



An Oracle White Paper
October 2011

Oracle Database Appliance

Introduction

The Oracle Database Appliance is a new engineered system consisting of hardware and software that saves customers time and money by simplifying deployment, maintenance, and support of high availability database solutions. Built using the latest generation of the world's most popular database, Oracle Database 11g, along with Oracle Real Applications Clusters (Oracle RAC), it offers customers a fully integrated system of software, servers, storage and networking in a single box delivering high availability database services for a wide range of home grown and packaged OLTP and Data Warehousing workloads.

The Oracle Database Appliance also offers customers a unique pay-as-you-grow software licensing capability, allowing seamless scalability from 2 to 24 processor cores without any hardware upgrades. It ships as a 4 rack unit (RU) server appliance that consists of two server nodes and 12TB raw storage capacity running Oracle Linux and Oracle Database 11g Release 2. All hardware and software components are provided by Oracle, which allows customers to benefit from streamlined single vendor support. By engineering hardware and software components to work together, the Oracle Database Appliance is an engineered high availability database solution in a single box that is:

- Simple
- Reliable
- Affordable

The Oracle Database Appliance is an ideal database appliance for customers who value simplicity and who seek to avoid the complexity, costs, and risks in deploying a highly available database solution. Customers can now benefit from high availability (HA) database solutions without having special skills or HA expertise.

Challenges to Deploy Highly Available Database Systems

Highly available database systems running on a cluster of database servers can be complex to implement and traditionally required specialized systems administration, database administration and storage management skills. However, many IT organizations don't have these skills, and feel the risk of implementing these solutions without the necessary expertise outweighed the anticipated benefits. Conversely, larger IT organizations may have the skills, but typically reserve high availability implementations for their most mission critical applications, leaving less critical database applications unprotected.

The Oracle Database Appliance offers a new way to take advantage of the latest generation of the world's most popular Database – Oracle Database 11g – and the high availability capabilities it has to offer. Now, a single database administrator (DBA) can deploy a highly available Oracle Database Appliance in about 2 hours. And with the industry's best database high availability solution – Oracle Real Application Clusters – running on the appliance, database or hardware failures can be handled in seconds, often with no perceptible impact on user response time. As a result the Oracle Database Appliance offers the highest availability in its class.

Simple to Implement, Manage, and Support

Simple to Implement

The hallmark of the Oracle Database Appliance is its simplicity: A single box, with servers, storage and networking — all engineered together as a complete system with no assembly or wiring required. To deploy and use the Oracle Database Appliance, simply unpack it, plug in the power cord, plug in the network cables, and run the Oracle Appliance Manager installation to create a clustered, highly available database.

Simple to Manage and Maintain

Maintaining systems and keeping all the associated software elements current with the latest patches is often one of the most time consuming and error-prone tasks administrators are confronted with. The Oracle Database Appliance and its specially engineered software enables “one button” patching for all the elements of the software stack — firmware, operating system, clusterware, storage manager, and database software.

The appliance simplifies storage management by automatically detecting performance and availability issues and performing corrective actions. Disks can be replaced without administrative tasks, and should a storage device exhibit behavior that indicates it is beginning to fail and is impacting performance, the appliance will offline the disk and rebuild redundancy.

If hardware fails or is about to fail, the Automated Service Request capability (phone home) generates automatic requisitions for replacement components such as disks, power supplies, fans etc.

When a problem occurs, the Oracle Database Appliance gathers and packages all the relevant logs to service the support request. Rather than requiring the DBA or System Administrator to manually search for and compile all the logs and system history when issuing a Support Request, the Oracle Appliance Manager automatically collects and then compiles the relevant logs and history, allowing issues to be processed, analyzed and fixed much more quickly.

A Complete, Engineered High Availability Database Solution

The Oracle Database Appliance is an integrated hardware and software database solution that offers many advantages over “do-it-yourself” implementations.



Hardware

Servers

The Oracle Database Appliance is a 4 rack unit (RU) server appliance that consists of 2 server nodes and 24 3.5” SAS/SSD disk slots. Each server contains two CPU sockets for the Intel Xeon Processor X5675 CPUs providing up to twelve enabled-on-demand processor cores and 96 GB of memory.

Networking

The two server nodes are connected via an internal redundant 1-GbE interconnect for cluster communication. Each server node also provides both 1-GbE and 10-GbE external networking connectivity ensuring the appliance will be compatible with any data center regardless of their preferred networking environment.

Engineered Systems – Why they are better

An Engineered System ensures the hardware and software uniquely interoperate and take advantage of what each knows about the other, to offer the best reliability and performance possible. Decisions about how to process work can be optimized because the database, storage management and clustering software can take advantage of certain features or facilities that may not exist with a “do-it-yourself” assembly of hardware and software components.

As an example, if the system is aware of the operating environment – down to the patch level of the operating system and database - it can:

- Make installation, configuration and tuning decisions as well as automate the setup
- Enable customer support to diagnose and resolve issues very quickly
- Issue “system” patches that combine OS, database, clusterware, and storage management together
- Proactively apply patches once known issues, raised by other customers, are resolved and fixed
- Employ updates/patches at any element immediately when available — no cross-certification of different vendor’s technologies to wait on, some of which can take more than a year to get tested and certified.

