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Enterprise Computing with Oracle® Solaris

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- **Simplify server provisioning**
- **Choose the right operating system for your enterprise**

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Enterprise Computing with Oracle® Solaris

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Contents at a Glance

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Introduction

Successful IT organizations are deploying more efficient infrastructures and processes and redirecting resources to focus on delivering the innovations that drive competitive advantage. By simplifying IT with the latest technologies, organizations can get maximum value from application investments, streamline management, optimize resources, and increase productivity across the enterprise.

A hardware and operating system upgrade can deliver immediate and ongoing benefits, including

- Access to the latest technology advancements
- Improved application performance and availability
- Lower total cost of ownership
- Increased eco-efficiency for reduced power and cooling costs
- Flexibility and scalability to accommodate future growth

Enterprise Computing with Oracle Solaris For Dummies explains why the right combination of an operating system and a hardware platform is so important for your mission-critical enterprise applications, how Oracle Solaris can help your enterprise realize the benefits of a hardware and operating system upgrade, and why Oracle Solaris has been the "go-to" operating system for enterprise computing environments for more than 20 years!

About This Book

This book contains volumes of information that rival the U.S. Congressional Record or the complete *Encyclopedia Britannica,* conveniently distilled into four short chapters chock-full of just the information you need! Here's a brief look at what awaits you in the pages ahead.

Chapter 1: Your Operating System and Why You Should Care about It. I start by explaining what exactly an operating system is. I also talk about some of the key differences between various operating systems and why choosing the right operating system is so important for your enterprise.

Chapter 2: Introducing Oracle Solaris. Here, you get a broad overview of the Oracle Solaris operating system, its many features and functions, and how it adds value to your enterprise computing needs.

Chapter 3: Putting Oracle Solaris to Work. Next, I help you roll up your sleeves and deploy Oracle Solaris in your enterprise data center. You also learn how to plan a deployment, select a partner, and maintain and support your enterprise computing environment.

Chapter 4: Ten (Okay, Eight) Great Resources for Learning More about Oracle Solaris. Finally, in that classic *For Dummies* style, I tell you about several other great resources to help you learn more about and maximize the value of your investment in Oracle Solaris.

Icons Used in This Book

Throughout this book, you occasionally see icons that call attention to important information that's particularly

worth noting. You won't find any winking smiley faces or other cute little emoticons, but you'll definitely want to take note! Here's what to expect.

This icon points out information that may well be worth committing to your nonvolatile memory, your gray matter, or your noggin — along with anniversaries and birthdays!

If you're an insufferable insomniac or vying to be the life of a World of Warcraft party, take note. This icon explains the jargon beneath the jargon and is the stuff legends — well, at least nerds — are made of.

Thank you for reading, hope you enjoy the book, please take care of your writers! Seriously, this icon points out helpful suggestions and useful nuggets of information.

Proceed at your own risk . . . well, okay — it's actually nothing *that* hazardous. These helpful alerts offer practical advice to help you avoid making potentially costly mistakes.

Where to Go from Here

With apologies to Lewis Carroll, Alice, and the Cheshire Cat:

"Would you tell me, please, which way I ought to go from here?"

"That depends a good deal on where you want to get to," said the Cat — er, the Dummies Man.

"I don't much care where . . . ," said Alice.

"Then it doesn't matter which way you go!"

That's certainly true of *Enterprise Computing with Oracle Solaris For Dummies* which, like *Alice in Wonderland*, is destined to become a timeless classic!

If you don't know where you're going, any chapter will get you there — but Chapter 1 might be a good place to start! However, if you see a particular topic that piques your interest, feel free to jump ahead to that chapter. Read this book in any order that suits you (though we don't recommend upside down or backwards).

I promise that you won't get lost falling down the rabbit hole!

Chapter 1

Your Operating System and Why You Should Care about It

In This Chapter

- Discovering what an OS does for your business
- Learning about Windows, Unix, and Linux
- Choosing the right OS for your business requirements

Operating systems are often taken for granted in today's data center. Deciding which operating system (OS) to use might be based on experience, anecdotal evidence, or just "it's what we've always used." However, as you learn in this chapter, an operating system is perhaps the most critical piece of software running on a server.

Choosing the right OS for your data center is a critical decision that has serious implications for your enterprise computing requirements today and for the future.

Understanding What an OS Is

An OS manages all of the processors, memory, and input/output (I/O) operations, as well as any installed

hardware and software, that run on a computer (or server). The OS enables multiple types of software and hardware to coexist and run simultaneously on a computer.

The OS also enables software and hardware to communicate with a computer — through the OS kernel — without having to know or understand the computer's machine language.

Where the OS sits, in short, is critical ground: it's at the intersection of hardware and software, and this is the point where investments can have the greatest impact on your business's ability to control security, observability, and performance. It's where virtualization and consolidation can be most effectively addressed. And it's the launch pad for cloud computing and data center optimization.

Computer engineers know how to share

We can thank the wonderful mothers of computer engineers for the modern computer as we know it! It seems that computer engineers learned at an early age to always share their toys: specifically, processors, memory, and I/O!

