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→ [Support & Training](#)

[Home](#) > [Company Info](#) > [Press Center](#) > [Press Releases](#) >

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SUN ANNOUNCES SOLARIS[tm] 9 OPERATING ENVIRONMENT: WITH OVER 300 NEW FEATURES, CUSTOMERS SAVE MONEY AND TIME

New version of leading enterprise operating environment provides customers with path to application services future and all the features they need for increased manageability, security, availability, and scalability

Santa Clara, Calif. -- May 22, 2002 -- Sun Microsystems, a leader in systems and solutions that make the net work, today announced the [Solaris\[tm\] 9 Operating Environment \(Solaris OE\)](#), the new version of the leading operating system for UNIX (R) servers. With over 300 new features, Solaris 9 provides users, system administrators, and developers with a superior services platform, making it easier to develop, deploy and manage Web services on Sun systems. Sun also announced it is integrating significant elements of middleware, including its next generation [Java\[tm\] 2 Platform, Enterprise Edition \(J2EE\)\[tm\] 1.3](#) compliant Sun[tm] ONE Application Server 7, Platform Edition, and the foundation for identity management, the Sun ONE Directory Server. Saving millions for the typical enterprise, Solaris 9 OE also includes enhanced manageability, security, availability, and scalability features.

"Solaris 9 OE provides the industry's most complete platform architecture for today's mission critical applications," said Andy Ingram, vice president of marketing for Solaris software at Sun Microsystems, Inc. "Solaris 9 OE is the only Operating Environment to deliver so many dimensions of middleware and application architecture built-in, while still allowing for the integration of third party applications. Furthermore, key components of security and provisioning are built right into the operating environment. Taken together, these enhancements will help to reduce cost of acquisition, testing, integration and management, and will dramatically improve resource utilization while making deployment of Web services more secure, available, and easier to manage."

New Features Enhance Manageability, Security, Availability, Scalability

Sun announced over 300 new feature enhancements in Solaris 9 OE in the areas of manageability (Sun ONE integration; data management; provisioning and change management; and server virtualization); security; availability (configuration management and full Sun Cluster 3.0 support); and scalability (performance enhancements and increased compatibility.)

"Sun has delivered a solid platform for deploying Web applications and services with Solaris 9 OE by anticipating the technological innovation required to take computing to the next level," said Tony Iams, vice president of systems software for D.H. Brown Associates. "Improving security, manageability and provisioning, Solaris 9 OE also benefits from the most mature partitioning capabilities in the UNIX space."

Sun[tm] Open Net Environment (Sun ONE) Integration

Amazon Ex. 1009
IPR Petition - USP 7,519,814

Oracle Ex. 1009
Oracle v. VirtaMove, IPR2025-01002

The Solaris 9 OE will feature the integration of the new J2EE 1.3 compliant Sun ONE Application Server 7, Platform Edition with a single server development and deployment license for use on Sun systems. The Application Server includes the market proven and high performance http engine and web infrastructure from the Sun ONE Web Server and the Sun ONE Message Queue, which is ten times faster than IBM's WebSphere MQ product. Solaris 9 OE also integrates the Sun ONE Directory Server, an industry-leading foundation for open, scalable identity management. The integration of these Sun ONE middleware elements into Solaris 9 OE makes it easier to build and deploy application and web services based on Java, XML and SOAP technologies, while helping customers to save on acquisition, integration, testing, support, and management costs. Further details to be unveiled in June, at <http://www.sun.com/sunonenetevent/>

Data Management

The Solaris 9 OE incorporates many file system features which provide high performance and superior manageability without the need to buy additional products. New features include:

- Unix File Systems (UFS): Journaling and concurrent direct I/O improves performance and resilience, particularly of databases.
- Solaris[tm] Volume Manager: Provides storage management tools that allow users to efficiently manage large disks as well as large numbers of disks. For example, the number of disk partitions per device has been increased from eight to eight thousand, which means that customers can more cost-effectively utilize large capacity storage devices by partitioning them as needed. Graphical disk management has also been enhanced, making it easier for customers to manage their storage environment.

"The data management features in Solaris 9 OE provide an integrated platform for the production database and file system requirements of EG&G's customers," said Boyd Fletcher, systems engineer, EG&G.; "The cost savings of having the Solaris Volume Manager integrated into Solaris 9 OE are significant, on average \$50K per site, and the UFS and Network File Systems (NFS) enhancements enable faster creation of file systems with improved performance and reliability."

