

Maximize IT Flexibility and Lower Costs with Grid Computing on Windows

Maximize IT Flexibility and Lower Costs with Grid Computing on Windows

By Randy Hietter

© 2008 TechTarget

BIO

Randy Hietter is a director at Oracle Corporation with the Real Application Clusters product management team. His extensive experience in enterprise software product marketing and management includes specialization in performance management software, database, and J2EE application servers with companies such as EMC/Luminate, Sybase, and Persistence Software.

This *IT Briefing* is based on an Oracle/TechTarget Webcast, “Maximize IT Flexibility and Lower Costs with Grid Computing on Windows.”

This TechTarget *IT Briefing* covers the following topics:

• Introduction	1
• IT Challenges	1
• Oracle Enterprise Grid Computing	2
• Benefits of Grid Computing	2
• Elements of Oracle Enterprise Grid Computing Environment.	3
• Oracle Real Application Clusters	5
• Flexibility and Agility.	6
• Oracle Clusterware	7
• Automatic Storage Management	8
• Oracle Enterprise Manager	9
• Grid Implementation Strategies	11
• When to Implement	12
• Oracle’s Commitment to Windows	12
• Summary	13
• Common Questions	14

Copyright © 2008 Oracle. All Rights Reserved. Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.

About TechTarget *IT Briefings*

TechTarget *IT Briefings* provide the pertinent information that senior-level IT executives and managers need to make educated purchasing decisions. Originating from our industry-leading Vendor Connection and Expert Webcasts, TechTarget-produced *IT Briefings* turn Webcasts into easy-to-follow technical briefs, similar to white papers.

Design Copyright © 2004–2008 TechTarget. All Rights Reserved.

For inquiries and additional information, contact:
Dennis Shiao
Director of Product Management, Webcasts
dshiao@techtarg.com

Maximize IT Flexibility and Lower Costs with Grid Computing on Windows

Introduction

This document discusses grid computing, Oracle's definition of it, the elements that comprise an Oracle Enterprise Grid Computing environment, and Oracle Grid on Windows. It discusses a customer, TALX, a part of Equifax, which has recently moved aggressively to grid computing in a Windows environment. Lastly, it covers when to implement grid computing, how to start with the benefits of grid computing, how to implement it, and finally Oracle's commitment to Windows and its database integration with Windows and .NET.

IT Challenges

Figure 1 shows some drivers and IT challenges. In discussing grid computing with clients, the chal-

lenges that keep coming up are limited power, space, and cooling, and scarce and expensive resources, primarily human resources. It is hard to find skilled talent that can manage these complex environments. Changing business requirements—business activity, mergers, acquisitions, new product lines, new facilities being opened—all create a lot of change in the IT world that has to be accommodated. Underutilized infrastructure leads to the whole phenomenon of virtual machines and to people trying to consolidate workloads and get their utilization percentage above 10% to 15%.

With these challenges come a few trends in the industry that have occurred in the last six to eight years and are impacting the way IT infrastructure is architected and deployed. One of the key trends is increasingly powerful low-cost commodity servers, especially in

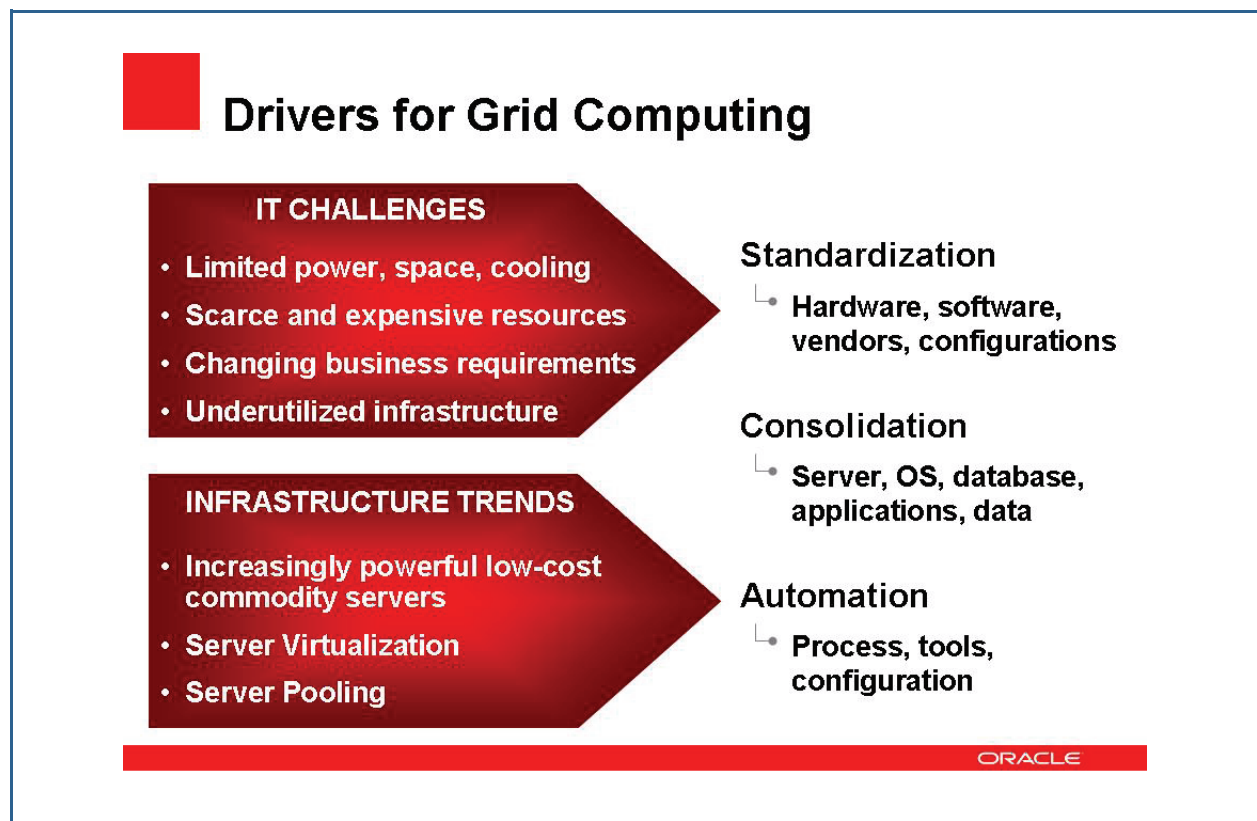


Figure 1

the x86 world. Another one is server virtualization as a way to increase utilization of the servers in a data center. Finally, server pooling aggregates a number of physical discrete servers and presents that aggregate environment as a single virtual resource to a higher layer. That is a key part of grid computing and server pooling.

