, OpenCL might be great platform to port the code but it comprises on the performance. Hence I would prefer writing code considering the hardware in mind.