SYCL Academy

A QUICK INTRODUCTION TO SYCL (WITH A LOT OF HANDS-ON)

LEARNING OBJECTIVES

- Quick SYCL introduction
- Lot of Hands-On code examples to learn key concepts
- The goal is to be interactive!

WHAT IS SYCL?

SYCL is a single source, high-level, standard C++ programming model, that can target a range of heterogeneous platforms

WHAT IS SYCL?

- Backed By Khromos (Vulkan, OpenCL, SPIRV)
- Two big implementation (OneAPI, and AdaptiveCPP)
- Lot of backends (Cuda, OpenCL, Level Zero, OpenMP)
- Used by lot of Codes (HACC, Kokkos, ...)
- Spec develoepment in public (**https://github.com/KhronosGroup/SYCL-Docs/**). Join us!

SYCL KEY CONCEPTS

- SYCL is a C++-based programming model:
  - Device code and host code exist in the same file
  - Device code can use templates and other C++ features
  - Designed with "modern" C++ in mind
- SYCL provides high-level abstractions over common boilerplate code
  - Platform/device selection
  - Data movement
  - Kernel function compilation
  - Dependency management and scheduling

ECOSYSTEM

- CUDA -> SYCL Translator: **https://github.com/oneapi-src/SYCLomatic**)
- MKL / RNG (e.g wrapper arround cublas): OneMKL
- Thrust Like: OneCCL

AND NOW HANDS-ON

- `./Code_Exercises/The_9_sycl_of_hell`
- Will introduce Device, Queue, Kernel, Events (all in 20 min)