The way many customers are addressing the challenges and exploiting these trends is by trying to improve the efficiency and the economics of their IT operation. Three things recur: they standardize on hardware and software, they standardize on fewer vendors, and they standardize on configurations based on the kinds of workloads they have, such as OLTP, batch, data warehousing, and so forth.

Next they consolidate servers. In many cases they can do that with virtualization. Then they consolidate their databases. A number of Oracle customers have done that, using grid computing, starting with Oracle Database 10g. Next they consolidate applications and data. That is part of the database consolidation exercise. Last, they take advantage of the automation capabilities that exist in products like Oracle Enterprise Manager, Oracle Database, and Oracle Real Application Clusters. They let the system monitor and manage and react to various events, because as they get this proliferation of servers, workloads, databases, and users, they have to rely on the automation capabilities that are built into this system to effectively manage that and keep up the quality of service. The three watchwords for successful data centers are standardization, consolidation, and automation, the essence of grid computing.

Oracle Enterprise Grid Computing

What is grid computing? Many of us know the early definition of grid computing, which had a very compute-intensive workload parceled out to a variety of discrete physical servers. They crunch on that workload and the results are reassembled. Often this is for scientific work, compute-intensive kinds of calculations. This workload is pushed out largely to independent servers.

But five years ago, Larry Ellison at Oracle OpenWorld introduced what he termed Enterprise Grid Computing. This relates to the grid as the IT infrastructure that dynamically changes to accommodate the varying workload and changes that occur in the data

center, based on the user population and the dynamics of the business.

Oracle refers to Enterprise Grid Computing as an IT infrastructure built with clustered commodity servers and low-cost storage that adapts to changing business needs. As Figure 2 shows, the key grid capabilities are resource pooling and sharing, dynamic resource provisioning, and automated monitoring and management. The idea is to plug workload, user, and customer environments into a grid of IT infrastructure and it works just like a power grid. For resource pooling and sharing, a company is dynamically assembling resources to take care of a particular workload that exists. Dynamic resource pooling and sharing is a key element of a grid, and you have to have an IT infrastructure that is designed from the ground up to monitor that and react to the varying changes that occur in the workload.

Benefits of Grid Computing

Since its introduction five years ago, tens of thousands of customers have implemented production systems in an Oracle Enterprise Grid Computing environment. The business benefits they describe are that they have a more agile and responsive IT environment and significantly lower server and storage costs. They are able to offer higher quality of service. What that means is better uptime; in fact, their unplanned outages go way down and planned outages or upgrades can be minimized as well.

Technical benefits are that the infrastructure is dynamically configurable. A company may need to have three servers supporting a particular workload between 10:00 am and 5:00 pm, but the batch reporting workload goes way up in the evening, so they want to deploy more horsepower to that. You can reconfigure the environment to support the changes in the workload that exist in a business and its calendar.

Oracle has built into the grid the ability to balance workload across this infrastructure, so that people do not always have to be monitoring and making those decisions. An Oracle Enterprise Grid has no single point of failure, which is achieved largely through real application clusters, among other components, and incremental scaling.

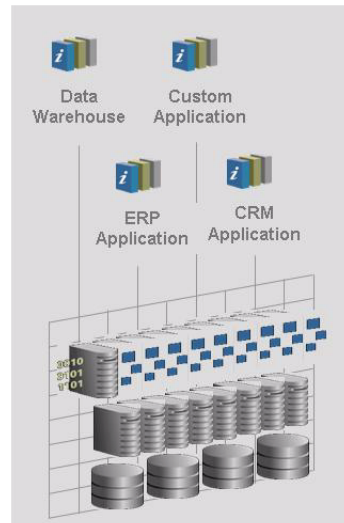
When Oracle introduced grid computing, an independent third party polled some of the early adopters and asked them, "Where are you realizing the benefits of

What is Grid Computing?

IT infrastructure built with clustered commodity servers and low-cost storage that adapts to changing business needs

Key Grid Capabilities

- Resource pooling & sharing
- Dynamic resource provisioning
- Automated monitoring & management



ORACLE

Figure 2

grid computing?” As Figure 3 shows, the benefits are either in hardware savings and software license savings or in labor savings—fewer people required to do the same job—and it depends on the environment. Hardware savings were significant for the Stock Exchange. Migration off a mainframe environment was the key, and they were able to accommodate the same user population and workloads with an Oracle Grid in a much less expensive commodity server-based environment.

The next example in the table, the tech provider, a platform provider that supports Windows, is a computer manufacturer. They realized great savings in software licenses. They were able to consolidate a number of their distributed data centers into one, and because of that and because they began to rely on x86 commodity servers, they were able to reduce the number of software licenses they had to pay for: operating system licenses, database licenses, and application licenses. The bank example, because of the automation features and database consolidation, was able to realize significant savings in the number of human resources required to get the job done. Thus, the grid can have a significant impact on the

economics of an operation in one or more of three key areas: hardware, software, and labor.

