

## ISSUE 1

## THE ENTERPRISE READY OPERATING SYSTEM

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## Solaris Delivers Business Results

by Dan Roberts, Director, Solaris Marketing

In today's rapidly changing IT environment, choosing the right operating system is more important than ever. IT managers have a number of key issues to consider. Power and performance are obviously important, but an operating system directly affects many other aspects of IT that could have a significant impact on the business.

One thing to consider: How robust is the community of developers and systems administrators who are familiar with the OS? At Sun, we have worked to help build a thriving community around the Solaris Operating System. Since the release of Sun's flagship Solaris 10 operating system in 2005, along with the creation of the OpenSolaris community the same year, Solaris has attracted tens of thousands of new developers from other OS communities. Also, the growing momentum of Solaris on x86 servers from Dell, IBM, Sun, and other vendors, along with Solaris on Sun's new UltraSPARC T1 and T2 powered servers, is rapidly expanding the reach of Solaris beyond its traditional SPARC installed base.



Dan Roberts

Because the code base for Solaris has been developed under an open source license, any developer can join OpenSolaris.org and help guide the future of the world's leading free and open source OS. Today, the OpenSolaris community includes more than 82,000 members working on the development of the OS – including a port of Solaris to the IBM System z mainframe (a working prototype of this advance was recently demonstrated). Worldwide, more than 11 million copies of Solaris 10 have been licensed – with more than 70 percent of those on x86 platforms from Dell, IBM, and other non-Sun vendors. While Linux has been known for its accessibility and the large number of developers and system administrators familiar with the open source OS, the OpenSolaris community has really helped turn the tide for Solaris. IT departments now have a deeper and richer pool of talent experienced with the Solaris OS – and that number continues to grow.

Companies that choose Solaris also gain access to many more applications than on a typical Linux distribution. In fact, there are currently more than 5,000 software products available for Solaris 10 – more applications than any Linux distribution. And unlike Linux, where binary compatibility with new releases is, at best, hit or miss, Sun has guaranteed binary compatibility of Solaris versions for more than ten years! Having a broad set of application with a stable OS

## Executive Perspective

deployment platform is critical for businesses that want choice and flexibility in the way that they deploy their IT assets.

Another important consideration when choosing an OS is how it will affect the day-to-day management of the IT infrastructure. Because of an exponential growth in data, IT departments now manage complex distributed computing systems, high-performance computing clusters, and complex Web infrastructures.

To help IT handle this data management complexity, Solaris 10 includes ZFS, which streamlines storage administration and provides the flexibility to grow, snapshot, and move data on the running system. With ZFS, included with Solaris 10, there is no need for expensive third-party volume management software to manage additional storage.

For those organizations that need to store petabytes of data, maintaining data integrity is also a vital issue. The more data your organization stores, the more likely you are to suffer from silent data corruption that statistically will occur due to media errors when enough data is stored for long enough on disk. Along with providing new levels of manageability, ZFS helps eliminate silent data corruption errors automatically, ensuring data integrity even in petabyte-sized file systems.

Of course, many companies attempt to simplify IT administration by consolidating servers. While consolidation makes sense, it often requires proprietary virtualization software to manage the added

complexity. Unlike other vendor approaches that are limited to x86 platforms, Solaris virtualization capabilities are cross-platform, supporting both x86 and SPARC platforms. Solaris Containers, included for free with Solaris 10, safely run multiple different applications on a single server and give IT the ability to prioritize applications and control resource usage – which results in better system utilization. Additionally, Solaris Containers enable IT to combine servers as well as application licenses – which means lower costs.

But as companies put more and more applications on each server, and as more of these applications have users outside the boundaries of the company, security is paramount. The security features included in Solaris 10 were originally designed for government clients, to provide the highest level of security access control while maintaining ease of user management.

Finally, an operating system must provide flexibility for future growth – including mergers and partnerships. Because Solaris can run on a wide range of hardware, from the datacenter to the desktop, it offers distinct advantages. Currently, there are more than 900 systems compatible with Solaris. The Solaris OS is available on a wide range of Sun, IBM, Dell & HP x86 systems, and Sun's alliance with Intel and its close relationship with AMD ensure even more innovations that meet our customers' growing computer requirements.

