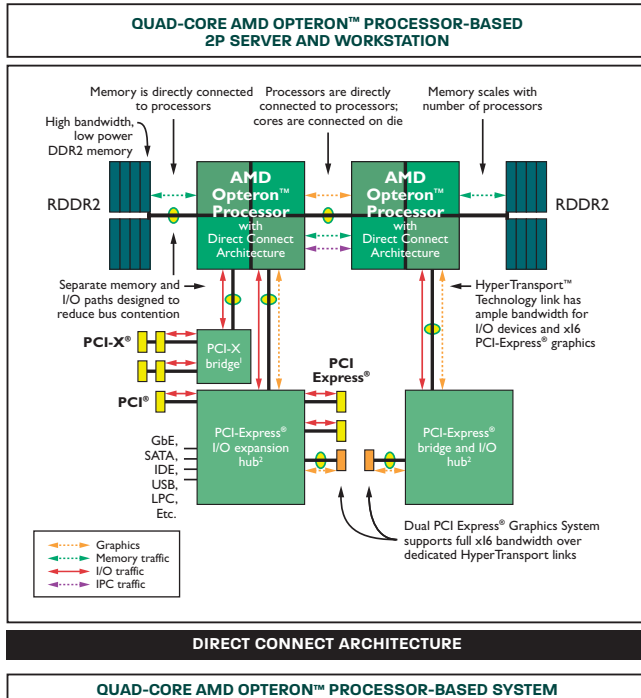


Quad-Core AMD Opteron™ Processor with Direct Connect Architecture

2P Server and Workstation Comparison



OUTSTANDING PERFORMANCE WITH AMD64 AND DIRECT CONNECT ARCHITECTURE

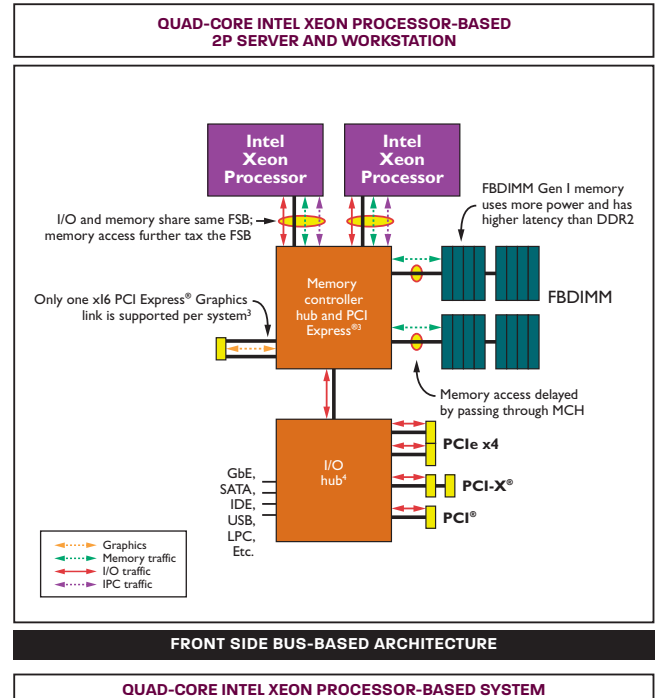
- » AMD64 enables simultaneous high-performance on 64-bit and 32-bit applications
- » Addresses and helps reduce the real challenges and bottlenecks of legacy system architectures by directly connecting the processors, memory, and I/O
- » Integrated DDR2 memory controller: low-latency, high-bandwidth interface enables high performance on memory intensive applications while the on-line spare capability is designed to provide enterprise-class reliability for your datacenter
- » HyperTransport™ Technology links: At up to 8GB/s bandwidth per link, with up to 3 links per processor connecting CPUs-to-CPU and CPUs-to-I/O, provides bandwidth and scalability for supporting I/O intensive server and workstation applications
- » AMD Balanced Smart Cache and AMD Memory Optimizer Technology are designed for exceptional performance on highly-threaded applications and multi-tasking environments

