Oracle White Paper
September 2012

Accelerate SAP while Reducing Risk, Complexity, and Total Cost of Ownership
Oracle Optimized Solution for SAP
Executive Overview .................................................................................................................. 2
Introduction .............................................................................................................................. 2
  Multivendor Infrastructure Increases Data Center Complexity .................................................. 2
Simplify the Data Center with the Oracle Optimized Solution for SAP ................................. 3
  Oracle Optimized Solution for SAP ....................................................................................... 3
Reduce Total Cost of Ownership ............................................................................................. 4
Increase Productivity ............................................................................................................... 5
  Speed Time to SAP Service Delivery ..................................................................................... 6
Get Results Faster .................................................................................................................... 7
Reduce Risk ............................................................................................................................. 8
  Integration for Lower Deployment Risk .................................................................................. 8
Full Redundancy for Greater Reliability ................................................................................... 9
  High Availability for Continuous Access .............................................................................. 9
Maximize Investment Value and Reduce Risk with Oracle Services ..................................... 10
Trust a Longstanding Partnership ......................................................................................... 11
Conclusion ............................................................................................................................... 11
For More Information ............................................................................................................. 12
Executive Overview

Many companies rely on Oracle and SAP for their business-critical enterprise applications. Whether automating manufacturing processes, uncovering volatility in supply or demand, or running the latest financial analyses, the ability to access and analyze the right data quickly is essential. As business needs continue to evolve, adding new capabilities, increasing performance levels, and meeting service-level agreements (SLAs) with flat or declining budgets are pushing IT organizations to the breaking point.

Oracle delivers all the pieces needed to accelerate SAP deployment and reduce costs throughout the SAP lifecycle. From operating environments, virtualization, and management tools, to innovative computing systems, storage, and networking solutions, Oracle integrates, optimizes, and tests it all. Now companies can take advantage of the unique capabilities of the Oracle Optimized Solution for SAP, based on Oracle’s SPARC SuperCluster, to simplify the data center, reduce total cost of ownership (TCO), improve workforce productivity and performance, and reduce risk.

Introduction

When building platforms for SAP applications, IT organizations must take a lot into account. First, performance is paramount. The ability to quickly gather, analyze, and use information results in more accurate insight, which in turn leads to better business decisions and competitive advantage. In addition, cost containment plays an important role in determining the business effectiveness of the solution. With budgets under growing pressure, companies cannot afford to sacrifice SLAs, lengthen analysis times, delay results to business users, or compromise system availability.

For IT organizations, the design, architecture, and deployment of a large-scale, multivendor environment for SAP is a time-consuming and expensive task—with the resulting infrastructure often difficult to maintain. System administrators must integrate many components, including SAP applications, databases, operating systems, servers, networking, storage, management tools, and backup software, and validate they work together. Expert staff often is needed to identify bottlenecks, tune the database, optimize server and storage performance, and ensure high availability of the critical services on which SAP applications depend. Factor in infrastructure components and support contracts from a wide variety of vendors, and complexity, risk, and cost rise exponentially.

Multivendor Infrastructure Increases Data Center Complexity

Typically IT organizations deploy large-scale SAP environments so that users sit at the edge of the network, while data center infrastructure hosts SAP landscapes and storage systems handle information management. Often, system administrators create separate Development (DEV), Test and Quality Assurance (QAS), and Production (PRD) systems, with one set dedicated to each SAP application.

When IT staff opt to host each layer on separate physical servers, the result is a complex and sprawling deployment architecture that makes adding new SAP services a time-consuming and expensive task. IT managers find themselves sizing individual servers for peak demand—a condition that might occur only...
once a week or once a month—leaving the systems idle or running at very low utilization rates the rest of the time. With so many servers often running only at 10 to 20 percent of capacity, resource utilization is low, power and cooling demands are high, and data center floor space is at a premium. As a result, enterprises running multiple SAP applications on multiple sites quickly find themselves with a complex environment with islands of compute and storage resources (Figure 1).

