

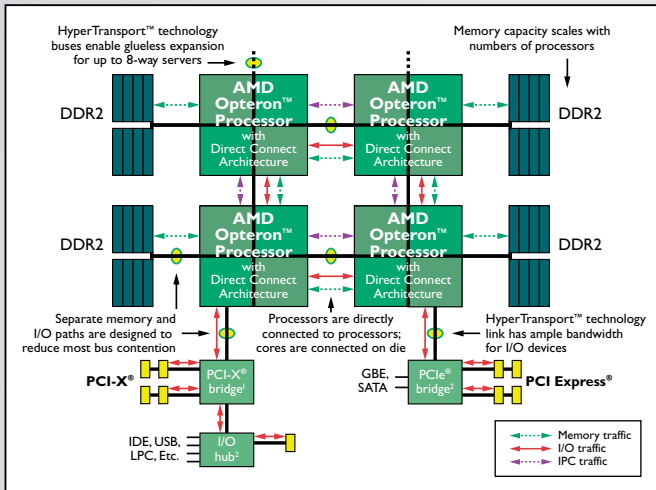
Quad-Core AMD Opteron™ Processor with Direct Connect Architecture

4P Server and Workstation Architecture Comparison

Generations
Ahead



QUAD-CORE AMD OPTERON™ PROCESSOR-BASED 4P SERVER



DIRECT CONNECT ARCHITECTURE

QUAD-CORE AMD OPTERON™ PROCESSOR-BASED SYSTEM (Shanghai)

OPTIMAL VIRTUALIZATION

- » Silicon-assisted AMD Virtualization™ (AMD-V™) with Rapid Virtualization Indexing, offers leading-edge performance, security and application support
- » Rapid Virtualization Indexing is designed to improve performance on many virtualized applications by enabling memory management in hardware, allowing for a higher-performing, more flexible environment
- » Direct Connect Architecture for excellent scalability and performance on I/O and memory-intensive virtualized application environments; enabling more virtual machines to run per server
- » Integrated memory controller offers leading-edge x86 capabilities, helping improve performance while efficiently enforcing security between virtual machines

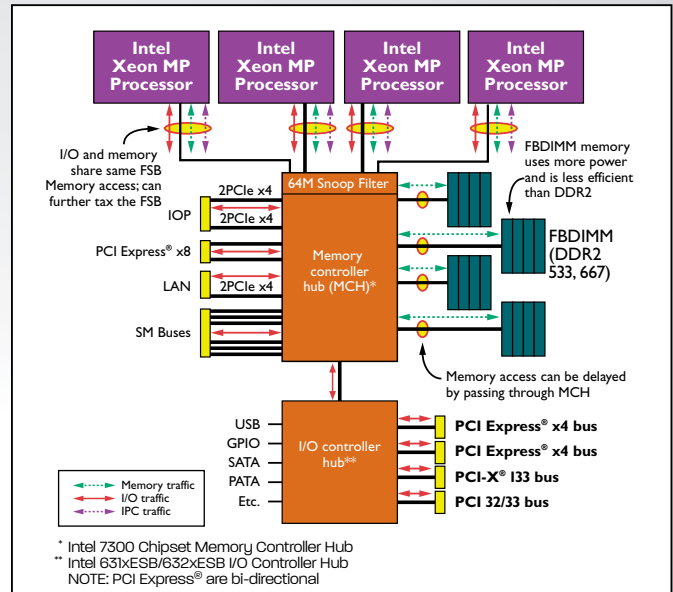
INDUSTRY-LEADING PERFORMANCE-PER-WATT

- » Highly efficient computing cores with Enhanced AMD PowerNow™ technology can reduce CPU power consumption to match application needs, to help reduce power consumption without compromising performance
- » AMD CoolCore™ technology reduces power to unused sections of the CPU to help 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 superior application performance
- » Uses low-power, high-bandwidth DDR2 memory for excellent performance and greater efficiency than competing memory technologies

BALANCED PERFORMANCE WITH AMD DIRECT CONNECT ARCHITECTURE

- » AMD64 technology enables simultaneous high-performance on 64-bit and 32-bit applications
- » Addresses and helps reduce the real challenges and bottlenecks of traditional front-side bus 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 performance 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

SIX-CORE INTEL XEON PROCESSOR-BASED 4P SERVER



FRONT SIDE BUS-BASED ARCHITECTURE

SIX-CORE INTEL XEON PROCESSOR-BASED SYSTEM (Dunnington)

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

- » Passage through memory controller hub (MCH) can delay memory reads
- » Memory and I/O must share FSB bandwidth, which can further reduce 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
- » Intel SpeedStep technology and demand-based switching lacking on several processors

¹ AMD-8132™ HyperTransport™ technology PCI-X® Tunnel
² Third-Party Chipsets

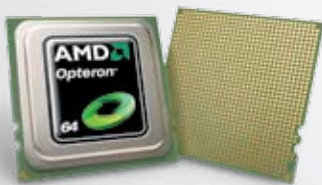
QUAD-CORE AMD OPTERON™ PROCESSOR-BASED 4P SERVER WITH DIRECT CONNECT ARCHITECTURE

SERVER SYSTEM COMPARISON	QUAD-CORE AMD OPTERON™ PROCESSOR (45nm)	SIX-CORE INTEL XEON MP 7400 SERIES^{1,2}
Modular, glueless scalability	Yes	Requires Northbridge
SMP Capabilities	Up to 8 sockets / 32 cores	Up to 4 sockets / 24 cores
Direct Connect Architecture	Yes	No – uses front side bus
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	Intel VT
Memory support	RDDR2 400/533/667/800	FBDIMM 533/667
Memory Bandwidth 4P System	51.2GB/s ¹	32GB/s
Maximum I/O bandwidth with 4P System	32.0GB/s ¹	6GB/s
L1 cache size (max)	64KB (Data) + 64KB (Instruction) per core	32KB (Data) + 32KB (Instruction) per core
L2 cache size (max)	512KB per core	6-9MB shared (3MB per 2 cores)
L3 cache size (max)	6MB (shared, exclusive)	8-16MB (shared, inclusive)
SIMD Instruction Set Support	SSE, SSE2, SSE3, SSE4A	SSE2, SSE3, SSE4
	Dedicated Bandwidth	Shared Bandwidth

¹ AMD 4P System – AMD Opteron™ processor 8000 Series with 4 HyperTransport™ technology Inter-processor Buses and 4 HyperTransport™ technology I/O Buses with DDR2-800 memory

¹ With Intel 7300 and 7200 Chipset (<http://download.intel.com/design/chipsets/datashts/318082.pdf>)

² Other OEM chipsets support additional capabilities



AMD (NYSE:AMD) designs and produces innovative microprocessors and low-power processor 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 www.amd.com.

TECHNICAL SUPPORT

USA & CANADA: 800-222-9323 OR 408-749-5703
USA & CANADA PC MICROPROCESSOR: 408-749-3060
USA & CANADA EMAIL: HW.SUPPORT@AMD.COM
LATIN AMERICA EMAIL: AMDXSBRPO@VSR.AMD.BR
EUROPE & UK: +44-0-1276-803299
EUROPE & UK FAX: +44-0-1276-803298
FRANCE: 0800-908-621
GERMANY: +49-89-450-53199
ITALY: 800-877224
EUROPE EMAIL: EURO.TECH@AMD.COM
FAR EAST FAX: 852-2956-0588
JAPAN FAX: 81-03-3346-784

ACCESS POWER COMPARISON INFORMATION ONLINE AT WWW.AMD.COM/POWER