OPTIMAL VIRTUALIZATION

- » Silicon-assisted AMD Virtualization™ (AMD-V™) with Rapid Virtualization Indexing, offers industry-leading performance, security and application support
- » Rapid Virtualization Indexing significantly improves virtualized application performance by enabling memory management in hardware rather than relying on slower software-based methods
- » Direct Connect Architecture for excellent scalability and performance on I/O and memory-intensive virtualized application environments; for more virtual machines per server
- » Integrated memory controller offers industry-exclusive x86 capabilities helping improve performance while efficiently enforcing security between virtual machines

INDUSTRY-LEADING PERFORMANCE-PER-WATT

- » Highly efficient computing cores with Enhanced AMD PowerNow!™ technology can reduce CPU power consumption to match application needs, for in power and cooling cost savings
- » AMD CoolCore™ technology reduces power to unused sections of the CPU to save on power and cooling costs
- » Dual Dynamic Power Management™ helps maximize the power saving capabilities of AMD PowerNow!™ technology while maintaining memory throughput for improved application performance
- » Uses low-power, high-bandwidth DDR2 memory for excellent performance that can consume almost 8 watts per DIMM less power than Fully Buffered DIMM memory



FRONT-SIDE BUS (FSB) BASED ARCHITECTURES CAN LIMIT PERFORMANCE AND SCALABILITY

- » Passage through memory controller hub (MCH) delays memory reads
- » Memory and I/O must share FSB bandwidth, further reducing the efficiency of the FSB
- » Hardware-assisted VT must run memory-intensive virtualization applications over a shared front side bus
- » With one MCH per system, PCI Express® interface integration can limit expansion options
- » Workstation systems limited to a single PCIe x16 link with 5000X chipset
- » Intel SpeedStep technology and demand-based switching lacking on several processors

¹ AMD-8132™ HyperTransport PCI-X® Tunnel

² Third-Party Chipsets

³ Intel 5000P, 5000V and 5000X Chipset

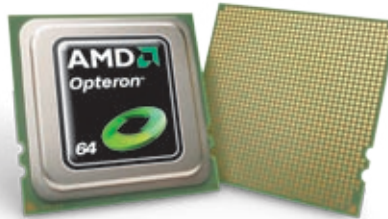
⁴ Intel 6300ESB I/O Controller



QUAD-CORE AMD OPTERON™ PROCESSOR-BASED 2P SERVER/WORKSTATION WITH DIRECT CONNECT ARCHITECTURE

SYSTEM COMPARISON	QUAD-CORE AMD OPTERON™ 2300 SERIES PROCESSORS	QUAD-CORE INTEL XEON PROCESSOR 5300 SERIES¹
Modular, glueless scalability	Yes	Requires Northbridge
SMP Capabilities	Up to 2 Sockets/8 Cores	Up to 2 Sockets/8 Cores
Direct Connect Architecture	Yes	No
Native Multi-Core Technology	Yes	No
High-Performance 32-bit and 64-bit computing	AMD64	EM64T
HyperTransport™ technology	Yes	No
Integrated DDR2 memory controller	Yes	No
Hardware-Assisted Virtualization	AMD-V™ with Rapid Virtualization Indexing	VT
Memory Support	RDDR2 400/533/667	FBIMM 533/667
Maximum Memory Bandwidth 2P System	21.2GB/s [†]	21.2GB/s
Maximum I/O Bandwidth with 2P System	16.0GB/s [†]	14.0GB/s
Maximum Total Bandwidth with 2P System	37.2GB/s [†]	21.2GB/s
Maximum Graphics Support	Dual PCIe® x16	Single PCIe® x16
L1 cache size (max)	64KB (Data) + 64KB (Instruction) per core	32KB (Data) + 32KB (Instruction) per core
L2 cache size (max)	512KB per core	4MB (shared) x 2
L3 cache size (max)	2MB (shared)	N/A
SIMD Instruction Set Support	SSE, SSE2, SSE3, SSE4A	SSE, SSE2, SSE3
	DEDICATED BANDWIDTH	SHARED BANDWIDTH

^{††} AMD 2P System—AMD Opteron 2300 Series with 1 HyperTransport™ Inter-processor Bus and 2 HyperTransport I/O Buses with DDR2 667 memory
¹ With Intel E5000X/E5000X chipset (<http://developer.intel.com/products/chipsets/5000x/index.htm>)



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