



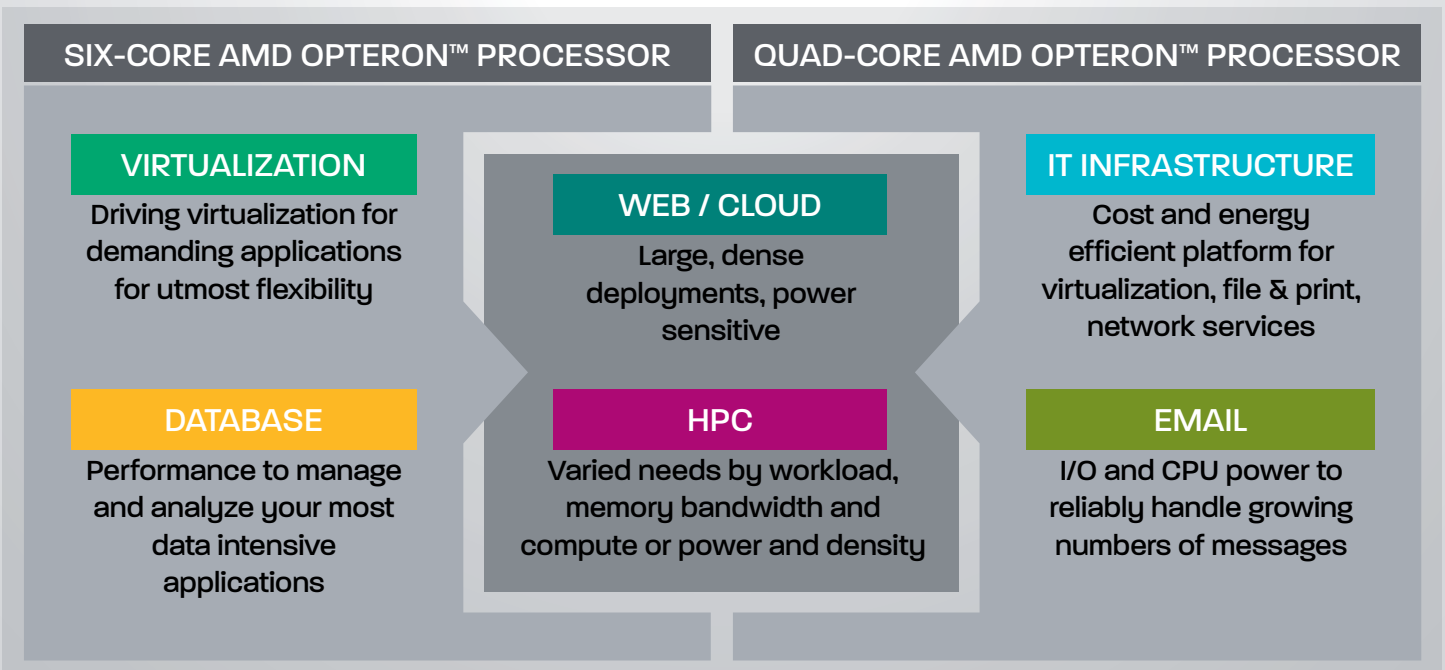
Six-Core AMD Opteron™ Processors: Top-line performance that's bottom-line efficient

- Industry's only x86 six-core processor for 2P, 4P and 8P and servers
- Up to 50% higher performance (depending on workload)* than Quad-Core AMD Opteron™ processor-based servers at the same processor ACP
- Total cost advantage with AMD Opteron™ processors = Affordability without compromise

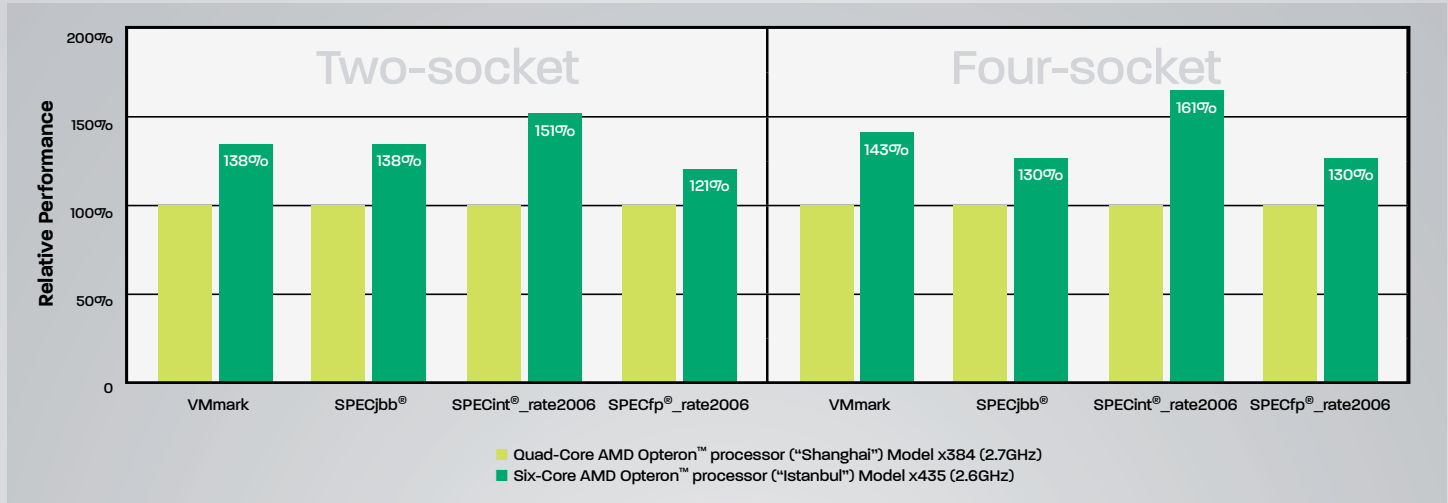
Quad-Core AMD Opteron™ Processor and Six-Core AMD Opteron™ Processor Product Comparison

