### AMD Opteron™ Processor-Based Server

- **Primary Bus Technology**
  - **HyperTransport™ Technology** – I/O is directly connected to the CPU
    - Helps balance throughput and enables expandable I/O
    - At up to 6.4 GB/s bandwidth per link, HyperTransport technology provides sufficient bandwidth for supporting new and existing interconnects including Fibre Channel, Gigabit Ethernet, PCI-X, PCI-Express, Serial ATA, Serial Attached SCSI, and 10G Ethernet

- **Architecture**
  - **HyperTransport™ Technology** – Connecting CPUs directly to CPUs
    - Provides more linear symmetrical multiprocessing
  - **AMD64 Technology**
    - Enables simultaneous high-performance 32- and 64-bit computing environments
    - Allows businesses to migrate to 64-bit computing as they require

### Intel Xeon Processor-Based Server

- **Architecture**
  - **EM64T Technology**
    - Allows simultaneous 32- and 64-bit computing
    - Memory addressability limited to 36-bit

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1. AMD-8131™ HyperTransport PCI-X Tunnel
2. NVIDIA CK804 Professional
3. Intel E7520 Chipset Memory Controller Hub (MCH)
4. Intel 6700FX0 64-bit PCI/PCI-X Controller Hub
5. Intel 82801ER I/O Controller Hub (ICH)

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**AMD Opteron™ Processor with Direct Connect Architecture**

- **Memory Access Technology**
  - Integrated Memory Controller directly connected to the CPU
    - Dramatically reduces latency for fast memory reads
    - Provides a dedicated path from memory to processor
    - Memory bandwidth scales as processors are added
    - Helps eliminate need for larger caches

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- **HyperTransport™ Technology** – Connecting CPUs directly to CPUs
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**Intel Xeon Processor**

- “Northbridge”-style Memory Controller via Front Side Bus
  - Passage through memory controller hub delays memory reads
  - Processors compete for FSB bandwidth
  - Memory and I/O must share FSB bandwidth, further reducing the efficiency of the FSB

- Multiple Hub I/O Buses
  - With one MCH per system, PCI Express interface integration onto MCH limits expansion options
  - I/O Hub interface bus can be overloaded by the aggregate demands of its many I/O devices

- EM64T Technology
  - Allows simultaneous 32- and 64-bit computing
  - Memory addressability limited to 36-bit