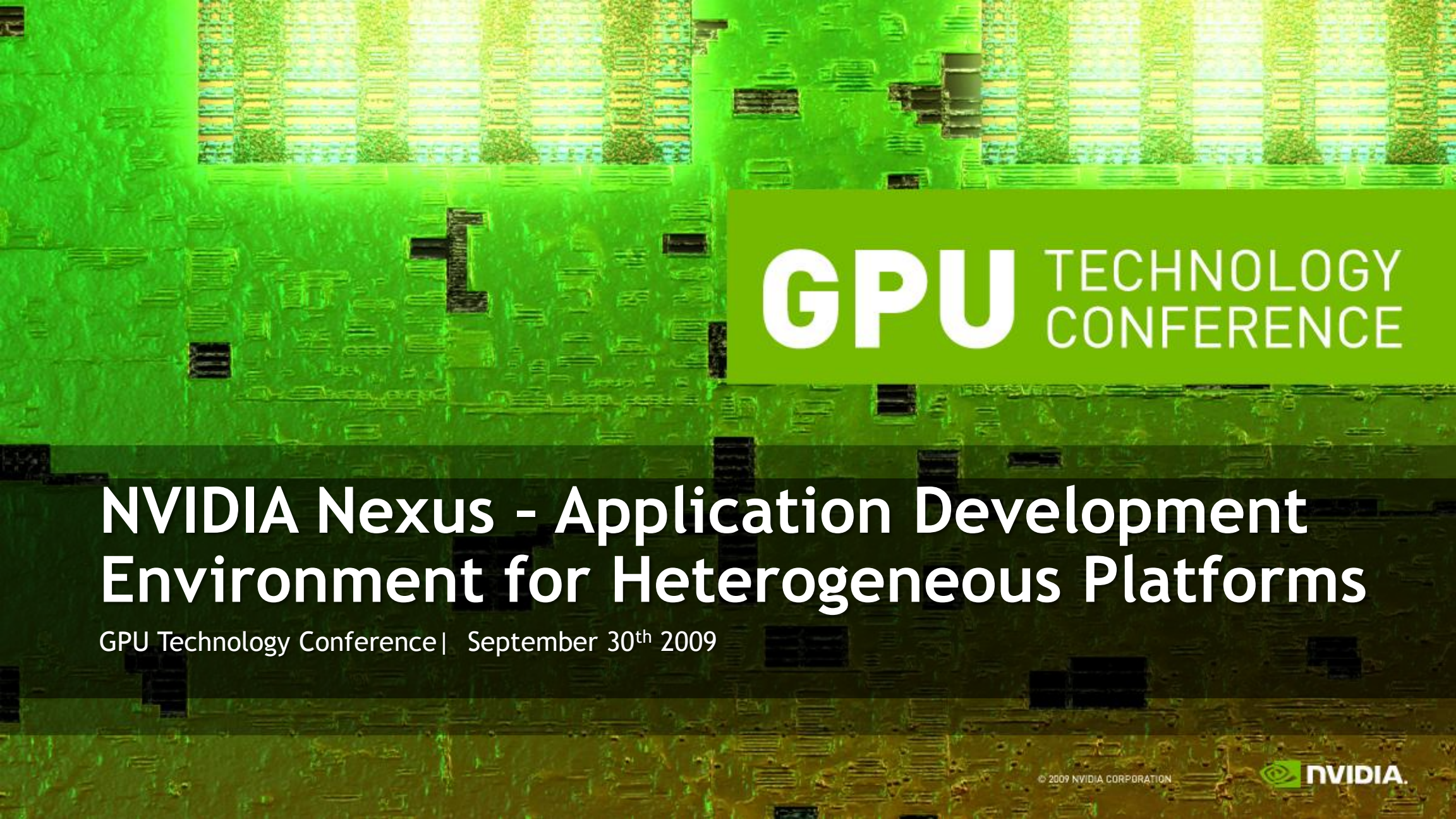
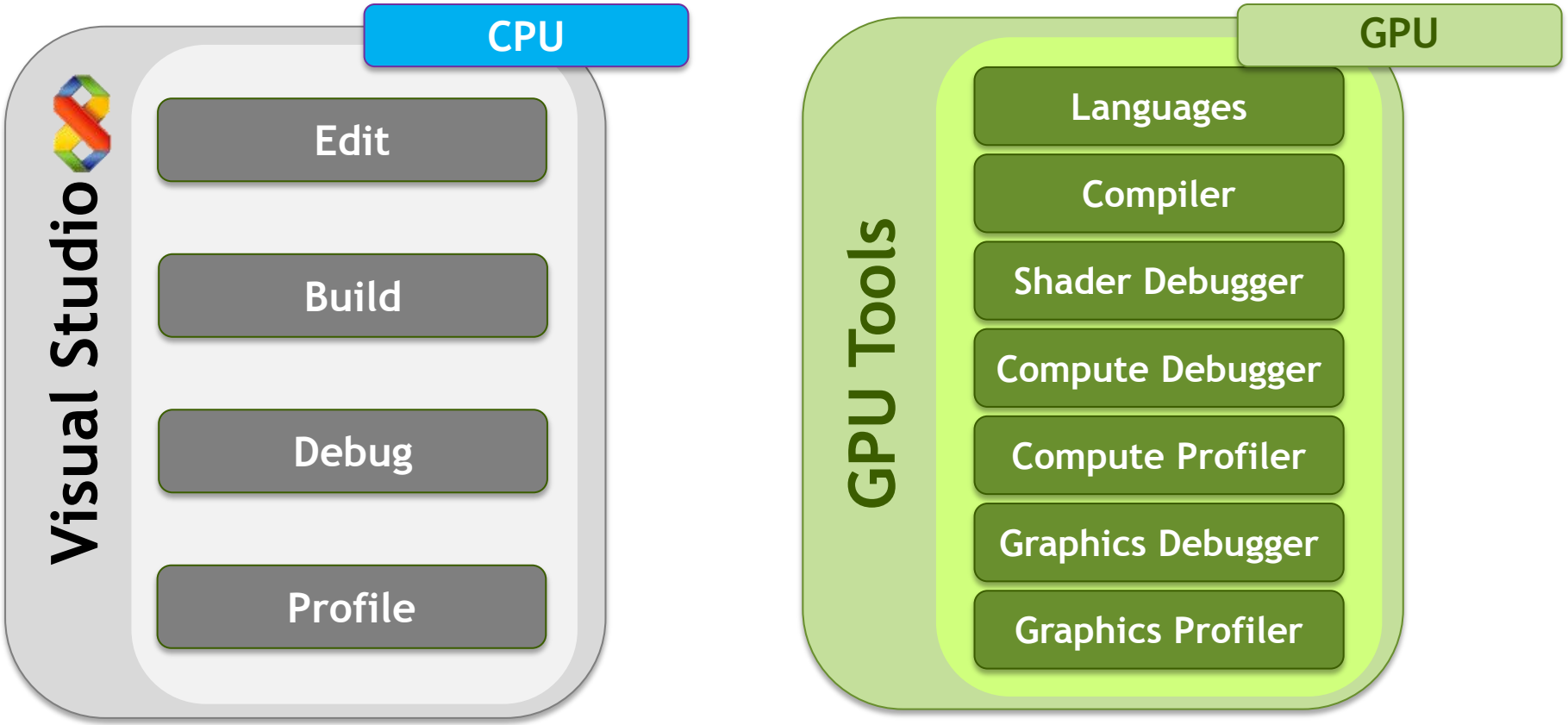


