# Running OpenCL C Kernels on Vulkan for Fun and Profit

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# SIGGRAPH 2017 Khronos BoF Memories

KHRONOS GROUP

## Vulkan Compute

**Porting OpenCL C to Vulkan**

**Ralph Potter, Codeplay**

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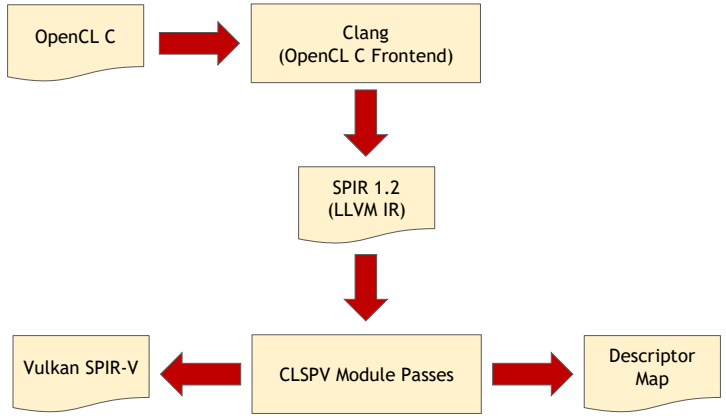
## CLSPV Compiler




## Acknowledgements

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codeplay

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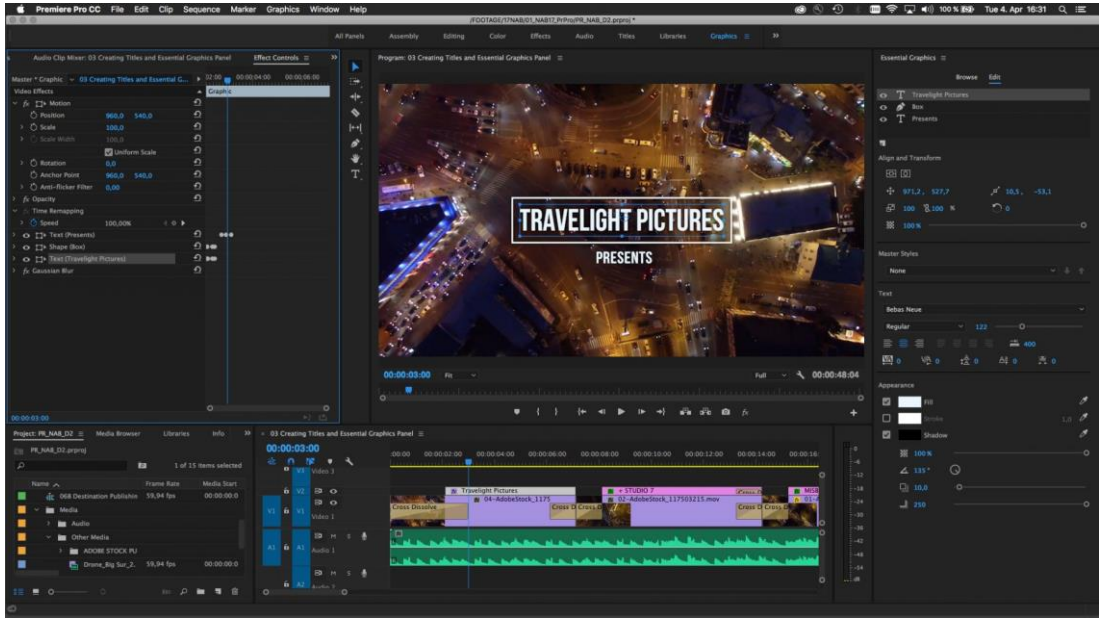


workflows and user experience

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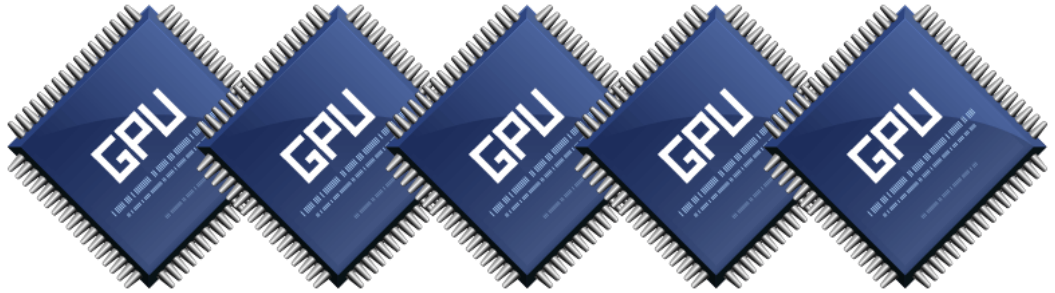


Mercury Playback Engine

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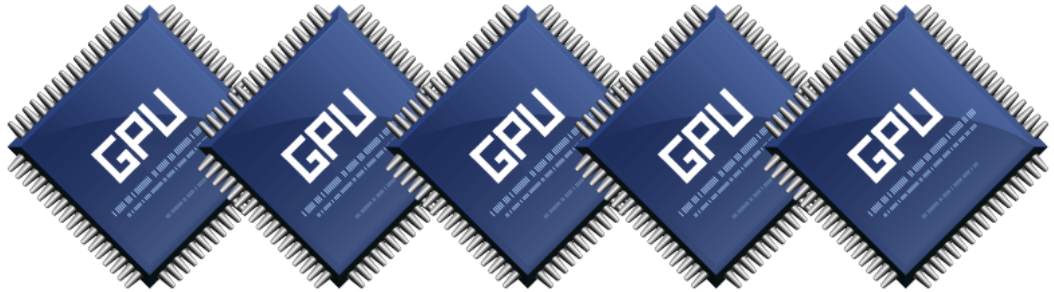
# Thought Experiment: Mercury Playback Everywhere?