An OS shares the available processing power, memory, and I/O capacity of a computer with all of the software and hardware that runs on a computer. This model of sharing limited resources has extended beyond the OS to include the mainframe computing model and, more recently, virtualization!

Thus, sharing is the basis for practically all modern computing as we know it!

Recognizing That All Operating Systems Are Not Created Equal

The most popular operating systems in enterprise data centers today include Windows, Unix, and Linux. Typically, some combination of these various operating systems is deployed in most data centers. Organizations deploy different operating systems to address various business requirements.

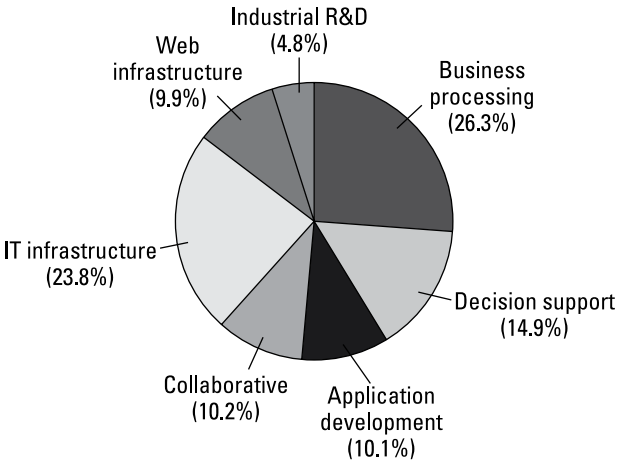
In 1993, Microsoft introduced the Windows NT server OS. Originally developed as a relatively low-cost server OS with an intuitive graphical user interface (GUI) for simplified administration, Microsoft Windows Server has since become a frequently used server OS for the x86 architecture.

Although the Microsoft Windows Server OS supports many different business applications, mission-critical enterprise database systems and applications with extremely high-performance and reliability requirements are more commonly deployed on Unix- or Linux-based operating systems.

Unix — originally developed by AT&T Bell Labs in 1970 — is the right solution for organizations that have extreme scale-up and ultra-high-resiliency requirements for their mission-critical systems and applications.

For example, an October 2012 IDC white paper reports that "Unix has shown its resiliency with workloads such as business processing and decision support. On a share-of-total basis, Unix servers support nearly twice the share of decision support workloads than the industry at large."

Figure 1-1 shows that business processing and decision support comprised more than 40 percent of Unix workloads in 2011.



Source: IDC, 2012

Figure 1-1: Enterprise computing workloads on Unix Servers, 2011.

Today, more than three dozen Unix variants and derivatives are in widespread use, including Oracle Solaris and Oracle Linux.

Before 1990, commercial versions of Unix were relatively expensive and only ran on minicomputers, rather than the increasingly popular x86 architecture found in microcomputers at that time. Sun Microsystems and others used Unix to democratize computing, moving

the industry away from proprietary mainframes and mini operating systems.

In 1991, Finnish student Linus Torvalds picked up on this idea and took it further. He began developing a free kernel that ran on the x86 architecture as a terminal emulator to access Unix servers. This kernel soon became the Linux OS, which also has become a popular choice for x86 computing today.

Although many versions of Unix will not run on the x86 architecture, Oracle Solaris can run on either a SPARC (discussed later in this chapter) or x86 architecture, a design point outlined in the very first Solaris announcement in 1991.

Knowing Why Choosing the Right OS Matters — a Lot

Your choice of OS is more than a technical decision because it has far-reaching implications for your data center infrastructure and the mission-critical applications that your enterprise uses.

If you plan to standardize your entire data center on an x86 server platform, your choice of operating systems includes Unix (such as Oracle Solaris), Linux (such as Oracle Linux), and Microsoft Windows.

The Oracle SPARC server infrastructure offers a more massively scalable and highly reliable server architecture than the x86 infrastructure for your mission-critical systems and applications. However, your choice of native operating systems in the SPARC architecture is limited to Unix (Oracle Solaris).

Oracle VM for x86 enables you to run any combination of Oracle Solaris, Oracle Linux, and Microsoft Windows, as well as numerous other operating systems, as guest operating systems in a virtual environment. Similarly, Oracle VM for SPARC allows you to run different Oracle Solaris releases on a single system.

Although the maximum number of processor sockets and cores continues to increase every year for different server infrastructures, there is an important core (err, sorry) difference between the x86 and SPARC architectures.

Processors in the x86 family are based on the CISC (Complex Instruction Set Computers) architecture, while the SPARC (Scalable Processor Architecture) processor is based on the RISC (Reduced Instruction Set Computers) architecture philosophy.

A CISC processor uses more complex instructions, which can take multiple CPU cycles to complete, to perform operations. The CISC architecture could be analogous to a luxury car — in addition to a fast engine, you might get a leather interior, a sunroof, air conditioning, and a nice stereo system.

In contrast, a RISC processor uses more simplified instructions that can be executed in a single CPU cycle. The RISC architecture is therefore built for speed. Continuing the earlier analogy, the RISC architecture would be more like a Formula One race car — no bells and whistles, just pure speed!