Simplify the Data Center with the Oracle Optimized Solution for SAP

For more than 20 years, companies have trusted their business-critical SAP environments to state-of-the-art Oracle platforms. Today, Oracle’s integrated infrastructure stack—consisting of servers and storage, operating systems, virtualization, database software, networking, and management tools—is optimized to deliver agility and performance to SAP applications. Now this integrated stack is available in a family of engineered systems that are pre-integrated to reduce the complexity and risk associated with large-scale data center infrastructure deployments.

One of these engineered systems, Oracle’s SPARC SuperCluster, is the foundation of Oracle’s latest infrastructure innovation for SAP. The Oracle Optimized Solution for SAP simplifies and accelerates SAP deployment by enabling the consolidation of SAP applications and landscapes onto a single, highly available and scalable platform. Delivering a factory-assembled enterprise platform, the solution eliminates infrastructure complexity and reduces the time needed to get from concept to service deployment.

Oracle Optimized Solution for SAP

Designed with fast SAP application and landscape deployment in mind, the Oracle Optimized Solution for SAP mitigates the traditional risks associated with implementing large-scale enterprise application
deployments. Using Oracle’s proven, tested, application-to-disk infrastructure, the solution eliminates the need for complex, multitier, multivendor hardware configurations. Because the entire environment is engineered and optimized to work together, IT organizations can get SAP services up and running faster. Predictable, high-performance SAP applications can take advantage of a highly scalable, available, and serviceable platform to eliminate the potential pitfalls and time-consuming troubleshooting associated with complex multivendor environments.

The solution is based on SPARC SuperCluster T4-4 servers and offers a complete, pre-engineered, and pre-tested high-performance enterprise infrastructure solution that is faster and easier to deploy. Available in half-rack, full-rack, or multi-rack configurations, the system leverages innovative Oracle technologies—the computing power of Oracle’s SPARC T4-4 servers, the performance and scalability of Oracle Solaris, and the optimized database performance of Oracle Database 11g accelerated by Oracle Exadata Storage Servers, and a high-bandwidth, low-latency InfiniBand network fabric. These technologies are combined into a scalable, engineered system that is optimized and tuned for consolidating enterprise SAP applications and landscapes (Figure 2).

![Figure 2. SPARC SuperCluster provides complete infrastructure for SAP in a single system.](image-url)

### Reduce Total Cost of Ownership

When budget pressures mount, companies look to IT organizations for ways to drive cost out of the business. Infrastructure acquisition, real estate, energy, and management costs all contribute to capital and operational expenditures and are targets for cost reductions. With a focus on contributing to the bottom line, IT departments look for money saving opportunities in every aspect of the data center. The Oracle Optimized Solution for SAP provides a smarter engineered system that is balanced and designed to help IT save on space, power, cooling and assets, as well as streamline operation.

Deployment and ongoing administration are simplified when resources are aggregated and management tools enable service-level management instead of individual component management. To that end, the
Oracle Optimized Solution for SAP pools resources into tightly coupled clusters that make it more cost effective for businesses to acquire, deploy, manage, and maintain SAP resources.

- **Save on infrastructure integration.** SPARC SuperCluster comes pre-bundled and integrated, eliminating the traditional cost of on-site integration using internal resources or an external integrator.

- **Save space.** Using the Oracle solution, IT organizations can reclaim valuable data center floor space. Key Oracle technologies, such as built-in consolidation and virtualization tools for servers and storage, help IT staff deploy more services on fewer systems to reduce overall footprint. For example, the use of Oracle’s Sun ZFS Storage Appliance in SPARC SuperCluster requires only 20 percent of the storage space of other solutions. Consolidating multiple SAP landscape tiers or applications in a single SPARC SuperCluster further enhances these benefits.

- **Improve resource utilization.** A wide range of SAP workloads can be consolidated onto the high-performance, highly available solution to improve resource utilization and data center efficiency. The SAP Central Services, SAP Application Servers, and Oracle Database software are all consolidated on the system, eliminating much of the time and effort typically associated with installing, integrating, and configuring enterprise applications on clustered solutions.

