'Process Cruise Control'
Throttling Memory Access in a Soft Real-Time Environment

Performance Degradation Due To Memory-Bandwidth Preemption
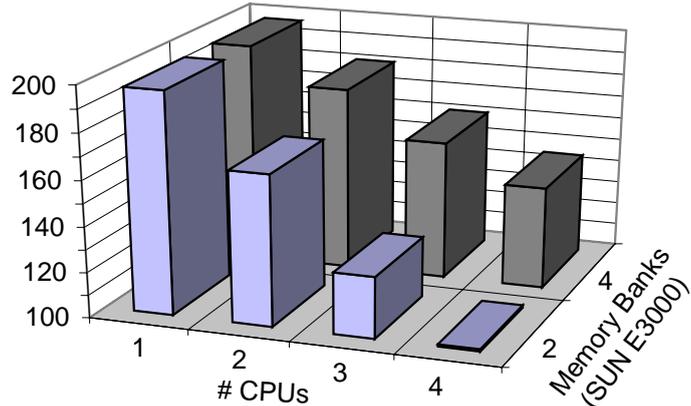
- CPUs share the available limited memory bandwidth.
- CPUs with high memory demands influence each other.

$\Longrightarrow$ **Memory Preemption**

- No memory-bandwidth guarantees in contemporary RT operating systems!
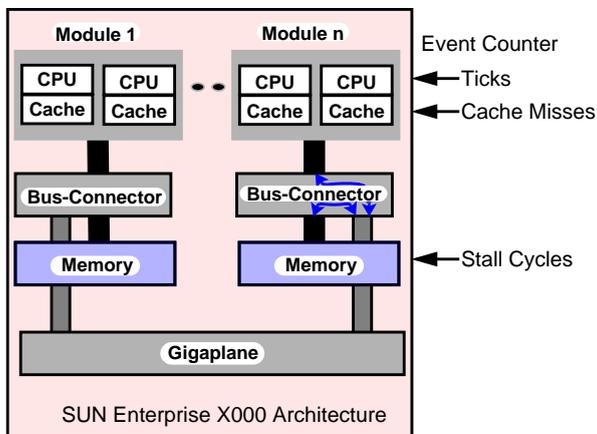
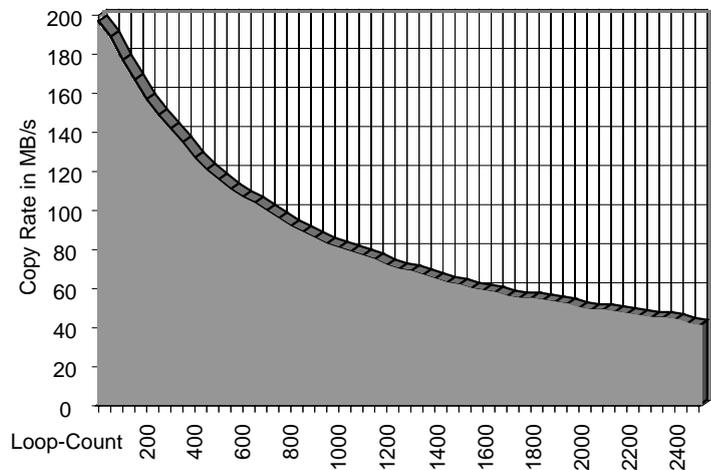$\Longrightarrow$ **Process Cruise Control**

STREAMS copy-rate of each CPU in MB/s

Measurement and Throttling of Memory Access

Enhancing the thread context by level-2 cache misses and clock ticks

SUN Enterprise X000 Architecture

Relation between the loop-count of the idle-loop inside the TLB-Miss handler and the memory bandwidth

Benefit of Process Cruise Control in Soft RT Video-Stream Processing

- ■ Video application running in a real-time scheduling class
- ■ Video application with 64 MB/s bandwidth-guarantee under Cruise Control

Memory bandwidth in MB/s that free CPUs would use without Cruise Control