Accelerating Business Innovation with Oracle Servers, Storage, and Engineered Systems

Extreme Performance, Simplified Management, Lower Costs
Oracle’s integrated hardware and software was the only way we could meet our project requirements for application speed, scalability, reliability, and availability. The solution’s price and support levels were also very attractive to us.

Khalid H. Al-Zahrani, Director, Corporate Datacenter, National Guard Health Affairs
Ten of the ten top global banks. Ten of the ten top global telecommunications companies. Ten of the ten top pharmaceutical companies. What do they all have in common?

They all use Oracle hardware systems.

Businesses are transforming IT organizations by deploying Oracle software—and other applications—on Oracle hardware. They know that Oracle’s technology and comprehensive product portfolio deliver the easier management, reliability, and superior performance demanded by today’s business environments.

They also know that when Oracle Database and Oracle Applications run on Oracle hardware, availability goes up, costs come down, and people are more productive.

**FACT:** As the second-largest software-as-a-service (SaaS) provider, Oracle supports its managed cloud infrastructure—as well as its own highly demanding internal IT function—using more than 200 PB of storage from Oracle ZFS Storage Appliances.
FACT: “IDC survey participants expect that approximately 50% of compute, storage and network resources and workloads will run on integrated systems by the end of 2015.”

"As a leading provider of business consulting solutions and 24x7 managed services for Oracle Applications, Tier1 is using Oracle's Virtual Compute Appliance to deliver high-quality private cloud services for a range of Oracle and third-party applications. With technology already engineered and integrated together, Oracle's Virtual Compute Appliance allows us to enable our clients to spend more time adding value to their company and less time managing the day-to-day issues that come with supporting their own Oracle environment.”
Edward Eichler, Chief Operating Officer, Tier1 Inc.

The Power of Integration in Oracle’s Engineered Systems

Oracle’s engineered systems are complete, preintegrated “in-a-box” solutions that reduce the cost and complexity of your IT infrastructure. By engineering hardware and software together, and then delivering the entire system ready to go, Oracle brings unprecedented performance, uptime, and productivity to IT—freeing up your staff to focus on more-strategic initiatives for the business.

ENGINEERED FOR EXTREME PERFORMANCE AT LOWER COSTS

Oracle offers engineered systems for a variety of workload requirements. Before they are shipped, Oracle’s engineered systems are integrated, tested, tuned, and certified. They are preassembled for targeted functionality, and individual components are optimized throughout the system. The result is a synergy that drives extreme performance.

And, with the cost of integrating, testing, and tuning coming out of Oracle’s R&D budget instead of yours, Oracle’s engineered systems provide outstanding value for your investment.

To produce the best solutions for their organizations, Oracle customers mix and match Oracle’s engineered systems and use them with both new and existing Oracle installations.

• One Oracle customer replaced 70 servers with an Oracle Exalogic and Oracle Exadata–based platform, eliminating the need for 10 to 12 servers annually and cutting costs in half.

• To meet the backup and restore demands of Oracle’s engineered systems, Oracle ZFS Storage Appliance delivers InfiniBand connectivity and leverages RMAN best practices, resulting in customer backup rates as high as 29 TB per hour.

ENGINEERED FOR TRANSFORMING IT

The future of your IT organization, as well as the role IT plays in the business, is being shaped by choices you’re making now. Whether in the data center, in the cloud, or in a mixed deployment, your goal is to make IT a strategic asset to the business. The lower acquisition and operational costs associated with Oracle’s engineered systems provide advantages that transform the value that IT brings to your company.
FACT: Oracle Enterprise Manager lets you manage your compute, storage, networking, software, and private cloud resources in a single console, accelerating your transition to the cloud.

ORACLE’S ENGINEERED SYSTEMS

- **Oracle SuperCluster.** The most powerful consolidation platform for Oracle Database and Oracle Applications, Oracle SuperCluster is ideal for consolidating a wide range of mission-critical applications, implementing database as a service (DBaaS), and rapidly deploying private cloud services.

