

AMD Opteron™ Processors with DDR2 - Features and Benefits Guide

AMD64 Technology: Architectural Benefits

AMD64

32 and 64-bit computing: Runs all your applications today. Ready for the next generation of software. **Extends the life of your server.**

AMD PowerNow!™ Technology

Reduces CPU power consumption with optimised power management and CPU operating temperature for a **cooler, more energy efficient Server.**

Direct Connect Architecture

Provides optimized memory performance, balanced throughput, expandable I/O, and more linear scalability by **removing the bottlenecks of legacy system architectures.**

HyperTransport™ technology

HyperTransport™ technology, a high speed, low latency communication link, provides greater bandwidth between system components to **improve multitasking and application performance**

AMD-V™ Hardware Virtualization Support

Hardware-enabled **AMD Virtualization™** is designed to improve all aspects of x86-based virtualization for **better performance and scalability** when using virtualization software

DDR2 / RDDR2

Uses latest DDR2 (1000 Series) or RDDR2 (2000/8000 Series) memory technology for **improved performance and reduced power consumption**

Dual and Quad core compatible Socket F 1207

Simple migration from Socket F (1207) Dual-Core to Socket F (1207) Quad-Core in 2007. BIOS upgrades may be required.

Maintained Thermal Envelope

Same thermal solution, chassis and PSU as "Rev.E" servers as well as future Quad-Core. Offers **investment protection & a clean upgrade path**

Socket F (1207): A Better Quad-Core Migration Path¹

AMD Opteron processors offers lower combined CPU and Memory power consumption!

AMD is already winning bids based on future quad-core products

- Large US National Labs chose Quad-Core AMD Opteron™ over competitors

Quad-Core AMD Opteron is a native quad-core design

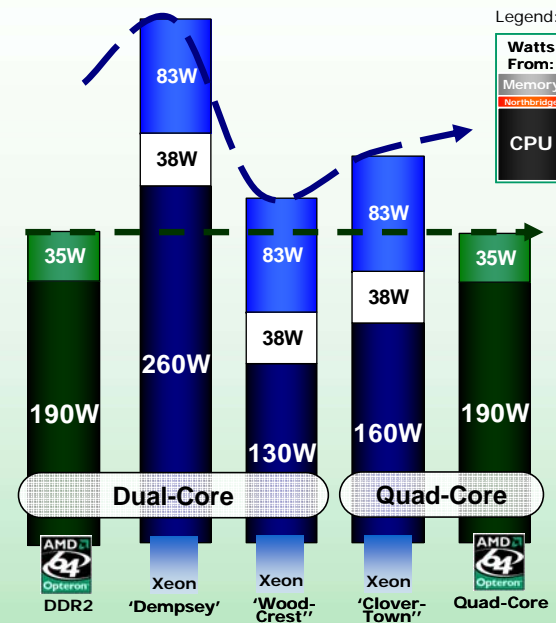
- Intel packages two Xeon 5100 processors in an MCM for Clovertown

AMD offers full quad-core performance

- Intel will scale Clovertown FSB back by 20% (1066 vs. Xeon 5100's 1333)

AMD will have the same power/thermal profile

- Intel TDP estimated to rise by ~50% or more



Memory and Power: The hidden expense of FBDIMM²

Wattage and Cost/Year per DIMM

DDR2: ~4.4W/DIMM
\$5.01/year

DDR1: ~6.3W/DIMM
\$7.17/year

FBDIMM: ~10.4W/DIMM
\$11.84/year

AMD Opteron™ with DDR2 - Builds on a Consistent Architecture and Delivers:

Continued performance-per-watt leadership

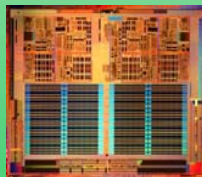
- High-performing, low-power DDR2 memory
- Consistent max power, and low-power options

Advanced leadership in x86 virtualization

- **AMD Virtualization™ (AMD-V™)** hardware-assisted support
- Based on AMD's Revolutionary Direct Connect Architecture

Reduced total cost of ownership

- One transition to a new socket infrastructure
- Seamless Dual-Core to **Quad-Core upgradeability** in same thermal envelope