NVIDIA Nexus - Application Development Environment for Heterogeneous Platforms

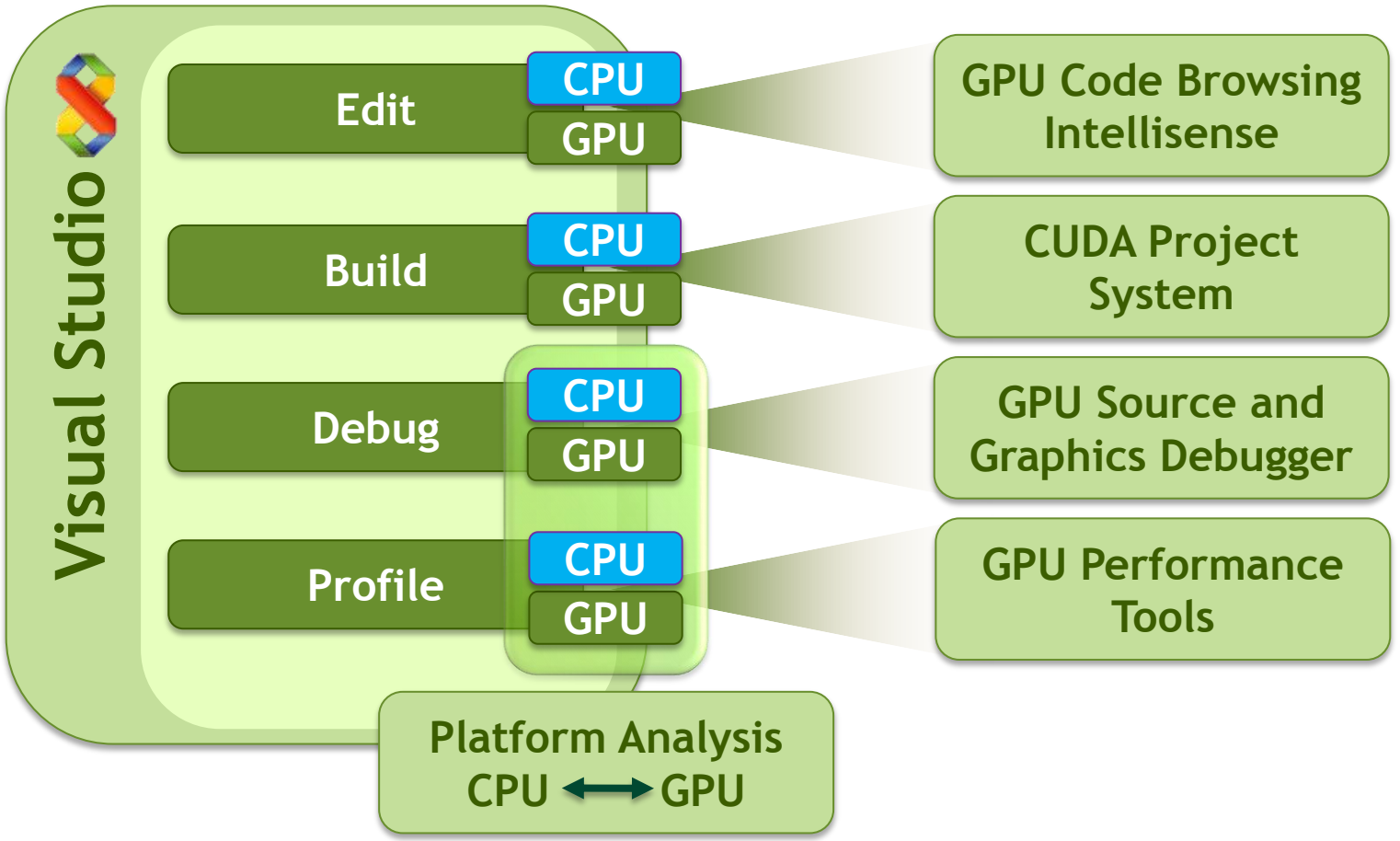
GPU Technology Conference| September 30th 2009

NVIDIA.

