

## Cool Tools for Web-Tier Optimization

### Building the Next-Generation Web Tier



#### Highlights

- Sun Fire™ T1000 and T2000 servers based on CoolThreads™ technology offer breakthrough performance and dramatic space and power efficiency
- Chip multi-threaded (CMT) UltraSPARC® T1 processors deliver performance, scalability, and high levels of utilization for most Web-tier applications
- The proven and scalable Solaris™ Operating System (OS) with built-in consolidation and virtualization technology make the most of CMT processor resources
- Cool Tools for Sun Fire CoolThreads servers help accelerate application selection, development, tuning, debugging and deployment of key applications
- The Sun Fire CoolThreads server Try and Buy Program offers no-risk, on-site proof of concept evaluation with extensive on-line support resources



*“Scaling open source databases to our exacting levels of performance and reliability is always challenging. Our Sun Fire™ T2000 servers have liberated us by reducing 75 percent of the complexity normally required for our high-availability database clusters. The UltraSPARC® T1 has completely overturned the way we plan services and scalability.”*

— Dale Williams, CEO, DigiTar, Inc.

#### Facing Web 2.0 with better infrastructure

There is no question that x86 servers helped to drive the first generation of Web applications. Unfortunately, much of the infrastructure that built the Web is proving insufficient to carry it forward into the Participation Age. Demanding Web 2.0 applications along with millions of new users joining the Web each week are fueling the need for capacity and scalability. At the same time, organizations now face very real challenges in terms of rapidly deploying applications, managing complexity and server sprawl, and coping with power, cooling, and real estate limitations. It is clear that the next generation of Web-tier infrastructure must accomplish even more.

In the face of these challenges, Sun’s Web-tier optimization offerings help organizations gain high compute density in a smaller footprint,

with lower power and cooling overhead to streamline their Web infrastructure. Through consolidation and optimization, customers can benefit from:

- Greater throughput in less space
- Up to 60 percent fewer systems required
- As little as 1/4 the power consumption of competitive systems
- Improved management and security of Web infrastructure

With one of the strongest commitments in the industry to transparency and open source solutions, Sun is ideally suited to help organizations build and optimize next-generation Web-tier infrastructure, with less risk than ever before.

### Web tier optimization from Sun

The crush of new Internet users and the advent of new Web 2.0 applications is changing the way that organizations view their Web-tier infrastructure. Business and on-line growth is demanding more capacity. New and stringent regulatory requirements such as Sarbanes Oxley are bringing their own requirements that must be met to protect the business and its executives. In particular, the inability of the Web tier to scale to meet new demands within fixed power, cooling, and real estate limits has become a dominant priority. Merely deploying more servers is increasingly not an answer.

## With Cool Tools and Sun's Try and Buy Program, customers can try a Sun Fire CoolThreads server for 60 days with no risk.

In fact, the proliferation of power consumptive servers (such as servers based on the Xeon processor) have contributed directly to these problems. Server sprawl has its own costs, as large numbers of even the most inexpensive servers are causing massive operational inefficiencies along with excessive power loads, heat generation, and space consumption. With some data centers now consuming the power of small cities, and 80 percent of all data centers constrained by power and space, its clear something has to change.

Many organizations now realize that most of TCO is related to management, and that infrastructure complexity is the real enemy of agile and cost-effective operations. In fact, Sun estimates that 75 to 80 percent of costs are associated with back-end management, including acquisition, provisioning, operations, optimization, and migration to next-generation platforms and services.

### Sun Fire™ servers based on CoolThreads™ technology and the Solaris™ OS

As organizations seek to scale their Web-tier infrastructure within a fixed footprint of power and cooling, Sun Fire™ servers based on CoolThreads™ technology provide a unique opportunity. Powered by the open source based 64-bit UltraSPARC T1 processor with support for up to 32 active execution threads, these systems provide virtually unprecedented levels of scalability and operational efficiency.

Designed for scalability and consolidation, the Solaris™ 10 OS gets the most out of

CoolThreads technology, allowing organizations to take advantage of the considerable resources of the UltraSPARC T1 processor. In fact, Sun Fire servers based on CoolThreads technology and running the Solaris OS are ideal platforms for considerable growth and Web-tier consolidation. For

example, innovative Solaris Containers technology enables a single Sun Fire T1000 or T2000 server to be divided into multiple secure and isolated virtual systems, each with their own applications and resources.

