AMD64 Dual-Core Design Elegance

AMD64 designed from the ground up for multiple cores

- True dual-core, with two CPU cores on one die
- Inter-core communication at processor speed
- Direct Connect Architecture allows access via crossbar to memory controller and HyperTransport™ technology link

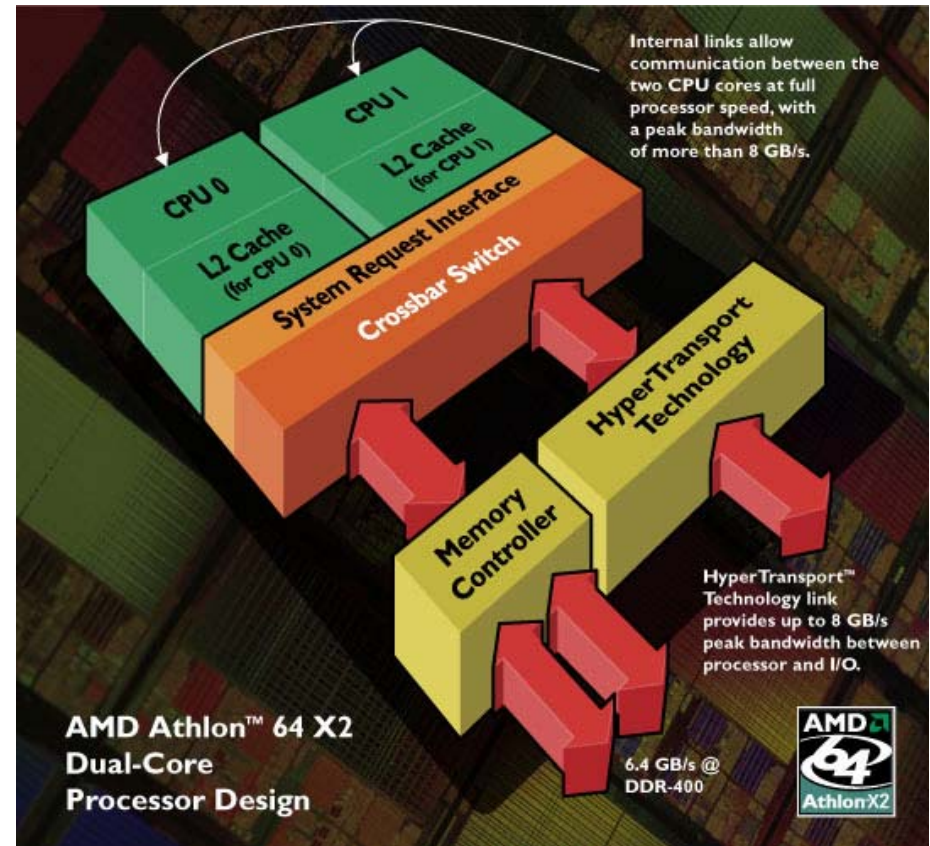Designed for existing 939 infrastructure

- Requires only BIOS update
- Standard heat sinks and power

Advanced features of AMD64 technology

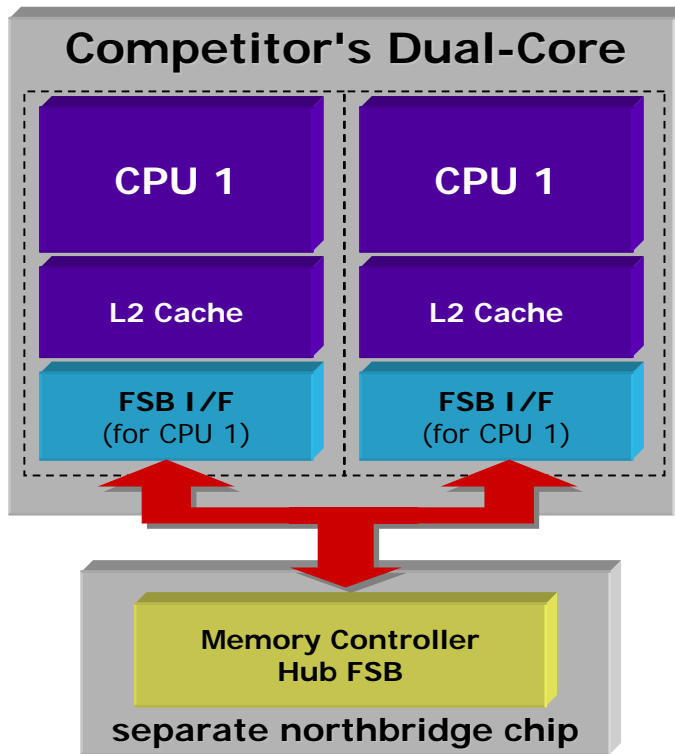- Enhanced Virus Protection*
- Cool'n'Quiet™ technology

