ORACLE AND SAP
ENTERPRISE SOLUTIONS

Oracle Exadata Database Machine: Accelerating SAP Deployment and Operation

When companies need to improve their SAP landscape operation, they turn to Oracle®. Deploying Oracle Exadata Database Machine enables enterprises to increase SAP performance, accelerate deployment, simplify management, and ensure business continuity while meeting ITIL® best practices.

Highlights

- Accelerate SAP performance and availability with the fully integrated hardware and software stack of Oracle Exadata Database Machine

- Comply with ITIL best practices for Availability Management, IT Service Continuity Management, and Change Management

- Align IT services with business needs for increased productivity, lower TCO, and business growth

- Significantly reduce operational management costs and increase agility with simplified administration and use of a single toolset across the whole Oracle software and hardware stack

- Increase reliability and availability with redundant components and fault-tolerant design

To be successful in today's hyper-competitive business climate, enterprises must operate as efficiently and effectively as possible. Worldwide, companies rely on SAP applications to run their business and make informed decisions.

Implementing and maintaining an effective SAP landscape can be complex and time-consuming. All infrastructure components must be integrated and validated to work together, including SAP applications and databases, operating systems, server, networking, and storage hardware, and backup, virtualization, and management software. Tuning, troubleshooting, and maintaining a conventional, piecemeal solution from multiple vendors requires a large IT staff with deep expertise in each infrastructure area, increasing costs and organizational complexity.

Oracle Exadata Database Machine provides the ideal platform for SAP deployment. Each Oracle Exadata engineered system is a complete hardware and software solution containing all the components of an effective and well-built SAP infrastructure. Oracle's fully integrated, pre-tested system designs are supported as a single stack, eliminating the need for tedious component integration and validation tasks and improving data center operations. Oracle Exadata also help enterprises to implement Information Technology Infrastructure Library® (ITIL®) best practices for aligning IT services with business needs and creating more efficient and cost-effective business and IT processes.

Simplifying SAP Deployment

Successful SAP deployment hinges on three key concepts: simplicity, reliability, and performance.

- **Simplicity.** The SAP landscape must be easy to set up, adapt, operate, and maintain, with minimal total cost of ownership (TCO).

- **Reliability.** The SAP landscape must provide uninterrupted service delivery and business continuity at all times.

ORACLE®

- **Performance.** The SAP landscape must be tuned to minimize user transaction and report generation times and enable new services with exceptional performance levels.

Two main deployment scenarios have emerged for SAP landscapes. Vertical scaling, typically utilizing high-end UNIX systems, maximizes availability and performance, but at a relatively high acquisition cost. Horizontal scaling with commodity x86 servers reduces initial acquisition costs, but can increase multi-vendor and multi-configuration integration and management tasks and introduces availability concerns.

Oracle engineered systems provide a third choice, incorporating the best of both worlds into a rapidly deployable, high-performance, cost-effective, pre-engineered SAP platform. Tightly integrated components boost performance to unprecedented levels while simplifying management and reducing TCO. Redundancy throughout the system maximizes reliability and availability, making Oracle engineered systems the ideal platforms for keeping businesses up and running.

Accelerating SAP Performance with Oracle Exadata Database Machine

Overall SAP system performance depends primarily on two key infrastructure components—the application servers and the database. The number and speed of CPUs, amount and speed of memory, and bandwidth of network connections mainly determine the performance of application servers and database. Balancing these compute, memory, and network characteristics is essential for cost-effective performance. If any one component features higher or lower performance than the rest,

bottlenecks will limit the system and costs will increase.

In addition to CPUs, memory, and network connections, database performance is also impacted by the capacity and scalability of the underlying storage system, which has the greatest effect on system response time. With exponential growth in file volumes, storage networks must quickly and efficiently transfer terabytes of data, and conventional solutions rapidly reach capacity limits.

The Oracle Exadata Database Machine is a fully integrated database platform ideal for Oracle database consolidation and deployment in SAP. As shown in Figure 1, SAP and non-SAP database instances can be consolidated onto a single Oracle Exadata platform. Additionally, SAP central services can be implemented on Oracle Exadata for high availability solutions. Pre-integration and pre-testing eliminate tedious provisioning work, enabling IT staff to rapidly deploy databases into production. Pre-engineering ensures that all system components are balanced for maximum performance.

Built-in Oracle Exadata Storage Servers, featuring extreme bandwidth and massive

parallelization, are key to Oracle Exadata's superior performance. With a raw data throughput of up to 100 GB per second and 1.5 million IOPS of storage performance, Oracle Exadata's storage system scales much further and more easily than conventional architectures. Faster query response times are supported by Oracle Exadata Smart Flash Cache, which transparently and automatically caches frequently used data to solid-state storage.