With CPU performance rapidly increasing as new dual- and quad-core processors are released from Intel and AMD, along with Sun's octal-core UltraSPARC T1 and T2 processors, your operating system also needs to

keep pace. Solaris speeds application performance on today's multi-core CPUs, where a single multi-core CPU today often has the same power as a large multiprocessor system only a few years ago. Solaris engineers from both Intel and AMD work closely with Sun to ensure Solaris is optimized for Intel and AMD CPUs, as well as for our own UltraSPARC CPUs. Features like DTrace, also a part of Solaris 10, provide powerful tools not found in any other operating system to quickly identify and fix bottlenecks in both application and system level code. This has resulted in more than 170 performance and price/performance world records for Solaris.

Operating systems should improve IT efficiency, not add more layers of complexity. Sun believes that your operating system should also offer you choice: choice of more applications, choice of CPU, choice of hardware vendor, and choice of free and open source licensing – or commercial licensing for customers that want Sun's legendary Solaris support (now available directly from IBM and Dell as well as from Sun). So it's not surprising that more and more IT managers are choosing Solaris.

Sincerely,

*by Dan Roberts, Director,  
Solaris Marketing*

## How Sun Is Recasting Solaris and What it Means to Users

by George J. Weiss, VP Distinguished Analyst, Gartner

**Gartner created a classification scheme to help IT organizations decide where and how Solaris may be relevant again. Use this approach to enable strategic planners to better understand how and where Solaris can be a relevant part of the IT infrastructure**

### Key Findings

- Analyze Sun Solaris using the four categories outlined in the document.
- Do not be misled that Sun is a box supplier – its core value is in the stack, and Solaris and Java play a central role in driving user decisions.
- An important transition is Sun's ability to turn Solaris – a Unix operating system (OS) – and its x86 platforms into an integral part of the commodity platform market. In this way, any declines in traditional Unix markets can be counterbalanced by the commodity market.
- The recent agreement with IBM to become a distribution channel for Solaris on some of its hardware platforms will be a high point in getting Solaris more industrywide recognition.

### Recommendations

- In mixed hardware/OS platform decisions, decide on a management tools strategy to support applications tuning, error detection and maintenance.
- Get a written commitment from IBM and Sun of at least seven years of

- support for future Solaris and IBM hardware upgrades.
- Differentiate the roles of Solaris and Linux by application complexity, availability and scalability with guidelines on future implementations.
- Determine the seriousness of hardware OEMs such as IBM in supporting Solaris by the amount of available support resources and investments in sales/support.
- Explore ways to mix Solaris, Linux and open source to command the broadest pool of applications.
- Consider Solaris in highly mission-critical environments where Linux releases may create instability and compatibility problems.
- Track the OpenSolaris community for enhancements relevant in future projects.
- If binary compatibility, stability and minimum disruption are key IT drivers, then consider a multitiered Solaris-Linux deployment strategy.

### ANALYSIS

Sun recently announced the deal with IBM to distribute the Solaris 10 OS with support subscriptions on certified IBM models of the BladeCenter and System x servers. This agreement, although

significant, amounts to one more pillar in a strategy to recast Solaris from an aging legacy OS to a dynamic and versatile OS suitable in multiple roles. Had Sun tried



George Weiss

to position Solaris on the basis of a better Unix OS against IBM and HP, or a better general-purpose OS against Linux and Windows, we believe it would have failed. For the past three years, Sun has been driving new marketing programs, functionality, system certifications, packaging, support and developer programs that have left the other vendor Unix strategies relatively market-constrained by their reduced instruction set computer (RISC)/Itanium platforms. This research will interpret the global picture of Sun's strategy and identify what IT planners should do about it.

We classify Sun's Solaris strategies into four categories. Although these categories have not been articulated by Sun, we believe virtually every Solaris-related announcement can be applied to one or more of these categories:

- Positioning Solaris as a commodity OS (in addition to scalable high-end servers)
- Delivering Solaris as a Linux-like alternative by openness, packaging and subscription support
- Creating broad channels of distribution
- Adding innovation and feature advantages in layered products and systems

Then we “stuffed” these categories with various announcements and deliverables made by Sun during the past 12 to 24 months. Although each category could be expanded into a more comprehensive description and analysis, for the purpose and brevity of this research, only major highlights are provided.

### Positioning Solaris for Commodity Markets

In a surprise move, Sun is working closely with Intel to support new Intel processors that complement the AMD processors that launched Sun’s x86 family. Intel is partnering in design, coding and post-integration testing. Intel does not want to lag behind AMD as Sun’s x86 unit volumes increase. In addition to Solaris, Sun delivers multiple OS x86 support for Windows and Linux (primarily Red Hat). Sun ships its own full range of x86/x64 systems, the Sun Fire X series (Galaxy), the only Unix vendor to have implemented an x86 Unix strategy. Sun also has a Solaris hardware compatibility test program for Tier 1 vendors, such as IBM, HP and Dell, and a license arrangement with Fujitsu-Siemens. Sun has built a strong hardware compatibility list for Solaris, with 320 servers (including 20 IBM systems), together with 3,000 independent software vendor applications (including the IBM software portfolio, such as DB2, WebSphere, Lotus and Tivoli) shipping for Sun’s Solaris on x86 hardware. Sun Solaris is uniquely distinguished in this category, but Sun should also position itself to play an important role in a multiple OS deployment strategy of Solaris, Linux and Windows.

