

High Performance Technical Computing

Top Technology Needs

1. High Performance per Watt
2. Open Systems
3. Multiple Software Entry Points
4. Scalable Systems
5. Commodity Components

Evolution of High Performance Computing

High performance computing is evolving. Commodity CPUs and GPUs are combining to push the compute envelope where true performance is measured in GFLOPs per watt and not just raw speed. Commercial and academic researchers alike demand faster results that leverage open systems and commodity components measured in \$/GFLOP.

AMD and AMD Stream Computing deliver a combination of low power, high performance GPUs and CPUs as well as a complete open systems ecosystem.

How AMD Stream Computing Can Help

When researchers standardize on AMD Stream technology, they get a wealth of benefits including:

- **Over 5 GFLOPs per watt!** 500 GFLOPs* of raw floating point performance at under 100 watts
- **Commodity GPU technology** optimized for computation, under \$4/GFLOP**
- **Multiple software development paths** from high level languages and libraries to low level microcode and single device access
- **Solution scalability** through combinations of CPUs and GPUs to match specific problem needs
- **Support from AMD engineers and partners** throughout your development process

Technology Need	AMD Stream Computing Solution
High performance per watt	• Over 5 GFLOPs per watt of performance potential
Open systems	• Familiar 32 and 64 bit Linux and Windows environments • High level tools from multiple 3rd party developers
Multiple software entry points	• C-like development environment via extensions to open source Brook • Low level access to hardware via open IL and ISA specifications in AMD Stream's CAL
Scalable solutions	• Stream software supports multiple GPUs per system
Commodity components	• FireStream leverages commodity GPU components designed for PC gamers resulting in a reliable GPU and memory upgrade roadmap

AMD FireStream 9170

Delivering the tremendous parallel processing power of the GPU to compute-intensive applications

AMD FireStream 9170, the industry's first GPU accelerator to combine double precision floating point in hardware with a performance profile of over 5 GFLOPs per watt.

AMD Stream utilizes mainstream GPU technology developed for the gaming community and repurposes it for high performance compute needs. The result is a standard PCIe plug-in board using established commodity components for a low cost, reliable compute engine for the HPC community

AMD Stream SDK

An open systems approach

AMD Stream SDK leverages open source technology and software technology partners to provide a robust, open, multi-layer development environment on 32/64 bit Linux and 32/64 bit Windows.

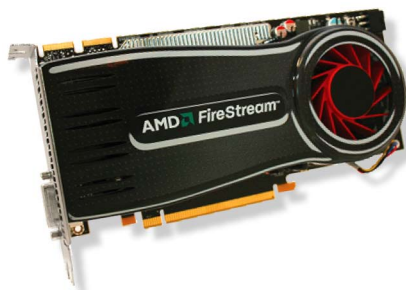


Image courtesy of Los Alamos National Labs

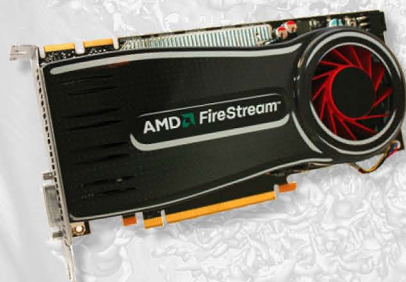
Learn more by visiting www.amd.com/stream

AMD
Smarter Choice

AMD Stream Computing

GPU technology that accelerates complex scientific, business, and consumer applications

AMD FireStream 9170 GPU accelerator



Feature	Benefit
500 GFLOPs of compute power	Dramatic acceleration for critical algorithms
< 100 watts power consumption	55nm process provides optimal power performance match
Double precision floating point	Appropriate for scientific and engineering calculations
Asynchronous DMA	Move data without interrupting streams processor or CPU
2GB on-board memory	Compute on large datasets without CPU traffic
Memory export	Provides flexible storage for intermediate results

AMD Stream SDK

The AMD Stream SDK delivers the tools developers need to create and optimize applications on Stream processors. Developers can begin with Brook+, an AMD-enhanced and supported implementation of Brook, the popular open-source C-level language and compiler. Math functions can be implemented using a new release of AMD Core Math Library for the GPU (ACML-GPU) and tools like ATI Shader Analyzer and AMD Code Analyst help identify and correct performance issues.

AMD's Compute Abstraction Layer (CAL) provides low level access to the GPU for development and performance tuning. AMD's open systems approach allows developers access to all key APIs and specifications, enabling performance tuning at the lowest level and development of third party tools.

AMD Stream SDK supports 32/64-bit RHEL 5.1 and 32/64-bit SUSE 10 SP1 as well as 32/64-bit Windows XP.

Industries and Applications

Financial Analytics

Increase Black-Scholes speed-to-results through the highly parallel architecture of the Stream processor

Energy, Oil and Gas

Seismic analysis on larger or more granular geographies to quickly identify regions of high discovery probability

Life Sciences

Protein folding, sequencing and alignment investigations, Hidden Markov Models and more are ideal problems for the highly parallel Stream Computing architecture

Computer Aided Engineering (CFD, FEA, etc.)

Faster results with existing model DoF or higher number of variables (finer mesh) within existing calculation time frames

Consumer

High definition video and gaming benefit from the integration of GPU and CPU

AMD System Solutions



HP DL385 SERVER

HP reliability and AMD Opteron™ processor performance combine in a 2U server for simplified management and powerful computing.



HP xw8600 WORKSTATION

Delivering extreme performance for massive compute and visual capacity.

* Single precision

** MSRP: \$1999 for the 2GB FireStream 9170