- **Oracle Exadata Database Machine.** The world’s fastest database machine—exclusively engineered to run Oracle Database—is the ultimate, fully integrated database system for the data center and the cloud, and the first database machine that’s optimized for data warehousing, online transaction processing (OLTP), and workload consolidation.

- **Oracle Exalogic Elastic Cloud.** Blazing-fast performance, reliability, and scalability for Oracle Applications, Oracle Fusion Middleware, and third-party Java applications, Oracle Exalogic helps you do business faster—in the data center and the cloud—while delivering lower total cost of ownership (TCO), reduced risk, higher user productivity, and one-stop support.

- **Oracle’s Virtual Compute Appliance.** Radically simplifies the way you install, deploy, and manage virtual infrastructures for any Linux, Oracle Solaris, or Microsoft Windows applications so you can deploy applications in hours, not days or weeks.

- **Oracle Exalytics In-Memory Machine.** In-memory analysis with the fastest solution for discovery, business intelligence, modeling, forecasting, and planning applications, along with optimized, advanced data visualization for actionable insight into large data sets.

- **Oracle ZFS Storage Appliance ZS3 Series.** One of the best values in the industry, this next-generation of application engineered storage systems uses tight integration and extreme performance to complement Oracle’s engineered systems with leading performance and backup/restore speeds while reducing risk, complexity, and overall costs.

- **Oracle Big Data Appliance.** A complete big data solution, this optimized hardware and comprehensive software stack delivers complete, easy-to-deploy solutions for acquiring, organizing, and loading big data into Oracle Database.

- **Oracle Database Appliance.** A high-availability database solution with remarkable affordability, Oracle Database Appliance is a complete package of integrated software, server, storage, and networking that saves time and money by simplifying the deployment, maintenance, and support of database and application workloads and ensuring high availability and performance.

REINVENTING DATABASE PROTECTION

Treating database backups the same as other file backups can be a costly mistake for your organization. Today’s solutions for protecting business data simply don’t address the specific integrity and performance requirements of mission-critical enterprise databases. What’s more, these solutions place a heavy load on your production servers and can’t scale as your databases grow.

Now there’s a better way.

Oracle’s Zero Data Loss Recovery Appliance is a groundbreaking data protection solution that tightly integrates with Oracle Database to eliminate your exposure to data loss. It dramatically reduces the impact of data protection on production servers, and also ensures end-to-end data validation, implements full lifecycle protection (including disk backup, tape backup, and remote replication), and scales to protect thousands of databases.
Oracle’s new SPARC T5 servers have more than 20 world-record benchmarks and are the world’s best platforms for enterprise computing at any scale. Visit oracle.com/us/solutions/performance-scalability/index.html for more benchmark results.

THE LATEST IN SPARC TECHNOLOGY

Oracle’s SPARC T5 is a well-balanced, general-purpose processor that scales from the simplest task to the most complex and demanding workloads. Since the introduction of Oracle’s SPARC T5, servers based on this processor have set numerous performance records. SPARC T5 servers are now providing customers with the industry’s best value and leading price/performance.

Oracle customers can be assured that the workloads they’ve been running on previous SPARC systems will also run on SPARC T5 servers—just faster.

Read more about the technical details and the process used to design these innovative chips in “SPARC T5 Deep Dive: An Interview with Oracle’s Rick Hetherington” at oracle.com/us/corporate/innovation/sparc-t5-deep-dive.

Servers with a Difference

All processors are not created equal.

Faster performance across Oracle’s hardware portfolio and a reliability that’s unsurpassed in the industry are just the beginning. Oracle servers contain capabilities that provide advantages for Oracle software—advantages that simply aren’t available in the designs of competitors. When Oracle hardware and Oracle software work together, the benefits are real, significant, and unique.

THE BEST FOR ORACLE SOFTWARE

Simply stated, Oracle servers are the best choice for running Oracle software. No other servers can run Oracle Applications and Oracle Database as well as Oracle servers can.

• Oracle’s industry-leading SPARC servers come with Oracle Solaris, Oracle VM Server for SPARC, and Oracle Enterprise Manager already built in to provide advanced virtualization, cloud management, and systems management capabilities at no cost.