### Appealing to a Broad Development Community by Delivering Openness, Packaging and Support Similar to Linux

In addition to freely available versions of Solaris 10, Sun delivers free Express editions (8 million downloads) designed for developers to experience easier installations with packaged development tools, including Java and C++, the Gnome user interface, StarOffice and many other open-source applications. Sun created the OpenSolaris developer community with free availability of source code. About 67,100 registered community members are involved in OpenSolaris (via Red Hat Fedora and Novell OpenSuse). Sun has already “GPL’d” (an open-source license) Java and is reviewing the license for other technologies, such as ZFS (a file system for Solaris). Selected storage and ZFS file system features have been donated to the OpenSolaris community, along with the Sun Open HA cluster available with OpenSolaris. We expect more Linux-style packaging to emerge from a program called Project Indiana, headed by the chief OS platform strategist, Ian Murdock (ex-Debian founder).

Sun’s rigorous attention to binary compatibility places Solaris in a particularly advantageous position to Linux, which does not define binary-level compatibility as a strategic goal. Sun’s major challenge is to reignite interest of college curricula in Solaris against Linux, and ward off the Linux community’s natural dislike for anything competitive to Linux.

### Creating Broad Channels of Distribution

The recent Sun partnership with IBM will enable IBM to act on behalf of

Sun in selling subscription support services for Solaris on selected IBM hardware platforms. Although Sun has enlisted other platform vendors, such as HP and Dell, the IBM agreement is the most comprehensive in service, support and testing (others do not have the same level of certification and support from Sun). Although the initial announcement was restricted to selected IBM x systems and IBM BladeCenter models, both companies have alluded to work IBM has been engaged in on porting to the z (and likely to p as well), which would open more opportunities for Solaris in mainframes and data centers in core IBM accounts. However, Sun must be cautious of the downside: IBM asserting account control through consolidation strategies in which Solaris becomes a feature in a subsidiary role, not enterprisewide strategic.

### Adding Innovation and Functional Advantages in Layered Products and Systems

Most recently, Sun has begun focusing attention on virtualization, including the Xen hypervisor and Solaris Containers. In addition are its high-performance file system (ZFS), mandatory access controls and trusted containers, dynamic trace (DTrace) and chip multithreading. Niagara products are achieving increasing attention in high-bandwidth applications. The x4500 (named Thumper) is a packaging approach to high-bandwidth/high-capacity storage and input/output with potential in clusters and grids, video streaming and applications demanding high network bandwidths. Sun has also integrated ZFS on Solaris as a high-capacity file storage system within Thumper. Sun should embark on further initiatives in hardware and software appliances.

## Competitive Market Dynamics: Winners and Losers

- Sun is the only vendor with a viable Unix x86 story. Getting IBM to align its channel to sell subscription support for Solaris on IBM hardware helps both vendors create a greater competitive threat to slow HP's ProLiant (as well as Dell's) momentum running Linux. IBM and Sun can gain market share by expanding their presence relative to HP (and Dell).
- By collaborating on a Unix go-to-market strategy for x86, IBM and Sun may also steer away potential business for Windows among users harboring doubts about Linux.
- By creating a strong binary compatibility story at a time when Linux community efforts are preoccupied with high-velocity kernel enhancements on quick-release cycles, Sun appeals to stable-minded shops wishing to avoid disruption.
- If Solaris is also ported to other IBM platforms (that is, Systems z and p), IBM benefits from consolidation trends at the expense of HP, while Sun gets expanded presence where Java may keep Sun interest in the account over multiple generations.

## Advice

Decide in which category or categories Sun has its biggest value-add to your IT organization. Plan to engage Sun in a way that the optimum benefits can be received from the categories of interest. Decide whether Solaris on x86 can be adapted to procurement configuration standards and whether Sun can certify and test for competitive advantage. Favor Solaris if selective features and functions (for example, file system, security, HA/cluster, containers, diagnostics and storage/bandwidth) would be strategic to the success of new projects. Perform a total cost of ownership analysis to measure the practical returns on new deployments using Solaris vs. Linux or Windows, and choose accordingly.

