GPUProfiler

Intro

CodeXLGpuProfiler is the executable created by the CodeXLGPUProfiler project. It handles the following :

- setup of the environment for profiling mode, depending on the arguments passed
- launch of the app to be profiled, including the injections of profiling code (shim dlls, sycl profiling dll)
- gather the tmp files resulting from the various profiling subsystems
- create a final atp file
- generate summary pages, if enabled

Basic functionality description

The executable is launched by the GPUProfiling dll, whose project name is AMDTGPUProfiling, in the ProfileProject member function. This function creates the command line arguments for the profiler base on the current project settings.

Once the GPUProfiler is invoked, it parses the cmd line arguments and sets the Config struct fields accordingly.

The profiler at this point sets the Agent for openCL and hsa, but we opted for a different approach for SYCL (see later).

Now it initializes the app to be profiled, gathering the various commands and options passed to the profiler.

At this point the profiler creates a new process, and detours the OpenCL and DIrectCompute app calls to the shim dlls. Here we exploit the process to inject our sycl profiling dll, if sycl profiling is enabled.

We accomplished this by extending the pre existing functionality, which only allowed to inject a single dll into profiled app, allowing to inject an arbitrary number of dlls.

The pre existing system either relied on Microsoft's Detour Express library, or on a hand written version of the functionality. This can be controlled with a macro definition at compile time, which determines

whether the ms detours layer gets included:

```
26    */
27
28   // How to use the dll injector from Detours Express:
29    // 1. Download the Detours express package from Microsoft
30    //    It can be downloaded from here:
31    //    http ://research.microsoft.com/en-us/downloads/d36340fb-4d3c-4ddd-bf5b-1db25d03713d/default.aspx
32    //    or by searching for "Detours express 3.0 download".
33    // 2. Install the package to the hard drive. The detours files are included from
34    //    dllInjectorDetours.inl and assume that detours is installed to Common/Lib/Ext/Detours Express 3.0.
35    //    It can be installed elsewhere but the path for the included detours files will need modifying
36    //    in dllInjectorDetours.inl, including creatwth.cpp and modules.cpp.
37    // 3. Bug fix: In creatwth.cpp, Change the line:
38    //       DETOUR_EXE_RESTORE der;
39    //    to:
40    //       static DETOUR_EXE_RESTORE der;
41    //    This struct is quite large and can a cause stack overflow on some systems.
42    //    Also replace both occurrences of '#1' in the same file with 'InjectDLL'
43    // 4. Uncomment the #define USE_DETOURS line below and rebuild the solution.
44
45   //TODO(bmanga): Re-enable detour express?
46    //NOTE: Detours Express is not supported anymore, as it doesn't provide the multiple dll inject functions
47    //#define USE_DETOURS
48
49    // Implementation files
50    #include "dllInjectorLoadLibrary.inl"
51   #ifdef USE_DETOURS
52        #include "dllInjectorDetours.inl"
53    #endif // USE_DETOURS
```

I did not look into a way to also supporting Detours Express, as it did not seem like a necessary piece of code. It may thus not work with the current implementation anymore. Additonal details here.

Once the profiled app has finished running, the profiler goes on to cleaning the various temporary files created.

MergeFragFiles MergeTraceFile

MergeTraceFile is where we merge all the files generated into a single ATP file.
For SYCL, the dll generates a tmp file in the default temp location, which the SYCLATPFilePart then picks up to append into the final atp file.

CheckOutput file checks that the atp file is actually created

APITraceAnalyze generates the summary pages (for opencl only?)