Provisioning and Change Management

Solaris 9 OE enables system administrators to more easily and securely install and update software stacks, thus simplifying common tasks and reducing cost of operations. Key provisioning features include:

- Solaris Flash software: allows a user to create a snapshot of the entire software stack (including applications, the OS, and customizations) and then copy it to another system, reducing typical installation or reconfiguration time from hours to minutes.
- Live Upgrade: minimizes downtime by allowing for operating environment upgrades while still supporting production workloads. The original OE configuration is preserved, allowing for safe rollback if needed.
- New change management features include:
- Sun[tm] Management Center Change Manager. To be available later this year, Change Manager will allow rapid automated deployment of software stacks to groups of systems simultaneously across the network.

Server Virtualization: Solaris Containers, Resource Management

Solaris 9 OE extends Sun's leadership in resource utilization by introducing Solaris software containers as well as integrating advanced resource management functionality into the operating environment:

- Solaris software containers are an extension of the UNIX (R) partitioning concept introduced with Dynamic System Domains, a fifth-generation leadership technology from Sun, and Dynamic Reconfiguration, in which components including CPUs and memory can be replaced with no system or application downtime. This functionality extends across Sun's server product line, from the Sun Fire[tm] V880, 3800-6800, 12K, 15K, and the Sun Enterprise[tm] 10000.
- Containers: Allows customers to run multiple applications on a single server, with fault, security and resource containment built-in. Container sizes can even be changed without bringing down the application. This enables the delivery of more predictable application service levels to all of the diverse applications that are consolidated on a given system. Rather than repurposing old mainframe technology to UNIX, Sun is delivering an innovative approach which more efficiently utilizes resources.
- Solaris software containers will be delivered in phases, beginning with Solaris 9 Resource Manager. Now built into the Solaris OE, Solaris 9 Resource Manager makes it easy to allocate resources, allowing for fine-grain control of CPU and memory.

Security

The Solaris 9 OE builds in the core security services required to protect modern application services that live on the Internet. New security features in Solaris 9 OE include:

- SunScreen[tm] 3.2: This enterprise class firewall enables system level access control in addition to stealth mode perimeter security.
- Secure Shell: for secure remote access and management.
- IPSec: Built-in 128 bit encryption allows for greater protection of data on the network.
- Kerberos v5 server: Built into Solaris 9 OE, this industry-standard protocol enables single sign-on.
- Buffer overflow protection: Limits attacks based on buffer overflow exploits.
- Other features include security hardening scripts; extensible password encryption, and RBAC (role-based access control).

Availability

Extending an already highly available system, Solaris 9 OE includes the following features:

- The Solaris 9 OE will be available immediately with full Sun[tm] Cluster 3.0 support through its latest update, Sun Cluster 3.0 5/02 software. Sun Cluster 3.0 software enables pooling of resources in a tightly coupled environment providing customers with easier manageability at higher service levels. Sun Cluster 3.0 software provides agents for applications such as Oracle9i RAC and SAP to ensure that these applications can run in a highly available manner within the cluster. Sun Cluster 3.0 software is the only clustering solution for Solaris OE that delivers Dynamic Reconfiguration capability in a cluster.
- Data multipathing: Solaris OE provides for multipathing data to storage devices and across the network through the Sun StorEdge[tm] Traffic Manager and enhancements to IP Multipathing.
- Reconfiguration Coordination Manager: Automates dynamic reconfiguration operations. The Reconfiguration Coordination Manager and Automated Dynamic Reconfiguration tools enable system administrators to easily manage the process of adding and removing physical system resources.
- High Availability Service Packs: Blends out of the box consulting, training, and support services to provide a foundation from which a comprehensive availability solution can be implemented and managed throughout the application life cycle.
- Dynamic Reconfiguration: Processors, memory, and I/O interfaces can be
- plugged into Sun's Sun Fire [TM] V880, 3800-6800, 12K, 15K, and Sun Enterprise[TM] 10000 systems to dynamically configure into or out of an operating system's domain and be replaced with no downtime.

Configuration Management

Using the Sun Sigma process to measure customer experience, Sun has determined that proper configuration is a key contributor to system uptime. To address this, Sun has made significant investments in configuration management services. They include:

- Reliability Availability Serviceability (RAS) Knowledge Database: An innovative rules database which captures best practices for systems configurations, particularly as it pertains to system availability.
- RAS Profile: A Sun service that compares the RAS Knowledge Database to a customer's existing configuration and makes recommendations on how to improve configurations with the goal of achieving higher availability.
- Solaris[tm] Patch Manager: Gives system administrators better control over configurations, by enabling them to easily determine what patches are already installed on a system, identify needed patches and then allowing those patches to be obtained and deployed in a secure automated fashion.

Performance: Increasing the Lead

Solaris 9 OE has made significant improvements in performance without necessarily requiring developers to recode, recompile or redesign existing applications. These include improvements to:

- Multithreading: Improved implementation of the threads library without breaking existing applications.
- Memory Optimization: Solaris 9 OE accelerates applications, allowing them to take advantage of the extensive memory architecture available in Sun Fire systems.
- Java technology: Solaris 9 OE integrates "HotSpot" Java 2 Platform, Standard Edition, (J2SE)[tm] 1.4 platform, which significantly increases performance of applications that use Java technologies.

