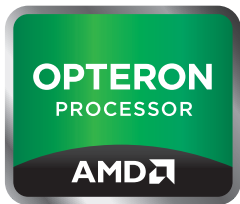


AMD Opteron™ 3000 Series Platform Quick Reference Guide

The AMD Opteron™ 3200 Series processor:
Entry level, enterprise-class servers at desktop pricing - a single-socket, money-in-pocket server solution.¹

AMD Opteron™ 3200 Series Processor



KEY FEATURES

- **New Core Architecture** — drives more core density and greater throughput
- **AMD Turbo CORE Technology** — turns unused TDP headroom into added clock speed for improved performance
- **TDP Power Cap** — allows the user to set the maximum processor power ceiling via BIOS or APML
- **Direct Connect Architecture 2.0** — can improve overall system performance and efficiency by eliminating traditional bottlenecks inherent in legacy front side bus architectures

END USER BENEFITS

Keep more money in your pocket with single-socket servers for under \$600¹

- Get up to 11% lower server acquisition cost than the competition.¹
- Faster payback – up to 14% quicker than the competition. In as few as 7 months, hosting fees can cover your AMD Opteron™ 3200 Series processor-based server hardware costs.²
- Get server quality and reliability features at a price that provides up to 11% lower acquisition cost than the competition.¹
- Achieve lower BOM and higher margins with up to 48% lower processor cost.³

Delivering more cores and better price performance^{4,5}

- Get up to 38% better price per performance than competing processors.⁵
- Experience up to 100% more cores than competition to deliver cost-effective performance.⁴
- Realize 19% less power per core than competing processors.⁶
- Maximize floor space by getting twice the server density per rack.⁷

Delivering performance and flexibility with worry-free, enterprise class reliability, software and OS certification and manageability

- Experience a true enterprise platform design at 11% lower cost than Intel-based servers.¹
- Certified for all major server OS families as well as Windows for Server 2008
- Provides enterprise OS support and are manageable and compatible with existing data center tools.
- ECC and reliability features
- Manageability capable
- Designed to run 24/7/365
- Long lifecycles that desktop parts can rarely match

1 AMD Opteron™ 3250 based server costs \$573 (est.) and an Intel Xeon E3-1220L based server costs \$643 (est.). The processor and motherboard make up the cost differences between an AMD Opteron 3200 Series based server and an Intel Xeon E3-12xxL Series based server. The costs for chassis, drive, and memory will be the same in a like-for-like configuration. Low-end processor costs: AMD Opteron™ 3250 1kU preliminary price is \$99 and Intel Xeon E3-1220L is \$189 as of 1/9/12 at www.intc.com/pricelist.cfm. MSI motherboard for Intel (MS-S012); approximately \$170 as of 12/20/11. Chassis: Antec Sonata Proto No Power Supply ATX Mid Tower Case (Black) - SONATA PROTO BLACK \$63.99 as of 12/22/11 at [http://www.worldsale.com/western-digital-re4-wd1003fjx-1tb-sata2-7200rpm-64mb-enterprise-hard-drive35_8733_64564.html](http://www.superblitz.com/detail.php?c=CA-SONATAAT&c=pw&hash=5efdcBmUy8TimgEYzeWu3W7aeIgoOVs6Hd1Zx3H4DdumgkEVh%2BUMKk4%2Bmtpatc5k0TCFpcoo3v5JGv61%2FdxUNXKJq2%2FNFES0xTXNs8R9%2FwHard drive: ITB SATA2 7200rpm 64MB Enterprise Hard Drive $124.32 pricing as of 12/16/11 at <a href=). Memory: 4GB x 2 Unbuffered, 15V 2 Rank \$95.99 pricing as of 12/16/11 at http://www.crucial.com/store/partspecs.aspx?IMODULE=CT2KIT51272BA1339_SVR-115