Dual-core benefits available on today's software with no changes

- Microsoft® Windows® XP Home & Professional Editions
- All current versions of Linux

* Enhanced Virus Protection (EVP) is only enabled by certain operating systems including the current versions of Microsoft® Windows®, Linux, Solaris and BSD Unix. After properly installing the appropriate operating system release, users must enable the protection of their applications and associated files from buffer overrun attacks. Consult your OS documentation for information on enabling EVP. Contact your application software vendor for information regarding use of the application in conjunction with EVP. AMD and its partners strongly recommend that users continue to use third party anti-virus software as part of their security strategy.

Competitive Comparison

Competitor's Dual-Core

CPU 1	CPU 1
L2 Cache	L2 Cache
FSB I/F (for CPU 1)	FSB I/F (for CPU 1)

Memory Controller Hub FSB

separate northbridge chip

AMD Opteron™ Dual-Core

CPU 0	CPU 1
L2 Cache	L2 Cache`

System Request Interface

Crossbar Switch

| Memory Controller | HyperTransport™ Technology |

- Requires new chipset and motherboards to implement
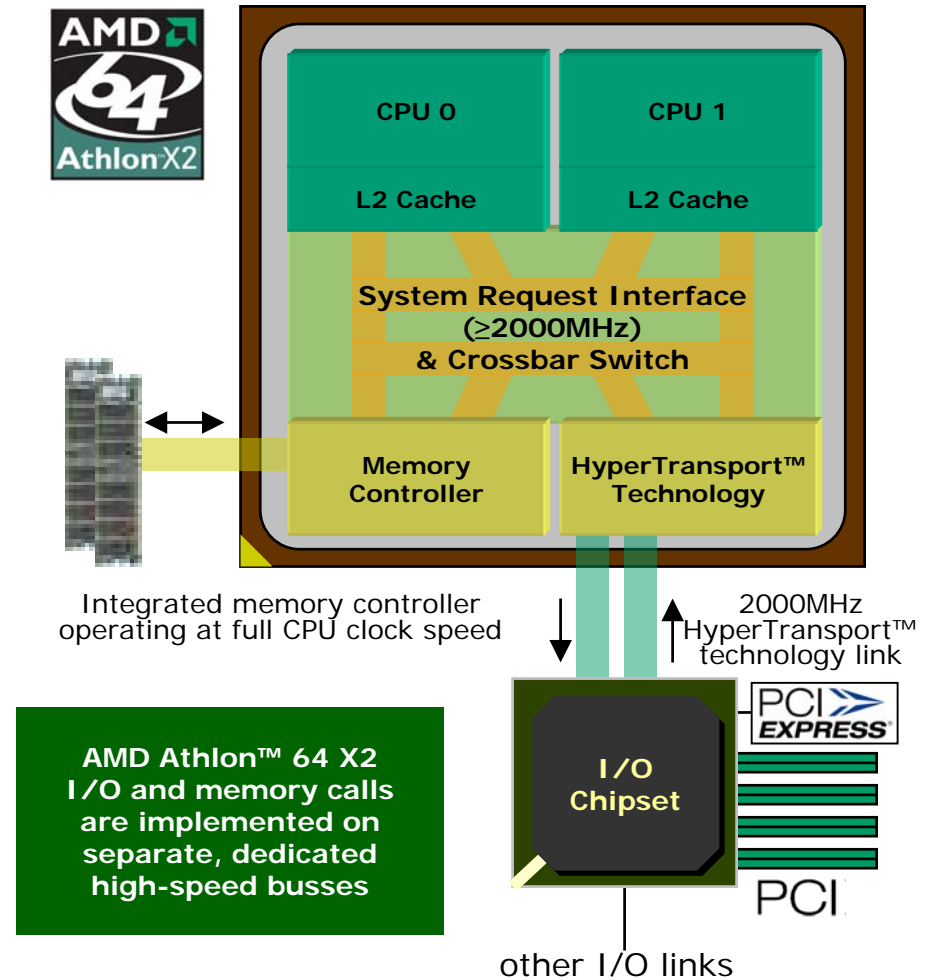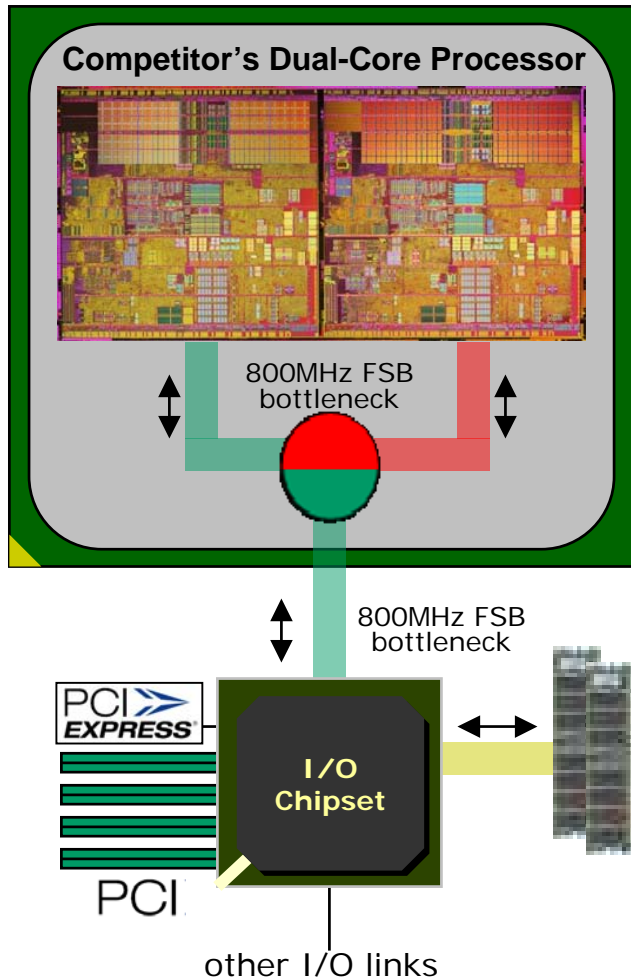- 119A/125W+ TDP adds cost to board & cooling solution