Windows Development Environment



… what developers really want

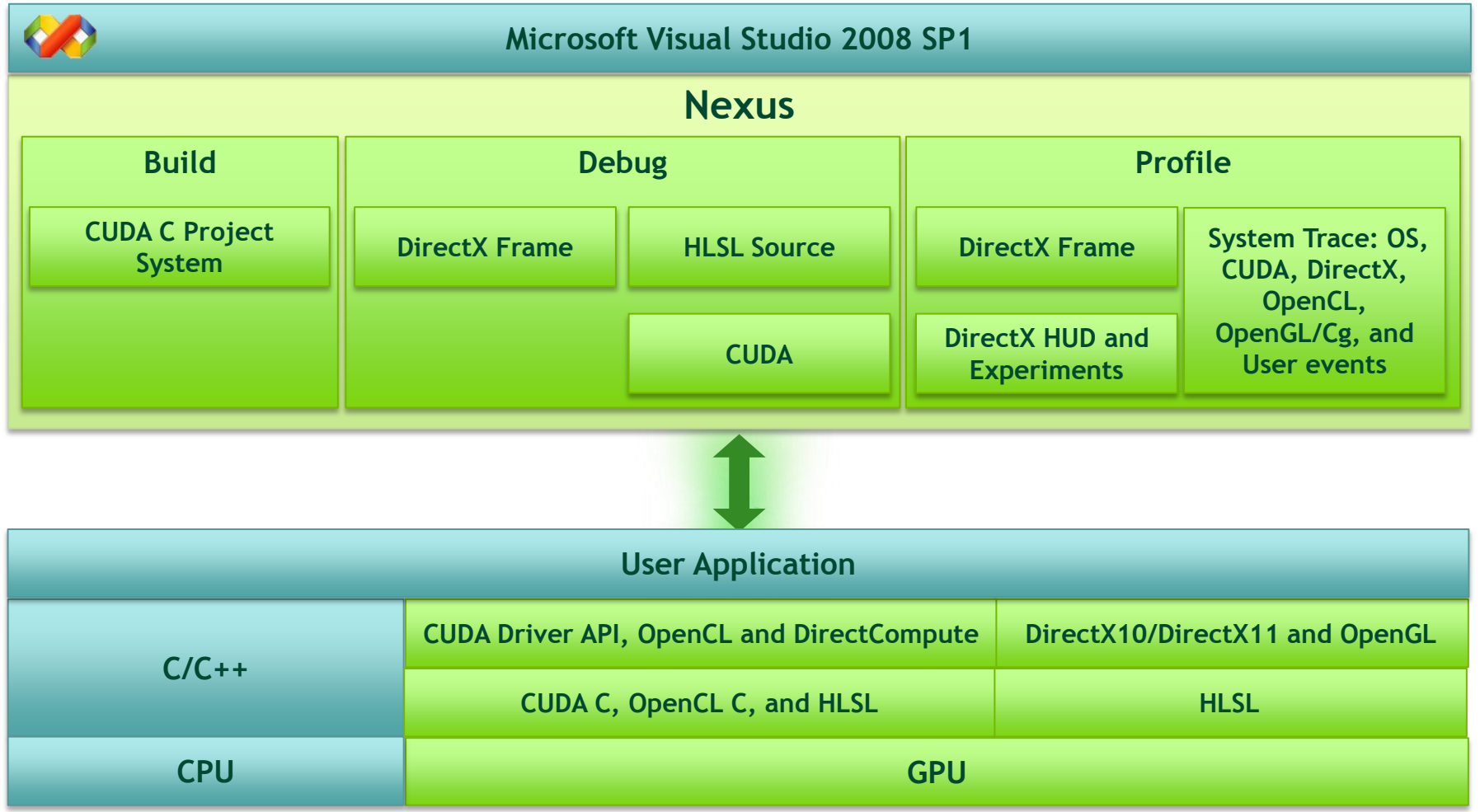


NVIDIA Nexus

Enables Seamless Co-Processing Development

- Full-featured debugging on GPU
- Platform-wide activity analysis
- Visual Studio 2008 integration

