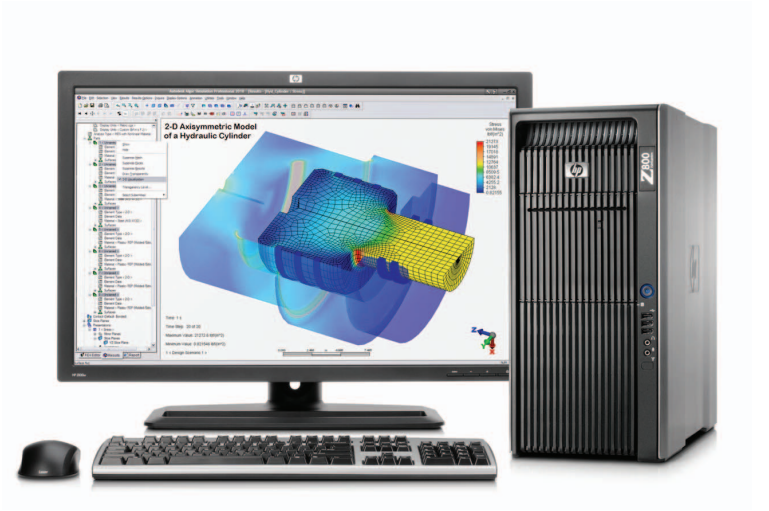
GPU computing



Introduction: This white paper introduces the concepts of GPU computing, discusses its hardware and software requirements, and provides recommendations for creating a GPU computing system with HP Workstations.

GPU computing overview:

GPU computing uses the graphics-processing unit (GPU) to accelerate compute-intensive-tasks. GPU computing is best suited to computationally intensive problems such as video encoding, digital image processing, fluid dynamics, financial analysis and molecular modeling that can scale well on a GPU and take advantage of the hundreds of cores a GPU offers. Applications and third-party providers are adding functions that use the GPU to accelerate common operations. Others are implementing their own proprietary algorithms using GPU compute to realize performance increases.

GPU computing software

Applications must be specifically written to take advantage of GPU computing hardware. Some software packages, such as the Jacket engine for MATLAB or the Elemental plug-in for Adobe® Creative Suite 4, have been optimized for increased performance on a GPU. Many other applications, through the efforts of over 250 ISVs in fields such as CAD, oil and gas, and medical imaging, have been designed to work with NVIDIA's CUDA. Whether or not an application will benefit from GPU computing depends on the nature of the application or problem. Applications not written for GPU computing will not show a performance increase.

GPU computing with HP Workstations

The 3D NVIDIA Quadro and ATI FirePro graphics cards available with HP Workstations are capable of performing GPU computing. NVIDIA Tesla cards are available as an option for the HP Z800 Workstation. Both NVIDIA and ATI solutions are supported as part of the tested and certified HP Leadership Graphics program.

GPU COMPUTING WITH HP WORKSTATIONS		
GOOD	**BETTER**	**BEST**
HP Z800 Workstation	HP Z800 Workstation	HP Z800 Workstation
4 GB system memory	8 GB system memory	8 GB system memory
1 Tesla C1060	2 Tesla C1060	1 Tesla C1060
1 Quadro FX 380	1 Quadro FX 380	1 Quadro FX 3800 or FX 5800

HP recommends a single-socket CPU with at least 1066 MHz front-side bus and at least 1 GB of system memory (required) or 4 GB of system memory (recommended) for each Tesla C1060 card in the system.

For more information, please visit:

Tesla— http://www.nvidia.com/tesla

CUDA— http://www.nvidia.com/cuda

Stream— http://www.amd.com/stream

OpenCL— http://www.khronos.org/opencl

DirectX Compute— http://www.nvidia.com/dxcompute

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