Additional useful links

- System Component Information www.amd.com/configuration
- Open Platform Mgmt. Architecture (OPMA) www.amd.com/opma
- Online Processor Quick Ref. Guide www.amd.com/processorquickrefguide
- AMD64 Ecosystem www.amd.com/amd64ecosystem
- AMD Lead-Free Initiative www.amd.com/leadfree
- Model Numbers www.amd.com/modelnumbers
- Processor Diagram www.amd.com/architectural-features

¹ Wattage based on 2P systems with 8 DIMMs at max CPU wattage; Wattage for 'Dempsey', 'Woodcrest' and 'Clovertown' is estimated based on currently publicly available values (see, eg: http://www.reghardware.co.uk/2006/05/25/intel_clovertown_power_specs/) and is subject to change. The examples contained herein are intended for informational purposes only. Other factors will affect real-world power consumption.

² Measurement based on avg. power of DDR1, DDR2, and FBDIMM; cost per year based on \$0.13 per kWh based on '03 & '04 global average cost of energy as reported by the International Energy Agency

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The AMD Opteron™ Processor Family



AMD Opteron™ 1000 Series Processors

Designed for 1-way Server / Workstation solutions
Only native x86 dual-core solution for 1-way computing



AMD Opteron™ 2000 Series Processors

Designed for 2-way Server / Workstation solutions
Only native x86 dual-core solution for 2-way computing



AMD Opteron™ 8000 Series Processors

Designed for 4-way and 8-way Server solutions
Only native x86 dual-core solution for 4-way / 8-way computing

Validated infrastructure from



Questions to ask your Server customers..

Do you want to offer low total power consumption?

-Tell them about the AMD Opteron™ processor's lower total power and AMD PowerNow!™ technology.

Do you know that FBDIMMS consume significantly higher power and generate more heat than DDR2 DIMMS?

- AMD Opteron™ processors uses DDR2 DIMMS, resulting in lower total platform power consumption.

Have you considered using 'HE' processors for further total power savings?

-AMD Opteron HE Processors have a max power of 68Watts. When combined with AMD PowerNow! Technology, this gives even greater power efficiencies.

Do you want to be able to offer an upgrade to quad-core in 2007?

-Socket F(1207) and Socket AM2 give a seamless upgrade from dual- to quad-core.

Do you need to support virtualization?

-AMD Opteron processors Socket F (1207) feature HW virtualization features.

Have you done some real world benchmark tests, or are you relying on manufacturer's information & synthetic benchmarks?

- Only real world testing demonstrates true performance for specific applications.

Does the customer want 3 year limited CPU warranty?

-Build the servers / workstations with PIB or WOF products

Do you want to try before you buy?

-Speak with your Authorised AMD Distributor about their Server Evaluation schemes.

AMD - Keeping max power under control

Model Number Rev E	Socket	MAX POWER	GHz	Model Number Rev F	Socket	MAX POWER
185	939	110W	2.6	1218	Socket AM2	103W
180	939	110W	2.4	1216	Socket AM2	103W
175	939	110W	2.2	1214	Socket AM2	103W
170	939	110W	2.0	1212	Socket AM2	103W
165	939	110W	1.8	1210	Socket AM2	103W
285	940	95W	2.6	2218	Socket F (1207)	95W
280	940	95W	2.4	2216	Socket F (1207)	95W
275	940	95W	2.2	2214	Socket F (1207)	95W
270	940	95W	2.0	2212	Socket F (1207)	95W
265	940	95W	1.8	2210	Socket F (1207)	95W
			2.4	2216 HE	Socket F (1207)	68W
275 HE	940	55W	2.2	2214 HE	Socket F (1207)	68W
270 HE	940	55W	2.0	2212 HE	Socket F (1207)	68W
885	940	95W	2.6	8218	Socket F (1207)	95W
880	940	95W	2.4	8216	Socket F (1207)	95W
875	940	95W	2.2	8214	Socket F (1207)	95W
870	940	95W	2.0	8212	Socket F (1207)	95W
865	940	95W	1.8	8210	Socket F(1207)	95W
			2.4	8216 HE	Socket F (1207)	68W
875HE	940	55W	2.2	8214 HE	Socket F (1207)	68W
870HE	940	55W	2.0	8212 HE	Socket F (1207)	68W