Gartner RAS Core Research Note  
G00151305, George J. Weiss,  
4 September 2007

### What's Next For Solaris?

by Ian Murdock, Chief Operating Systems Strategist, Sun Microsystems, Inc.

One of the big advantages of open source software is that it gives businesses and developers rapid access to the newest technologies. While the Solaris Operating System is known for providing unmatched features and support, it has historically been difficult to install, and it has lacked certain features that users raised on Linux have grown to expect – such as package management and the GNU environment.

That will change in Q2 2008 when Sun introduces the OpenSolaris operating system, a second delivery vehicle for Solaris technology. This operating system will offer developers the latest OpenSolaris and open source technology at regular, much shorter intervals. It will also provide access to key features (such as ZFS, Dtrace, and virtualization capabilities) in a package that has been rearchitected to make it more familiar to Linux users.

Solaris, which was open-sourced as the OpenSolaris project in 2005, will still be one platform. The OpenSolaris OS will be a rapidly moving community version, while Solaris remains Sun's enterprise-grade, supported-for-many-years, backward-compatibility- guaranteed operating

system for the data center. Our goal is to create a distribution of OpenSolaris that simultaneously delivers a Linux-like distribution alongside the great features that make Solaris unique. And over time, the new technology in OpenSolaris will become a part of Solaris as well.

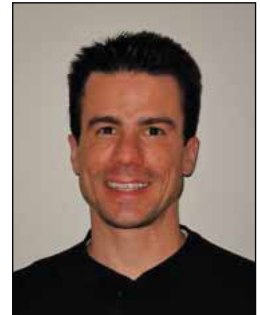
With OpenSolaris, developers gain access to an open source operating system that is:

- Easier to download and install
- Easier to manage, thanks to a package management system that allows the user to easily select, install and upgrade software components
- Includes well known utilities, such as GNU utilities

The full features and long-term support of the Solaris OS will also continue to be available. It will still have the lowest cost of acquisition of any commercial OS (it's free), and come with full indemnification for Solaris customers.

Our goal with the OpenSolaris operating system is to make OpenSolaris technology more accessible and to grow the number

of developers with hands-on experience in a Solaris environment. As the developer ecosystem for OpenSolaris expands and more applications are developed for Solaris, businesses will find it easier to hire Solaris developers and create new products and services based on Solaris technology. We will also enable a distribution ecosystem based on a brand that stands for compatibility. From my own experience, I know that it is the incompatibility of distributions that bedevils the Linux market today.



Ian Murdock

Another advantage of OpenSolaris for businesses is that it is based on technology that has been in the datacenter for many years. As a systems company, Sun spends \$2 billion annually on research and development focused on all parts of the technology stack. Our alliances with leading technology companies (like IBM, Intel, and AMD) and our decades of experience in integrating software, hardware, and systems enables Sun to offer solutions and support that meet the needs of enterprises.

After working in open source for 15 years, I'm excited that more developers and businesses will soon be able to take advantage of all that OpenSolaris offers. I can't wait to see what evolves from here.

Sincerely,

Ian Murdock  
Chief Operating Systems Strategist  
Sun Microsystems, Inc.

#### Featured Gartner Research: How Microsoft, Sun and Novell Can Change Linux Market Dynamics

Microsoft, Sun and Novell are engaged in important cooperative strategies and agreements that could change user behaviors and buying patterns. These changes will likely affect Red Hat's ability to maintain its pre-eminent position in the Linux market.

[Click here to access the full Gartner report](#)

### Siteworx, Inc. Healing Growing Pains Virtually with the Solaris 10 Operating System and Sun Fire X2200 M2 Servers Industry: Media & Entertainment

#### Organizational Summary:

Siteworx (siteworx.com), one of the most technologically sophisticated Internet companies, provides award-winning client solutions to optimize the Web as a communications medium. It offers interactive design, user experience, application development and backend integration services. In 2007, Inc. magazine named Siteworx one of the 500 fastest-growing private companies in the U.S.

#### Business Issues:

- Reduce operational costs
- Simplify time-consuming administrative tasks
- Maintain quality, efficiency and uptime of systems
- Standardize on a single hardware solution for a multi-platform environment
- Reduce cost of rack space and power consumption

#### Solution:

To scale to the demands of high growth in a short time, Siteworx invested in high-performing, energy efficient Sun servers and optimized its platform using the virtualization features in the Solaris 10 Operating System to create fast, innovative and user-friendly Web properties for its customers.