RISC is also much easier and more effective to implement as a multi-threaded/multi-core architecture than CISC because each thread and core is simpler and requires fewer resources, both in silicon and within the OS.

Recognizing the types of mission-critical systems and applications that your organization uses is yet another important factor that must be considered when determining the right OS for your enterprise. As discussed earlier in this chapter, many core enterprise applications and database systems are deployed on Unix-based operating systems.

Examples of such enterprise computing systems and applications include

- BI (business intelligence)
- CMM (coordinate measuring machine)
- CRM (customer relationship management)
- Decision support systems
- ERP (enterprise resource planning)
- GIS (geographic information systems)
- Meteorological numerical modeling
- OLTP (online transaction processing) databases

Choosing the right OS for your current and future enterprise requirements is a critical business decision that needs to be made early in the data center planning and design process. Changing server platforms and/or core enterprise applications later is neither easy nor cheap!

Oracle Solaris 11: An OS for the cloud

Cloud computing presents many opportunities to deliver better, faster services to users, but it also brings a number of challenges. Applications must roll out quickly and scale seamlessly to handle increasing demand, and information needs to be available to the people who need it, when they need it, while being protected from internal and external threats.

Oracle Solaris 11 brings the performance, reliability, security, and scalability of the industry's top UNIX OS to the cloud, helping speed application deployment, slash costs, and increase flexibility with virtualization built in at no additional cost.

Featuring innovative technologies to accelerate the adoption of enterprise scale workloads in the cloud, Oracle Solaris 11 provides fast, intelligent provisioning capabilities, fully virtualized networking features for increased flexibility with reduced costs, improved data management, and simplified administration with fully integrated security systems.

Upgrading to Oracle Solaris 11 can help you deliver

- **Total protection** for data, applications, and users, with world-class security designed into the OS, not bolted on afterward
- **High availability** with Predictive Self Healing to diagnose, isolate, and resolve hardware and application faults
- **Simpler data management** with improved data integrity and near-zero administration with Oracle Solaris ZFS

Designed for the cloud

Oracle Solaris 11 combines key computing elements — virtualization, security, deployment, availability, and performance — into a robust and flexible foundation for public, private, and hybrid cloud deployments.

Oracle Solaris 11 is engineered for the cloud and delivers

- **Virtualization in every dimension:** Network virtualization and zero overhead virtualization
- **Instant provisioning:** Safe, intelligent provisioning and rapid update
- **Integrated hardware and software security:** Data protection at line speed and secure live migration
- **Complete visibility:** Safe, pervasive observability of production workloads

Chapter 2

Introducing Oracle Solaris

In This Chapter

- Simplifying server provisioning
- Ensuring system reliability
- Improving performance
- Integrating security
- Diagnosing and troubleshooting issues
- Choosing a server platform for your business

Oracle Solaris is ideal for organizations that have scale-up and ultra-high-resiliency requirements in their data centers. Oracle Solaris is optimized on both SPARC and x86 systems to take maximum advantage of the hardware features of each server platform.

In this chapter, you learn the business value of Oracle Solaris in features and technologies including rapid provisioning, service reliability and high availability, optimized performance, fully integrated security, full stack observability, and server platform independence.

Provisioning

Enterprise-class automated installation and provisioning is an important feature of Oracle Solaris. Simplification and automation of software installation and management when deploying Oracle Solaris–based systems and software stacks result in lower upfront and ongoing costs.

Organizations moving from earlier versions of Oracle Solaris will discover that Oracle Solaris 11 facilitates the transition process by providing tools for infrastructure migration, as well as application workload transition.

Oracle Solaris installation and provisioning technologies (see Figure 2-1):

- Unleash dramatic improvement for the cloud-driven software life-cycle process
- Reduce complexity by architecting in and providing desired enterprise-scale flexibility features in the product
- Bring innovation with a unified design supporting various installation options including desktops, standalone "headless" servers, and automating multi-server farms
- Offer superb and flexible capabilities in creating and deploying customized images
- Empower end-users to take advantage of modern network protocols and architectures with WAN-based network and file-based software repositories

- Integrate and are engineered with other parts of Oracle Solaris such as its SMF (Service Management Facility) and ZFS features to provide a more consistent experience when installing (and subsequently updating) bare-metal systems or Oracle Solaris Zones environments
- Provide tools to make it easier for customers to transition from existing Oracle Solaris installation methods

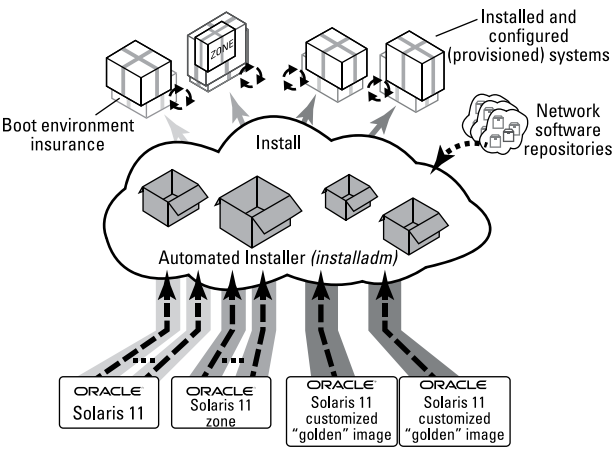


Figure 2-1: Oracle Solaris system installation and configuration.

