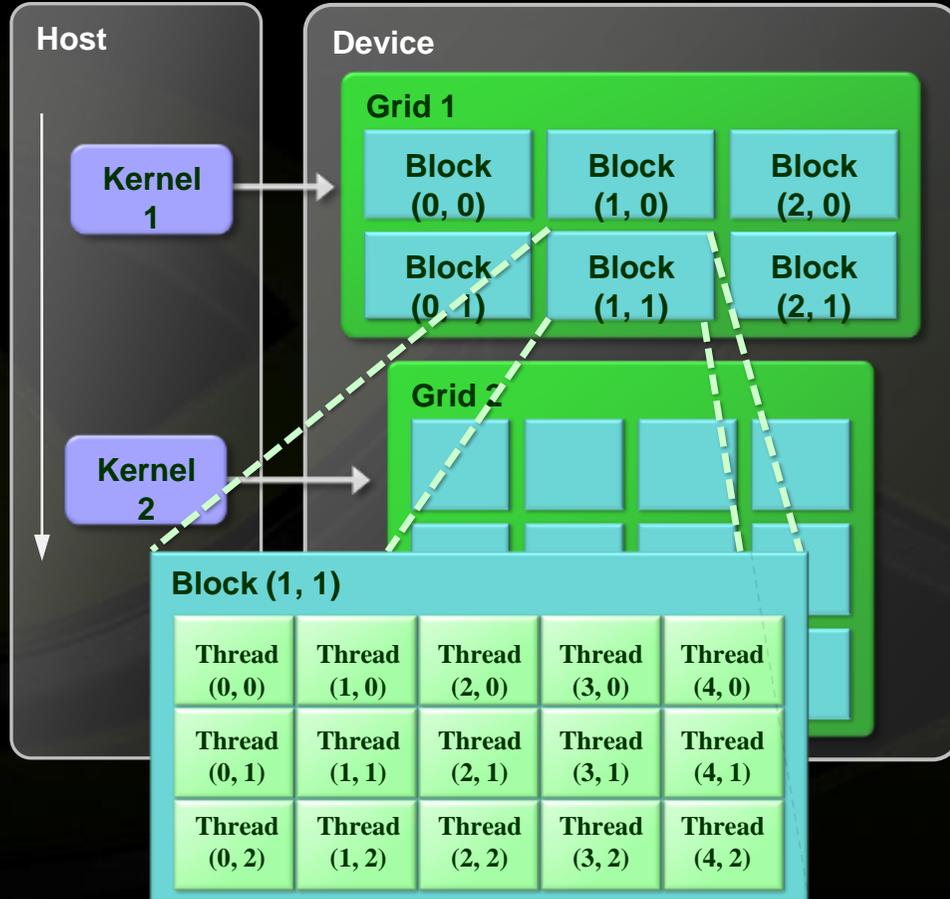




A Powerful IDE for GPU Computing on Windows Codenamed “Nexus”

Supercomputing '09 | November 2009 | Stephen Jones, Product Line Manager, NVIDIA

Massively Parallel Application Design Considerations



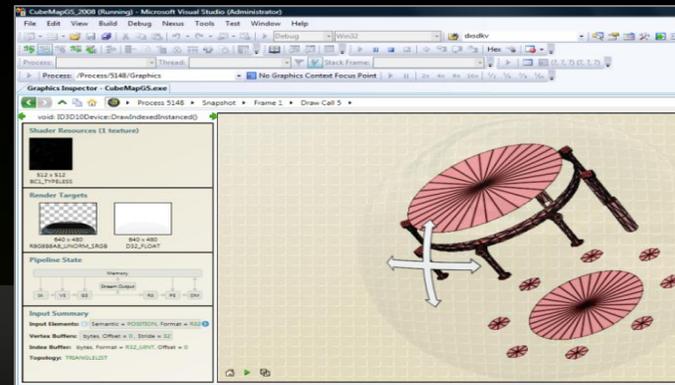
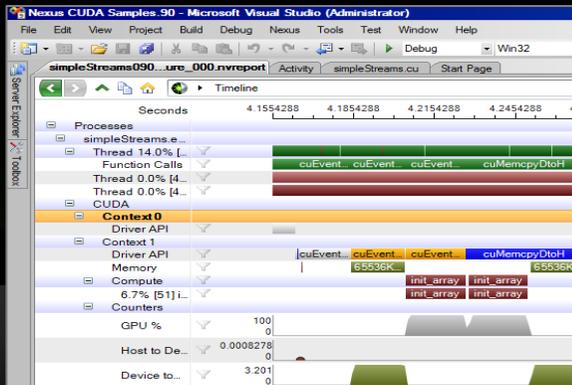
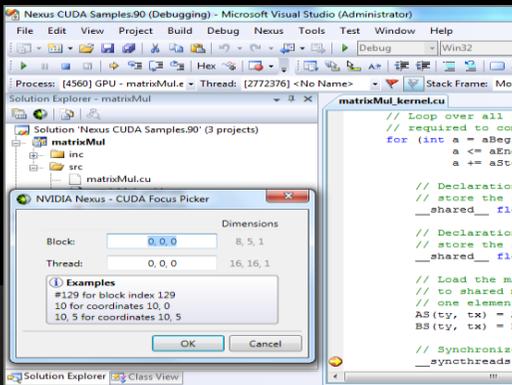
- Asynchronous processing
- Memory transfers
- Tens of thousands of threads
- Debugging divergent branches
- Complex memory hierarchy