• Oracle’s x86 servers are enterprise-ready platforms that feature only the latest and highest-performing Intel CPUs. In addition to full support for Oracle Database In-Memory, Oracle’s x86 systems offer innovative capabilities such as elastic computing, which lets customers adapt server profiles for any workload.

ONLY FROM ORACLE

Oracle continues to invest in innovative servers and predictably deliver competitive products for customers. With extremely high reliability and a single point of support, Oracle’s comprehensive, scalable server portfolio offers the best choices for enterprise environments and supports both Oracle and non-Oracle applications.

Whether as part of Oracle’s engineered systems or as standalone SPARC and x86 systems, Oracle servers bring record-breaking performance, simplified management, high availability, and significant cost savings.

**FACT:** Oracle is the only tier 1 x86 vendor whose engineers completely control all aspects of system design, storage/DIMM part acceptance, and system validation testing. Even in standardized OEM components (like disk controllers and NICs), firmware is modified to improve Oracle software performance.

**BUSINESS-CRITICAL WORKLOADS DEMAND SPARC**

Oracle’s SPARC servers running Oracle Solaris are ideal for mission-critical applications that require high performance, availability, security, and scalability. These systems take advantage of the tight integration between Oracle software and hardware to create an efficient platform with benefits such as in-memory computing, no-cost virtualization, and on-chip security encryption for the entire stack.

Oracle’s SPARC servers scale from 1 to 32 CPUs and up to 32 TB of RAM to meet any size workload and come with Oracle Solaris already installed. Oracle’s near-linear pricing means all SPARC systems have the same price/performance, with no premium for Oracle’s larger SPARC servers.

All Oracle SPARC servers include both Oracle VM Server for SPARC and Oracle Solaris at no additional charge. Oracle VM Server for SPARC is a key tool for virtualizing SPARC servers. Oracle Solaris provides the scalability, reliability, and manageability needed for business-critical workloads, and also guarantees application compatibility so customers can purchase new systems—or upgrade Oracle Solaris on their older systems—and still run their existing applications.

**WHEN QUALITY MATTERS: ORACLE’S X86 SERVERS**

Oracle’s engineered systems depend on Oracle’s x86 standalone systems to provide outstanding performance for Oracle software.

Oracle Database, Oracle Linux, and Oracle Solaris all take advantage of the special features and the customized firmware in Oracle’s x86 servers—enhancements that aren’t available from third-party x86 vendors. The result is an integrated and finely tuned environment that’s ready for deployment.

Oracle’s x86 servers that are purchased with Oracle Premier Support include your choice of Oracle VM Server for x86 or an Oracle operating system (either Oracle Solaris or Oracle Linux) installed at no additional cost. Oracle Enterprise Manager and infrastructure-as-a-service (IaaS) software are also included. Oracle's x86 servers use only the latest processors and are available in four form factors, using 2, 4, and 8 socket options.

Oracle uniquely controls the end-to-end manufacturing quality for its x86 systems—including its own x86 motherboard design. This translates into servers that have the performance, availability, and reliability demanded by today’s enterprise environments.

"With Oracle’s SPARC servers running on Oracle Solaris, we gained peace of mind for our 24/7 television service, enabling us to scale our services to growing demand while steadily meeting service-level-agreement requirements and supporting our revenue growth."

N. Ravishanker, CIO, Tata Sky
**FACT:** You can accelerate the adoption of your Oracle hardware with the unique tools and expertise of Oracle Migration Factory. Use Oracle’s dedicated migration experts, automated migration tools, and cost-effective factory approach to maximize automation and minimize migration time. Visit oracle.com/migrationfactory to learn more.

**ORACLE OPTIMIZED SOLUTIONS**

Oracle Optimized Solutions help you size, configure, purchase, and deploy enterprise solutions. Proven to save money, reduce integration risks, and help your users be more productive, Oracle Optimized Solutions are designed, pretested, tuned, and fully documented architectures that have been optimized for performance and availability.

