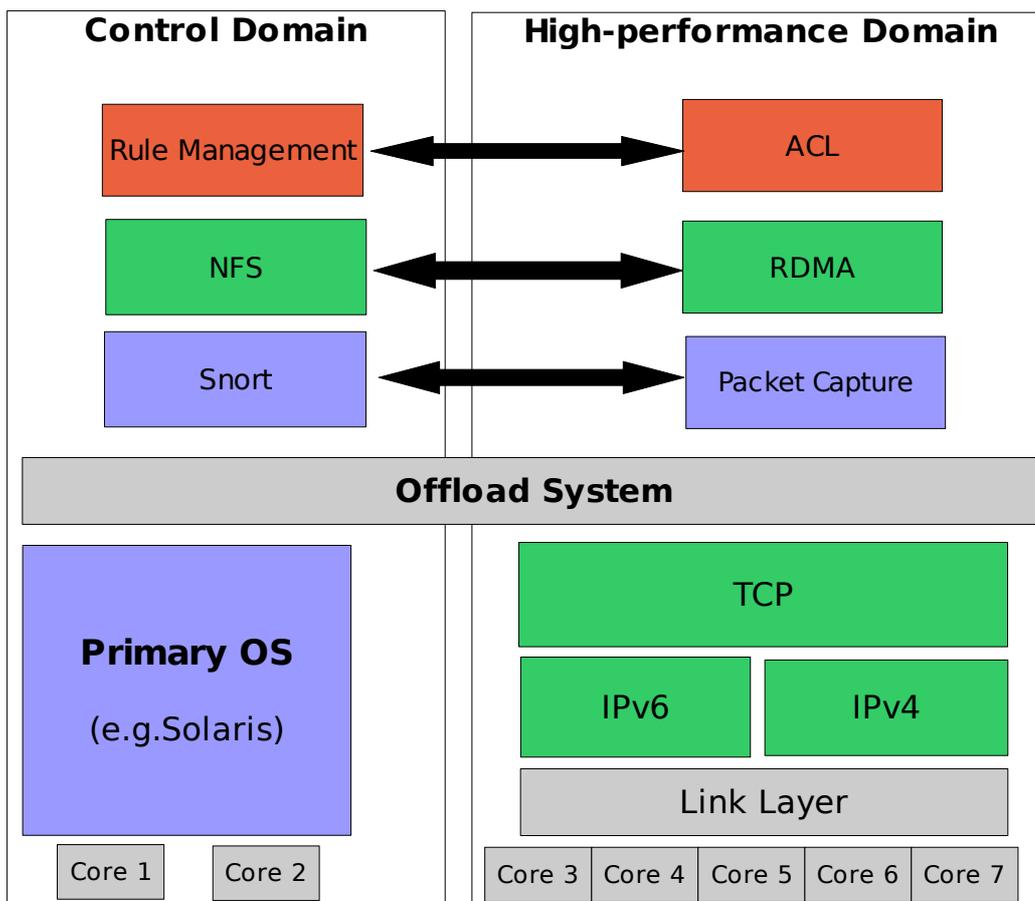# World45: Accelerators for Networking Stack

www.world45.com

World45 offers a world-class system for optimising network application using Sun Microsystem's Niagara multicore platform and Logical Domains virtualization software.

Control Domain	High-performance Domain
Rule Management ←→ ACL	
NFS ←→ RDMA	
Snort ←→ Packet Capture	
Offload System	
Primary OS (e.g.Solaris)	TCP / IPv6 / IPv4 / Link Layer
Core 1 Core 2	Core 3 Core 4 Core 5 Core 6 Core 7

Providing up to 64 CPUs in a single package, the Sun Niagara processor has a lot of potential. A potential that takes a lot of skill to tame. World45 provides all the skills and technology to take full advantage of massively multicore architectures. In conjunction with the Sun Logical Domains virtualization technology we can dedicate CPU resources to your specific problem. A shared-memory communications system provides high-bandwidth communi-cations between a conventional operating system and our unique offload-based network accelerator.

We provide full TCP/IP networking support, for both IPv4 and IPv6 with a multithreaded networking stack designed to bring data to the application as quickly as possible. We target solutions that handle 10 Gb/s links on general-purpose hardware.

We have a suite of applications that demonstrate the power of World45 offload-based accelaration for networking stack.

ACL (at wire speeds)

Fast access control lists for handling millions of rules at gigabit speeds. Reconfigurable at runtime, scalable and using specialised algorithms developed at World45 for maximum speed. Ideal for any application where fast packet classification is necessary.

RDMA (independent of the NIC)

The remote DMA protocol was developed for smart network hardware. By using an offload engine we have moved the protocol back onto general-purpose hardware without sacrificing performance or interfering with the normal operation of the OS. The scalability of the protocol is no longer tied to the availability of a better NIC.

Snort (24 times faster!)

By offloading the packet-capture process we can dramatically parallelize the Snort intrusion detection system increasing the throughput by a factor of 24. Using the offload system removes OS I/O overhead and interrupt overhead. In addition we can sort TCP streams and run Snort instances in parallel without losing stream-state information. A fast shared-memory interface removes the need for any copying of the data (another overhead). Only the input routines of Snort are altered, leaving the full flexibility and customizability you are used to.

Niagara

The Niagara processor from Sun provides a massively multicore environment with up to 64 CPUs and the ability to partition the chip with hardware virtualization. A standard operating system can run in one domain while an offload engine can run in another. This gives the offload engine complete freedom to use the Sparc hardware as it sees fit without any pre-emption or interrupt overhead. An IO/MMU allows sections of the PCI bus to be virtualized safely and allows an offload engine complete access to hardware without the need for a virtual device. Thereby removing one of the key overheads of virtualization.

SUN-P

Sun Unified Network Platform (SUN-P) is an award-winning Sun's UltraSPARC® CoolThreads(TM) technology that augments the software offerings of World45's solutions. This combination offers high-performance computing and networking solutions that exploit the recent advances in highly parallel hardware execution architectures.

World45 leverages and scales with the multicore architectures

Multicore chips are here to stay, they are the cost-effective and energy efficient solution for providing extra performance at current transistor densities. Adapting your single-core applications to multicore is tricky and requires expert advice and coding.
Our expertise extends beyond UltraSparc systems and is applicable to other multicore systems. Different architectures have different strengths and weaknesses – we understand these.

Whatever your application, if you want to utilize multicore hardware for speed, we will help:
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