NVIDIA “Nexus” Development Environment

- ✓ Complete **Visual Studio-integrated** solution
- ✓ The industry’s first IDE solution for **massively parallel** applications
- ✓ Accelerates **co-processing** (CPU + GPU) application development
- ✓ CUDA C, OpenCL and DirectCompute



“Nexus” : A Development Environment for Massively Parallel Applications



Parallel Debugger

GPU source code debugging

Variable & memory inspection

System Analyzer

Platform-level Analysis

For the CPU and GPU

Visualize Compute Kernels, Driver API Calls, and Memory Transfers

Graphics Inspector

Visualize and debug graphics content



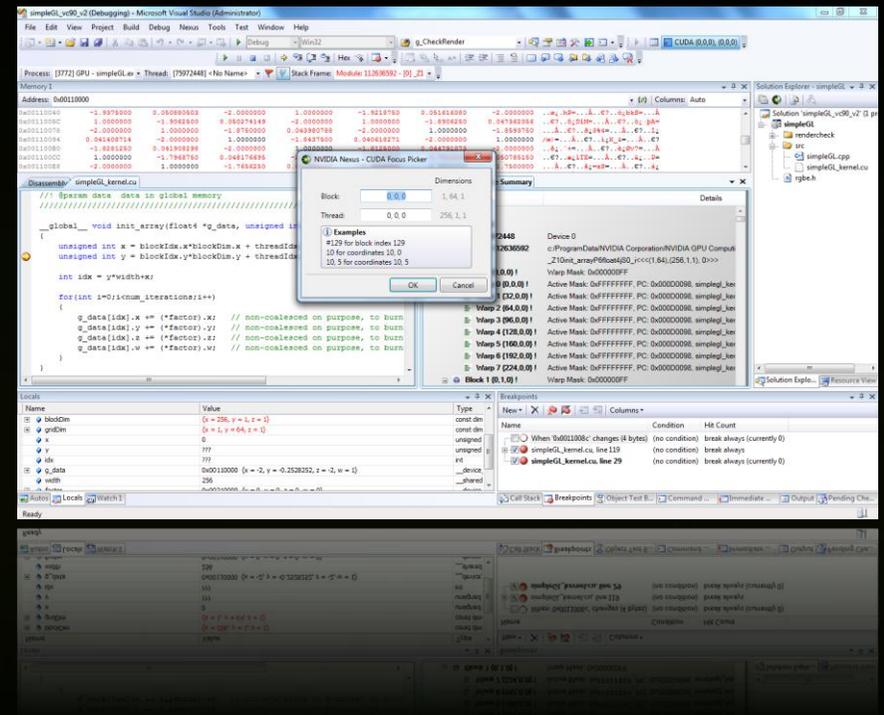
“Nexus” Massively Parallel Debugger

✓ Visual Studio Integration

- Memory, Locals, Watch, Register, Breakpoint, and Thread Views
- Syntax highlighting

✓ Parallel Debugging Tools

- Source, Conditional and Data Breakpoints
- Warp level run control and stepping
- Focus Picker for switching between thousands of active threads
- Out-of-bounds Memory Checker



“Nexus” Platform Analyzer



✓ System Trace (GPU + CPU)