Elements of Oracle Enterprise Grid Computing Environment

The key elements at the mid-tier, as shown in Figure 4, are, first, the Fusion Middleware layer. This is the application server layer, where application code lives and runs.

Applications need access to data, so the essence of grid computing occurs at the Real Application Clusters level, where the databases run. Real Application Clusters enable the database to run on a pool of servers. It virtualizes the database to the Fusion Middleware level.

Automatic Storage Management is a way of managing all your database files to eliminate part of the tedium of having to manage raw volumes that many Oracle Database administrators used in the past to gain performance. That was made unnecessary with Release 10g and Automatic Storage Management, which is a free facility of Oracle Database.

Benefits of Grid Computing

Business Benefits

- Agile and responsive IT
- Lower server and storage costs
- Highest Quality of Service

Technical Benefits

- Dynamically configurable infrastructure
- Effective workload management
- No single point of failure
- Incremental scaling

Cost Reductions with Grid Computing*

Savings in Year 1

	Bank	Stock Exchange	Tech. Provider
Hardware	19%	61%	21%
Software	33%	6%	73%
Labor	48%	33%	6%



* Source: Mainstay Partners

Figure 3

Elements of Oracle Grid Computing

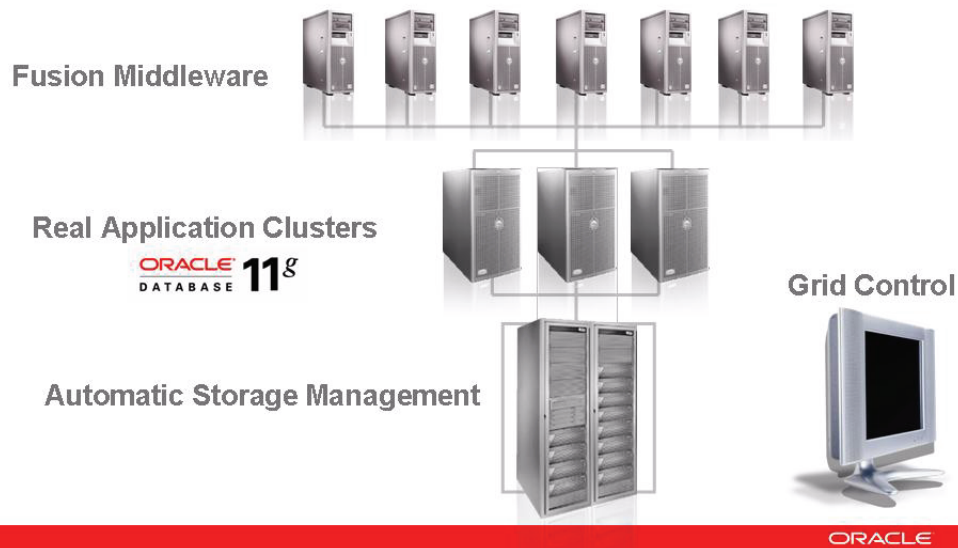


Figure 4

The fourth element of grid computing is Grid Control. Grid Control is part of Oracle Enterprise Manager. It allows a company to manage and monitor the grid environment, all the way from the application down to the storage.

The foundation of any Oracle Enterprise Grid environment is the database. Oracle introduced Database 11g this past summer, and it is a significant offering, with great features such as Real Application Testing. This gives a firm the ability to track its production workload, capture it, and then replay it in a test or development environment, so it eliminates the need for some load management tools, because it is now part and parcel of the database that Oracle introduced with Database 11g. This is Real Application, and Cameron Sturdevant of eWEEK Labs said about Oracle Database, "It is the cornerstone of the vendor's dynamically allocated computing grids and should garner the attention of database managers with its improved management, recovery, and table compression capabilities. Database 11g, released in August, also takes much of the guess-work out of the advanced database tuning." He also alluded to another key feature of Database 11g: the advanced compression capabilities. One can save significantly on storage by taking advantage of that. Go to www.oracle.com/windows and download Oracle Database 11g to get acquainted with it.

Oracle Real Application Clusters

Oracle Real Application Clusters are the essence of what makes Oracle's Enterprise Grid Computing work. Oracle Real Application Clusters is the cluster database technology that Oracle has been working on since the late 1980s with VAX/VMS clusters. This is the culmination of all that work and research. Oracle Real Application Clusters have been out for seven years at this point. As part of the grid initiative, it has been available for almost five years, and the cluster database pools together a number of physical servers and presents a single virtual database to the upper-level tier, the application tier. What that offers is high availability, efficient use of server resources. With an outage, the cluster database, the real application clusters, transparently takes care of that outage and migrates any user connections to another available instance of the database in that physical cluster.

Active-Active Versus Active-Passive

The alternative to real application clusters is the active-passive failover environment. This is what many

firms are running today, where a single server is running a single database, and if that server goes away, a cold failover environment has to be started up. Users then have to reconnect, and they have lost minutes of productive work. In some cases, depending on the application and the size of the database, they may have lost hours. It is an inefficient use of server resources because the standby idle system is occupying power and space, and is not doing any work. It is a difficult and costly environment to support.

Contrast that with a RAC's active-active failover. All the servers in a RAC cluster are doing work all the time, and that is part of the unique aspect of RAC: it is active-active, and any workload that comes in is directed, via the workload balancing capabilities of RAC, to one of the instances in the cluster, based on either a round-robin mechanism or the runtime connection load balancing algorithm that Oracle introduced with Oracle 10g R2. All the servers in the cluster are doing database work all the time. There are no underutilized resources. If a server instance goes down or if the physical server fails, RAC automatically migrates those connections, and the work keeps going. Many firms buy Real Application Clusters for their high availability. With Oracle Grid, there is no single point of failure. RAC is one of the key mechanisms that enable that high availability and business continuity.

Pay as You Grow

Another reason that people pursue a Real Application Clusters solution is the pay-as-you-grow benefit it offers. A company can start small and grow incrementally, adding capacity on demand with zero downtime. Start with a two-node cluster and, as the workload or business requirements change, easily add cluster nodes and extend the shared database across those nodes.