	Quad-Core AMD Opteron™ Processor	Six-Core AMD Opteron™ Processor	Six-Core Benefit
	Quad-core performance for applications that need a balance of clock speed and threading	Six-core performance for applications that need a higher amount of threading	
Cores	4	6	Scalable systems to 48 total cores
Power/Thermals	ACP 40/55/75/105 TDP 60/79/115/137	ACP TBD/55/75/105 TDP 60/79/115/137**	Full line of products from EE to SE,** More performance in the same power/thermals
HyperTransport™ Technology	3x HyperTransport™ 1 or 3x HyperTransport™ 3 technology (between CPUs) Up to 17.6GB/s per link @ 4.4 GT/s	3x HyperTransport™ 1 or 3x HyperTransport™ 3 technology (between CPUs) Up to 19.2GB/s per link @ 4.8 GT/s	Improved overall system balance and scalability for scale out computing environments
Performance	Up to ~35% performance increase over Quad-Core AMD Opteron™ processor codenamed "Barcelona"***	Up to 50% performance increase over Quad-Core AMD Opteron™ processor codenamed "Shanghai"***	Increased performance within the same power envelope
Optimized Workloads	Web serving, email, file/print, network infrastructure, compute intensive, clock-sensitive HPC	Virtualization, database, multi-threaded or power-constrained HPC, cloud computing	Value and choice based on the needs of the workload

Which AMD Opteron™ processor is right for me?



Up to 50% higher performance (depending on workload)* than Quad-Core AMD Opteron™ processor-based servers at the same processor ACP



Six-Core AMD Opteron™ Processor Model Numbers



Model	Cores	Freq	Northbridge	ACP	L2 Cache	L3 Cache	Planned Production
8435	6	2.6GHz	2.2GHz	75W	512K/core	6MB	In Production
8431		2.4GHz					
2435		2.6GHz					
2431		2.4GHz					
2427		2.2GHz					
8425 HE	6	2.1GHz	2.2GHz	55W	512K/core	6MB	In Production
2425 HE		2.1GHz					
2423 HE		2.0GHz					
8439 SE	6	2.8GHz	2.2GHz	105W	512K/core	6MB	In Production
2439 SE		2.8GHz					
2419 EE	6	1.8GHz	2.0GHz	TBD	512K/core	6MB	Q3

* Up to 50% greater performance than prior generation:

Testing scores posted on www.amd.com as of July 21, 2009 showed the following performance gains for the Six-Core AMD Opteron™ processor Model 2384 ("Istanbul") over Quad-Core AMD Opteron™ processor Model 2435 ("Shanghai"): 2P VMmark 38%: <http://www.vmware.com/files/pdf/vmmark/VMmark-HP-2008-12-30-DL385.pdf> & <http://www.vmware.com/files/pdf/vmmark/VMmark-HP-2009-06-02-dl385g6.pdf>; 2P SPECjbb 38%: <http://www.spec.org/osg/jbb2005/results/res2008q4/jbb2005-20081024-00551.html> & <http://www.spec.org/osg/jbb2005/results/res2009q3/jbb2005-20090616-00744.html>; 2P SPECint_rate2006 51%: <http://www.spec.org/cpu2006/results/res2008q4/cpu2006-20081024-05683.html> & <http://www.spec.org/cpu2006/results/res2009q2/cpu2006-20090511-07357.html>; 2P SPECfp_rate2006 21%: <http://www.spec.org/cpu2006/results/res2009q1/cpu2006-20090116-06418.html> & <http://www.spec.org/cpu2006/results/res2009q2/cpu2006-20090511-07358.html>; 4P VMmark 43%: <http://www.vmware.com/files/pdf/vmmark/VMmark-Dell-2008-11-12-R905.pdf> & <http://www.vmware.com/files/pdf/vmmark/VMmark-HP-2009-07-14-bl685cg6.pdf>; 4P SPECjbb 30%: <http://www.spec.org/osg/jbb2005/results/res2008q4/jbb2005-20081112-00559.html> & <http://www.spec.org/osg/jbb2005/results/res2009q2/jbb2005-20090519-00729.html>; 4P SPECint_rate2006 61%: <http://www.spec.org/cpu2006/results/res2008q4/cpu2006-20081027-05740.html> & <http://www.spec.org/cpu2006/results/res2009q2/cpu2006-20090511-07355.html>; 4P SPECfp_rate2006 30%: <http://www.spec.org/cpu2006/results/res2008q4/cpu2006-20081110-05969.html> & <http://www.spec.org/cpu2006/results/res2009q2/cpu2006-20090511-07356.html>. SPEC, SPECjbb, SPECint, and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. The results stated above reflect results published on www.vmware.com <<http://www.vmware.com>> and www.spec.org <<http://www.spec.org>> as of July 16, 2009. The comparisons presented above are based on the best performing two-socket using AMD Opteron™ processor Models 2384 and 2435 and the best performing four-socket servers using AMD Opteron™ processor Models 8384 and 8435. For the latest results, visit www.vmware.com <<http://www.vmware.com>> and www.spec.org <<http://www.spec.org>>

** Six-Core AMD Opteron™ EE processors expected launch dates Q3 09.

*** Benchmarks published on [amd.com](http://www.amd.com) as of November 13, 2008, show the following performance gains vs. systems based on the Quad-Core AMD Opteron™ processor codenamed "Barcelona": SPECint®_rate2006: 32%; SPECfp®_rate2006: 32%; SPECjbb®2005: 64%. See http://www.amd.com/us-en/Processors/ProductInformation/0_30_118_8796_8800,00.html.

