

The AMD Opteron™ processor is the ideal solution for High Performance Computing



AMD Opteron™ processors = More Cores, More Memory, Less Money

Reasons to Recommend AMD Opteron™ processors for HPC:

- Intel offers 4 and 6-core Intel Xeon 5600 Series (“Westmere”) processors with fewer cores and fewer memory channels than AMD Opteron™ 6100 Series processors

How to Sell/Position:

- AMD dedicated cores deliver consistent thread performance for highly scalable workloads.
- 4 memory channels per AMD Opteron™ 6100 Series processor results in superior memory bandwidth
→ 400 GFlops in a 4P config¹

39% more GFLOPS per processor than Intel Xeon X5680!²

Processor Comparison	AMD Opteron™ 6100 Series processor	Intel Xeon 5600 Series processor
Cores per processor	8 or 12 cores	4 or 6 cores
Processors supported	2P or 4P	1P and 2P
Memory ch./processor	4	3
Total DIMM slots/socket	12/socket	9/socket
GFLOPS/processor	up to 110	up to 79

Workload Needs	Why Choose AMD
Floating point capabilities for complex math algorithms	The AMD Opteron™ 6100 Series processor has up to 12 floating point units (FPUs) per CPU at 128-bit.
Large memory footprint and higher bandwidth	The AMD Opteron™ 6100 Series processor has up to 4 memory channels and 3 DIMMs per channel, which allow for more robust memory configurations.
Scalability – compute, memory and I/O that supports high bandwidth interconnects	The AMD Opteron™ 6100 Series processor offers: <ul style="list-style-type: none"> • Four DDR3-1333 memory channels • Four HT3.1 links running at up to 6.4GT/s • HT Assist improves memory bandwidth • PCI Express® Gen 2 for high speed I/O peripherals (QDR InfiniBand & 10Gig(E))
Optimize rack space for large installations	The AMD Opteron™ 6100 Series processor has 8-12 physical cores that provide extremely high compute density to help address the most demanding tasks

Software and Tools to Extract Higher Value from AMD

- Linux & Windows clustered environments
- Broad array of commercial and open source HPC applications
- OpenCL™, X86 Open 64 Compiler, ACML – Visit Developer.amd.com for more information

2. What is your time frame for deployment?

- Q2 2011 – propose AMD Opteron™ 6100 Series processors
- Q3 2011 – pitch “Interlagos” processors

3. Do you have power limitations or guidance?

4. Do you have any budgetary guidance for consideration?

Consideration questions:

1. How many nodes/flops are you looking for?

→ Nodes = ?

→ Flops = ?



Positioning Guidance

The table below is sorted by descending SPECint[®]_rate2006 performance. For example, a server using 2 x AMD Opteron[™] processors Model 6172 provides higher SPECint[®]_rate2006 performance than a server using 2 x Intel Xeon processor Model X5670 AND has a lower total processor 1kU price.

Model	SPECint_rate2006	SPECfp_rate2006	SPECint_rate_base2006	GFLOPs (Theoretical)	Total Processor 1kU Price
AMD Opteron [™] processor Model 6168	706	584	608	365	\$2,976
AMD Opteron [™] processor Model 6136	588	516	507	307	\$2,976
AMD Opteron [™] processor Model 6134	569	504	491	294	\$2,092
AMD Opteron [™] processor Model 6128	512	465	444	256	\$1,064
AMD Opteron [™] processor Model 6176	406	324	352	221	\$2,530
2 x Intel Xeon processor Model X5675	397	266	372	147	\$2,880
AMD Opteron [™] processor Model 6174	395	319	354	211	\$2,330
2 x Intel Xeon processor Model X5670	387	259	361	141	\$2,880
AMD Opteron [™] processor Model 6172	380	309	331	202	\$1,978
2 x Intel Xeon processor Model X5650	365	248	340	128	\$1,992
2 x Intel Xeon processor Model X5660	355	245	331	134	\$2,438
2 x AMD Opteron [™] processor Model 6168	353	294	309	182	\$1,488
2 x Intel Xeon processor Model E5649	325	221	304	121	\$1,548
2 x Intel Xeon processor Model E5645	315	217	295	115	\$1,102
2 x AMD Opteron [™] processor Model 6140	313	271	269	166	\$1,978
2 x Intel Xeon processor Model X5672	306	228	291	102	\$2,880
2 x AMD Opteron [™] processor Model 6136	295	259	254	154	\$1,488
2 x Intel Xeon processor Model X5667	287	215	271	98	\$2,880
2 x AMD Opteron [™] processor Model 6134	286	254	247	147	\$1,046
2 x AMD Opteron [™] processor Model 6128	257	234	223	128	\$532
2 x Intel Xeon processor Model E5640	243	179	227	85	\$1,548
2 x Intel Xeon processor Model E5620	235	179	221	77	\$774
2 x Intel Xeon processor Model E5630	233	174	219	81	\$1,102

All Pricing reflects 1kU tray pricing for total system processor price on www.amd.com and www.intel.com as of March 7, 2011.

The AMD Opteron processor-based 2P server provides more cores, more memory channels, more memory capacity at a lower total processor price.

Additional Reference Materials:

For the latest benchmarking information, visit: www.amd.com/opteronperformance

Download the HPC High Performance Linkpack Whitepaper from developer.amd.com/documentation/articles/pages/HPCHighPerformanceLinkpack.aspx

Download the Compiler Options Quick Reference Guide from developer.amd.com/Assets/CompilerOptQuickRef-61004100.pdf

To subscribe to the AMD Developer Central newsletter, register at ssl-developer.amd.com/membership/registration.aspx

Additional comparison tools are available for Database and Virtualization, Web Hosting and Infrastructure workloads, and Cloud Computing on adam.amd.com.

Additional information on HPC & AMD at www.amd.com/hpc

SPEC, SPECint, and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. The SPECint_rate, SPECfp_rate, SPECint_rate_base, and SPECfp_rate_base results stated above reflect results published on <http://www.spec.org/cpu2006/results/> as of March 7, 2010. The comparison presented above is based on the best performing server using the specified AMD Opteron[™] processor Models and Intel Xeon processor Models operating at each processor's default frequency. For the latest SPECint_rate2006 and SPECfp_rate2006 results, visit <http://www.spec.org/cpu2006/results/>. For processors supporting a maximum memory speed of DDR3-1333, theoretical memory bandwidth = 10.667GB/s x number of memory channels per server. For processors supporting a maximum memory speed of DDR3-1066, theoretical memory bandwidth = 8.553GB/s x number of memory channels per server.

Theoretical GFLOPs = Core Count x Core Frequency x number of processors per server x 4.
All Pricing reflects 1kU tray pricing for total system processor price on www.amd.com and www.intel.com as of March 7, 2011

¹ A four processor server using AMD Opteron[™] processor Model 6180 SE can provide 480 theoretical GFLOPs.

² Intel Xeon processor specifications as of March 31, 2011: http://www.intel.com/p/en_US/products/server/processor/xeon5000/specifications

A two processor server using AMD Opteron[™] processor Model 6176 can provide 221 theoretical GFLOPs. A two processor server using Intel Xeon processor Model X5680 can provide 160 theoretical GFLOPs.

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