The benefits of this approach for Web tier infrastructure are many, including:

- Lower costs, better management, and economies of scale through consolidation
- Faster service deployment through a standardized environment
- A better foundation for disaster recovery and business recovery
- Lower total cost of ownership (TCO)

### Cool Tools for Sun Fire CoolThreads servers

No matter how compelling new hardware or OS platforms may be, organizations must be assured that the costs and risks of adoption are in line with the rewards. In particular, organizations want to be able to continue to leverage the considerable advantages of popular commercial and open source software. Developers don't want to have to switch compilers and basic development tools. Administrators can scarcely afford a more complex support matrix or more time spent getting applications to run effectively in a new environment. Sun's Cool Tools program (Figure 1) is designed specifically to take the cost and risk out of moving Web tier environments to the Solaris OS and Sun Fire servers based on CoolThreads technology.

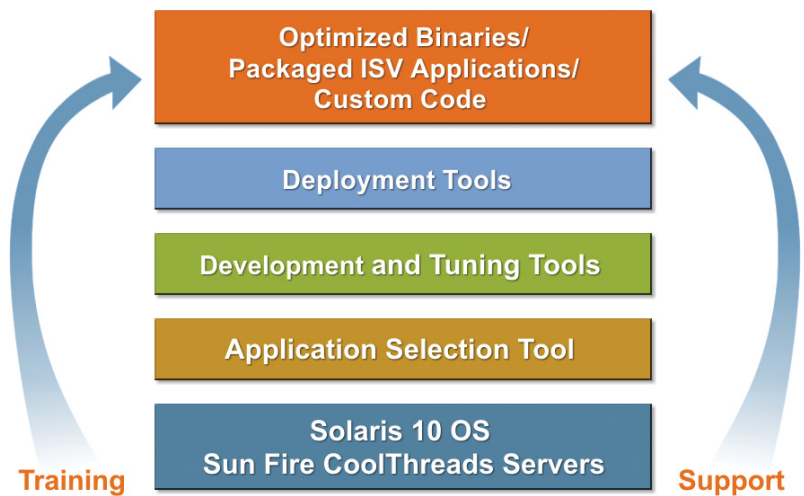


Figure 1: Sun's Cool Tools for Sun Fire CoolThreads servers provide a menu of options to help evaluate, tune, optimize, and deploy commercial and open source applications.

## Cool Tools elements

The Cool Tools for Sun Fire CoolThreads servers program features a menu of tools, letting organizations select only those elements that they need in order to evaluate, test, or optimize their applications.

### Application selection

Application selection helps identify those applications that stand to benefit from CoolThreads technology.

- **CoolThreads Selection Tool (*coolst*).** Coolst helps determine application suitability for the UltraSPARC T1 architecture, accelerating the understanding of application execution and helping to take the risk out of investment decisions. The tool measures application floating point content along with the number of light-weight processes (threads) to determine potential parallelism.

### Development

Developers need to be able to build, test, and evaluate applications, producing the most effective code while advancing their productivity with their chosen tools.

- **GCC for SPARC® Systems (*GCC4SS*).** Specifically tuned and optimized for SPARC systems, GCC4SS complements the popular GCC compiler suite, delivering up to three times the performance of compiled applications with even greater levels of reliability. At the same time, GCC4SS is 100 percent compatible with GCC, supporting all ABIs, language extensions, and flags.
- **Sun Studio 11.** Sun Studio 11 provides developers with the latest record-setting, high-performance, optimizing C, C++, and FORTRAN compiler compilers for the Solaris OS on SPARC® and x86/x64 platforms. Command-line tools and a NetBeans-based Integrated Development Environment (IDE) are provided for application performance

analysis and debugging of mixed source language applications. In addition to providing multi-platform support, Sun Studio 11 compilers are compatible with GCC, Visual C++, C99, OpenMP, and FORTRAN 2003.

- **Binary Improvement Tool (*BIT*) and Simple Performance Optimization Tool (*SPOT*).** Used for code coverage analysis, BIT provides instruction and call count data at run time, helping to significantly improve developer productivity and application performance. BIT does not require source code, and works with both executables and libraries. SPOT also helps deliver improved developer productivity by automating the gathering and reporting of code data.