- **Save on equipment.** Oracle’s solution optimizes systems for expected SAP workloads so that enterprises pay only for the capacity needed. For example, companies can reduce storage acquisition costs by up to 80 percent, and take advantage of lower costs by obtaining a right to use (RTU) license for Oracle Solaris with the purchase of Oracle servers.

- **Consolidate with confidence and at no extra cost.** Built-in, no-cost, hardware-accelerated virtualization technologies isolate SAP workloads and offer the fine-grained resource control needed to safely consolidate SAP environments and dynamically reallocate resources to handle peaks in user demand.

- **Protect software investments.** Consolidating SAP systems onto the Oracle Optimized Solution for SAP does not require re-certification or testing. Certified Oracle Solaris 8, 9, 10, and 11 applications can run simultaneously on a SPARC SuperCluster system without modification. Oracle Database 10g can run within a virtual environment (using Oracle Solaris Zones) to ensure progressive and controlled migration to the latest database technology from Oracle.

- **Save energy.** With an eco-friendly design, Oracle’s solution uses fewer components in a smaller footprint to lower energy consumption. Indeed, companies that deploy the solution can experience up to 80 percent less resource utilization, including power consumption and cooling.

**Increase Productivity**

Agile IT organizations understand how to deploy SAP services so that new features can be put into practice without delay. In turn, the underlying infrastructure must be dynamic and flexible, and utilize technology to the best advantage if changes are to occur on time and within budget. Once deployed, systems must deliver high performance to ensure users do not sit idle or struggle to complete tasks on time. Unfortunately, the
sprawling complex of multivendor solutions typically deployed to support SAP often is inflexible and underpowered, hampering agility and productivity as IT looks to deliver new or expanded SAP services.

By deploying the Oracle Optimized Solution for SAP, IT organizations can deliver needed change with speed and quality. Once the initial system is deployed, new SAP services can be added very quickly, as the hardware already is in place and operational. Systems can be partitioned into isolated environments to run new SAP applications without impacting production services. SPARC SuperCluster systems also can be expanded over time to provide greater compute power and storage capacity as SAP service demands grow.

Speed Time to SAP Service Delivery

Purchasing, configuring, provisioning, and deploying all of the hardware, software, and networking components needed for SAP infrastructure can be a time-consuming and complex task. Lengthy and intricate integration and testing processes, combined with the opportunity for human error, can introduce risk into the SAP environment as solutions are built, tested, and deployed. With the Oracle Optimized Solution for SAP, the entire environment is engineered and optimized to work together, reducing the time it takes to build SAP infrastructure and deploy new applications and services. In fact, IT using the solution enables production environments to be deployed four times faster than a do-it-yourself custom deployment. As a result, IT staff can eliminate the potential pitfalls and time-consuming troubleshooting associated with complex multivendor infrastructure deployment (Figure 3).

Figure 3. The Oracle Optimized Solution reduces the guesswork and time associated with multivendor environments.

- **Deploy services up to four times faster with a factory-assembled solution.** Designed to simplify solution integration and deployment, the Oracle Optimized Solution for SAP enables faster time to service. All hardware arrives ready for fast data center installation. Because Oracle pre-selects, pre-assembles, and integrates hardware and software components into an optimized solution stack, the tried
and tested solution helps reduce deployment cycles by up to four times. Indeed, by using Oracle’s solution and documented best practices, IT organizations can deploy SAP systems in just days rather than weeks or months.

- **Eliminate implementation errors.** Designing, building, and deploying sophisticated infrastructure for enterprise applications requires a massive configuration effort—a typically manual effort that is prone to error. SPARC SuperCluster arrives pre-installed, pre-cabled, pre-racked, and ready to run. This integrated approach ensures there are no missing components or erroneous parts. By eliminating the human error that could result in significant troubleshooting and time delays, the solution helps ensure SAP services get up and running quickly and run right the first time.

