

I want to provide
**my customers a
business solution**
worthy of a Fortune 100 organization.



AMD Opteron™ processor-based solutions are your ideal choice for any size business.

These days, businesses of all sizes demand enterprise-level solutions, yet few of them have the budgets to match. Driven by investment protection and ROI concerns, customers are looking for compatibility, value, and performance they can count on.

At AMD, we've heard from plenty of system builders, system integrators, and value-added resellers struggling to establish a competitive difference in the face of mounting market pressures. The bottom line is this: You need stable, reliable server solutions that have the flexibility to meet a variety of business needs – while answering customer demands for compatibility, performance, and value.

AMD and our partners are working together to bring you a wide variety of solutions based on the AMD Opteron™ processor. Whether you choose fully validated solutions, “barebones” systems, or if you build-your-own server and workstation platform components, you'll enjoy the freedom to design and build solutions appropriate to your business needs. And each AMD Opteron processor-based solution you build can offer your customers full x86 compatibility and industry-leading performance for both 32- and 64-bit applications – along with innovative capabilities like AMD64 technology to help maximize IT investments well into the future.

To find out more about the AMD Opteron™ processor, visit www.amd.com/opteron.

Partnership is a priority.

Through our commitment to shared success, AMD is working with many partners to help you meet market demands and build a competitive advantage.

“We chose to expand our product offerings with the AMD Opteron™ processor because we recognize the immediate performance advantages in 32-bit environments, which accelerates ISV adoption and further advances the future of 64-bit ecosystems. The ProLiant servers and blades incorporating the AMD technology simply gives us the ability to offer our customers more performance and more choice.”

– James Mouton,
vice president, platform division,
Industry Standard Servers, HP

AMD Opteron™ processor excels in server system comparison.

Feature	AMD Opteron™ processor	Intel Xeon ¹	Intel Xeon MP ²	Intel Itanium 2 ³
Direct connection of CPUs	Yes	Requires Northbridge	Requires Northbridge	Requires Northbridge
SMP Capabilities	Up to 8 sockets	Up to 2-way	Up to 4-way	Up to 4-way
High-performance 32-bit and 64-bit computing	Yes	No	No	No
I/O based on HyperTransport™ technology	Yes	No	No	No
Integrated memory controller	Yes	No	No	No
Direct Connect Architecture	Yes	No	No	No
Front Side Bus frequency	1.4 - 2.4GHz [†]	533MHz	400MHz	400MHz
Front Side Bus bandwidth	11.2 - 19.2GB/s [†]	4.2GB/s	3.2GB/s	6.4GB/s
Maximum Inter-processor bandwidth	6.4GB/s	4.2GB/s	3.2GB/s	6.4GB/s
Memory support	DDR200/266/333/400	DDR266 - 4.3	DDR200	DDR200
Memory bandwidth 2P system	12.8GB/s ^{††}	4.3GB/s	6.4GB/s	6.4GB/s
Memory bandwidth 4P system	25.6GB/s ^{†††}	N/A	6.4GB/s	6.4GB/s
L1 cache size (max)	128KB	8KB+12k μ op	8KB+12k μ op	32KB
L2 cache size	1MB	512KB	512KB	256KB
L3 cache size	N/A	2MB	4MB	1.5MB/3MB/4MB/6MB
Maximum I/O bandwidth 2P system	12.8GB/s ^{††}	3.2GB/s	4.8GB/s	6.4GB/s
Maximum I/O bandwidth 4P system	25.6GB/s ^{†††}	N/A	4.8GB/s	6.4GB/s
SIMD Instruction Set Support	SSE, SSE2	SSE, SSE2	SSE, SSE2	N/A

[†] With the memory controller integrated onto the AMD Opteron™ processor, the front side bus (interface to memory) runs at the speed of the processor

^{††} 2P System – AMD Opteron processor 200 Series with 1 HyperTransport™ Inter-processor Bus and 2 HyperTransport I/O Buses with DDR400 memory

^{†††} 4P System – AMD Opteron processor 800 Series with 4 HyperTransport Inter-processor Buses and 4 HyperTransport I/O Buses with DDR400 memory

¹ With Intel E7501 Chipset (<http://developer.intel.com/design/chipsets/e7501/>)

² With ServerWorks GC-HC chipset (<http://www.serverworks.com/products/GCHE.html>)

³ With Intel E8870 chipset (<http://developer.intel.com/design/chipsets/e8870/#features>)

Dedicated Bandwidth

Shared Bandwidth

Offer the benefits that your customers expect.

The AMD Opteron™ processor is designed to be completely backward compatible, delivering maximum flexibility. This helps avoid unnecessary changes to existing software, while taking advantage of the processor's enhanced 32- and 64-bit performance.

Like all AMD processor families, the AMD Opteron processor is backed by over one billion cycles of testing, along with validation and qualification from Microsoft® Windows® Hardware Quality Labs (WHQL). We also perform additional testing to help ensure compliance with a wide range of industry-standard software and peripherals.

With the AMD Opteron processor, your customers can enjoy compatibility and industry-leading performance for current 32-bit applications and operating systems – including Windows

Small Business Server 2003, Windows NT®, Windows 2000, and Windows Server 2003. And to enable compatibility with a wide range of software favorites, AMD has established alliances with the major Independent Hardware Vendors (IHVs) and Independent Software Vendors (ISVs).