As companies grow, the scalability of their infrastructure becomes a concern. Multiple Oracle Exadata systems can be connected via the integrated InfiniBand network to form a single, larger system, easily supporting changing business demands and growth.

Operational Planning for SAP Deployment on Oracle Exadata

Most IT organizations have separate teams managing storage, networking, operating systems, and databases. In a conventional data center, each of these components is a separate element, allowing for a strict division of responsibilities between teams. In contrast, the unique architecture of Oracle Exadata combines all of these components into a single system, and should be managed as a unified solution to
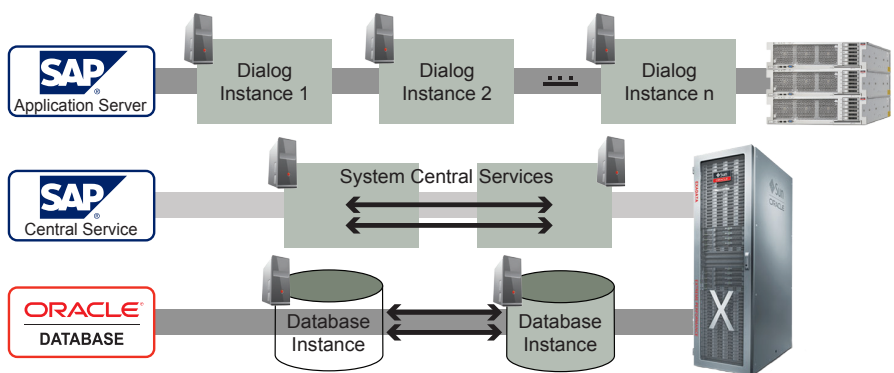
Figure 1. Oracle Exadata provides a platform for the most critical components of an SAP landscape.

maximize the benefits from the system's tight integration and optimization. As such, IT staff must carefully evaluate new and different ways to distribute data center management and operation responsibilities.

In most organizations, a highly trained core team with expertise in both Oracle Database and SAP software manages the SAP landscape while other teams provide expertise in areas outside the SAP team's core competency. As most management tasks for Oracle Exadata are part of a database administrator's standard skillset, the core team can manage Oracle Exadata with a few key changes in management responsibilities.

- **Storage.** Due to the integrated storage features in Oracle Exadata, including Oracle Automatic Storage Management (ASM), self-managing disks, and Smart Flash Cache, the workload for storage administrators is significantly lower than that of a large SAN infrastructure. Day-to-day storage administration mainly involves backup monitoring, capacity planning, and information life-cycle management tasks.

- **Operating system.** Because Oracle Exadata is designed purely for database operations, operating system management

is much simpler than for standalone servers. Operating system management tasks consist mainly of one-time Oracle Database setup and periodic patching.

- **Networking.** Oracle Exadata's preconfigured InfiniBand network requires minimal attention. Network administration tasks are limited to maintenance of the connection to the public network, monitoring and infrequent patching.

Although not essential, the simplified architecture of Oracle Exadata and reduced requirements for infrastructure administration enables a move toward a more unified and efficient management structure. Three main operational models for Oracle Exadata administration are outlined in the Oracle white paper *Operational Impact of Deploying an Oracle Engineered System (Exadata)*[1]—management by multiple teams (standard approach for most organizations), a database machine administration team, or an Oracle Exadata administration team. Each model is suitable for different situations, and to successfully migrate their SAP landscape to Oracle Exadata, IT departments must review and evaluate the options to optimize their organizational structure and administration tasks.
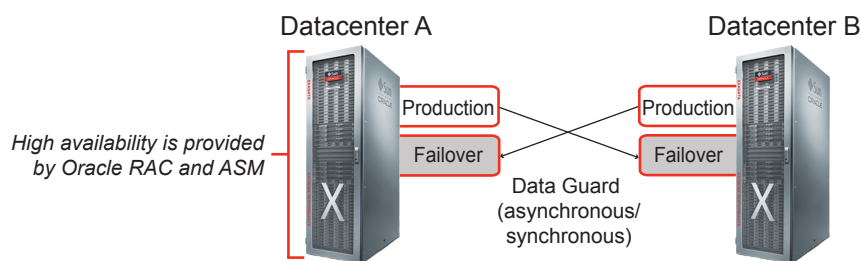
Implementing ITIL Best Practices with Oracle Exadata

The most widely adopted approach for IT Service Management, ITIL provides a foundation for core business processes and a framework to align IT services with business needs, allowing enterprises to identify, plan, deliver, and support IT services for business. Adoption of ITIL best practices has a range of benefits, including improved IT services, reduced costs, and increased productivity.