2 Calculation based on the time it takes for monthly hosting fees of \$89.99 to sum up to the cost of an AMD Opteron™ 3200 Series processor-based server (est. \$573) vs. an Intel Xeon E3-12xxL processor-based server (est. \$643). It does account for software, deployment, management, and power costs. Not accounting for licensing, deployment, management, or power costs, it takes seven months of hosting revenue to pay back the cost of an AMD Opteron™ processor Model 3250 and eight months of hosting revenue to pay back the cost of an Intel Xeon processor Model E3-1250L-based server. This assumes receiving \$89.99 dedicated hosting monthly fee, which is in between the pricing for the Server 4 and Server 41 Standard Application L packages as of 1/9/12 at www.landl.com. AMD Opteron 3250 based server costs \$573 (est.) and Intel Xeon E3-1220L based server costs \$643 (est.). The processor and motherboard make up the cost differences between an AMD Opteron 3200 Series based server and an Intel Xeon E3-12xxL Series based server. The costs for chassis, drive, and memory are expected to be the same in a like-for-like configuration. Low-end processor costs: AMD Opteron™ 3250 1kU preliminary price is \$99 and Intel Xeon E3-1220L is \$189 as of 1/9/12 at www.intc.com/pricelist.cfm. MSI motherboard for Intel (MS-S012); approximately \$170 as of 12/20/11. Chassis: Antec Sonata Proto No Power Supply ATX Mid Tower Case (Black) - SONATA PROTO BLACK \$63.99 as of 12/22/11 at [http://www.worldsale.com/western-digital-re4-wd1003fjx-1tb-sata2-7200rpm-64mb-enterprise-hard-drive35_8733_64564.html](http://www.superblitz.com/detail.php?c=CA-SONATAAT&c=pw&hash=5efdcBmUy8TimgEYzeWu3W7aeIgoOVs6Hd1Zx3H4DdumgkEVh%2BUMKk4%2Bmtpatc5k0TCFpcoo3v5JGv61%2FdxUNXKJq2%2FNFES0xTXNs8R9%2FwHard drive: ITB SATA2 7200rpm 64MB Enterprise Hard Drive $124.32 pricing as of 12/16/11 at <a href=). Memory: 4GB x 2 Unbuffered, 1.5V 2 Rank \$95.99 pricing as of 12/16/11 at http://www.crucial.com/store/partspecs.aspx?IMODULE=CT2KIT51272BA1339_SVR-115

3 1kU price for Intel Xeon E3-1220L (2-core) is \$189 as of 12/22/11 at www.intc.com/pricelist.cfm. AMD Opteron™ 3250 (4-core) 1kU preliminary price is \$99. SVR-109

4 Intel Xeon processor Model E3-1220L has 2 cores and E3-1260L has 4 cores as of 1/9/12 at www.intc.com/pricelist.cfm. AMD Opteron™ processor Models 3250, 3260, and 3280 have 4, 4, and 8 cores respectively. SVR-110

5 Comparison drawn between the Intel Xeon E3-12xxL and AMD Opteron 3200 Series processors with the lowest ratio of price to SPECint_{rate}2006. The estimated SPECint_{rate}2006 scores for the AMD Opteron 3200 Series processors reflect current expectations based on the performance of AMD Opteron 4200 Series processors and are subject to change. The results for the Intel Xeon processors reflect the highest IP results published on <http://www.spec.org/cpu2006/results> as of Jan 9, 2012 with each processor operating at its default frequency. 70.3, 1 x Intel Xeon processor Model E3-1220L in IBM System x3250 M4 (Intel Xeon E3-1220L), 16 GB (2 x 8 GB 2Rx8 PC3-10600E-9, ECC), Red Hat Enterprise Linux Server Release 6.1, Kernel 2.6.32-131.0.15.el6.x86_64, C/C++: Version 12.1.0.225 of Intel Compiler XE Build 20110803, <http://www.spec.org/cpu2006/results/res2011q4/cpu2006-2011121-18865.html>. 159, 1 x Intel Xeon processor Model E3-1260L in IBM System x3250 M4 (Intel Xeon E3-1260L), 16 GB (2 x 8 GB 2Rx8 PC3-10600E-9, ECC), Red Hat Enterprise Linux Server Release 6.1, Kernel 2.6.32-131.0.15.el6.x86_64, C/C++: Version 12.1.0.225 of Intel Compiler XE Build 20110803, <http://www.spec.org/cpu2006/results/res2011q4/cpu2006-2011121-18877.html>. SPECint_{rate} score= 75 (est.), 1 x AMD Opteron™ processors Model 3250. SPECint_{rate} score= 80 (est.), 1 x AMD Opteron™ processors Model 3260. SPECint_{rate} score= 117 (est.), 1 x AMD Opteron™ processors Model 3280. Intel Xeon processor Model E3-1220L is \$189 as of 1/9/12 at www.intc.com/pricelist.cfm. Intel Xeon processor Model E3-1260L is \$294 as of 1/9/12 at www.intc.com/pricelist.cfm. AMD Opteron™ processor Model 3250 has a preliminary price of \$99 as of 1/9/12. AMD Opteron™ processor Model 3260 has a preliminary price of \$125 as of 1/9/12. AMD Opteron™ processor Model 3280 has a preliminary price of \$229 as of 1/9/12. SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. For the latest SPECint_{rate}2006 results, visit <http://www.spec.org/cpu2006/results>. SVR-114