The Oracle Database Appliance is part of the “engineered system” family of products from Oracle and is able to deliver these significant advantages to customers, making it a superior HA database system with ease-of-installation and management, performance, and supportability.

Storage

The Oracle Database Appliance shares twenty 600 GB SAS Hard Disk Drives between the two server nodes that are triple-mirrored to provide 4 TB of highly available shared storage. This appliance also contains four 73 GB SAS Solid State Drives for redo logs, triple-mirrored to protect the Oracle database in case of instance failure. The appliance manager in conjunction with Oracle Automatic Storage Management (ASM) automatically configures, manages, and monitors the disk for performance and availability. The Oracle Appliance Manager provides alerts on performance and availability events as well as automatically configures replacement drives in case of a hard disk failure.

Built-in High Availability

The Oracle Database Appliance was developed collaboratively across hardware and software engineering teams to ensure that all high availability best practices were implemented throughout the design. Along with HA features such as triple-mirrored database drives, redundant server nodes, redundant fans, internal redundant 1-GbE connectivity for Oracle RAC, the appliance provides the highest level of resiliency with redundant power supply units and two buffer chips that are each individually wired to each server node to eliminate single points of failure. In addition, all wiring is internal to the chassis, reducing the chance of an accidental cable pull.

Software

The Oracle Database Appliance comes with the following software:

• Oracle Linux 5.5 – pre-installed
Software Stack (installed using the Appliance Manager)
• Choice of Oracle Database Software: <ul style="list-style-type: none">• Oracle Database Enterprise Edition (11.2.0.2)• Oracle Real Application Clusters (RAC)• Oracle Real Application Clusters (RAC) One Node
• Oracle Grid Infrastructure (11.2.0.2) which includes: <ul style="list-style-type: none">• Oracle Clusterware• Oracle Automatic Storage Management
• Oracle Enterprise Manager Database Control
• Oracle Automatic Service Requests
• Oracle Appliance Manager

“Leveraging the world’s most popular database on industry leading hardware in one plug and go appliance significantly reduces risk and complexity for my customers”

Wade Nicolas, President, Enkitec

Oracle Database 11g and Clustering Options

Organizations can choose to run just Oracle Database 11g Release 2 Enterprise Edition on the

system in a single instance fashion, or choose to run it as part of a high availability database solution using Oracle Real Applications Clusters (RAC) for an active-active database or Oracle Real Applications Clusters One Node (RAC One Node) for an active-passive failover system.

Affordable

Capital and Operating Expenditure Savings

The Oracle Database Appliance includes hardware and software components that are comparable to what a “do-it-yourself” system might be comprised of. However, factoring in the time required to design, acquire, deploy, and test such a DIY system, the advantage of the Oracle Database Appliance quickly becomes apparent: With the Oracle Database Appliance, the time ordinarily spent researching compatible components, creating and processing multiple orders across multiple vendors and validating configurations is saved.

Savings can be realized in all three stages of the systems lifecycle: from initial deployment, on-going maintenance, and requesting and dealing with support issues. Table 1 highlights the differences between tasks required for a “build-your-own” system versus the Oracle Database Appliance.

TABLE 1. COMPARATIVE SAVINGS WITH ORACLE DATABASE APPLIANCE

LIFECYCLE STAGE	BUILD YOUR OWN TASKS	ORACLE DATABASE APPLIANCE TASKS
Initial Deployment	<ul style="list-style-type: none"> • Sizing • Order • Research best practices • Assemble • Install, patch, and configure • Test unique configuration • Resolve issues 	<ul style="list-style-type: none"> • Order Oracle Database Appliance • Run Oracle Appliance Manager
Maintenance	<ul style="list-style-type: none"> • Research patch dependencies • Locate patches • Test unique configuration 	<ul style="list-style-type: none"> • Run Oracle Appliance Manager
Support	<ul style="list-style-type: none"> • Troubleshoot configuration with support • Locate log files • File SR 	<ul style="list-style-type: none"> • Run Oracle Appliance Manager and the Automated Service Requests (ASR) facility

Single System Configuration – Activate CPU Cores When Needed

The Oracle Database Appliance is offered in a single system configuration – two server nodes each with two 6-core CPUs for a total of 24 cores and 192 GB of memory. The administrator may choose how many cores to activate and license when installing the database. Organizations can minimize licensing costs while providing a pay-as-you-grow platform for deploying databases by initially licensing as few as 2 cores – additional cores can be activated at any time.

Common Use Cases

The Oracle Database Appliance has a variety of common use cases:

- Simple, affordable, low risk, high availability database system
- Pay-as-you-grow database system and hardware refresh for existing database systems
- Consolidation platform for running many smaller databases

"The Oracle Database Appliance was up and running in 20% of the time it takes us to roll out a typical 2 node RAC. For example; we didn't have to spend time on engineering the drives, o/s packages, or patching. When Oracle says one button install – they're right!"