Reliability

Oracle Solaris greatly increases system and service reliability and availability with Oracle Solaris Predictive Self Healing, which diagnoses, isolates, and helps recover from hardware and application faults. Oracle Solaris Cluster, co-engineered with Oracle Solaris, offers the most extensive Oracle enterprise high-availability and disaster-recovery solutions for the largest portfolio of mission-critical applications.

Oracle Solaris reliability and high-availability features and technologies (see Figure 2-2) include

- Fault Management Architecture (FMA) that proactively monitors system hardware and can take failing components off line while keeping the system running
- Service Management Framework (SMF) that provides resilience for software services
- Faster failure detection and recovery capabilities in Oracle Solaris Cluster, enabling a shorter overall service outage and fewer false positive and false negative failovers
- Seamless integration between Oracle Solaris Cluster and Oracle Solaris Zones, which makes it possible to consolidate multiple applications in one physical cluster for lower total cost of ownership (TCO) without compromising availability
- Oracle Solaris Cluster Geographic Edition's multi-cluster feature to protect business operations in case of local disaster

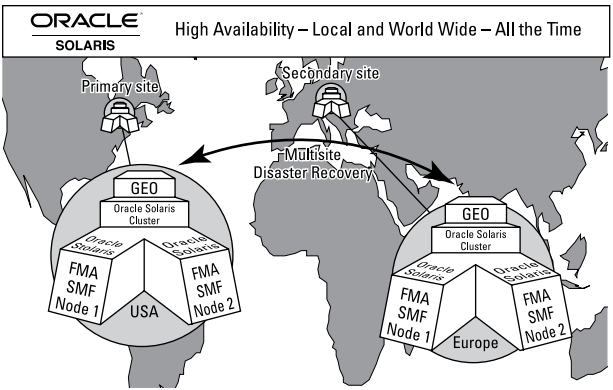


Figure 2-2: Oracle Solaris high-availability and reliability features and technologies.

Performance

Oracle Solaris 11.1 has been developed in conjunction with Oracle's SPARC systems as well as the Intel team responsible for the processors that power Oracle's x86-based systems.

This co-engineering means that, unlike other operating systems, Oracle Solaris 11.1 has been designed with tomorrow's servers in mind, offering the scalability to meet rapidly increasing memory, CPU, I/O bandwidth, and networking demands. Tight integration with Oracle hardware systems also increases uptime significantly

with Oracle Solaris Predictive Self Healing, which analyzes, reports, and corrects hardware components before they fail.

Oracle Solaris Predictive Self Healing technology starts at boot time and runs in the background to monitor the system. If a component (such as CPU, memory, or the I/O subsystem) generates an error, the daemon correlates the error with data from previous errors and other relevant information to diagnose the problem and, when possible, initiates steps to self-heal the system by taking the failed component offline.

In addition, Oracle Solaris 11.1 optimizes the performance of specific functionality in Oracle hardware, including on-chip cryptographic acceleration and high-speed InfiniBand networking.

With one OS designed to optimize the performance, efficiency, and security on both SPARC and x86 platforms, Oracle Solaris 11.1 makes it easy to deploy an enterprise-class foundation across your data center and cloud infrastructure.

Oracle Solaris is also designed with future system and application needs in mind. The new Virtual Memory Predictor, part of the VM 2.0 foundation introduced in Oracle Solaris 11, helps organizations take advantage of these new server platforms by delivering highly flexible and scalable memory operations for the most demanding enterprise applications.

Security

Security in Oracle Solaris 11 is considered to be the highest priority, which is reflected in both the security services provided to users and in the production of Oracle Solaris in a secure manner.

Oracle Solaris security technologies protect data, applications, users, and the OS itself from a variety of external and internal threats, which reduces risk and prevents breaches. Oracle Solaris has been developed following the Oracle Software Security Assurance process (Prevent, Protect, Manage, Assure — see Figure 2-3), which mandates that security is integrated into the design, build, testing, and maintenance process — not just bolted on afterward.

Oracle Solaris fully integrated security:

- Protects data at rest and in motion with discretionary and mandatory access control, data encryption, and integrity protection
- Contains applications and users using Oracle Solaris Zones, privileges, and role-based access control
- Reduces risk of insider attacks using role-based access control and delegated administration
- Assists in compliance with auditing and logging, including integration of the automated OpenSCAP framework
- Provides trusted labeled security and multi-level access control

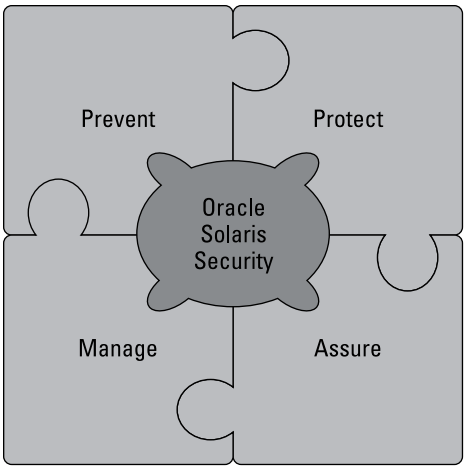


Figure 2-3: The Oracle Software Security Assurance process: Prevent, Protect, Manage, and Assure.

