

Igniting a Computing Revolution!



Throughput Computing

Sun's UltraSPARC® processor strategy is designed to radically reduce the cost and complexity of network computing.

Key Highlights

Sun's upcoming multithreaded UltraSPARC® processors are designed to boost application throughput up to 30 times.

- Dramatically reduced space, power, and maintenance requirements helps lower total cost of ownership.
- Fewer systems to manage can increase reliability and availability.
- Increased throughput allows fewer systems to handle the same workloads.
- Resources can be freed to support the delivery of new services.
- Maintains binary compatibility with previous generations of SPARC processors.

Sparking a Revolution

The demand for network services continues to rise while IT budgets and resources remain limited. Something needs to give.

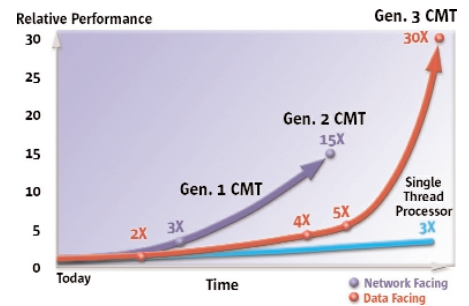
Leave it to Sun to innovate. Sun's throughput computing strategy is igniting a computing revolution—one that aims to radically cut the cost and complexity of network computing. Sun is making history again by introducing new UltraSPARC® processors built specifically to maximize throughput—or the aggregate amount of work done. These chip multithreading (CMT) processors, which can execute tens of threads simultaneously, are being designed to revolutionize computing by enabling tremendous increases in data processing.

A Quantum Change

In the 2005/2006 timeframe, Sun plans to dramatically improve performance while lowering price by delivering processors that provide 15x the application throughput of current processors. Beyond that, expect to see systems with 30 times today's performance.

Imagine the potential impact to IT operations: a single blade shelf designed to do the work of 32 of today's 4-way servers; eight rack units instead of 160; less than 3 kilowatts of power versus 38; one blade system to manage instead of 32 servers.

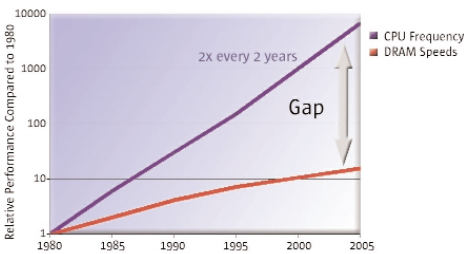
Today, our customers tell us that 70% of their IT budget is spent on current operations, while only 30% is invested towards new services. They would rather have the proportion reversed. Less equipment, as a result of throughput computing, should simplify management and lower TCO. Better still, resources can be freed to support the delivery of new network services without increasing IT budgets. Sound like a pipe dream? We warned you it was revolutionary.



CMT Chips Boost Relative Performance.

Chip Multithreading — The New Paradigm

In accordance with Moore’s Law, CPU clock frequency has doubled every two years. Meanwhile, memory speeds have only been doubling every six years, creating an ever-increasing gap. As a result, today’s processors are stalled as much as 75 percent of the time while they wait for data from memory.



The Gap between CPU and Memory Performance is Continuing to Grow.

To address this growing problem, Sun’s engineers asked some simple questions. “Since network computing workloads are inherently multithreaded, why not design processors accordingly? Instead of maximizing speed, why not use the additional transistors afforded by Moore’s Law to place multiple cores on a single piece of silicon, with each core processing multiple threads simultaneously?” When a thread must wait for memory, the affected core will simply start processing another thread and hide the memory latency problem. This approach dramatically improves chip efficiency and helps application throughput to skyrocket. Best of all, the customers’ existing software model is not disrupted.

Why Sun?

We believe Sun is the only company capable of delivering this quantum change in network computing. For the last decade, we’ve delivered technologies that fundamentally improve the economics of data centers:

- We have the most mature, 64-bit computing platform focused on the thread-rich network computing environment.
- Generation after generation of seamless, binary compatibility has allowed us to build a community of customers and ISVs that are confident we’ll protect their software investments while delivering new innovations.
- Solaris™ Operating Environment and Java™ technology are designed from the ground up to support multithreading.
- UltraSPARC processors provide 64-bit memory addressing, overcoming the bottleneck of competing 32-bit solutions.
- A CMT-based processor design strategy designed from the ground up.

Sun’s throughput computing strategy offers customers strategic long-term benefits. By freeing up resources, our CMT chips will help enable companies to:

- Reduce cost and complexity of service delivery.
- Focus investments on both improving existing network services while delivering new ones.

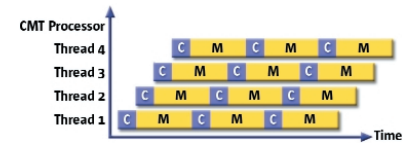
Let the revolution begin!

“Today’s processors can be idle up to 75 percent of the time, leaving considerable room for improvement in processor design. By focusing on increased application workload throughput instead of clock frequency, Sun’s CMT processors should deliver significant increases in application performance.”

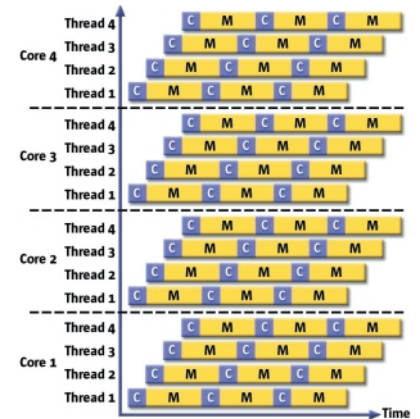
Vernon Turner
Group Vice President, Global Enterprise Server Solutions, International Data Corporation (IDC)



Typical Processor — 75% of Cycles Are Wasted.



Single-core CMT Processor — Multiple Threads Compute During Memory Latency Times.



Multi-core CMT Processor — Executing Tens of Threads Maximizes Throughput.

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