Figure 5 contrasts RAC with Big Iron installations. In the case of Big Iron, if you are not using x86 commodity servers but more specialized machines, Figure 5 shows how you need to plan ahead for the workload volume anticipated years down the road, and size the machine for that. The pink section above the SMP2 shows all the underutilized capacity that you pay for when the server is rolled in, which you hope to use over time. In contrast, the chart below it shows a very fine-grained way of adding capacity with low-cost commodity servers. As a firm needs more horsepower to support its database processing workload, it adds another node, so the Real Application

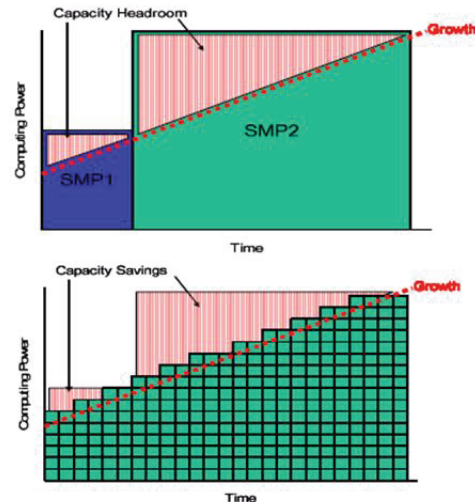
RAC: Scalability

Big Iron

- Buy based on predicted growth
- High incremental cost

Low cost clusters

- Buy as you grow
- Small increments at present day prices & clock speeds



ORACLE

Figure 5

Clusters grow capacity in a fine-grained, less expensive way.

Oracle has a customer in South America, Mercado Libre, which is basically eBay Latin America. They started with Oracle's Grid Computing in 2004. They were an early adopter of 10g, launching their auction site in Brazil starting with a four-node cluster. Their auction transaction volume grew steadily over the years, and within the first three months they added another node, and within six months added three or four nodes. They now have a 50-node cluster, a tenfold or more increase in their auction activity. They have a 15-node cluster of x86 machines and they have not had to take down that operation and do a forklift upgrade. They simply incrementally added another node to the cluster, bringing it online through Oracle Enterprise Manager. Real Application Clusters automatically run connections and work to that new node in the cluster without disrupting the cluster or database activity.

Flexibility and Agility

Major reasons for choosing Real Application Clusters and an Enterprise Grid Computing environment are

flexibility and agility. Without the grid, many firms have dedicated silos of hardware and software to accommodate a particular application area. This does not include a lot of inherent scalability. They have many underutilized resources, the operational procedures surrounding each of the silos have to be backed up separately, and they probably have a standby system for each of their mission-critical environments. Using a grid, flexibility and agility can be enhanced significantly. Figure 6 shows a cluster database in a RAC environment. This shows a consolidated database, and this particular customer has combined four discrete application areas—ERP, data warehousing, CRM, and web e-commerce—into a single database. With Oracle you can merge separate physical databases and then expose in the cluster what Oracle calls “services”; this is all part of 10g, released five years ago. These services represent the workloads and they provide great flexibility. Figure 6 shows various application workloads: ERP running on two servers, data warehousing running on one, one server in the cluster designated as test, and another server running web e-commerce and a CRM workload.

RAC: Flexibility and Agility

Enterprise Grid Computing

- Complete availability...unlimited scalability
- Server HW shared between applications

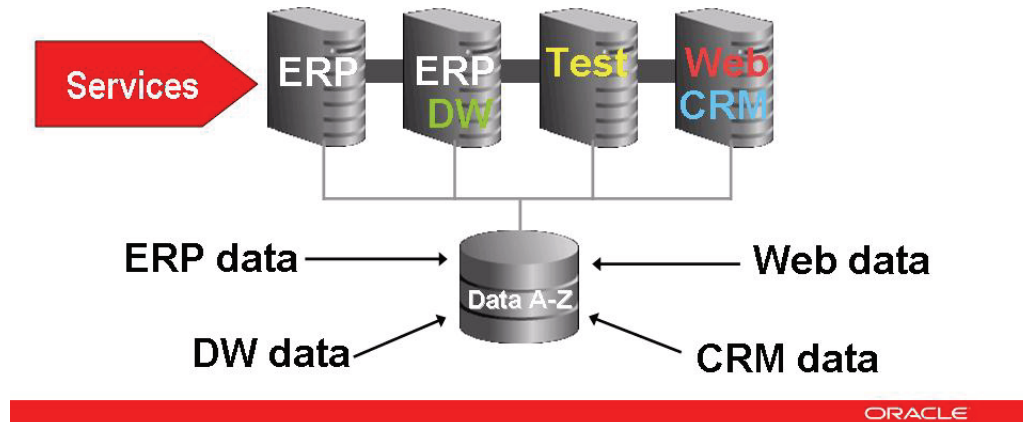


Figure 6

As users from the application tier connect to the database tier, they do not specify a specific host or IP address, they specify a service. This is part of the virtualization that 10g offers. The connect string in the application environment refers to a service rather than to the specifics of a host ID, IP address, or other entity. It is not hard-coded as it was in the past. When it receives this service connection request, RAC routes it to the appropriate instance in the cluster running that service, in a workload-balanced way. You do not have to worry about a particular node getting overloaded. RAC keeps track of that and routes that connection request.

With 10g, Oracle introduced services, which help virtualize the whole database tier to the upper-level application tiers. They also enable companies to consolidate their databases so they do not have multiple physical, discrete databases.

One customer, TalkAmerica, now called Cavalier Telephone, did this early on. They consolidated 60 discrete INFORMEX databases into a single Oracle Database, and are heavy users of services. That eliminated the need to back up 60 databases: now they back up one. It eliminated much of the extract, trans-

form, and load (ETL) activity that occurred moving data in one database, consolidating it with others, and moving it into another for reporting. The ETL activity and scripts in that environment went away. There are many advantages to moving to a consolidated database environment, and that is one benefit of moving to a grid solution.