### Tuning and debugging

Administrators and developers alike need to monitor, analyze, and tune applications under real-world conditions.

- **Corestat.** Corestat provides an on-line monitoring tool for core utilization of the UltraSPARC T1 processor, providing a more accurate measure of processor and system utilization than tools that only measure the utilization of individual threads. Implemented as a Perl script, corestat aggregates instructions executed by all the threads on a single core, revealing the cycles per instruction of key workloads and indicating where more tuning is needed.
- **Automatic Tuning and Trouble-Shooting System (*ATS*).** In the interest of automating application tuning, ATS automatically re-optimizes and re-compiles binaries with no need for source code. ATS identifies the inadequate optimization and then automatically rebuilds the application with the correct options for optimization. ATS is a plug-in for GCC4SS and Sun Studio 11.

### Deployment

Cool Tools deployment elements provide applications that are already optimized for Sun Fire CoolThreads technology, and save critical time in configuring systems for performance and consolidation.

- **CoolTuner.** CoolTuner provides an on-site “virtual” tuning expert, delivering system performance improvements by automatically applying current best practices including both patching and tuning. Depending on administrator experience, CoolTuner can save hours to weeks of effort tuning Sun Fire servers based on Cool Threads technology.
- **Cool Stack.** Cool Stack represents a collection of the most commonly used free and open source applications, pre-optimized for Sun Fire servers based on CoolThreads technology running the Solaris OS. Including such popular applications as Apache, Perl, PHP, Squid, Tomcat, and MySQL, these applications have been recompiled with Sun Studio 11 compilers to deliver a 30 to 200 percent performance improvement over standard binaries compiled with GCC. Cool Stack applications also bring performance benefits to any SPARC system.
- **Consolidation Tool for Sun Fire Servers.** Powerful Solaris Containers offer myriad consolidation possibilities and the Consolidation Tool for Sun Fire Servers speeds their deployment. With a wizard-based GUI, this tool simplifies and automates the installation of consolidated applications, enabling even novice administrators to create a fully virtualized and consolidated environment using Solaris Containers. The result is fast and high-quality consolidated deployments.

“Joyent's platform of Ruby on Rails applications, development tools, and unique collaboration offerings run at a greater throughput and lower operational costs on Sun's CoolThreads servers running OpenSolaris. This allows us to give our community of users and developers access to a great platform at a low price, and offers our Web 2.0 developers a powerful environment where they can scale their applications.”

**David Young**

Chief Executive Officer, Joyent



Figure 2: Sun Fire T1000 and T2000 servers provide dramatic scalability for most Web-tier applications.

**Putting Cool Tools to work**

Cool Tools are available free of charge for download from <http://cooltools.sunsource.net>, which also includes access to detailed documentation, presentations, and discussion forums. These tools are available for both new and existing customers of Sun Fire servers. Some of the Cool Tools elements are also installed on new Sun Fire T1000, and T2000 servers (Figure 2).

**More resources**

Sun provides extensive on-line resources for CoolThreads technology, including white papers, analyst reports, and more at <http://www.sun.com/servers/coolthreads/overview/index.jsp>.

**Uncensored testimonials**

As more organizations experience the real-world performance of the Sun Fire CoolThreads servers, the results are compelling indeed. Enthusiastic and uncensored testimonials can be viewed at: <http://www.sun.com/servers/coolthreads/testimonials>

**Sun Fire CoolThreads server Try and Buy offer**

For a limited time, Sun is offering the opportunity to qualify for a free 60-day trial of a Sun Fire server with CoolThreads technology. Together with the availability of Cool Tools for CoolThreads servers, this program represents an ideal opportunity to evaluate the Solaris OS and UltraSPARC T1 processor technology on key applications, at no cost. Applicants to the

Try and Buy program can avail themselves of Cool Threads tools and extensive on-line support (<http://www.sun.com/tryandbuy>).

Visit [sun.com](http://sun.com) today or contact a Sun representative to learn more about:

- Powerful Sun Fire servers based on CoolThreads technology
- The robust and proven open source Solaris OS
- Cool Tools for CoolThreads servers aiding open-source development, tuning, and rapid deployment
- Sun's CoolThreads Try and Buy program



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