Get Results Faster

Supporting corporate objectives through better business intelligence and analytics requires SAP landscapes to deliver outstanding performance characteristics. With massive compute power in a small footprint, high-speed networking built in, and integrated software that can take advantage of the right hardware platform capabilities, the Oracle solution delivers scalability and speed to SAP applications. With the Oracle Optimized Solution for SAP, companies can:

- **Accelerate SAP performance.** SPARC SuperCluster is designed around Oracle’s most innovative and highest performing enterprise compute, storage, and networking components, including Oracle’s SPARC T4-4 servers, Oracle Exadata Storage Servers, and Oracle’s Sun Datacenter InfiniBand switches.

- **Take advantage of server advancements.** Ideal for resource-intensive SAP applications, the SPARC T4-4 nodes within SPARC SuperCluster are designed with performance and consolidation in mind. These nodes deliver significantly more performance than previous generation servers, due to a massive 1 TB memory footprint and the inclusion of four CPU sockets, each hosting a faster processor that supports more CPU threads. These and other innovations provide increased computational density to consolidated SAP deployments while staying within constrained envelopes for power and cooling. Very high levels of integration help reduce latency and improve overall system security and reliability.

- **Experience extreme database performance.** Optimized for use with Oracle Database, the Oracle Exadata Storage Servers within SPARC SuperCluster employ a massively parallel architecture and Oracle Exadata Smart Flash Cache to accelerate Oracle Database processing and speed I/O operations. Intelligent software enables Oracle Exadata Storage Servers to quickly process database queries and return only the relevant rows and columns to the database server. Pushing SQL processing to Oracle Exadata Storage Servers reduces database server CPU consumption while using significantly less bandwidth to move data between storage and database servers. In addition, Oracle Exadata Storage Servers return a query result set rather than entire tables, eliminate network bottlenecks, and free up database server resources. As a result, users often see a 10x performance increase when scanning and analyzing data.
Reduce Risk

A global and connected economy is placing increasing importance on business continuity in boardroom agendas. There is increased awareness and recognition that daily business operations cannot continue without mission-critical SAP systems. Today, simple tasks such as validating orders and generating invoices can be completely dependent on the availability of SAP systems. Whether downtime is planned or unplanned, it can have an immediate impact on the bottom line and customer satisfaction. In some cases, just a few minutes of downtime can be disastrous.

Out of the box, the Oracle Optimized Solution for SAP delivers a resilient infrastructure for mission-critical SAP applications. Each layer of the technology stack is integrated and optimized to work in conjunction with other components to deliver increased SAP application availability. These software layers in turn run on the rock solid foundation of the SPARC SuperCluster to deliver performance, reliability, availability, and serviceability features that promote SAP service continuity.

Integration for Lower Deployment Risk

Risk is inherent in any data center deployment effort. Having the right platform underneath it all can mean the difference between failure and success. Multiple layers of integration in the Oracle Optimized Solution for SAP take the guesswork out of component selection and configuration to lower deployment risk.

- **Complete package.** Using a complete package that is designed and tested to work together is the best way to minimize risk and ensure SAP availability. Documented best practices ensure components are identified and verified to work together, minimizing the likelihood of errors that can cause unplanned downtime. In addition, IT organizations can take advantage of Oracle’s Advanced Customer Services (ACS). Oracle technology experts can further support SAP implementation and deployment activities following the best practices outlined by the solution.

- **Software consolidation.** In the Oracle Optimized Solution for SAP, the SAP Central Services (SCS and ASCS) instances, SAP Application Servers, and Oracle Database software are consolidated on the system, eliminating much of the integration effort and deployment time typically associated with clustered solutions.

- **Simplified patch management.** In multivendor environments, upgrades and patches become a high-risk endeavor. Ensuring all updates, upgrades, patches, and security fixes are applied and work well together takes time and is prone to error. Oracle mitigates these issues with the Oracle Optimized Solution for SAP. Built-in management tools provide out-of-box deployment processes that streamline software updates and patch rollouts. Oracle works with SAP to test and aggregate patches for SPARC SuperCluster components, as well as patches from SAP components.