If a workload spikes, during the holiday season, for example, the test node in the cluster could be instantiated as one of the web e-commerce services, and another data warehousing service could be added to one of the nodes, because the workload mix and volumes have changed and you may need additional horsepower. This is very easily done, either manually or via Oracle Enterprise Manager, which can monitor this environment and automatically instantiate additional service instances in a cluster.

Oracle Clusterware

After Oracle Databases and Oracle Real Application Clusters, the next element of the grid is Oracle Clusterware, which is part of a RAC environment. Oracle Clusterware can also be used standalone in a cluster to monitor various resources, like applications, and

can be used to monitor and fail over application instances in the cluster.

Figure 7 shows Oracle Clusterware running across a four-node cluster, with Protected Apps A, B, C, and the database. If Protected App A fails, or the physical node of the cluster fails, Oracle Clusterware will track that event and restart either that node or that application, or move it to another running node in the cluster. If we view the database in Figure 7 as an application running on a single instance, Oracle Clusterware can be used to restart that database on this node or on another node of the instance. Any single-instance Oracle customer can use Clusterware to fail over the database. They do not get the availability and flexibility of a RAC environment, but Oracle Clusterware can keep applications and the database running and available in a cluster. Oracle Clusterware is free if you are running an Oracle product in the cluster.

Oracle Clusterware is part of what Oracle introduced in 2001 with gi. Oracle needed a reliable Clusterware for Linux and Windows environments, so we licensed True Cluster from Compaq. That is the clustering technology that was used with the VMS environment, a pioneer in the world of clustering.

Automatic Storage Management

Another key capability of Oracle Grid is Automatic Storage Management (ASM), shown in Figure 8. ASM was introduced with 10g as part of the database: it is free, and it simplifies file and volume management. It is a volume manager and cluster file system for Oracle Datafiles, but it is easier to manage than file systems and provides the performance of raw volumes. It is tightly integrated with Oracle Database and Oracle RAC and is the foundation for the storage grid. It has a number of industry exclusives: software mirroring, striping, and automatic rebalancing—that is, as data in a shared storage environment increases, Oracle ASM balances it. One of the key aspects of ASM is the Disk Group. Disk Groups are comprised of disks, which are LUNs provisioned by a storage administrator.

ASM makes sure that the consumption and utilization of each disk in the Disk Group is evenly balanced, to avoid hotspots as data grows. ASM constantly monitors and rebalances data across all the spindles or disks in a Disk Group, providing more predictable and even performance.

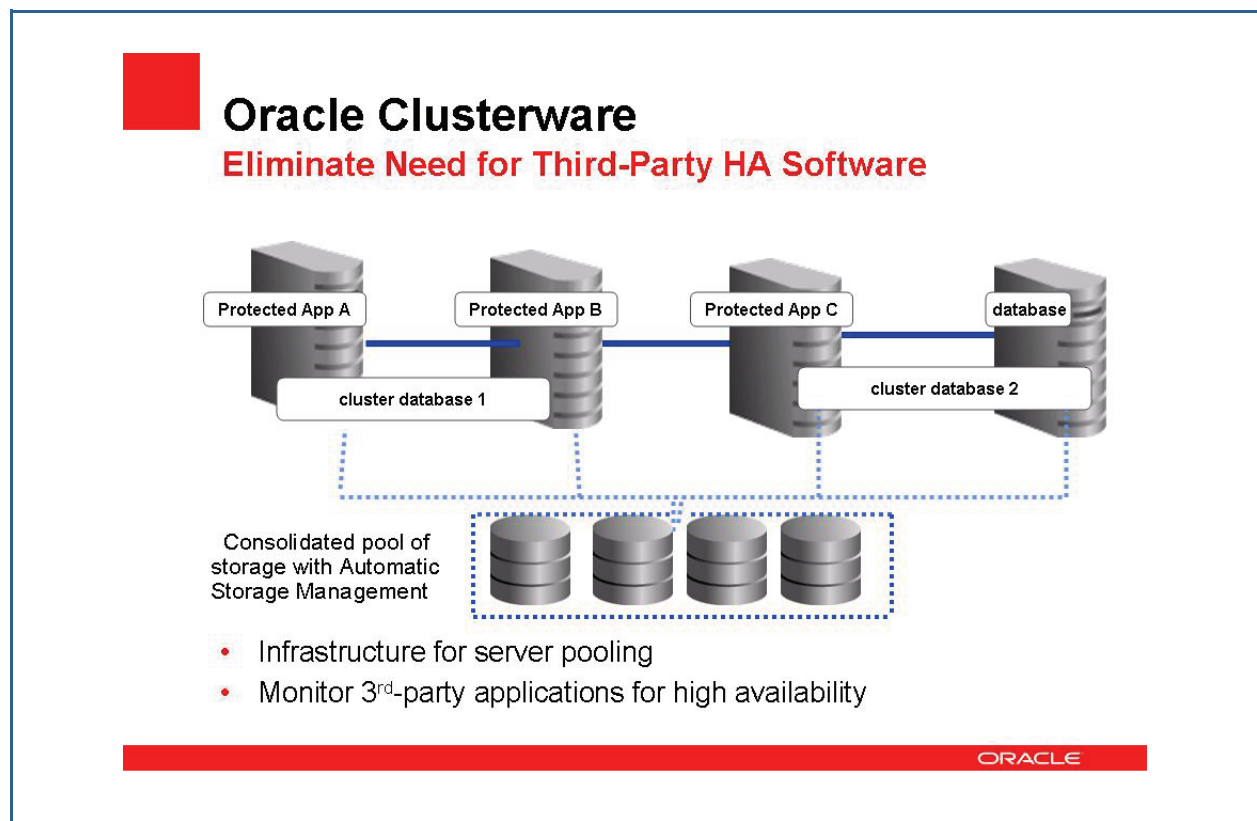
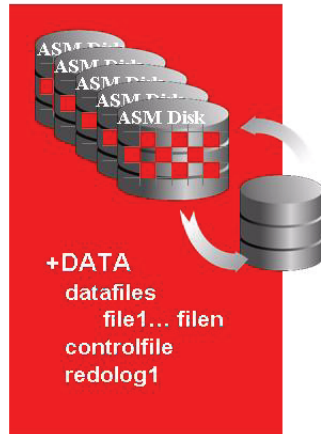