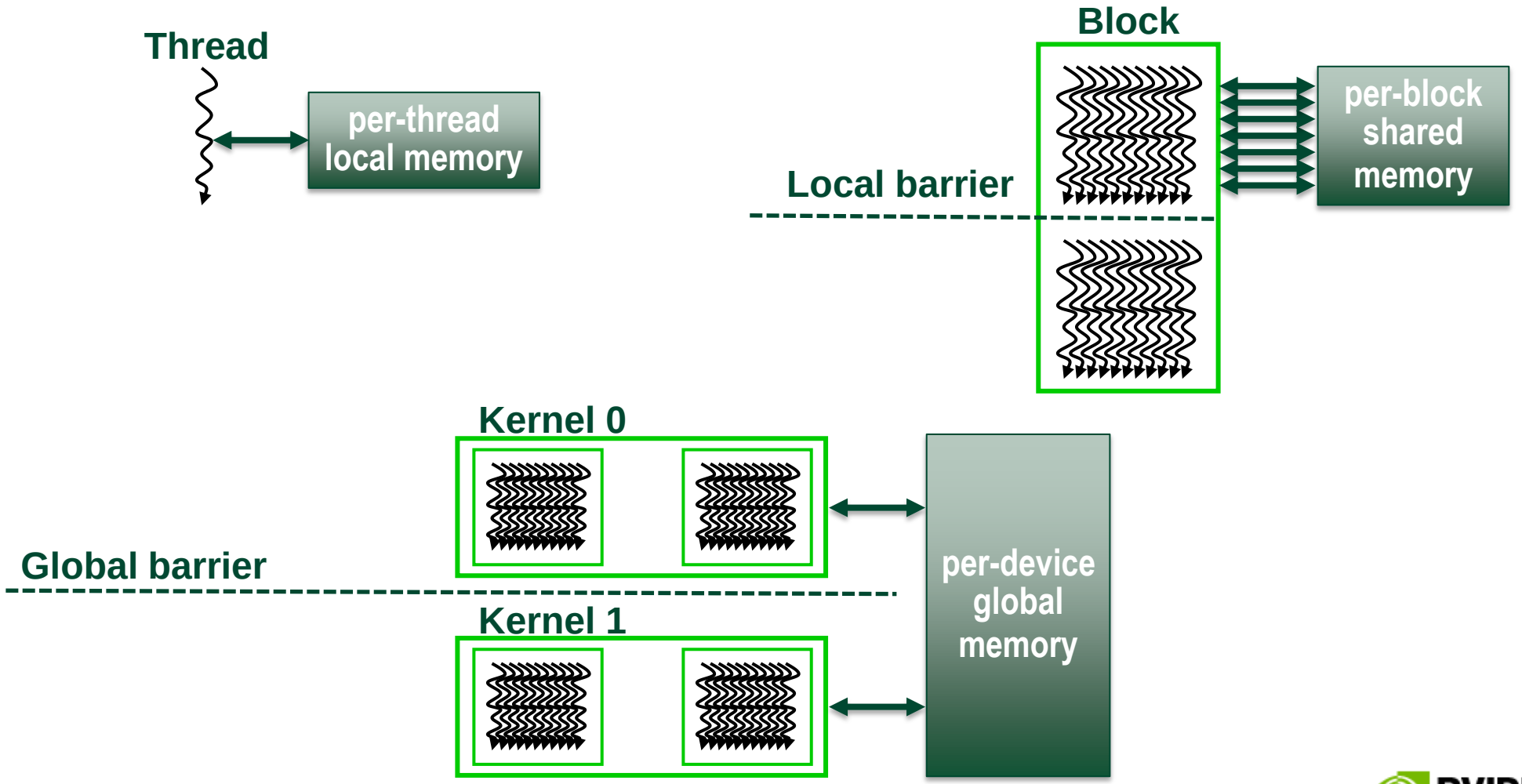
Nexus Overview



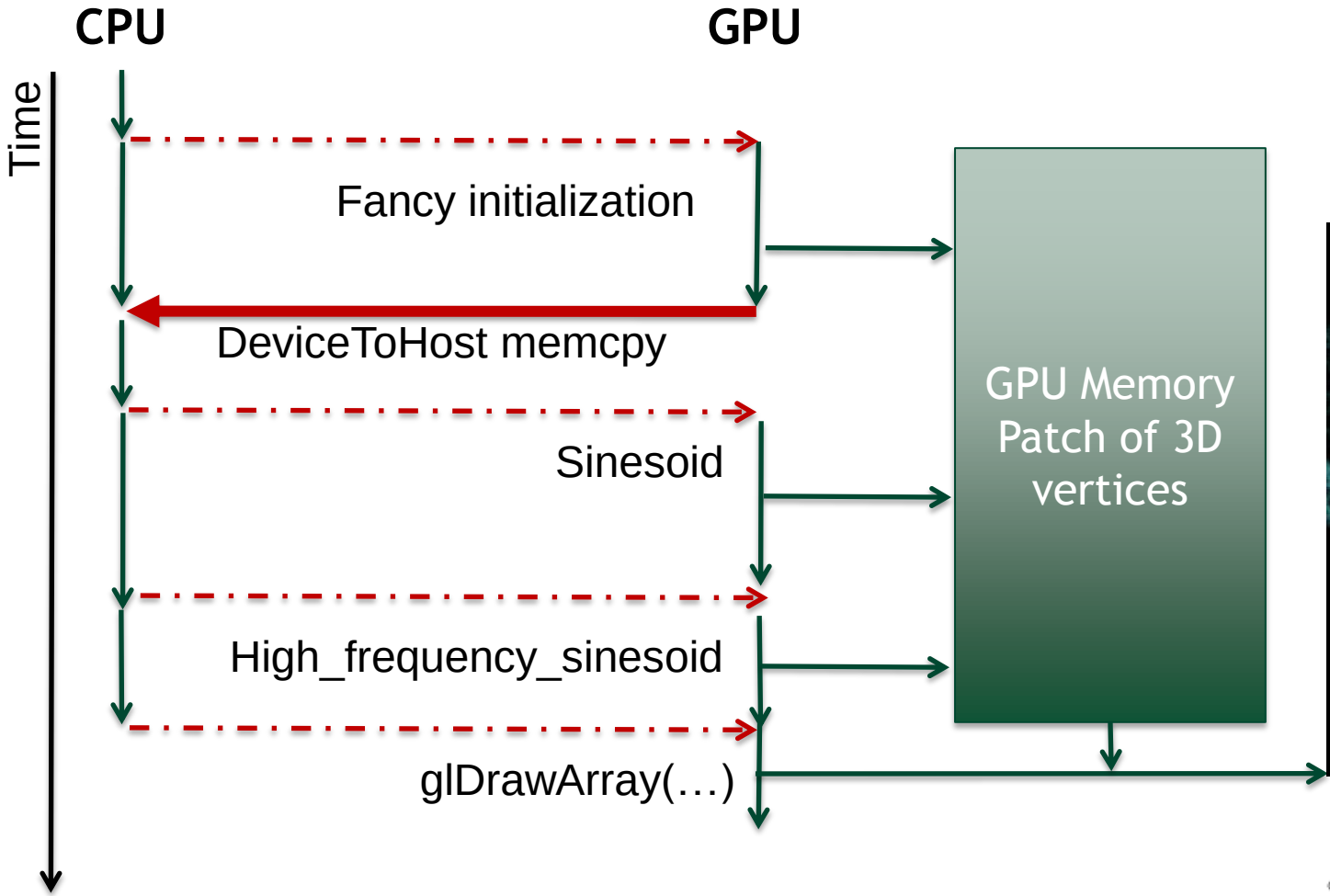
Native GPU Debugging

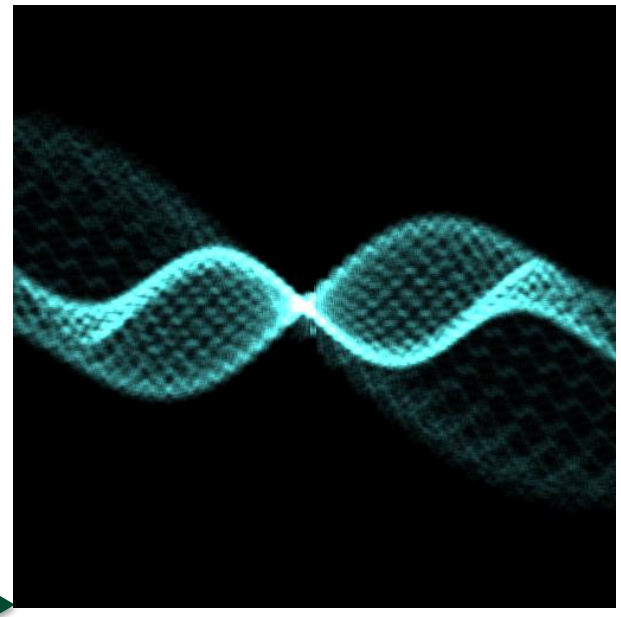
- No emulation
- No arithmetic discrepancy
- GPU pauses at the breakpoint
- Inspect GPU state and memory
- Faster programmer productivity

