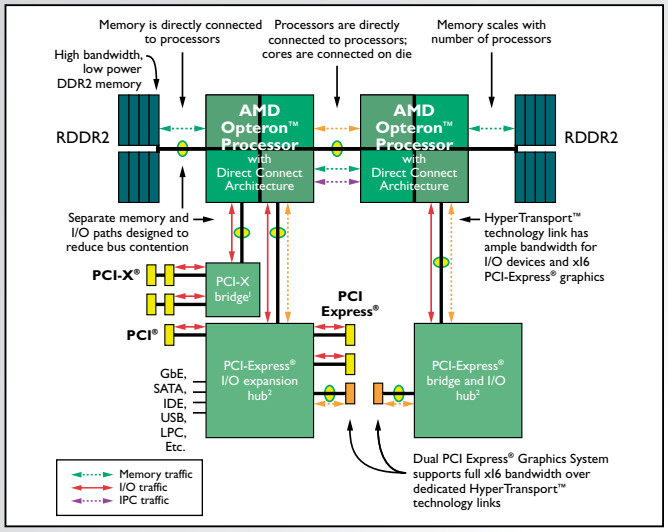
Quad-Core AMD Opteron™ Processor with Direct Connect Architecture

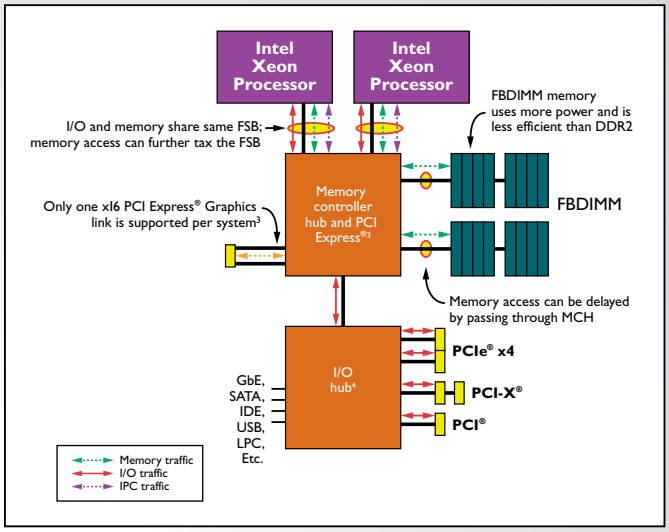
2P Server and Workstation Architecture Comparison

Generations Ahead

QUAD-CORE AMD OPTERON™ PROCESSOR-BASED 2P SERVER



QUAD-CORE INTEL XEON PROCESSOR-BASED 2P SERVER



DIRECT CONNECT ARCHITECTURE

QUAD-CORE AMD OPTERON™ PROCESSOR-BASED SYSTEM

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 CPU frequency to application needs, to help reduce power consumption without compromising performance

» 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 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-CPUs 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

FRONT SIDE BUS-BASED ARCHITECTURE

QUAD-CORE INTEL XEON PROCESSOR-BASED SYSTEM

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

» Workstation systems limited to a single PCIe® x16 link with 5000X chipset

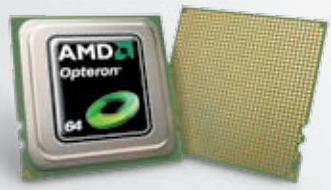
» Intel SpeedStep technology and demand-based switching lacking on several processors

[1] AMD-8132™ HyperTransport™ technology 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™ PROCESSOR (45NM)**	**QUAD-CORE INTEL XEON PROCESSOR 5400 SERIES [1]**
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 Technololgy	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 400/533/667/800	FBDIMM 533/667/800
Maximum Memory bandwidth 2P System	25.6GB/s[†]	25.6GB/s
Maximum I/O bandwidth with 2P System	16.0GB/s[†]	14GB/s
Maximum total bandwidth with 2P System	41.6GB/s[†]	25.6GB/s
Maximum Graphics Support	Dual PCIe® x16	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	6MB (shared) x 2
L3 cache size (max)	6MB (shared)	N/A
SIMD Instruction Set Support	SSE, SSE2, SSE3	SSE, SSE2, SSE3, SSE4
	Dedicated Bandwidth	Shared Bandwidth

[†] AMD 2P System – AMD Opteron™ 2000 Series processor with 1 HyperTransport™ technology bus and 2 HyperTransport™ technology I/O Buses with DDR2 800 memory

[1] With Intel 5400 chipset (http://www.intel.com/Products/Server/Chipsets/5400/5400-technicaldocuments.htm)



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