OpenSCAP is a framework of libraries and tools to improve and enhance the accessibility of SCAP. SCAP refers to the U.S. National Institute of Standards and Technology's (NIST) Security Content Automation Protocol (SCAP).

Observability

OS observability enables system administrators and application developers to determine the behavior of an entire system based on the system's outputs over a defined period of time.

Oracle Solaris makes it possible to delve deeply into complex systems to troubleshoot systemic problems in real time, providing enhanced system insight and enabling you to quickly identify and resolve hardware problems. Oracle Solaris observability tools and features include

- DTrace (Dynamic Tracing) technology
- System analysis tools
- Process accounting and statistics
- Enhanced patch management

DTrace

Oracle Solaris DTrace is a comprehensive, advanced tracing tool for troubleshooting systematic problems in real time. Administrators, integrators, and developers can use DTrace to dynamically and safely observe live production systems for performance issues, including both applications and the OS itself (see Figure 2-4). DTrace allows you to explore your system to understand how it works, track down problems across many layers of software, and locate the cause of any aberrant behavior. Whether it's at a high-level global overview (such as memory consumption or CPU time) or very fine-grained, detailed information (like what specific function calls are being made), DTrace gives you the operational insights that are often missing in the data center.

Key features of DTrace include

- Is designed for safe use on production systems — very often the only place to catch and solve the thorniest problems

- Provides a single view of the software stack — from kernel to application — leading to rapid identification of performance bottlenecks
- Dynamically instruments the kernel and instructions in any application with a near-infinite number of probe points, improving ability to service software
- Enables maximum resource utilization and application performance, as well as precise quantification of resource requirements
- Is fast and easy to use, even on complex systems with multiple layers of software

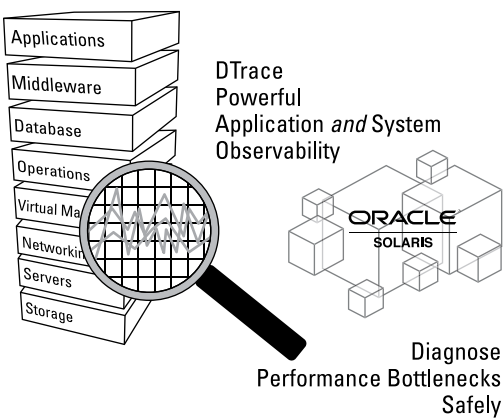


Figure 2-4: Oracle Solaris DTrace provides powerful observability throughout the OS and application stack.

System analysis tools

System analysis tools for Oracle Solaris include

- Virtualization monitoring and management tools, such as zonestat, for individual application zone analysis and reporting
- Powerful thread analysis and monitoring tools, including lockstat, to gather and display kernel locking and profiling statistics. Lockstat is implemented using DTrace, making it safe, pervasive, and reliable
- Process analysis tools such as truss and pstack, allowing system call and stack tracing
- Memory management and debugging tools, including libumem, a high-performance multi-threaded memory allocation library with built-in monitoring functions
- Support for Intelligent Platform Monitoring Interface (IPMI), an industry standard for "lights out" management of x86-based servers
- System and application core administration and debugging tools
- Oracle Enterprise Manager Ops Center to proactively mitigate risk, simplify day-to-day IT operations, and maximize system performance
- Sun Validation Test Suite (SunVTS) diagnostic software for hardware testing and analysis

Process accounting and statistics

The Oracle Solaris 11 project and task facilities allow you to label and separate workloads, as well as monitor resource consumption by each workload. The extended accounting subsystem captures a detailed set of resource consumption statistics on both processes and tasks. In conjunction with the Internet Protocol Quality of Service (IPQoS) flow accounting module, this subsystem can also capture network flow information on a system.

Enhanced update and fix management

Timely and accurate software maintenance is critical to system availability and performance. To this end, Oracle Solaris 11 includes tools to manually or automatically perform analysis of the OS and third-party software to make sure it not only has the latest fixes but also determines which fixes are appropriate for your configuration and what software dependencies may also need to be addressed. Updates are then performed using a mechanism to keep the system online from the beginning of the update process until reboot, with the reboot process itself streamlined for minimum downtime.

Platform Choice

Among popular operating systems, only Oracle Solaris gives you the complete freedom to choose the most appropriate processor/server platform for your

business requirements — whether SPARC or x86 (see Chapter 1 to learn more about these important choices).