Oracle Optimized Solutions—built with flexibility in mind and easily tailored to meet your specific needs—are available for

- Enterprise application environments
- Middleware
- Data management
- Virtualization and cloud infrastructure
- Backup and disaster recovery

**Operating Systems:**

**The Foundation of Your Data Center**

The right operating system (OS) lets you maximize the full capabilities of your infrastructure and provides a solid foundation for application and database software. Choose Oracle Solaris or Oracle Linux—both deliver superior results.

**ORACLE SOLARIS: ENGINEERED FOR CLOUD**

Oracle Solaris, the leading enterprise OS, provides built-in virtualization and consolidation tools that let you increase utilization rates, improve flexibility, and simplify the management of the entire technology stack.

Close integration with Oracle’s SPARC and x86 servers—along with a complete OpenStack distribution, software-defined networking, and virtualization that’s already built in—means that Oracle Solaris customers have higher levels of scalability and performance, with lower operational costs.

**ORACLE LINUX: THE BEST LINUX FOR YOUR ENTERPRISE**

Oracle Linux is another powerful option for businesses that deploy on x86-based enterprise systems.

Oracle Linux brings the latest innovations to the enterprise, delivering extreme performance, advanced scalability, and reliability. Oracle is the only vendor in the industry to offer a complete, Linux-based solution stack—applications, middleware, database, management tools, OS, and systems—all integrated to work together with a single point of support.
FACT: Oracle’s most popular software applications (as well as many third-party applications) are available as Oracle VM templates for fast deployment without the need for network or storage tuning.

Provisioned in Minutes with Oracle Virtual Networking

With Oracle Virtual Networking, you can provision new services and reconfigure resources quickly—in just minutes instead of days—giving IT and management the flexibility they need, while reducing capital and operating costs.

FASTER TO DEPLOY, FASTER PERFORMANCE

Organizations using Oracle Virtual Networking have experienced 4 times faster application performance as well as virtual machine migrations that are 20 times faster. Oracle Virtual Networking provides an agile, highly efficient infrastructure, built on your choice of hardware and software. You can adapt the infrastructure “on the fly” by dynamically adding or removing I/O resources—without having to restart the servers.

WIRE ONCE

As the industry’s first and only open architecture data center fabric, Oracle Virtual Networking simplifies complex data center deployments with a “wire once” solution. You can dynamically connect servers, networks, and storage, and then create networks and simple, software-defined connections to provide secure, isolated services to support your business processes and priorities.

All traffic types—including Ethernet and Fibre Channel—use a converged infrastructure. Oracle’s network and data center fabric products consist of high-performing, low-latency, InfiniBand connections that provide bandwidth of up to 80 Gb per second to the server. Oracle Virtual Networking can be implemented across both rackmounted and blade servers and used with Oracle’s SPARC and x86 systems, as well as with other third-party servers.

“Our clients cover a wide range of industries from financial services, retail to media and entertainment. They want a very fast and high-performance cloud platform to run their applications. Since 2007, we have continued to rely on Oracle Virtual Networking’s low-latency and high-speed fabric to meet our clients’ demand very quickly and elastically scale up and down both network and compute resources in our virtualized environment.”

Hein Brat, CEO, Bitbrains IT Services
FACT: Only Oracle Exadata and Oracle storage support Oracle Hybrid Columnar Compression, which improves performance and—with compression rates ranging from 10 times to 50 times—dramatically reduces storage consumption and its associated costs, including floor space, power, and cooling.

“Implementing Oracle Real Application Clusters, Oracle Enterprise Manager, and Oracle ZFS Storage Appliance has helped us significantly increase the IT environment’s performance, availability, scalability, and manageability—providing superior support tailored to our business needs while helping us reduce maintenance costs.”

Jean-Pierre Rasquin, IT Director, Munhowen

Application Engineered Storage

Today’s data centers can be complex environments—often with islands of expensive, overprovisioned but underused storage. It doesn’t have to be that way.