- **Easy serviceability.** When problems arise, they must be able to be resolved quickly. SPARC SuperCluster is designed with serviceability in mind, with component replacement allowed while the system is live.
Full Redundancy for Greater Reliability

Reliability features come standard in the SPARC SuperCluster. Every server in the cluster features automatic recovery with instruction retries, ECC protected memory, data path integrity, and register protection to ensure systems continue to operate. In addition, the SPARC SuperCluster system provides full built-in redundancy—from compute nodes to storage, network switches to network interface cards (NICs), and power distribution units (PDUs) to power supplies—to support the demands of mission-critical SAP applications. All components (SPARC T4-4 servers, Sun ZFS Storage appliances, and Oracle Exadata Storage Servers) are interconnected over a fully redundant InfiniBand fabric. System partitioning and electrical isolation keep issues in one component from affecting other components in the SPARC SuperCluster. In addition, virtualization technologies built into the operating environment enable application consolidation without fear that services will consume system resources or otherwise impact one another. Together, these built-in technologies minimize disruption and deliver the superior availability required by 24x7x365 SAP environments.

High Availability for Continuous Access

The Oracle Optimized Solution for SAP offers clustering technologies that can be used separately or in combination to increase the availability of SAP deployments. Optimized to work with Oracle hardware, these technologies contribute to the resilient infrastructure needed for mission- and business-critical SAP environments and form the foundation for highly available deployments.

- **Hardware failover.** Using Oracle Solaris Cluster, the solution ensures the availability of SAP Central Services by detecting, isolating, and containing failing hardware components, such as NICs, HBAs, networks, and storage.

- **SAP application failover.** Agents—software programs that enable SAP applications to take full advantage of Oracle Solaris Cluster features—specify the actions to be taken should a system or service fail or become unavailable. Agents are available for SAP Enqueue (including enqueue and replication servers), central services, the Web application server, SAP J2EE Engine, SAP liveCache, and Oracle Database. For maximum uptime, agents implement automated failover for the primary SAP application server, SAP Central Services, and the database tier, as well as failover for other mission-critical production applications.

- **Virtual clustering.** Oracle Solaris Cluster supports virtual clustering, allowing virtual environments to function in the same role as physical servers. Applications that run within dedicated virtual clusters are associated with specific cluster management policies. Agent actions can be layered, such as first trying to restart the service in a different virtual environment before attempting to restart it on a different server. This helps SAP applications achieve the required levels of service.

- **Database fault tolerance.** Oracle Real Application Clusters (Oracle RAC) is the preferred implementation option to ensure database availability for mission-critical SAP workloads. Oracle RAC supports the transparent deployment of the database across all four servers within the SPARC SuperCluster system, providing database fault tolerance in the event of hardware failures or planned outages.
• **Highly available shared file systems.** In the SAP environment, application servers access shared file systems for SAP binaries, configuration files, and log files. Accessed over the high-speed InfiniBand network within the SPARC SuperCluster, Sun ZFS Storage Appliances provide a highly available shared file system. Configured for redundancy, these appliances use the built-in self-healing and data integrity features of Sun ZFS Storage software with clustered controllers to ensure data availability.

Maximize Investment Value and Reduce Risk with Oracle Services

Oracle provides a wide range of services for SAP users that can maximize the value of Oracle investments, ease migration efforts, ensure SAP system operational readiness, and reduce deployment and ongoing production support risk. A number of Oracle organizations around the globe support joint Oracle and SAP customers, providing valuable pre-sales and post-sales resources. These organizations comprise a virtual center of expertise for organizations that run SAP applications on Oracle infrastructure.

• **Oracle services.** Oracle Engineered Systems deliver extreme performance through pre-integrated technology that enables rapid time to production. Proper planning, installation, deployment, and support are critical to take full advantage of these SPARC SuperCluster benefits. From strategic architectural design and planning, to on-site installation and configuration, to pro-active management services, Oracle pre-sales and service professionals deliver the technical expertise, tools, and best practices to help ensure smooth and timely deployment of a highly optimized and efficient production implementation.

• **Oracle Solution Centers for SAP.** These centers provide pre-sales support, including sizing and IT infrastructure optimization, to help customers discover a proven way to architect SAP deployments on Oracle technology. A simple engagement framework provides access to Oracle’s state-of-the-art facilities and Oracle and SAP architects, as well as Oracle Database and hardware support teams. With a global presence and facilities located in Tokyo (Japan), Santa Clara (California, USA), and St. Leon-Rot/Walldorf (Germany), the Oracle Solution Center team helps IT organizations assess current SAP deployments and achieve optimal results when transitioning to Oracle engineered systems, new Oracle servers and storage, and other Oracle technology.