CUDA Architecture

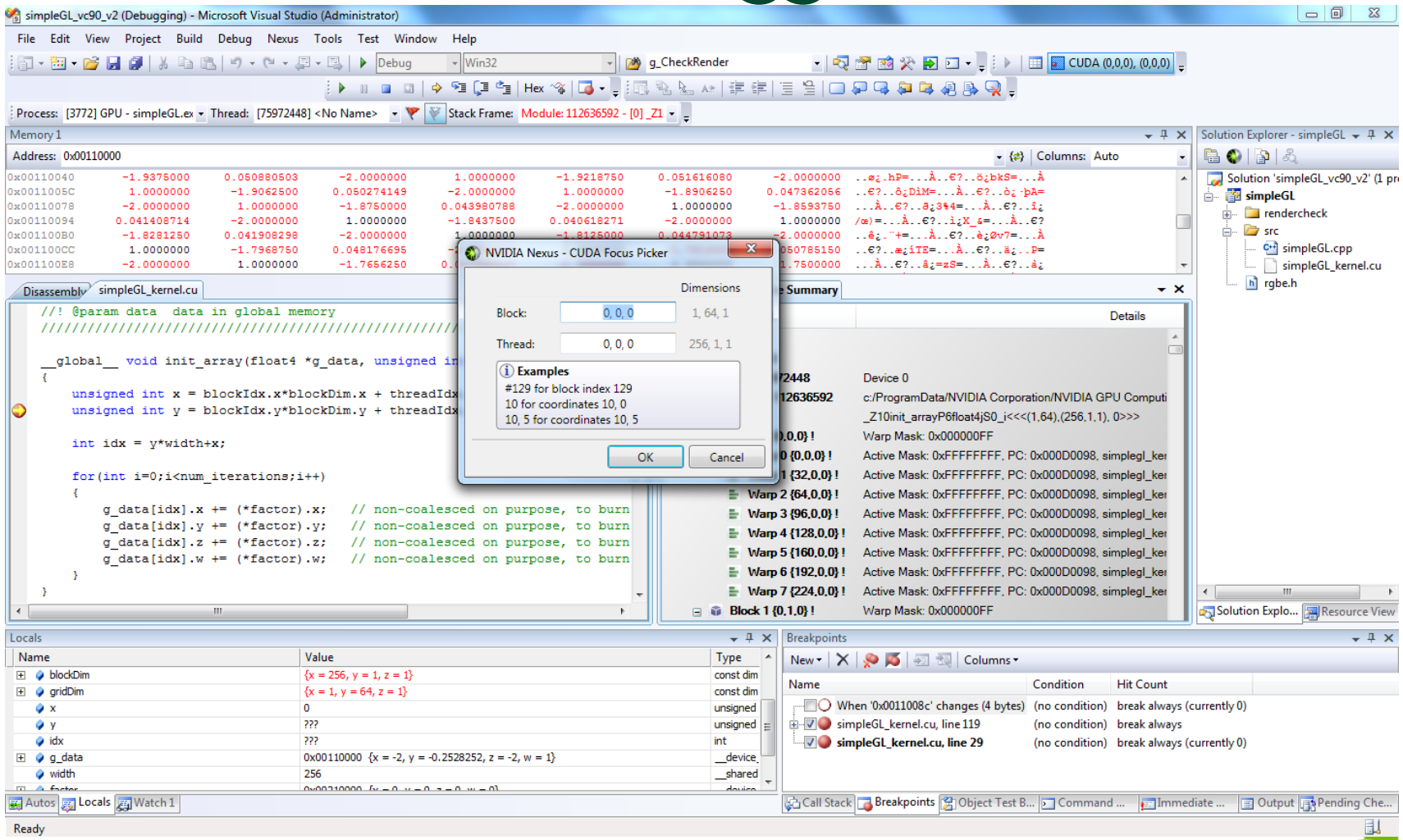


My Heterogeneous Computing Sample…





Nexus C-CUDA Debugger Demo



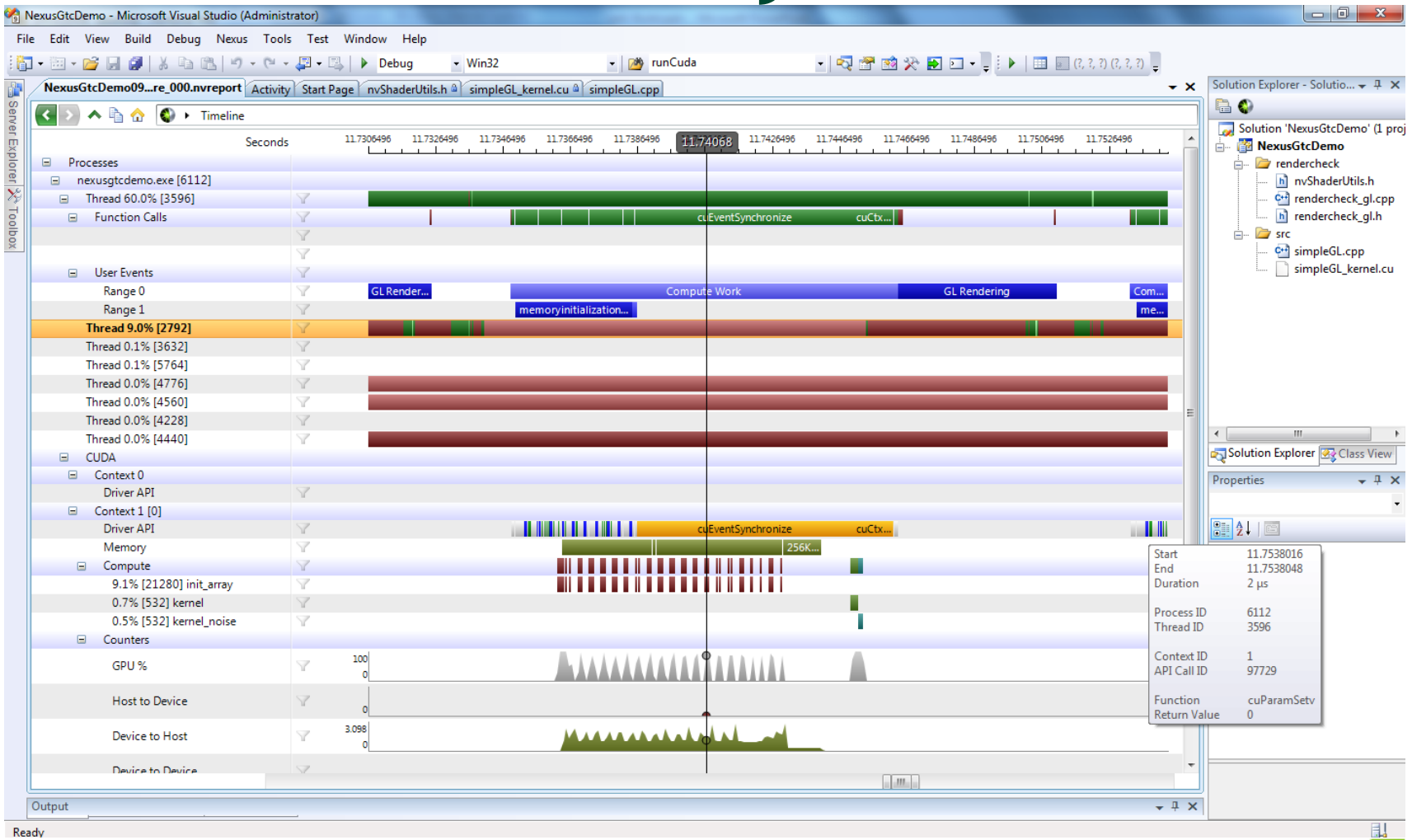
Developing for Heterogeneous Platforms

- CPU and GPU cooperation
- PCI-E / memory transfers
- Latency

Platform Analysis

- Collect platform activity
  - OS – process, thread, thread switch, and module events
  - CPU API Trace – CUDA driver API, DirectX, OpenGL, OpenCL, Cg2.2 and User Events
  - GPU Task Trace – C-CUDA and OpenCL launches and memory copies
- Display summary pages, timeline, API call logs, and GPU task logs