Oracle’s comprehensive storage portfolio helps simplify your data center operations by increasing efficiency, data availability, and application responsiveness while decreasing deployment risks and reducing both upfront and operational costs. Whether you’re building enterprise databases, deploying enterprise applications, or archiving data for regulatory compliance, these systems deliver some of the most reliable, scalable, and efficient storage in the industry.

Oracle storage solutions have been specifically engineered, tested, and optimized to support the mission-critical roles of Oracle Database and Oracle Applications, and the benefits are evident throughout Oracle’s storage portfolio.

- Oracle ZFS Storage Appliance delivers high-performance network-attached storage (NAS) to efficiently handle mixed workloads.
- Oracle FS1 Series combines intelligent resource management with automatic tiering to maximize the power of flash and fully exploit the economies of disk for enterprise-grade storage-area-network (SAN) applications.
- Oracle's StorageTek enterprise tape solutions offer exabyte-scale archiving and data protection.

And because all layers of the Oracle technology stack are engineered to work together, Oracle storage solutions have unique capabilities that run your Oracle software faster and more efficiently than on any other system.

POWERFUL, FLEXIBLE NAS SOLUTIONS

Oracle ZFS Storage Appliances are versatile, high-performance NAS systems that support diverse, dynamically changing workloads.

Proven to deliver superior performance and cost-effectiveness on database, streaming, and virtualized server workloads, Oracle ZFS Storage Appliances provide real-time, granular storage analytics that simplify deployment and management and speed the resolution of application performance bottlenecks.
"Oracle views database storage differently from most storage vendors. Oracle sees the database through the eyes, life, and tasks of the DBA. This led them to engineer a symbiotic relationship between Oracle Database and Oracle storage."

Marc Staimer, Founder, DragonSlayer Consulting

As the only NAS systems to support Oracle Hybrid Columnar Compression, Oracle ZFS Storage Appliances dramatically reduce your enterprise storage requirements and even extend your storage capacity savings to secondary processing uses, such as development, testing, and quality assurance.

Oracle ZFS Storage Appliances are also the only NAS systems to support Oracle Intelligent Storage Protocol, which means significantly less manual tuning for Oracle Database storage—in some cases as much as 65 percent less. And, Oracle ZFS Storage Appliances provide backup and restore capabilities for Oracle Exadata and other engineered systems at rates that are up to 9 times faster than traditional deduplication appliances and deliver a TCO that’s as much as 5 times better.

THE MOST INTELLIGENT FLASH STORAGE FOR SAN DEPLOYMENTS

The Oracle FS1 Series of flash storage systems—purpose-built for flash—is Oracle’s enterprise-grade SAN storage solution that lets customers optionally exploit the economics of disk. Using patented Quality of Service Plus, Oracle FS1 Series places data across flash and disk media so customers can optimize performance, efficiency, and cost according to their own business priorities. By implementing the most granular auto-tiering available today, Oracle FS1 Series is as much as 400 times more efficient in its use of flash media.

Expediting deployments and streamlining management, Oracle FS1 Series takes application engineered storage to new levels with storage provisioning profiles that have been pretuned for Oracle Database and key Oracle and third-party applications. Customers can consolidate storage while getting low-latency, predictable performance for multiple diverse workloads—in both enterprise computing and multitenant cloud environments. The Oracle FS1 Series is the only SAN storage solution to support Oracle Hybrid Columnar Compression.

ENHANCED ARCHIVING AND DATA PROTECTION WITH TAPE

For complying with government regulations, safeguarding data, and archiving video and other large data sets, Oracle’s StorageTek tape solutions provide significant cost and data integrity advantages over disk-based archives. For example, for long-term archiving, disk-based archives typically cost 26 times the average cost of tape-based archives. They consume 105 times more energy and occupy 4 times the data center floor space—not to mention that enterprise tape lasts twice as long as disks.

Oracle’s StorageTek tape solutions build on 40 years of industry-leading tape experience to combine these advantages with advanced reliability and nonstop availability to give you an unsurpassed long-term data protection solution at a significantly lower cost and a lower TCO.