Oracle's SPARC servers

Oracle's SPARC servers running Oracle Solaris are ideal for mission-critical applications that require best-in-class availability, scalability, and manageability. Upgrading to Oracle's latest SPARC servers running Oracle Solaris 11.1 can help you deliver

- **Optimal performance across all application tiers** from highly concurrent Web applications to complex enterprise applications and data warehouses
- **More than double the throughput performance** and better single-threaded performance for expanded application versatility
- **Mission-critical reliability** at a fraction of mainframe costs

Oracle's Sun x86 servers

Oracle's new generation of Sun x86 systems are optimized to run Oracle Solaris 11.1 to deliver the best possible x86 performance at the lowest TCO. Upgrading to the latest x86 servers running Oracle Solaris 11.1 can help you deliver

- **A complete, deployment-ready cloud infrastructure** with built-in virtualization for ultimate flexibility

- **Up to 52 percent lower TCO** than other deployments using third-party OS and virtualization software
- **Superior scalability** for enterprise virtualization and consolidation with world-class performance

While Intel Xeon processor-based systems from many hardware manufacturers are certified to run Oracle Solaris, Oracle has engineered Oracle Solaris to work with Oracle's x86 systems to provide benefits above and beyond those that can be achieved with non-Oracle systems, including advanced fault diagnostics, easy serviceability, and simplified installation.

Spotlight on Oracle's SPARC systems

Oracle Solaris 11 is co-engineered with Oracle's new generation of SPARC systems — taking advantage of Oracle's unique ability to innovate and optimize at every layer of the IT stack to simplify data center operations, drive down costs, and accelerate business innovation.

- **Oracle SPARC T4 and T5 servers:** Industry-leading performance, offering reliability, availability, and security. Oracle's latest-generation SPARC T5, together with Oracle Solaris 11, has set more than one dozen world records on industry standard benchmarks. Go to `/www.oracle.com/us/corporate/press/1923343` to see the complete performance results.

- **SPARC M6-32:** A massively scalable SMP server with 32 12-core processors, supporting up to 384 cores, 3,072 threads, and 32 terabytes of memory. The combination of Oracle Solaris and the M6-32 provides both high-compute capacity and ultimate agility with the latest generation of Dynamic Domains, Oracle VM for SPARC, Oracle Solaris Zones, and Oracle Virtual Networking capabilities as standard features.
- **Oracle SuperCluster**: A multipurpose Oracle engineered system, with the capability to run Oracle and Java twice as fast as comparable systems.

Chapter 3

Putting Oracle Solaris to Work

In This Chapter

- Deploying Oracle Solaris
- Creating a project plan
- Working with a partner
- Benefitting from upgrades and support services

In this chapter, you find out how Oracle Solaris can help you consolidate, virtualize, and upgrade your data center servers, plan your deployment, find a certified partner, and maintain your systems with ongoing maintenance and support.

Seeing How Oracle Solaris Fits within Your Data Center

Oracle Solaris is an integral part of data centers for organizations with enterprise computing requirements. Oracle Solaris can help you with server consolidation and virtualization initiatives and is the foundation for Oracle Optimized Solutions.

For more information, visit `www.oracle.com/us/solutions/oos/overview/index.html`.

Simplifying consolidation and virtualization

Upgrading to new Oracle hardware systems running Oracle Solaris provides an ideal platform for consolidating large numbers of applications, databases, and middleware workloads or for deploying complex, multi-user development, test, and production environments.

Oracle Solaris 11 includes Oracle Solaris Zones — one of the industry's most widely used and proven virtualization technologies — built into the OS. Oracle Solaris Zones enable existing applications to run unchanged in virtualized environments, accelerating and simplifying upgrades to faster, more efficient servers. Server utilization is increased by using Oracle Solaris Zones to run many applications in a single Oracle Solaris instance.

Read *Server Consolidation For Dummies,* Oracle 2nd Special Edition, and *Server Virtualization For Dummies,* Oracle 2nd Special Edition, to learn more about server consolidation and virtualization. Visit `www.oracle.com/goto/serverconsdummies` and `www.oracle.com/goto/servervirtdummies`, respectively.

The Oracle Solaris Zones technology was first introduced as a core element of Oracle Solaris 10, and in Oracle Solaris 11 these unique, built-in virtualization capabilities were made even more central to applications and users. Oracle Solaris 11 introduced a range of enhancements and new features in Oracle Solaris Zones, including

- **Tight integration** with the new Image Packaging System and ZFS technology
- **Improved observability** at every layer of even the most complex IT environments
- **Increased control** over administration and unmatched ease of management
- **Ongoing support** for Oracle Solaris 10 Zones

Oracle Solaris 11.1 adds additional functionality to make Oracle Solaris Zones even easier to create and manage while adding greater flexibility and improving resource management and monitoring.

Oracle Optimized Solutions

Oracle Optimized Solutions offer proven blueprints for improving performance, reducing costs and risks, improving user productivity, and accelerating ROI in Oracle software environments. These pretested, pretuned, and fully documented architectures are based on uniquely matched components from across Oracle's comprehensive hardware, middleware, and software portfolio. Designed to be completely flexible, they can be deployed as complete solutions or easily integrated into existing environments.