Figure 7

Automatic Storage Management

Simplify File and Volume Management

ASM Disk Group



- Easier to manage than File Systems
- Performance of Raw Volumes
- Tightly integrated with Oracle
- Foundation for Storage Grid
- A number of industry exclusives

ORACLE

Figure 8

You can easily add or remove disks from a Disk Group. Using Oracle Enterprise Manager, this is literally a button click. When you add a new disk to the Disk Group, Oracle ASM automatically moves data to those new disks quickly or slowly, depending on the impact you want in the production environment. If you add a disk during peak production hours, you want the least intrusion on the production workload, so you will balance that slowly with Oracle Enterprise Manager. Alternatively, you can do it quickly, which allows introduction of new generation disks very easily without taking anything down. TalkAmerica/Cavalier Telephone was able to introduce Next Generation Storage technology in a nondisruptive fashion by adding disks to their Disk Group and then, after the rebalance, removing the older disks automatically. It is a very flexible tool for managing a shared storage environment, and it is part of the Oracle Grid.

The key value our ASM customers see is manageability: simple provisioning and storage array migration up to newer technology without taking down storage and disrupting production workload. Also, storage pool cost savings come from eliminating the discrete, siloed storage many firms are using today. Because

ASM is part of the Oracle Database environment, you are charged no license fee.

Oracle Enterprise Manager

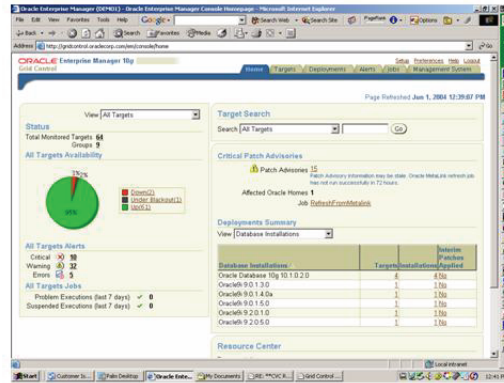
Oracle Enterprise Manager, shown in Figure 9, allows you to manage the many elements of a grid as one or drill down to the discrete performance of the grid elements. The Real Application Clusters database can exist as several instances running on several discrete servers within the cluster, and a manager can look at the performance of the clustered database in aggregate or drill down to the specific instances in a specific host and manage and monitor those individually. The same is true of application servers. You can look at the application server tier in aggregate or drill down to the individual instances in the app server running at the mid-tier. The same is true of hosts, as well: Oracle Enterprise Manager provides visibility to the host metrics: utilization I/O, memory consumption, and the like. You can look at individual applications and monitor the total response time from application to storage and back, through Beacon, which was introduced in Oracle Enterprise Manager 10g. You can also monitor groups of users, their



Oracle Enterprise Manager

Increase Productivity with Automated Management

- Manage many as one
 - Databases
 - Application Servers
 - Hosts
 - Applications
 - Groups
- Application service level monitoring
- Policy-based standardization
- Provisioning



ORACLE

Figure 9

respective authorizations, and the performance they are receiving.

Standardization

Policy-based standardization is another key aspect of Enterprise Manager. You can set policies around response times or other metrics. There are nearly 257 different metrics you can monitor and set thresholds for. If those thresholds are exceeded, you can be alerted or Enterprise Manager can take action. For example, some customers using services monitor CPU utilization. If CPU utilization on one of the nodes or the collection of the nodes in the cluster exceeds a particular number, they can bring another server into the cluster and instantiate another service on those nodes automatically through Oracle Enterprise Manager. There is tremendous flexibility for automatically managing and reacting to activities occurring in the grid environment.

TALX

One customer who successfully moved to the grid is a division of Equifax called TALX, with \$207 million in fiscal year 2006 and 7,000 clients. They provide outsourced payroll and HR services to mid-sized and

smaller businesses online. TALX implements these payroll and HR solutions on a RAC cluster running on Windows. The issues that caused them to migrate to a grid were that they were running out of scalability and the 32-bit operating system environment was unsatisfactory. They wanted to make the leap to 64-bit machines. A failure in a node in their existing environment would impact the business: data would be unavailable until the database had been relocated to another node. This was disrupting their customer base and potentially impacting their customer service and satisfaction. They wanted to be able to survive a two-node outage with minimal impact, so they went to an Oracle Grid solution. It is based on Windows Server 2003. They have six Oracle RAC clusters based on Oracle Database 10.2.0.3. They are using Oracle Clusterware, Oracle Automatic Storage Management, and Oracle Partitioning, which is the database option, and they are running services for their workload management. Oracle Enterprise Manager manages that cluster.