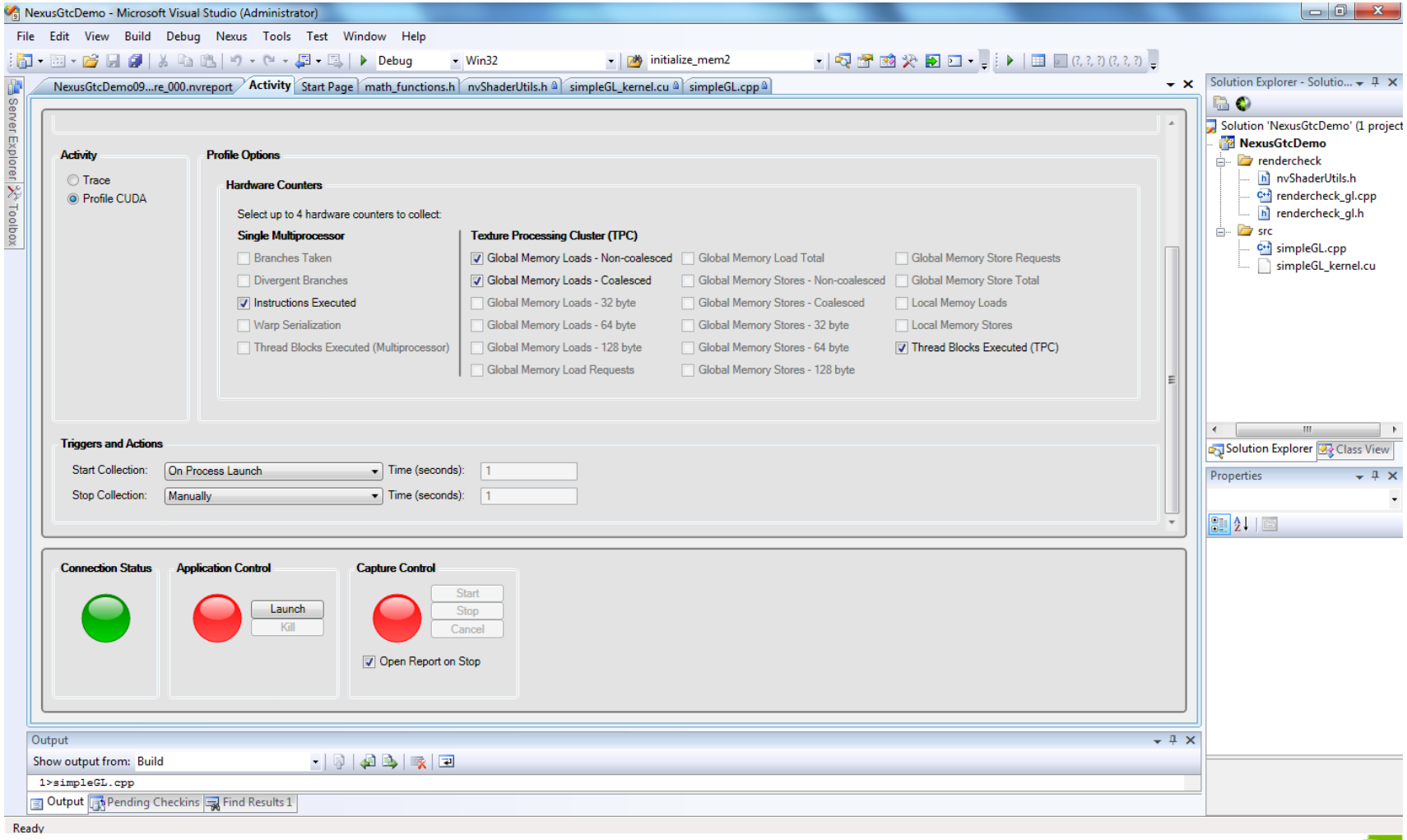
Nexus Platform Analysis Demo



CUDA Profiling

- Kernel tuning basic
  - Memory coalescing
  - Branch divergence
  - Instructions executed
  - Warp serialization
- Use of hardware performance counters

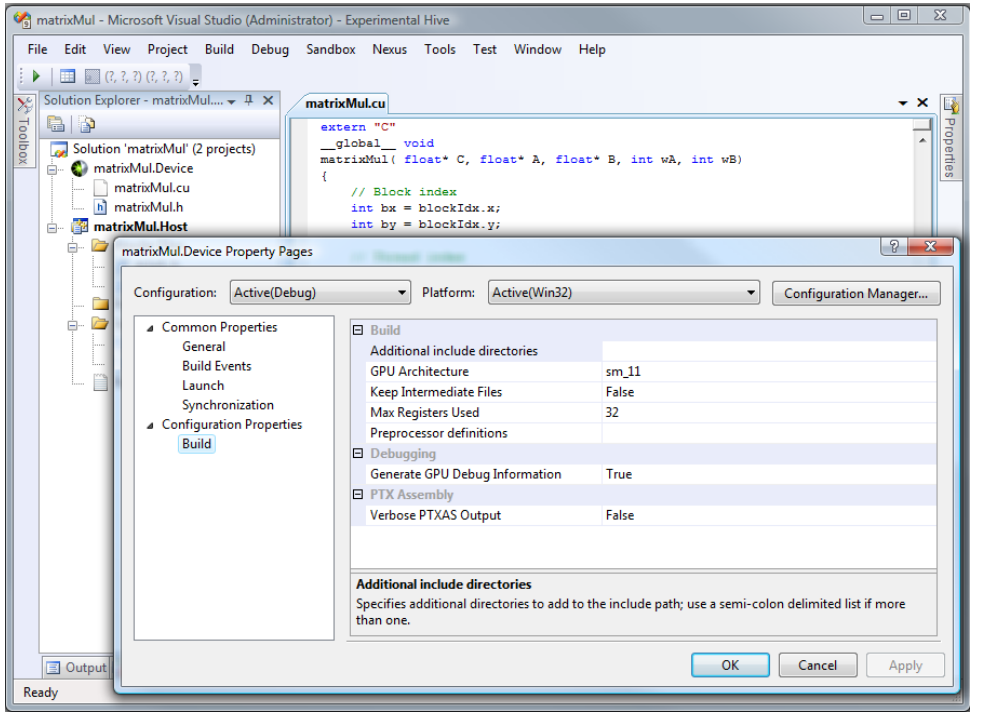
Nexus CUDA Profiler



NVIDIA.

