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Oracle Database Appliance

Introduction

The Oracle Database Appliance is a new engineered systems hardware and software offering that saves time and money by simplifying deployment, maintenance, and support of high availability database solutions. It's 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 applications.

The Oracle Database Appliance offers customers a unique pay-as-you-grow software licensing capability allowing seamless scalability from 4 to 24 processor cores without any hardware upgrades. And, all hardware and software components are supported by a single vendor – Oracle.

The Database Appliance comes 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.

Oracle Database Appliance is:

- Simple to implement, maintain, and support
- A complete, engineered high availability database solution
- Affordable

The Oracle Database Appliance is an ideal database appliance for customers who value simplicity and who seek to reduce the required skills, complexity, costs, and risks in deploying a highly available database solution.

Challenges to Deploy Highly Available Database Systems

In the past, highly available database systems running in a cluster of database servers were viewed as complex to implement requiring specialized systems administration, database administration and storage management skills. Many IT shops didn't have these skills, and felt the risk of deploying these solutions without the necessary skills outweighed their costs of downtime. Larger shops may have had the skills, but because of the costs of these solutions, and their perceived complexity, they usually reserved high availability implementations just for their most mission critical applications, less critical applications were often left unprotected.

The Oracle Database Appliance changes this thinking. Now, a single DBA can deploy a highly available Oracle Database Appliance in about 2 hours. With the industry's best active-active database availability solution (Oracle RAC) running on the appliance, database or hardware failures can be handled in seconds, often with no perceptible impact on user response time.

Simple to Implement, Manage, and Support

Simple to Implement

The hallmark of the Oracle Database Appliance is its simplicity. In one box are server, storage and networking — all engineered together as a complete system with no assembly or wiring required. To bring up the Oracle Database Appliance, simply unpack it, plug in the power cord, plug in the network cables, name it, and run the Oracle Appliance Manager installation to create a clustered, highly available database.

Simple to Manage & Maintain

Maintaining systems, keeping all the 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.

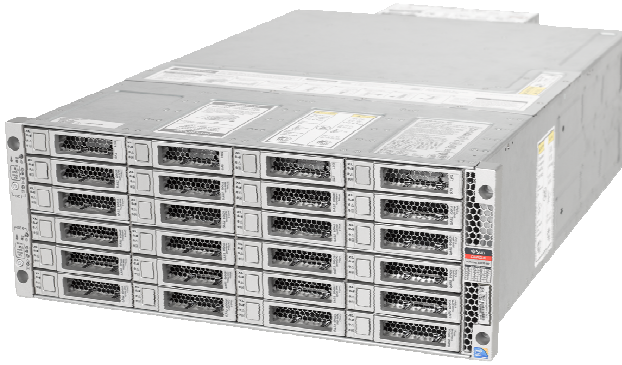
The appliance simplifies storage management by automatically detecting performance and availability events and performing corrective actions. Disks can be replaced without administrative tasks, and should a storage device exhibit behavior that indicates it is beginning to fail and is impacting performance,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

If hardware fails or is about to fail, the appliance's Automated Service Request capability (phone home) generates automatic requisitions for replacement components such as disk, 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 having the DBA or System Administrator manually search for and compile all the logs and system history so that a Support Request can be processed, the Oracle Appliance Manager automatically collects and then compiles the relevant logs and history so that issues can be quickly analyzed and fixed.

A Complete, Engineered High Availability Database Solution

The Oracle Database Appliance is an integrated, turnkey, hardware and software database solution. The Unbreakable Database Appliance has a unique combination of benefits that a “do-it-yourself database system” cannot provide.



Hardware

Servers

Based on the Sun Fire X4370 M2, 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 technology.

Engineered Systems – Why they are better

An Engineered System is one where the hardware and software uniquely interoperate and take advantage of what each knows about the other to offer the best performance and reliability 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 in a “lowest common denominator” operating system, networking and hardware environment. Once the system knows specifically what the operating environment is even down to the patch level of the operating system and database, the system 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 send 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 the third “engineered system” from Oracle and is able to deliver these significant advantages to customers, making the Oracle Database Appliance a superior system for ease-of-installation and management, performance, and supportability.