Availability Management

Availability Management, one of the five components comprising the ITIL Service Delivery area, ensures that application systems are available for use according to conditions outlined in Service Level Agreements (SLAs). Implementing ITIL's Availability Management guidelines allows enterprises to put in place the most cost-effective contingency plans by prioritizing IT services based on business needs. Providing just the level of availability required avoids unnecessary costs while meeting SLAs. Additionally, Availability Management helps IT staff to identify and correct potential service availability issues before they can negatively impact operations and services.

The unique architecture of Oracle Exadata simplifies Availability Management with no single points of failure. Fully redundant, hot-swappable components can be replaced without service interruption, dramatically reducing planned and unplanned downtime. Oracle Exadata systems provide the fault-tolerant operation required for business-critical SAP applications, and automatic failover functionality can re-establish availability at a remote site in the event of multiple simultaneous errors, as shown in Figure 2.

Datacenter A   Datacenter B

High availability is provided by Oracle RAC and ASM

Production   Production
Failover   Failover

Data Guard
(asynchronous/
synchronous)

Figure 2. Oracle Exadata systems can automatically fail over to a remote site in the event of multiple simultaneous errors.

[1] http://www.oracle.com/us/solutions/sap/ops-impact-of-exadata-wp-1936695.pdf

Built-in software, such as Oracle Real Application Cluster (Oracle RAC), Oracle ASM, and Oracle Data Guard, provides additional data safeguards to enable the system to absorb errors without disruption to services.

Continuity Management

IT Service Continuity Management (ITSCM) manages risks that can acutely impact IT services. ITSCM planning reduces the risks from disaster events to acceptable levels and puts in place procedures for service recovery in the event of a failure. With proper risk management, service interruption times are reduced, and customer and user confidence in service quality is increased.

Oracle Data Guard, included in Oracle Enterprise Edition, is the preferred solution to protect Oracle data from data failures, disasters, human errors, and data corruption. Oracle Data Guard provides functionality that enables greater data protection for valuable SAP applications than host-based mirroring or storage-based replication. Oracle Recovery Manager (RMAN), the backup and recovery manager for Oracle Database, mitigates high availability and disaster recovery concerns with full and incremental database backups and recovery and restoration capabilities. Traditional high-availability solutions like Oracle Solaris Cluster complement Oracle Data

Guard and Oracle RMAN to ensure high availability for the overall SAP IT infrastructure.

Change Management

Change Management helps organizations minimize the risks involved with changes to the IT environment and implement standardized methods and procedures to efficiently handle changes. Successful Change Management implementation improves risk assessment, better aligns IT services with business requirements, and improves day-to-day operations.

Because Oracle Exadata systems are pre-integrated, pre-tested, and optimized out of the box, the risks involved with system integration are greatly reduced. Oracle bundled patches further extend the pre-engineered concept to ongoing system maintenance. The patching process is simplified, utilizing only two pre-tested patch bundles. With Oracle Enterprise Manager, only the patches needed for Oracle Exadata are downloaded, simplifying the patching process even more and saving network bandwidth and computing resources. IT staff can patch live systems, test the changes, and place changes into production without taking the system offline.

As businesses grow, their SAP environment must scale accordingly. IT organizations can

expand Oracle Exadata infrastructures easily with complete module upgrades, rather than adding individual components. Multiple Oracle Exadata systems can be combined into a single system through the built-in InfiniBand network.

Oracle Exadata—A High-Performance Platform for SAP Based on Best Practices

SAP applications reach unprecedented levels of performance and availability with Oracle Exadata Database Machine. Offering a new approach for operating SAP landscapes, Oracle Exadata allows IT services to be easily aligned with business needs for availability, performance, and maintainability. With a foundation in ITIL best practices, SAP deployed on Oracle Exadata transforms data center operation into service-based IT focused on improving business processes and enabling business growth.

Did you know? The information presented in this document is also valid for other Oracle engineered systems, including Oracle SuperCluster, Oracle Exalogic Elastic Cloud, and Oracle Database Appliance.[2]

CONTACT US

To learn more, call **+1.800.ORACLE1** to speak to an Oracle representative or visit **oracle.com/sap**

Outside North America, visit oracle.com/corporate/contact to find the phone number for your local Oracle office.

[2] Visit http://www.oracle.com/us/solutions/sap/engineered-systems/overview/index.html for more information.