The following world records were achieved using the Solaris 8 OE. Sun expects similar or better results will be achieved with the Solaris 9 Operating Environment:

- #1 Java platform performance on SPECjbb[tm] 2000--77 percent faster than IBM's best posted number. [1]
- #1 non-clustered DSS performance on TPC-H for 1000GB database--43 percent faster than HP's best posted number. [2]
- Best linearity: Sun Fire 15K server demonstrates 99 percent (98.96%) linearity on 64-bit processors across 72 CPUs (Oracle 9i data warehouse query; at 72 CPUs, performance is 71.25 times faster than 1 CPU)

Compatibility

Sun is so confident about compatibility between revisions that it offers a guarantee of application compatibility. The Solaris Guarantee Test Suite provides a means by which a customer can determine whether an application can move from one Solaris OE release to the latest without incurring potential compatibility problems.

Solaris 9 OE has enhanced built-in Linux compatibility and includes many new features, including APIs, commands, tools, utilities, and services. This is one of Sun's key Linux initiatives, ensuring Linux applications can 'just run' while scaling up and taking advantage of the rich features and benefits of Solaris OE. Sun also provides the Linux Compatibility Assurance Toolkit (LinCAT) to further simplify the process of developing source code compatible applications. Solaris 9 will also feature the next generation desktop, GNOME 2.0.

Services

Sun is providing a comprehensive suite of services to help customers quickly and cost-effectively implement, upgrade or migrate to the new Solaris 9 Operating Environment and get the most out of its new features and functionality. Sun's services include technical

consulting to assess opportunities for mainframe migration and consolidation, a complete portfolio of training options, and total care support solutions. For more information, please visit <http://sun.com/service/about/features/solaris9.html>

Pricing and Availability

Sun includes a Solaris software license in the price of each hardware system shipped. Customers with Sun support contracts receive upgrades as part of the price of support. For all others, Solaris 9 OE is available from \$50 and up.

The Solaris 9 Operating Environment (SPARC® Platform Edition) is available for download at no cost for an unlimited number of systems with a maximum capacity of a single CPU. The Free Solaris Binary License Program is at <http://www.sun.com/solaris/binaries>. A Systems Administration kit with Solaris software media, hard copy installation documentation and bonus software is also available at this site.

About the Solaris 9 Operating Environment

The Solaris Operating Environment (OE) is the premiere operating environment for the enterprise. With over 300 new features, Solaris 9 OE is the most scalable, available, manageable and secure services platform for the networked world. By focusing on industry standards, the Internet, innovation and integration, Solaris 9 OE delivers a documented lower cost of operation. Solaris is the leading UNIX operating environment with Sun servers capturing 64 percent US market share in shipments and 54 percent revenue share, according to Gartner Dataquest's "1Q02 Servers Quarterly Statistics."

The Solaris 9 OE is available on the SPARC Architecture platforms and supports more than 12,000 applications. Customers have access to many freeware programs, including utilities, productivity tools and development tools. In addition, the Solaris 9 OE will include the integrated Sun ONE Application Server 7, Platform Edition, and the Sun ONE Directory Server, along with special licensing for other Sun ONE products and the Oracle 9i database.

Solaris 9 will include a single server development and deployment license for Sun's next generation J2EE 1.3 compliant Sun ONE Application Server 7, Platform Edition, with full integration scheduled for the end of calendar 2002. The Sun ONE Directory Server is fully integrated today and is available immediately with a license for 200,000 named entries per Solaris Enterprise Wide Network on Sun systems. Full licensing and support information is available from <http://sun.com/solaris>.

Listen to the Solaris 9 Audiocast at <http://www.sun.com/webcast/solaris9/index.html>.

About Sun Microsystems, Inc.

Since its inception in 1982, a singular vision -- "The Network Is The Computer[tm]" -- has propelled Sun Microsystems, Inc. (Nasdaq: SUNW) to its position as a leading provider of industrial-strength hardware, software and services that make the Net work. Sun can be found in more than 170 countries and on the World Wide Web at <http://sun.com>

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[1.] SPECjbb is a trademark of the Standard Performance Evaluation Corp. (SPEC). Results published on <http://www.spec.org> as of 5/20/02. For the latest results see <http://www.spec.org>

[2] On TPC-H the Sun Fire 15K delivered 18,802.1 QphH@1000GB, \$287/QphH@1000GB, avail 7/17/02. TPC-H, QphH and \$/QphH are trademarks of the TPC. For latest information see <http://www.tpc.org>

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