Rhos B. Dyke, Executive Vice President, Cloud Creek Systems, Inc

Simple, Reliable, Affordable, Low Risk, High Availability Database System

The Oracle Database Appliance will appeal to customers looking for an affordable, highly available database system that is easy to implement and maintain. In the past, highly available database systems running in a cluster of database servers were viewed as complex to implement

requiring specialized systems, database, and storage management administration skills. Many IT organizations, therefore, didn't have any failover capability or relied upon an expensive, redundant, underutilized active-passive cold failover system to achieve the high availability they desired. These failover systems often took a long time to react to a primary system failure and, in addition, consumed precious floor space, cooling and power.

With the Oracle Database Appliance, a single DBA can deploy a high availability clustered database system in about two hours. Small and midsize businesses and departments can now quickly and easily employ the industry's best database availability solution (Oracle RAC) on the Oracle Database Appliance to transparently and seamlessly handle database or hardware failures in seconds, often with no perceptible impact on user response time.

Pay-as-you-grow Database System

A new project just about to be put into production may take several years to ramp up to the workload levels that are expected. Hence, IT organizations are leery of purchasing and then deploying excess capacity prior to the point at which it is actually needed. With the affordability of the Oracle Database Appliance hardware, customers can now deploy the fully provisioned system and grow into the software capacity they need over time by activating just the cores they need.

"The "a platform for database consolidation combined with rapid deployment and ease of use makes this the ideal solution for our customers"

John Ezzell, EVP and Co-Founder of BIAS

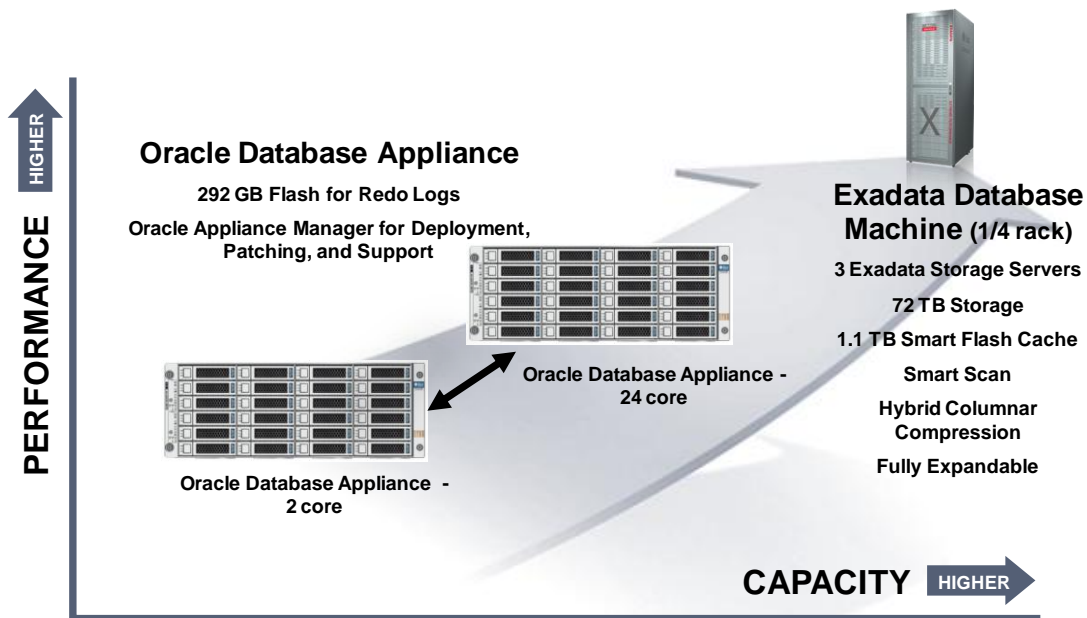
Consolidation Platform for Small Databases

Many IT shops are pursuing a database consolidation effort by taking the databases running on standalone systems and co-locating them on a clustered database system. The Oracle

Database Appliance offers a great, low cost platform for this consolidation effort. By hosting multiple databases on the single cluster/shared storage solution, significant operational efficiencies in terms of backups, database and operating system patching, and upgrades can be achieved because administrators are managing just the one cluster and shared storage, rather than a multitude of separate servers, operating systems and database home directories.

Hardware and Software Engineered to Work Together

The Oracle Database Appliance is a simple, reliable, affordable addition to the family of engineered systems offered by Oracle. Its position relative to the Oracle Exadata Database Machine and Oracle Exalogic Elastic Cloud system is that it is a turnkey, non-expandable system that offers engineered simplicity in a complete, affordable appliance. The diagram below positions the Oracle Database Appliance relative to a quarter-rack Oracle Exadata Database Machine and provides a lower capacity entry into Oracle's portfolio of engineered systems.



Conclusion

For customers seeking extreme simplicity in a database solution, the Oracle Database Appliance is an ideal choice. The Oracle Database Appliance is the first enterprise-class highly available plug-and-go database solution that:

- Reduces complexity
- Reduces risk
- Reduces cost

To learn more about the Oracle Database Appliance, please visit:

www.oracle.com/goto/databaseappliance

To learn more about x86 systems offered by Oracle, please visit:

www.oracle.com/goto/x86



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September 2011

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Hardware and Software, Engineered to Work Together