- Separate cores connected only by FSB means bandwidth constraints & lower performance
  - 6.4GB/s total bandwidth
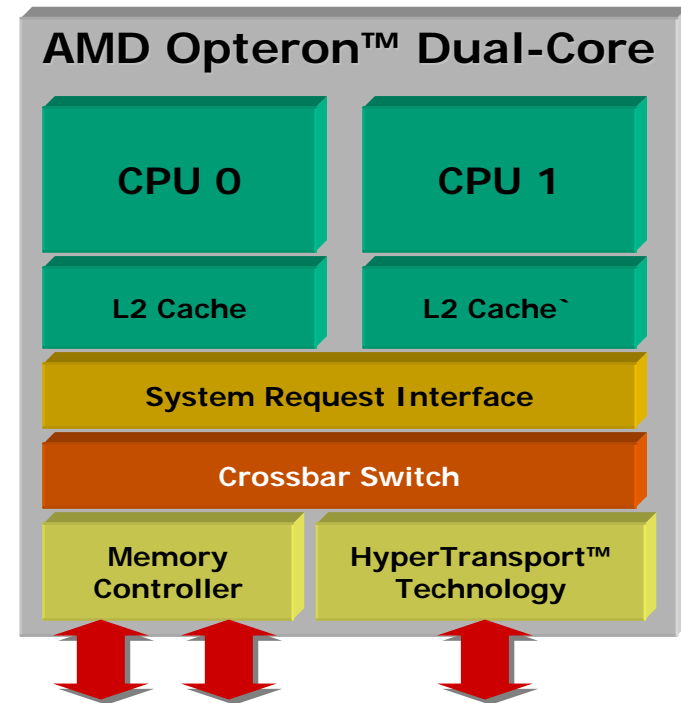
- Only requires BIOS update for most 939 motherboards
- 80A/110W TPD means no added costs
- Integrated dual-core design means high speed, high performance CPU
  - More than 22GB/s total bandwidth

AMD

Dual-Core Architecture Comparison

Competitor's Dual-Core Processor

800MHz FSB bottleneck

800MHz FSB bottleneck

PCI EXPRESS

I/O Chipset

PCI

other I/O links

AMD 64 Athlon X2

| CPU 0 | CPU 1 |
| L2 Cache | L2 Cache |

System Request Interface
(≥2000MHz)
& Crossbar Switch

Memory Controller

HyperTransport™ Technology

Integrated memory controller operating at full CPU clock speed

2000MHz HyperTransport™ technology link

AMD Athlon™ 64 X2 I/O and memory calls are implemented on separate, dedicated high-speed busses

PCI EXPRESS

I/O Chipset

PCI

other I/O links

AMD

Dual-Core Architecture Comparison

Competitor's Dual-Core Processor

800MHz FSB bottleneck

800MHz FSB bottleneck

PCI EXPRESS

I/O Chipset

PCI

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AMD 64 Athlon X2

CPU 0

CPU 1

L2 Cache

L2 Cache

System Request Interface ($\geq$2000MHz) & Crossbar Switch

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PCI EXPRESS

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AMD