Nexus Build

- C++ project system
  - Nexus options: launch, sync,…
  - CUDA vsprop files
- CUDA project system
  - NVCC build integration
  - Error reporting
  - Debugger session



Nexus Products

	Nexus Standard	Nexus Professional
Price	Free	$349
Platforms	Windows Vista SP1 Windows 7	Windows Vista SP1 Windows 7
IDE Integration	Visual Studio 2008 SP1 Standard and above	Visual Studio 2008 SP1 Standard and above
CUDA -C debugging and profiling	✔	✔
DirectCompute debugging and profiling	✔	✔
Remote Debugging	✔	✔
OpenCL Profiling	✔	✔
Memory Checker	✔	✔
Data breakpoints	-	✔
Buffer Visualizer	-	✔
System Trace (CPU + GPU)	-	✔
Priority Ticket Support	-	✔

Supported Operating Systems

Windows Vista SP1

32bit

64bit

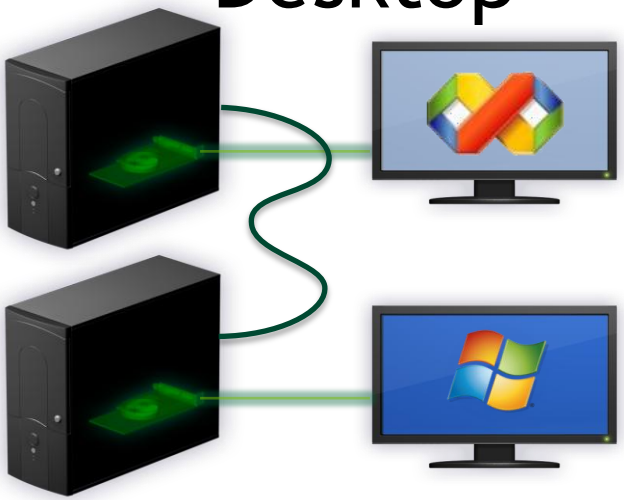
32-on-64

Windows 7

System Requirements

Remote Debugging

Desktop

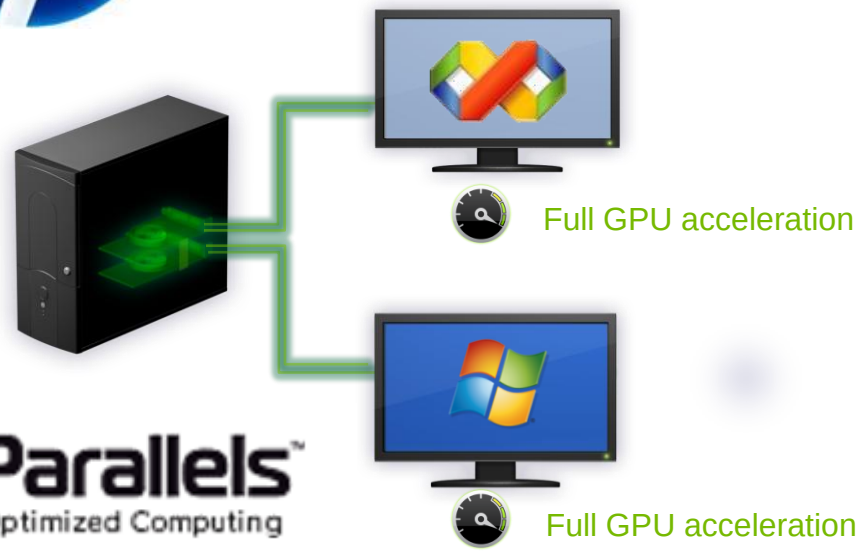


Mobile

System Requirements

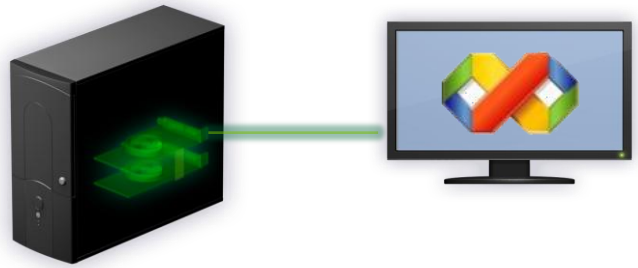
Local Debugging

SLI Multi-OS



Parallels™ Optimized Computing

Multi-GPU



GPU Requirements

- CUDA 1.1 capable GPU
- GeForce 9 and GTX series
- QuadroFX x700 and x800 series
- Tesla C1060
- Fermi architecture-based products
- Non-NVIDIA DirectX 10 and 11 GPUs (with reduced feature set)

Roadmap and Schedule

	Beta1 October '09	Beta2 January '10	Release Q1'10
C-CUDA	✔	✔	✔
DirectX 10	✔	✔	✔
DirectCompute		✔	✔
DirectX 11		✔	✔
OpenCL 1.0		Trace only	Trace only
OpenGL 3.2/Cg2.2	Trace only	Trace only	Trace only

Conclusion and Recap

- Revolutionizing GPU development
  - GPU is now a first-class development target
  - All Compute and Graphics languages and APIs
- Co-Processing Development Solution
  - Clear view of the overall platform activities
  - Deep analysis of specific workloads
- Visual Studio 2008 SP1 Standard and Above
- Windows Vista SP1 and Windows 7

Q&A

- 1-hour Nexus Labs @ Piedmont Room:
  - Friday (2pm-5pm)
- Register for the Beta program today:

  http://developer.nvidia.com/object/nexus.html
- For Linux - CUDA-gdb talk
  - Friday, Gold Room at 2h30pm