Figure 10 shows their three different databases. They did not consolidate all their databases, but merged into three main ones: Single Sign-on is a 1 TB database; Work Number is 3 TB; and ePayroll is 750 GB,



Case Study: TALX

Oracle Solution

TALX

- Oracle Database 10g on Microsoft Windows Server 2003
- Six node Oracle Real Application Clusters 10.2.0.3 Cluster Database
- Oracle Clusterware
- Oracle Automatic Storage Management
- Oracle Partitioning
- Services for workload management
- Oracle Enterprise Manager

Single Sign-On



- ~ 1TB data
- Add 30-50,000 docs/day
- Performance is critical

Work Number



- > 3TB data
- Add 80 M records/month
- + \$100 M annual revenue

ePayroll



- ~ 750 GB data

ORACLE

Figure 10

with the details shown at the bottom of the figure. They went to a grid environment for availability and ease of scalability, and when they did, they had an option: stay with Windows or move to another operating system. They chose to stay with Windows because 99% of their IT operation runs on Windows and they are very comfortable with it. They like the multicore processor licensing and scale-out architecture that Windows provides. They have deep Windows experience and it is easy to hire talent. They are very comfortable with the .NET development platform and like Microsoft support for the Windows environment. Their question was: why change?

TALX chose 64-bit because they needed a large number of connections. Their growth was constrained by 4 GB/process and needed to run multiple concurrent instances of Windows. When choosing RAC, the expense of scaling up was key. They did not want a forklift upgrade or an SMP environment. They went to RAC to allow them to do fine-grained scaling on commodity x86 machines. They wanted the higher memory that 64-bit environments offer, and RAC is able to take advantage of that by having very large shared caches per machine and fast recovery time.

RAC offers a completely transparent failover in the event a server or database instance goes down.

Fault tolerance with RAC is significantly better than with the fail-safe environment, which was the cold failover environment for the 32-bit machines that TALX migrated from. There were no memory constraints using 64-bit machines. They plan to move up to 48 GB servers and believe that Windows is an excellent platform for their high-availability RAC environment. They were able to achieve the benefits of grid computing using the familiar Windows operating system. By not having to change their applications, they were able to migrate their single-instance applications into a grid environment with no changes. One can slide a grid infrastructure underneath the current application environment without making any changes to the curve—and still take advantage of the flexibility and high availability the grid offers.

Grid Implementation Strategies

Figure 11 shows the path to the grid. On the lower left is HA. This is how many companies start, but you

Grid: Implementation Strategies

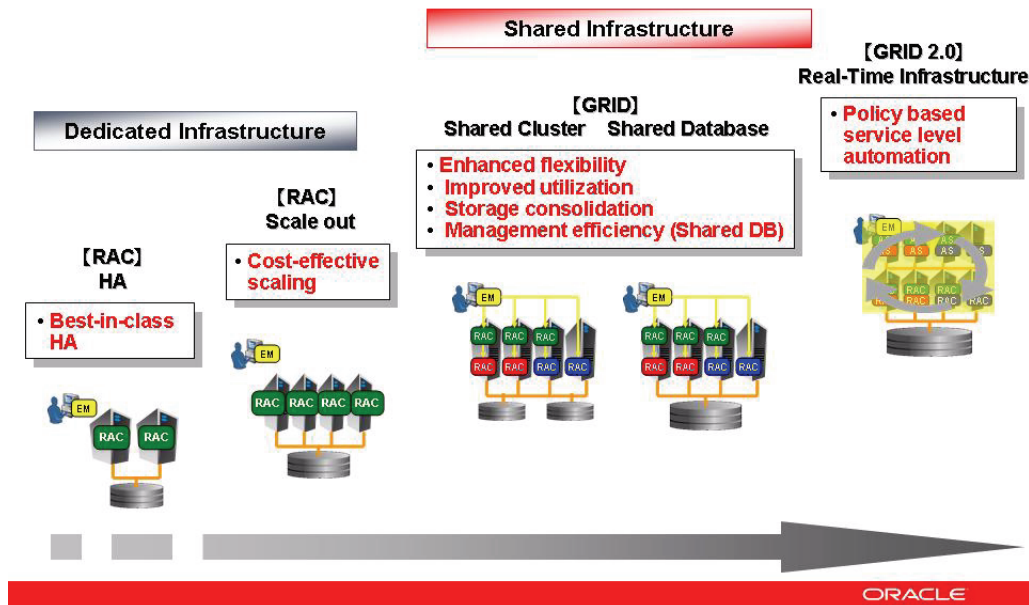


Figure 11

can actually leap to any of these points. Many start with a two-node cluster running a single workload. In this example, the green represents a single type of workload running in a two-node cluster. The next step would be scaling, adding nodes to that existing cluster, but still running a single workload. All the workload in the figure is green, representing ERP. Some companies then move from cluster to a grid, and the grid here has four nodes, showing different kinds of workloads: ERP, CRM, and two databases. This is a shared cluster with more than one database, with multiple workloads running across the many nodes in the cluster.

The next phase in grid computing is a single or shared database, where you consolidate all the databases into one and run multiple workloads as services in a cluster. This begins to achieve operational benefits: the availability and scalability benefits of the grid. The next thing Oracle will introduce is Grid 2.0 Real-Time Infrastructure, where you can have more than just a database grid, since the application server grid and servers can be reprovisioned as the overall workload requires.

When to Implement

If you are upgrading a database version, especially if you are a current Oracle customer migrating from 9i right now and moving to 10 or 11, this would be a good time to look at moving to a grid environment.

If you are introducing new applications and new projects, and just deciding what that infrastructure should look like, this is a good time to pursue a grid or HA initiative. Often you want to do something other than a cold failover environment: grid is a perfect option for achieving better high availability or capacity addition. If you are contemplating a forklift upgrade, you may want to move to a cluster of x86 commodity servers instead.

Oracle's Commitment to Windows

Oracle has six brands with Windows and a commitment to .NET. We started with Windows. Oracle's first relational database for Windows NT was released in 1993. We have been providing database support for .NET for over six years, as shown in Figure 12. With 11g, we introduced the Oracle Data Access components: a collection of .NET, Oracle Data Provider .NET, ODBC, and OLE DB.