Oracle Solaris 11 is an essential part of Oracle Optimized Solutions. Engineering systems to work together seamlessly across the IT stack means that Oracle can build solutions that enhance every layer. If an enhancement is identified in a hardware product, or in a particular configuration of hardware, Oracle tunes the OS to ensure the enhancement delivers its full effect right up to the application level.

Oracle creates solutions that optimize performance at every layer of the enterprise IT stack to deliver

- Up to 11 times faster user response times
- 75 percent lower acquisition and operational costs
- 6 times faster deployment

Planning Your OS Deployment

Your data center OS deployment involves much more than just installing an OS on new hardware. You should begin by identifying your business requirements. Based on the needs of the business, you can then identify appropriate technical requirements and define specific, measurable goals for your project. From there, you might consider beginning with the "low-hanging fruit": standardize your data center on a current OS version and upgrade any existing Oracle Solaris instances to that version. Next, consider implementing any planned Oracle Optimized Solutions and beginning your server consolidation and virtualization initiatives.

Selecting a Partner

Choosing a trusted partner to work with is an important step to help ensure the success of your data center OS deployment and implementation.

Your IT organization most likely already has a number of highly qualified system administrators with experience installing and provisioning new servers, as well as upgrading and maintaining existing servers. However, a

large project such as server consolidation or virtualization (discussed earlier in this chapter) is not a normal day-to-day task for most system administrators.

At one end of the services spectrum, a trusted partner can offer best-practice insights, validate your data center design, and help you plan your OS deployment — giving you the benefit of its broad experience across many different types of organizations and addressing numerous challenges. Working with a partner in such a capacity also helps to demonstrate due diligence in case your OS deployment project encounters unforeseen issues.

At the other end of the services spectrum, your trusted partner can fully participate in your entire OS deployment project and provide the resources to perform the actual work, as well as provide valuable on-the-job training through knowledge sharing throughout the project.

Your evaluation of potential partners should include several important criteria, such as:

- **Certification.** Any partner you are considering should have appropriate partner-level vendor certifications for the solutions it is implementing.
- **Breadth of solutions.** Look for a partner that has broad experience with many different OS solutions. This helps to ensure that you are working with a partner to select and implement the OS that best suits your business needs, not just the solutions the partner happens to sell.

- **Depth of expertise.** Your partner should have a strong technical bench with more than a single "rock star" subject-matter expert. Inevitably, a partner without a lot of depth on the bench will overcommit its limited resources for too many projects.
- **Past experience.** Your organization's past experiences — good or bad — working with a partner should be strongly considered in your decision-making process. Consider not only past results but also how it responded and resolved issues when challenges did arise.
- **Customer references.** In addition to, or in the absence of, your own past experiences with a partner, talk to some of a potential partner's other customers. Reference calls can be valuable, but don't forget to look to your professional network as well to gain perspectives from as many vantage points as possible.

The Oracle Partner Network (OPN) is comprised of approximately 8,000 certified Oracle partners worldwide. Go to `www.oracle.com/partners/index.html` to find a trusted and certified Oracle partner.

Getting Maintenance and Support

Oracle makes it easy and affordable to upgrade to the latest systems with the Oracle Upgrade Advantage Program. This program provides trade-in credits for your existing servers, storage systems, and other data

center components, allowing you to boost performance, utilization, security, and availability with new Oracle hardware powered by Oracle Solaris.

Oracle's trade-in program enables you to:

- **Improve eco-efficiency** with Oracle's Eco Returns Program
- **Reduce TCO** with lower costs for more powerful, efficient servers
- **Better plan for growth** with a clear upgrade path
- **Meet regulatory mandates** such as Sarbanes-Oxley by deploying more secure systems

Oracle Premier Support for Systems provides the highest level of fully integrated support for Oracle servers and storage systems. Benefits include 24/7 service and support, comprehensive systems coverage, and access to OS patches, security updates, management tools, and many other resources and enhancements. Go to `www.oracle.com/us/support/index.html` to learn more about Oracle Support Services.

Chapter 4

Ten (Okay, Eight) Great Resources for Learning More about Oracle Solaris

In This Chapter

- Getting more information

Just in case you're hungry to learn more about Oracle Solaris and its many benefits for your enterprise computing needs, this chapter points you to several resources to help you further your Oracle Solaris knowledge and skills!

Brochures

Oracle product and solution brochures provide valuable information about Oracle's extensive portfolio of products and solutions for IT managers and business leaders. Take a look at:

- **Oracle Solaris 11 E-book: Reliable, Scalable, Secure.** Discover how organizations across the world are transforming their data centers with Oracle Solaris 11.1, and Oracle's SPARC, x86, and

engineered systems. Download this e-book at www.oracle.com/goto/solaris_e-book.

- **Accelerating Business Innovation with Oracle Hardware: Extreme Reliability, Simplified Management and Lower Costs.** See how Oracle's optimized and integrated systems are helping create next-generation data centers at www.oracle.com/goto/innovation-hw-brochure.

Infographic

Take a journey through 20 years of Oracle Solaris innovation and get a glimpse of what the future holds. You can view the Oracle Solaris timeline at www.oracle-downloads.com/solaris20info/.