• **Joint Customer Support Center.** The center provides a single point of contact for handling customer support calls, escalating issues from or to SAP when needed, and resolving problems. An SAP-aware team of engineers is available through a direct access hotline and provides assistance for critical service requests (SRs). The Joint Customer Support Center also provides a range of proactive services, including assessments and root cause analysis.

• **Oracle Advanced Customer Support Services.** This extensive range of services is designed to help customers achieve the optimization of SAP on SPARC SuperCluster architectures. Oracle staff members possess deep product knowledge and, together with the Oracle Solution Center for SAP, are used frequently to supply staffing and deliver content for SAP technical events, as well as provide Oracle database and systems related SAP Notes. Offering a full range of services—Install and Configuration Diagnostic Review, Installation Service, Configuration Service, SAP-specific Oracle-to-Oracle (O2O) and Oracle-to-Oracle Online (Triple O) Migrations, Production Support Readiness, and a Patch Deployment Service—Oracle ACS can help IT organizations get SAP landscapes up and running on engineered systems quickly.
• **Oracle Support offerings for SPARC SuperCluster.** Oracle offers 24x7 integrated hardware and software support, proactive support tools such as phone home capabilities and automated service requests, and customer incident management to accelerate problem resolution. Additional high availability services are delivered with Oracle Platinum Support for certified Oracle SPARC SuperCluster configurations, including remote fault monitoring, and industry-leading response and restore times.

**Trust a Longstanding Partnership**

Oracle’s extensive partnership with SAP—including database, operating system, hardware, and Java technology—has continued for more than 20 years and still is strong today. As a large majority of SAP deployments rely on the Oracle Database and other Oracle technologies, Oracle and SAP understand the importance of maintaining strong cooperation that benefits their joint customers.

• **Collaborative engineering.** Oracle and SAP make their teams available to one another to foster greater innovation and collaboration. For example, the Oracle Database and hardware development team manages and executes joint Oracle/SAP database and Oracle Solaris integration projects.

• **Coordinated global support processes.** These processes provide proactive risk mitigation for the introduction of new products, reducing support-related assistance requests. In addition, single, consistent service relationships with a dedicated, long-term team of technical analysts provide direct contact to SAP customers using Oracle databases for improved insight and support.

Oracle was one of the technology partners involved in developing SAP R/3 in 1992, with a goal of closely integrating Oracle Database with SAP applications to provide optimal performance. Since that time, Oracle Database has been optimized continuously for SAP applications. This is why tens of thousands of SAP customers run SAP applications on Oracle hardware and Oracle Solaris, and over two-thirds of mid-size to large SAP customers rely on Oracle Database. (For more information on SAP and Oracle deployments, see [http://www.sap.com/ecosystem/customers/directories/technology/oracle/index.epx](http://www.sap.com/ecosystem/customers/directories/technology/oracle/index.epx).)

**Conclusion**

When companies look for business optimization tools, they turn to SAP and Oracle. With industry-leading enterprise SAP applications, enterprises are better positioned to make better business decisions. By combining these innovative tools with the Oracle Optimized Solution for SAP, Oracle makes it easy to deploy SAP environments and optimize the underlying infrastructure. Indeed, years of experience helping companies deploy SAP applications, combined with innovative system engineering expertise, come together in a tested and proven solution that can help IT lower total cost of ownership, improve productivity, and reduce business risk.
For More Information

For more information on the Oracle Optimized Solution for SAP, see the references listed in Table 1.

<table>
<thead>
<tr>
<th>TABLE 1. REFERENCES FOR MORE INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Optimized Solution for SAP</td>
</tr>
<tr>
<td>Oracle Database and Infrastructure Solutions for SAP</td>
</tr>
<tr>
<td>Oracle Consulting Services</td>
</tr>
</tbody>
</table>