#### Results:

- Gained system flexibility by implementing Solaris 10 Containers
- Reduced administrative time by as much as 90% through the ZFS file system feature of the Solaris 10 OS

- Maintained 100% uptime by utilizing the Solaris 10 OS and Sun x64 servers
- Reduced rack space rental costs by 80% and decreased power consumption costs by 65%

#### Sun Products/Services:

- Sun Fire X2200 M2 Servers
- Solaris 10 Operating System
- Sun Java Platform Standard Edition (SE) 6

#### Success at a Glance:

Cited as one of the fastest growing private companies in the United States, Siteworx, an “Interactive Design, User Experience and Application Development” company faced the challenge of expanding rapidly without compromising the quality of service it delivers to its prestigious clientele – a group that includes AOL, U.S. News and World Report, Coldwell Banker Commercial, Accenture, and AARP. Siteworx wanted to upgrade its technology and streamline processes in order to control costs at two facilities – a production center in upstate New York and a creative and production hub in Reston, Virginia that houses about 80 employees serving an estimated 30 active accounts at any point in time.

After evaluating the competition, including the Dell servers they were then using, Siteworx President Tim McLaughlin cited that investing in a fleet of Sun Fire X2200 M2 servers was “a no brainer.” The Sun Fire X2200 M2 server system addressed all of the

company’s requirements – it’s fast, stable, energy efficient and runs virtually any operating system. “The technology is simply better and the price was right,” McLaughlin says.

Siteworx and its subsidiary, Axiom®, an enterprise software development company, traditionally developed in Java and delivered their work on the client’s operating system of choice. They were considering standardizing on Red Hat Linux when the server upgrade led them to try the Solaris 10 Operating System for the first time.

The company liked what it saw and switched. Since then, Siteworx has maintained an uptime of 100 percent on servers running the Solaris 10 Operating System. Implementing the ZFS file system feature of the Solaris 10 OS has improved disk allocation management and freed up administrative time. For example, upgrading individual systems is 90 percent faster with global upgrades and setting up new environments is 83 percent faster. Using DTrace, the dynamic tracing technology in the Solaris 10 OS, Siteworx has been able to rapidly discover, diagnose and repair flaws and bottlenecks in running code – an important capability for a company that designs and architects highly interactive, high-traffic Web properties.

Most dramatic in meeting the Siteworx goal of reducing the total cost of ownership was the virtualization capability Solaris 10 OS offers. By implementing Solaris Containers to separate and protect client applications in a virtualized environment, Siteworx was able to revolutionize its use of server space. “Using Containers, we have been able to pack a lot more on a box,” states McLaughlin. “We estimate that Solaris Containers have

## Customer Snapshot

been able to give us the equivalent memory and processing power of ten virtual servers on every physical server. That's resulted in an 80% reduction in space requirements and 65% savings in energy costs," says Brad Forrester, Siteworx Systems Operations Manager.

In parallel to the stability, maturity and broad feature set that Siteworx appreciates in the Solaris 10 Operating System, it uses the Java Platform Standard Edition (SE) 6 as a programming language. McLaughlin applauds the huge library of APIs available to Java developers, its

portability and ease of interfacing with other programming languages. Additionally, Siteworx benefits from the merger of Java and Java script in version 6.0, the huge international developer community, the JMX debugger and most of all, how well Java scales to a multi-processor or multi-core environment. All of these features help Siteworx and Axiom achieve the combination of stability and agility needed for success in their highly competitive, highly creative business space.

Source: Sun Microsystems

*"The Solaris 10 Operating System is extremely reliable and has provided us with 100 percent availability since our implementation about a year ago. We bought Sun solutions because of their superior technology."*

*-Tim McLaughlin  
Founder and President  
Siteworx, Inc.*

## About Solaris

The Solaris Operating System – supported on over 900 x86 and SPARC platforms – delivers the performance, stability and security users and customers demand. With more applications available than for any other open operating system, one OS can span the entire enterprise: the Web tier, the data warehouse, and the most demanding technical compute applications.

Solaris has offered guaranteed binary compatibility between Solaris releases for nearly a decade, making it easy to move existing applications to Solaris 10. Sun maintains source code compatibility between SPARC and x86 processors, helping to enable applications to be easily supported on every platform Solaris 10 runs on, including those based on the latest AMD Opteron and Intel Xeon

processors, and CoolThreads systems. Solaris 10 is supported on more than 890 x64, x86 and SPARC systems from Sun, Dell, Fujitsu, HP and IBM. For a complete list of new features in Solaris 10 or to download Solaris visit: <http://sun.com/solaris>.

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