Mercury Playback Engine

CUDA, OpenCL, Metal

CUDA, OpenCL

Metal

Vulkan?

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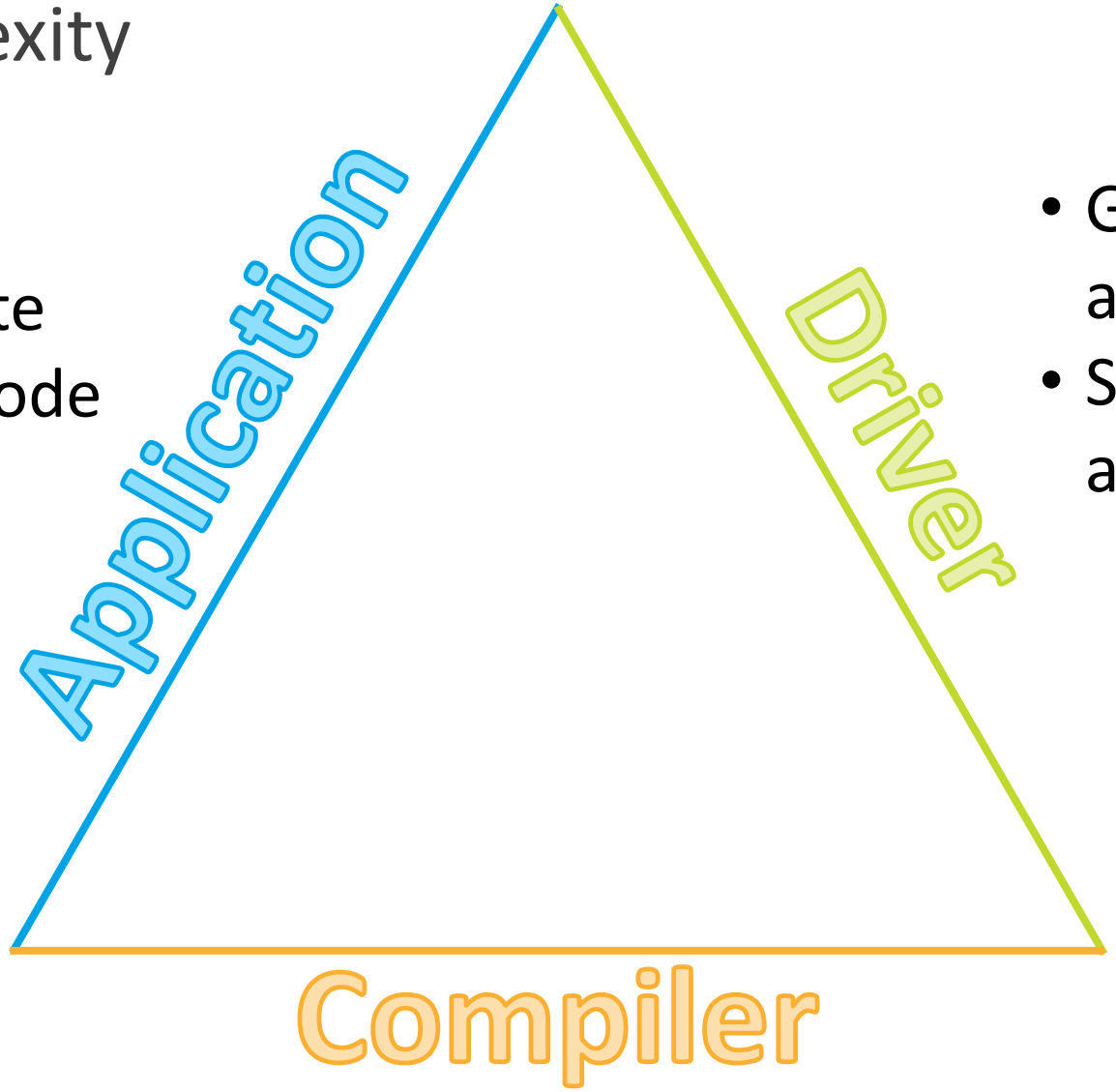
# Managing Complexity

- Great Flexibility
- Expensive to rewrite large amounts of code




- Greatest breadth and impact
- Sensitive to quality and performance

Tremendous leverage!

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# Observations

- Vulkan and SPIR-V today are sufficient to host compute shaders written in novel languages
- In the App+Driver+Compiler triad, the compiler has huge advantages!
- Clspv has allowed us to compile several hundred thousand lines of OpenCL C code to SPIR-V (graphics) with minimal changes
- The Clspv experience revealed coverage gaps in Vulkan CTS
  - We have improved CTS coverage
  - Compilers are remarkably agile for working around bugs in drivers
- Clspv is today an insanely useful prototype with which I'm building a commercial Android product

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# Project Rush – Unveiled at VidCon 2018

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