Oracle's Commitment to .NET

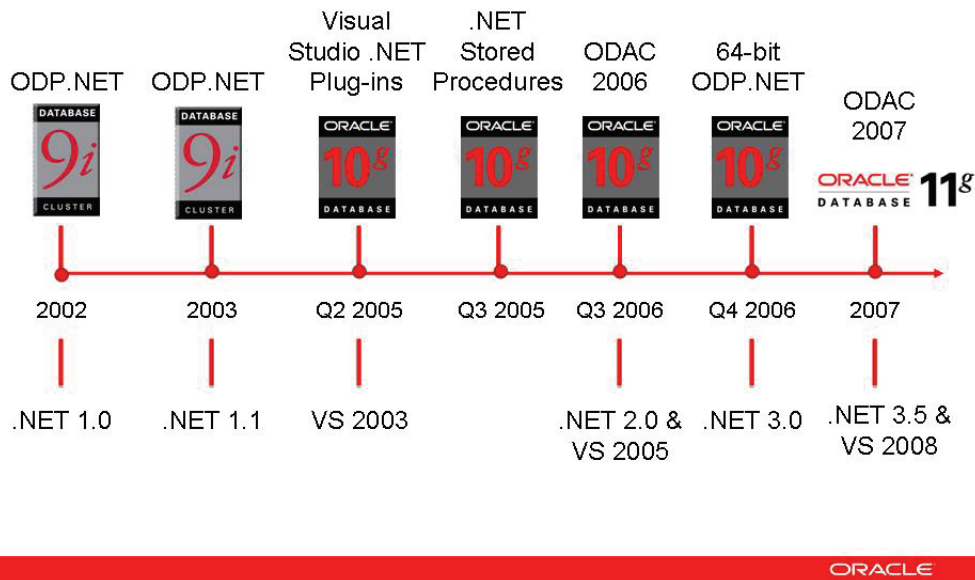


Figure 12

Oracle's relationship with Microsoft is very good. We are in close collaboration with the Microsoft engineering teams and, in fact, Microsoft uses Oracle Database Workload to test various versions of their server offerings. We have access to prerelease drops of Microsoft products. We are part of their Premier Marketing Program, we have a Premier Support Agreement, and we have collaboration of support teams. So when a Windows customer has an issue with Oracle, we work with the Microsoft Support teams to get answers quickly.

We have long-standing integration with Visual Studio and .NET, as well as free Oracle tools integrated with Visual Studio. This integration uses the advanced Oracle Database features and is productive for beginners and advanced users alike.

Summary

To summarize the benefits of grid computing, foremost is an agile and responsive IT operation, lower server and storage costs—taking advantage of commodity x86 servers—and shared low-cost commodity storage. A higher quality of service is achieved through grid, because of the business continuity it offers. The fact that you can scale and do patches without taking down workload allows rolling upgrades of operating systems, patches, and database versions. Thousands of customers are benefiting from Oracle on Windows in a grid fashion, and Oracle Database 11g is optimized for Windows and .NET.

More information can be obtained through www.oracle.com/grid, www.oracle.com/windows, and www.oracle.com/database. Feel free to download the latest version of 11g and experiment with it.

Common Questions

Question: In regard to RAC and clustering, you mentioned the ability to reduce ETL, but if you reduce ETL presence what is replacing the movement of the data from one database to another?

Answer: When you go to a consolidated database, you are combining the schemas of the various discrete databases. It may take some application rework, but you are eliminating the need for activity against one database to be migrated through an ETL to another, another, and another database. The activity that occurs against data occurs in that one consolidated database, so the reporting against that one consolidated database is against live, up-to-the-second, fresh data. You do not have extract, transform, and load activity. That is going to possibly take some consolidation, some reconciliation of various schemas, possibly some rework at the application level, but the benefit is eliminating all those discrete ETL jobs. What is replacing the movement is working on one instance of the data. You are eliminating the multiple instances of customer balance, for example, because you do not have five or six discrete customer databases or customer tables; you now have only one.

Question: What is the difference between grid and RAC?

Answer: Grid is a philosophy. It is a way of architecting in your environment. RAC is a specific Oracle

product that enables it. The grid is a way of virtualizing resources so they can be dynamically grown or shrunk as your business needs or growth lines dictate. Oracle RAC is a software product that allows you to create a cluster database that virtualizes the database layer to the upper level mid-tier layers. By pooling a number of discrete servers, that virtualized database layer creates ability and flexibility in your infrastructure, so you can grow and shrink it as needed.

Question: What is Oracle's plan to support Windows Server 2008?

Answer: It is being certified right now. Oracle certifies new operating systems in conjunction with the platform vendors, so we are working with Microsoft on that. We will be running through a number of certification tests in the next few months. There is no specific end-date, but it is in process.

Question: Is there a performance difference between running Oracle on Windows and Oracle on Linux?

Answer: No. We have run a number of tests and there is an imperceptible performance difference. If you are comfortable with Windows and are intrigued by some of the benefits that Oracle Grid can offer, you should get started with that.



About TechTarget

We deliver the information IT pros need to be successful.

TechTarget publishes targeted media that address your need for information and resources. Our network of technology-specific Web sites gives enterprise IT professionals access to experts and peers, original content, and links to relevant information from across the Internet. Our events give you access to vendor-neutral, expert commentary and advice on the issues and challenges you face daily. Our magazines give you in-depth analysis and guidance on the critical IT decisions you face. Practical technical advice and expert insights are distributed via specialized e-Newsletters, video TechTalks, podcasts, blogs, and wikis. Our Webcasts allow IT pros to ask questions of technical experts.

What makes TechTarget unique?

TechTarget is squarely focused on the enterprise IT space. Our team of editors and network of industry experts provide the richest, most relevant content to IT professionals. We leverage the immediacy of the Web, the networking and face-to-face opportunities of events, the expert interaction of Webcasts, the laser-targeting of e-Newsletters, and the richness and depth of our print media to create compelling and actionable information for enterprise IT professionals.

ORACLE_04_2008_0005