Podcasts

Instead of reading about new technology developments, why not hear about them directly from the people responsible for them? Oracle regularly publishes podcasts in the Oracle Podcast Center that you can download and listen to at your convenience on your Apple device or MP3 player. Some recent podcasts include

- **Oracle Solaris 11: Upgrade Your Skills.** Discover the many different ways and possibilities to upgrade your skills for Oracle Solaris 11 at www.oracle.com/goto/solaris11-skills-podcast.

- **Oracle Enterprise Manager Ops Center and Oracle Solaris 11.** See how Ops Center helps you to design and manage mission-critical cloud environments at scale with Oracle Solaris 11. Go to `www.oracle.com/goto/solaris11-Ops Center-podcast` to download this podcast.

Product Pages

You can read analyst reports, customer case studies, data sheets, and press releases about all of Oracle's products and solutions on Oracle's Product Pages at `www.oracle.com/solaris`.

For example, learn how Oracle Solaris 11 brings the performance, reliability, security, and scalability of Unix OS to the enterprise cloud and see how AAPT, one of Australia's leading telecommunications infrastructure companies, delivers enterprise cloud services with Oracle Solaris.

Social Media

You can connect with Oracle Solaris through a number of social media channels, including

- **Blogs.** Get the latest news from the Oracle Solaris team at `https://blogs.oracle.com/solaris/`.
- **Facebook.** Follow Oracle Solaris on Facebook at `www.facebook.com/oraclesolaris`.

- **LinkedIn.** Join the Oracle Solaris Insider Group on LinkedIn to get inside information, stay up to date, and discuss Oracle Solaris. Join at `www.linkedin.com/groups/Oracle-Solaris-Insider-3951282`.
- **Twitter.** If you're up for a real "tweet," be sure to follow Oracle Solaris on Twitter at `https://twitter.com/ORCL_Solaris`.
- **YouTube.** Learn how to solve unique business and technical challenges with Oracle Solaris, watch video tutorials, and follow discussions on YouTube at `www.youtube.com/oraclesolaris/`.

Training

Learn more about Oracle Solaris 11 from Oracle's experts. Stay ahead of the pack with leading-edge skills for deploying and implementing the industry's best enterprise computing operating system.

Go to `www.oracle.com/goto/OracleUni-training` to find information on training courses, certifications, learning paths, course schedules and costs, training formats and locations, and how to register for a training course.

Webcasts

Watch on-demand webcasts about Oracle Solaris 11 to find out more about the innovative, built-in features in Oracle Solaris that deliver breakthrough virtualization, high availability, and advanced security. Popular webcasts include

- **Oracle Solaris 11 webcasts.** Register for upcoming and on-demand events in the IT Webcast Center to learn more about Oracle Solaris topics of interest, such as Oracle Solaris Containers, developer tools, server virtualization, application infrastructure, and more. Go to `http://vshow.on24.com/vshow/itwebcastcenter/#exhibits/solarisod`.
- **Oracle Solaris 11 Online Forum.** See how the latest developments in Oracle Solaris 11 are revolutionizing cloud adoption. Go to `www.oracle.com/goto/solarisforum` to view the agenda and sessions, and to register for this on-demand event.

White Papers

Oracle Solaris technical white papers are the ultimate resource for managing your Oracle Solaris systems and developing applications on those systems. Whether you want to automate installations, manage ZFS storage pools, isolate applications to run in an Oracle Solaris zone, or manage your resources effectively, you will find detailed help in Oracle technical white papers. Some examples of excellent white papers include

- **Oracle Solaris 11: Built for Clouds.** Find out how Oracle Solaris combines virtualization, security, deployment, availability, and performance into a stable, secure, mission-critical cloud foundation. You can download this white paper at `www.oracle.com/goto/wp-solaris-for-clouds`.

- **Oracle Solaris 11: Best for Enterprise Applications.** See why the advances in Oracle Solaris 11 make it an ideal platform for business applications. Go to `www.oracle.com/goto/wp-solaris-for-apps` to download this white paper.
- **Oracle Solaris 11 System Software Management with Image Packaging System.** Discover how a new approach to package management simplifies processes to help reduce the risk of OS maintenance issues. To download this white paper, visit `www.oracle.com/goto/wp-solaris-system-mgmt`.

Improve performance, reliability, and efficiency

Oracle Solaris has been a leader in operating system (OS) innovation for more than 20 years. In this book, you find out why Oracle Solaris is the right OS for your mission-critical enterprise computing needs!

- ***Understand why operating systems are so important — and how they differ***
- ***Learn about new features in Oracle Solaris 11.1 — and why you should upgrade***
- ***Consolidate and virtualize your data center — and standardize for efficiency***

Open the book and find:

- **Why the right OS matters for enterprise systems and applications**
- **How to match your OS to your requirements**
- **How observability improves troubleshooting and performance**
- **How to plan your OS deployments**

Go to Dummies.com®
for videos, step-by-step examples, how-to articles, or to shop!

Oracle engineers hardware and software to work together in the cloud and in your data center. For more information about Oracle (NYSE:ORCL), visit oracle.com.

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