“The old Dell stack that we ran, the HP stack that we ran, and standard SANs (EMC, Hitachi, NetApp)—we could copy a 32 GB file in 30 to 45 minutes. On the Oracle ZFS Storage Appliance, we can do it in a minute. It was a no-brainer when you look at the cost—the performance—that we could come up with.”

Darian Anderson, Founder and CEO, IXTEND
Highlighting how Oracle can run better (faster and more efficiently) on Oracle is a strong story that is hard to counter.

IDC Insight, Oracle Storage: Standalone and Engineered Systems, June 2013, IDC #241407, Volume 1
“Oracle products have always been synonymous with reliability and efficiency. That’s why we chose Oracle Exalytics In-Memory Machine—a one-vendor solution that guarantees excellence for both hardware and software.”

Pierpaolo Veglio, Information and Communication Technology Finance Process Manager, Fiat

Why Run Oracle Software on Oracle Hardware?

With complete integration and “at the factory” testing and tuning, it just make sense that Oracle software runs best on Oracle hardware. The resulting simplified management and increases in performance make IT more responsive to users and more valuable to the business.

In addition, running Oracle on Oracle means

- Single-vendor support for the entire technology stack—hardware and software. With Oracle hardware running Oracle software, you don’t worry about figuring out whether it’s a hardware or software issue. You only need one contact for easier troubleshooting and faster resolution of the entire stack.
- One integrated system management tool on a single screen for the whole stack helps easily identify bottlenecks and diagnose performance problems.
- Faster time to value with no-cost Oracle VMs throughout make the entire stack easier to provision, deploy, manage, and support.
- IaaS includes chargebacks at no extra cost to you.
- The very fastest performance throughout the stack—Oracle software is optimized to use Oracle hardware to its best advantage.

Only Oracle innovates and optimizes at every layer of the technology stack to simplify data center operations, drive down costs, and accelerate business innovation.

“Deploying Oracle Exadata Database Machine was amazingly easy because everything is optimized for Oracle. The Oracle Exadata software is really great and easy to work with and definitely an advantage. Overall, Oracle Exadata required little to no tuning, and we had the system set up, out of the box, in less than a day by working with Oracle Advanced Customer Support Services. In just one week, we had the system in service, helping to speed the time to value for our organization. You can’t beat that.”

Trent Ratcliff, Senior Manager, Information Technology, Denver Regional Transportation District
“Using Oracle hardware and software to redesign our archiving environment has given us virtually limitless scalability. We reduced costs and gained a strong foundation for the future.”

Peter Cosman, Information and Communications Technology Project Leader, AZ Sint-Jan Brugge-Oostende

FACT: With solid year-over-year financial performance, Oracle is completely focused on enterprise environments and providing innovative products for our valued customers.

Oracle Premier Support for Systems

Maximize your technology investments with Oracle’s comprehensive technical assistance and global support services. Oracle provides the essential services and resources your business needs to maintain its performance and availability service-level agreements.

Oracle Premier Support for Systems includes

• 24/7 rapid-response hardware service
• Expert technical support
• Powerful, proactive tools
• Updates to Oracle operating systems, Oracle VM, and built-in Oracle software
• Remote monitoring and patch deployment at no extra cost for qualified engineered systems with Oracle Platinum Services

Optimize Your Data Center Today

From servers and storage to database, middleware, and applications, Oracle provides systems that simplify your IT infrastructure and deliver

• Extreme reliability with faster performance
• More flexibility
• Increased security
• Easier implementation
• Integrated management across the stack
• Lower costs
• Single-source support for the entire technology stack
• Complete, open-standards-based solutions for the data center and the cloud

Take advantage of the new opportunities and greater productivity that Oracle innovation can bring to your business with Oracle systems and software that are engineered, integrated, and optimized to work together.
“Perhaps the most compelling reason to simplify IT infrastructure is that for most enterprises, IT is not their core business. By simplifying their IT infrastructure, organizations can devote more of their resources to providing better services to customers and users, enabling innovation and increasing productivity for workers throughout the enterprise.