Storage

The Oracle Database Appliance shares twenty 600GB 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 73GB 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 while working closely with the Oracle Database team to ensure that all Oracle Database high availability (HA) best practices were implemented in the hardware design. Along with the 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 Release 2 Enterprise Edition and Clustering Options

The appliance comes with Oracle Database Enterprise Edition 11g Release 2. Organizations

can choose to run just Oracle Database 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 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 initial outlay for both hardware and software for the Oracle Database Appliance is comparable to what a “do-it-yourself” system would run. However, when factoring in the time the IT staff would expend to acquire, and deploy the systems, the advantage of the Oracle Database Appliance becomes apparent. The time spent researching compatible components and software and then the time to create and process multiple orders to multiple vendors is saved

Savings can be realized in all three stages of the systems lifecycle from initial deployment, ongoing 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 the 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 192GB of memory. No variations or additional hardware options are available or orderable.

Another aspect of the appliance's affordability is that administrators can choose how many cores to activate when installing the database using the Oracle Appliance Manager. This can dramatically reduce license costs while providing a pay-as-you-grow platform for deploying databases. The default is to activate all 24 cores, but organizations can start with as few as two cores (distributed across both servers for redundancy). If more cores are needed, they can be activated in four-core increments (evenly across both servers) at any time.

Common Use Cases

The Oracle Database Appliance has three common use cases:

- Simple, affordable, low risk, high availability database system
- Pay-as-you-grow database system
- Consolidation platform for running many small 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, 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 shops 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 also consumed precious floor space, cooling and power.

The appliance changes that. Now, a single DBA can deploy an Oracle Database Appliance in about two hours. IT shops 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. IT shops are leery of purchasing and then deploying a lot of excess capacity prior to the point where they actually need it. With the affordability of the Oracle Database Appliance hardware, IT shops can now deploy the fully provisioned box and then 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"

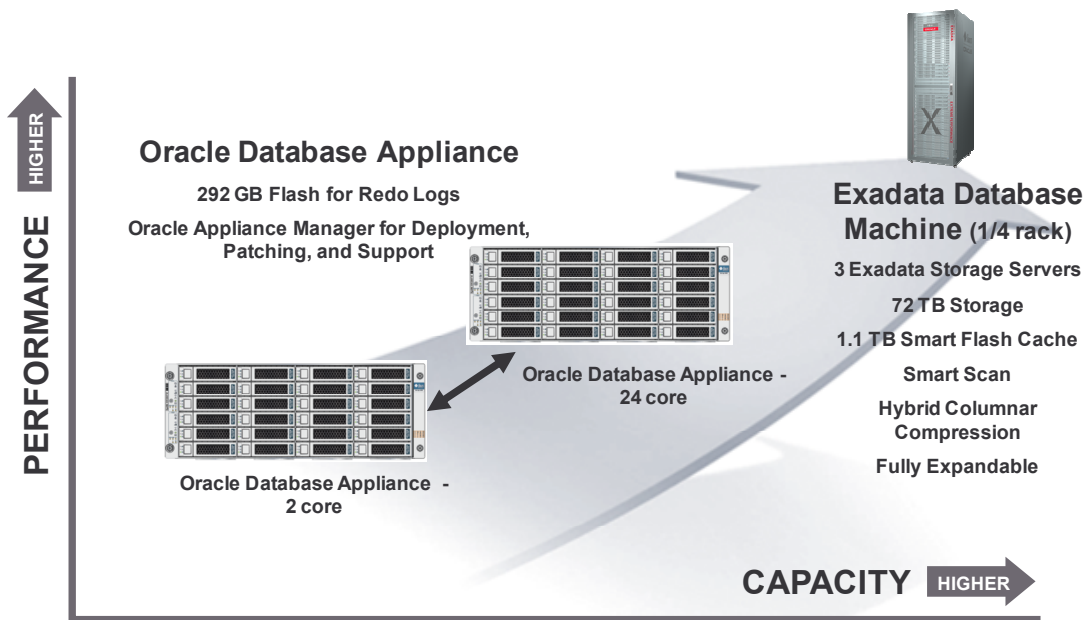
John Ezzell, EVP and Co-Founder of BIAS

Consolidation Platform for Running Many 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 individual systems, operating system and database home directories.

Hardware and Software Engineered to Work Together

The Oracle Database Appliance is another engineered system offered from 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 extreme 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 database solution that:

- Reduces complexity
- Reduces risk
- Reduces cost

To learn more, navigate to: www.oracle.com/goto/databaseappliance. Go to www.oracle.com/goto/x86 to learn more about Oracle's x86 systems.



Oracle® Database Appliance
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Hardware and Software, Engineered to Work Together