6 Intel Xeon processor Model E3-1220L has 2 cores and 20W TDP, which equals 10 watts/core. Intel Xeon processor Model E3-1260L has 4 cores and 45W TDP, which equals 11.25 watts/core. Pricing and TDP values as of 1/9/12 at www.intc.com/pricelist.cfm. Both the AMD Opteron™ processor Models 3250 and 3260 have 4 cores and 45W TDP, which equals 11.25 watts/core. AMD Opteron™ processor Model 3280 has 8 cores and 65W TDP, which equals 8.1 watts/core. SVR-112

7 Intel Xeon processor Model E3-1260L has 4 cores per processor. See www.intc.com/pricelist.cfm or 168 cores per rack, assuming 1P 1U servers. AMD Opteron™ processor Model 3280 has 8 cores per processor or 336 cores per rack, assuming 1P 1U servers. SVR-115

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AMD Opteron™ 3200 Series Processor Product Specifications

Model Number	Core Count	Clock Speed	All-Core Turbo Speed	Max Turbo Speed	TBD	L2 Cache	L3 Cache	Watts Per Core (TDP)
3280	8	2.4 GHz	2.7 GHz	3.5 GHz	65W	8 MB	8 MB	8.1
3260	4	2.7 GHz	3.0 GHz	3.7 GHz	45W	4 MB	4 MB	11.3
3250	4	2.5 GHz	2.8 GHz	3.5 GHz	45W	4 MB	4 MB	11.3

AMD Opteron™ 3200 Series Processor Product Specifications

Cache Sizes	Total Cache: 16MB (8 core), 8MB (4 core) L2 Cache: up to 8MB total L3 Cache: up to 8MB total
Process Technology	AM3+ technology
HyperTransport™ Technology Links	1x HT3 at up to 5.2GT/s* per link
Memory	Integrated DDR3 memory controller with up to 32 GB/s memory bandwidth per CPU for AM3+ socket
Number of Channels/Types of Memory	Dual Channel DDR3, supporting 1333, 1600, 1866* MHz memory speeds
Die Size	315 mm ²
Packaging	AM3+

*1866MHz supported only with a single physical DIMM per memory channel

AMD SR56X0 I/O Hub Northbridge Product Specifications

Model Number	Processor Interface	PCI Express®	Number of PCIe® Ports/engines	Virtualization	Error Detection/Isolation	Max TDP/Idle (w/c1e)	Process Technology	Package
SR5650	HyperTransport™ 3.0 technology (5.2GT/s)	v2.0	22 lanes/8 engines	AMD-Vi (IOMMU 1.26)	HyperTransport error handling, PCIe® Advanced Error Reporting, PCIe® end-to-end Cycle Redundancy Check	12.6W/ 5.4W	TSMC 65nm	29 x 29mm FCBGA
SR5670	HyperTransport™ 3.0 technology (5.2GT/s)	v2.0	30 lanes/9 engines	AMD-Vi (IOMMU 1.26)	HyperTransport error handling, PCIe® Advanced Error Reporting, PCIe® end-to-end Cycle Redundancy Check	15.4W/ 5.75W	TSMC 65nm	29 x 29mm FCBGA
SR5690	HyperTransport™ 3.0 technology (5.2GT/s)	v2.0	42 lanes/11 engines	AMD-Vi (IOMMU 1.26)	HyperTransport error handling, PCIe® Advanced Error Reporting, PCIe® end-to-end Cycle Redundancy Check	18W/6.15W	TSMC 65nm	29 x 29mm FCBGA

AMD SP5100 Southbridge Product Specifications

USB Ports	12 USB 2.0 + 2 USB 1.1
PCI Bus Support	PCI rev 2.3
Serial ATA	AHCI 1.1 SATA 3.0Gb/s with SW RAID Support
SATA Ports	6 (can be independently disabled)
Max TDP/Idle	4W/1W
Process Technology	TSMC .13um
Package	528 ball FCBGA, 21x21mm, 0.8mm pitch