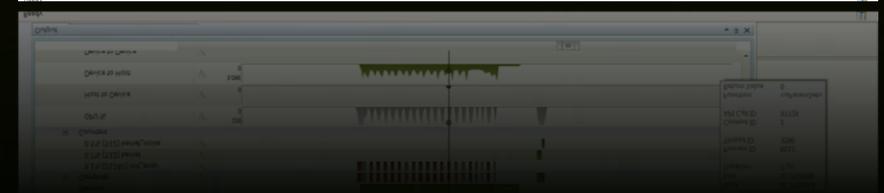
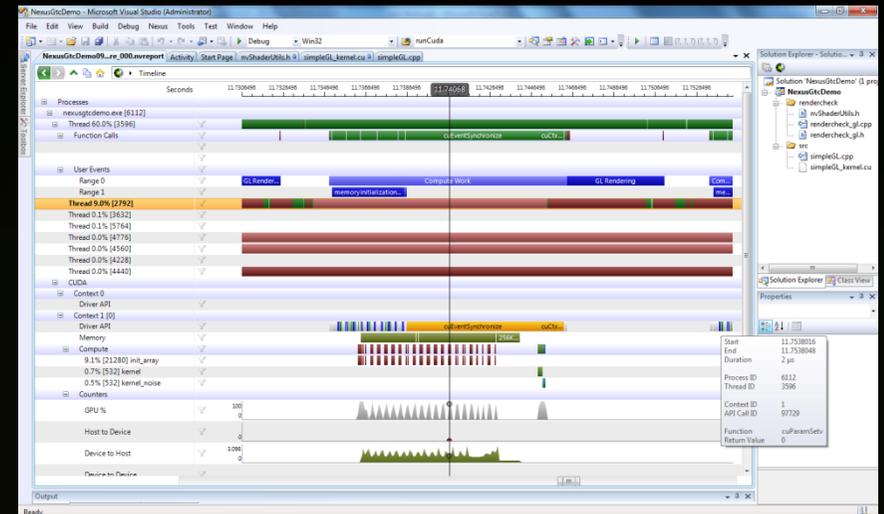
- Visualize Compute Kernels, Driver API Calls and Memory Transfers
- Optimize GPU Utilization
- Custom Markers and Events

✓ CUDA Profiling

- Hardware Counters

✓ Reporting Views

- Summary Reports
- Timeline View



Massively Parallel Development Tools for Linux



cuda-gdb

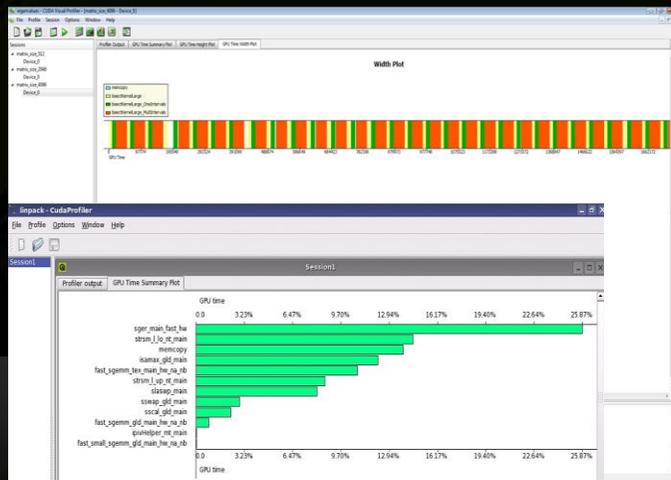
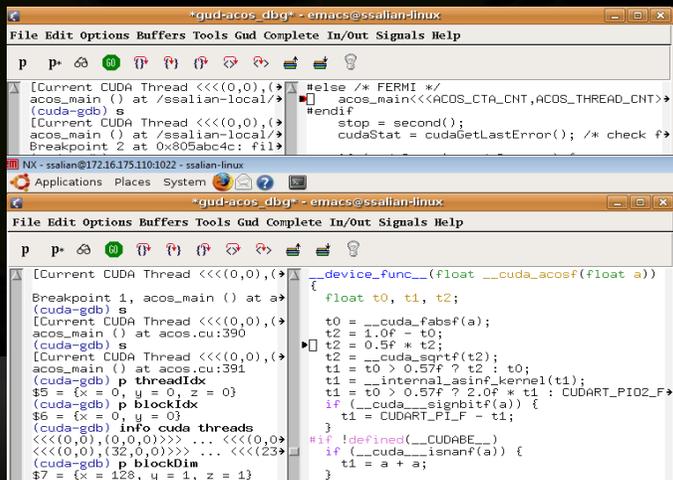
- Supports both 32 and 64 bit
- Seamlessly debug both the host/CPU and device/GPU

Visual Profiler

- Cross-platform compute profiler

Tools Partners

- Allinea and TotalView



“Nexus” Availability



	“Nexus” Standard	“Nexus” Professional
Price	No Charge	\$349
Platforms	Windows Vista, Windows 7	Windows Vista, Windows 7
IDE Integration	Visual Studio 2008 SP1	Visual Studio 2008 SP1
CUDA C	✓	✓
DirectCompute	✓	✓
OpenCL (Profiling-only)	✓	✓
Data Breakpoints	✗	✓
Buffer Visualization	✗	✓
System Trace (CPU + GPU)	✗	✓
Professional Support	✗	✓

Beta available November 2009 | Releasing in late Q1 2010 | www.nvidia.com/nexus

Conclusion

- ✓ **NVIDIA GPUs provide support for debugging and profiling.**
- ✓ **“Nexus” delivers professional tools for massively parallel application development within Visual Studio.**
- ✓ **Visual Profiler and cuda-gdb support Linux development.**
- ✓ **NVIDIA supports other vendors, such as Allinea and TotalView for professional class solutions for Linux.**



Register for the “Nexus” beta program:
www.nvidia.com/nexus.



Stephen Jones (sjones@nvidia.com)
Product Line Manager, NVIDIA

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