To take your customers into the future, AMD Opteron processors feature AMD64 technology, which delivers built-in capabilities designed to run most OS choices, including Linux and Microsoft Windows Server 2003 for 64-bit Extended Systems. At the same time, AMD64 technology helps customers protect their IT investment and simplify planning by enabling them to migrate to 64-bit computing on their own timetable – without sacrificing the existing hardware, software, or people they rely on to run their business.

“We are proud to be one of the first server manufacturers to ship the newest AMD Opteron™ processors. This new series of AMD Opteron processors offers industry-leading performance and gives our customers the ability to seamlessly transition to 64-bit applications for the ultimate in investment protection.”

– David Driggers, CEO of Verari Systems

“It is no surprise that in a little over one year, the AMD Opteron™ processor is the solution of choice in the high-performance computer market. AMD’s relentless drive to provide the highest performing processors enables Angstrom to continually increase its ranking on the Top 500 list and satisfy an ever-growing customer base.”

– Lalit Jain, CEO of Angstrom Microsystems

Features and benefits of the AMD Opteron™ processor.

AMD64 technology

- Allows customers to run their existing base of 32-bit applications and operating systems at peak performance
- Enables a single architecture across 32- and 64-bit environments, representing a new class of computing

Direct Connect Architecture

- Addresses and helps reduce the real challenges and bottlenecks of system architectures
- Optimizes memory performance by connecting directly to the CPU
- Creates more balanced throughput and expandability by connecting I/O directly to the CPU
- Connects CPUs directly to allow for more linear symmetrical multi-processing

Integrated DDR DRAM memory controller

- Changes the way the processor accesses main memory, resulting in increased bandwidth, reduced memory latencies, and increased processor performance
- Scales available memory bandwidth with the number of processors
- Supports up to eight (8) registered DDR DIMMs per processor with 128-bit integrated DDR DRAM memory controller
- Increases available memory bandwidth of up to 6.4GB/s (with PC3200) per processor

HyperTransport™ technology

- Provides scalable bandwidth interconnection between processors, I/O subsystems, and other chipsets
- Supplies up to 19.2GB/s of peak bandwidth per processor by supporting up to three (3) coherent HyperTransport links
- Offers sufficient bandwidth for supporting new interconnects including PCI-X, DDR, InfiniBand, and 10G Ethernet by offering up to 6.4GB/s bandwidth per link
- Allows for low-power consumption (1.2 volts) to help reduce a system’s thermal budget

Other features of the AMD Opteron processor:

- Incorporates a 48-bit virtual address space and a 40-bit physical address space through 64-bit wide key data and address paths
- Protects using ECC (Error Correcting Code) for L1 cache data, L2 cache data and tags, and DRAM with hardware scrubbing of all ECC arrays
- Lowers thermal output levels and improves frequency scaling with 130-nanometer SOI (Silicon on Insulator) process technology
- Supports all instructions necessary to be fully compatible with SSE2 technology
- Amplifies performance and frequency scalability with two (2) additional pipeline stages (in comparison to the AMD seventh-generation architecture)
- Increases IPC (Instructions per Clock) through additional key features, such as larger TLBs (Translation Look-aside Buffers), flush filters, and enhancing branch prediction algorithms

Low-power processors

- Offers industry-leading performance per watt with the AMD Opteron processor HE 55-watt, making it an ideal solution for rack-dense IU servers or blades in datacenter environments and cooler, quieter workstation designs.
- Provides the maximum I/O bandwidth currently available in a single-CPU controller with the AMD Opteron processor EE 30-watt; making it a good fit for embedded controllers in markets such as NAS and SAN.



“As the first OEM to announce support of the AMD Opteron™ processor and the first to introduce an AMD Opteron processor-based workstation to the market, IBM has worked closely with AMD to give customers the flexibility and performance to power intense-computing applications. As our customers continue to pursue new achievements in business and science through high-performance computing, we will continue to work with companies like AMD to offer the choices customers require.”

— Dave Turek, vice president of
Deep Computing at IBM

Experience AMD Opteron™ processors today.

AMD is completely committed to serving your business goals, as well as the technology needs and desires of your customers. We build upon this commitment – and that of valued partners like Microsoft – to create innovative solutions that contribute to your bottom line and offer genuine advantages to the marketplace. AMD Opteron processor-based solutions are a prime example, offering the flexibility and purchase options you need, along with the benefits your customers expect and deserve.

To find out more about the AMD Opteron processor, visit www.amd.com/opteron.

To become a member of the award-winning AMD Solution Provider Program, visit us at <http://marketbuilder.amd.com> or email reseller@amd.com.

About AMD

AMD (NYSE: AMD) designs and produces innovative microprocessors, Flash memory devices, and low-power solutions for the computer, communications, and consumer electronics industries. AMD is dedicated to

delivering standards-based, customer-focused solutions for technology users, ranging from enterprises and governments to individual consumers. For more information, visit <http://www.amd.com>.

For more information, please visit: www.amd.com/opteron



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