Mid-Market Survey Results and Oracle Database Appliance White Paper

Overcoming Mid-Market Database Concerns & Challenges with Oracle Database Appliance

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Executive Summary

Deploying and managing a database solution using hardware and software from a variety of vendors can be a challenging endeavor even for large enterprises. Smaller companies, often with overtaxed and less-experienced IT staff, find it even more difficult.

A recent survey of over 240 mid-market database administrators (DBAs) and IT managers reveals the obstacles companies face in deploying and managing database services that support their mission-critical applications. Key findings include:

- **Availability.** Over 40 percent of respondents currently experience challenges in meeting database Service Level Agreements (SLAs) and two-thirds have had to work overnight in the past year due to a database emergency. The two top concerns for DBAs are database performance degradation and its impact on SLAs (58%), along with unscheduled downtime affecting business operations (42%).

- **Deployment.** More than a third of respondents feel that deploying or provisioning a new database, adding database capacity, or introducing new database features is too expensive or requires too much coordination between different subject matter experts (SMEs). Hardware capacity limits and time-to-deploy were also highlighted as challenges.

- **Administration.** In addition to performance and downtime issues, more than a third of respondents also pointed to patch management and coordination with non-database administrators as significant challenges. Although many performance issues can be addressed by scaling up the database environment, almost 40 percent of respondents said that it takes more than six days to do so.

- **License Management.** The majority of respondents indicated significant concern about unused licenses.

Through analysis of the results of the survey and four in-depth interviews, this whitepaper illuminates how the Oracle Database Appliance, based on Intel® Xeon® processors, overcomes the above challenges with a fully-integrated package of software, server, storage, and networking in a single box. Engineered for simplicity and featuring one-button automation of provisioning, patching, and diagnosis, the Oracle Database Appliance offers a simple, reliable, affordable high-availability solution ideal for database consolidation in mid-market companies and enterprise departments.
Introduction

Businesses of all sizes depend on a growing number of mission-critical applications. Such applications must deliver 24/7 information access with a minimum of planned or unplanned downtime. Providing this level of service, however, can be a challenge.

This is especially true for mid-market companies, who are already likely to be struggling with IT budget and resource constraints, including reliance on a limited number of database administrators managing ever-growing data environments. Adding the burden of planning, assembling, deploying, configuring, and managing a high-availability (HA) database system may seem a bridge too far, and as such, companies often decide they don’t have the necessary expertise to ensure that the risks outweigh the benefits.

In July of 2012, Oracle and Intel sponsored an online survey conducted by Crimson Consulting to illuminate the database challenges and concerns of mid-market companies. This white paper discusses the results of that survey, bolstered by in-depth interviews of four mid-market DBAs or IT managers, and illustrates how the Oracle Database Appliance addresses these challenges and concerns.
Survey Methodology and Demographics

The online questionnaire was designed to probe the attitudes and experiences of a broad group of technical database users worldwide. Invitations to the survey were aimed at mid-market companies, but responses from database users at larger companies were also collected as a basis for comparison where useful. The survey was completed by 309 users, over three-fourths of whom (234, or 76 percent) were working for companies with an annual revenue of a billion dollars or less (Figure 1).

![Figure 1: What are your company's annual revenues (USD)? (N=309)](image)

While only the responses for mid-market companies were analyzed for this white paper, the distribution of database experience among all respondents underscores the expertise advantage that large enterprises generally have over their mid-market competitors: more than a third of the respondents (36 percent) had less than six years’ experience. This highlights a fundamental reason why smaller companies often delay or forego high-availability database solutions (Figure 2).
Responses from mid-market database users came in largely equal parts from North America (NA); Europe, Middle East, and Africa (EMEA); and Asia Pacific (APAC), with a sprinkling of completed surveys from South America (SA), as illustrated in Error! Reference source not found.. The data from the surveys is heavily weighted towards IT professionals with technical database roles: 71 percent of them were either database administrators or database architects (Figure 4).
To gain additional insight into the results of the survey and probe areas of interest in more detail, Crimson also conducted in-depth interviews of four database administrators or IT managers with a database focus at mid-market companies, one from each of the four regions represented in the survey data. All of the interviewees had significant databases expertise: two had ten years’ experience, one 17 years, and one 19 years. They were asked the same questions as in the survey, but invited to expand on their answers to supply more specific information where possible. Table 1 lists their roles and the type of company for which they worked.

**TABLE 1: ROLES AND COMPANY DESCRIPTIONS FOR IN-DEPTH INTERVIEW RESPONDENTS**

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<th>ROLE</th>
<th>COMPANY DESCRIPTION</th>
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<td>Database team manager</td>
<td>Supply-chain management firm</td>
</tr>
<tr>
<td>Database administrator</td>
<td>Financial services company</td>
</tr>
<tr>
<td>Systems engineer</td>
<td>Engineering and manufacturing firm</td>
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<tr>
<td>IT director</td>
<td>Cosmetics firm</td>
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The survey results and follow-up interviews illuminate four areas in particular where the Oracle Database Appliance addresses the needs and concerns of database users in mid-market companies:

- Database Availability
- Database Deployment
- Database Administration
• Database License Management

Database Availability

Every business that uses IT in its operations has applications and services that are mission-critical, regardless of company size. These may be something as simple as email, or as complex as internal billing systems, online banking applications, or business intelligence (BI) systems, but they all have one thing in common: performance degradation or downtime can result in lost revenue, lost productivity, or lost customers.

Thus, it’s not surprising that 58 percent of survey respondents identified challenges in meeting Service Level Agreements (SLAs) as a top concern, followed by unscheduled database downtime at 42 percent. (These and other concerns are covered in more detail under Database Administration, below.)

“My biggest concern is unscheduled database downtime. That is something that we always try and guard against using various means and scenarios.”

— Database team manager, supply-chain management firm.

Two survey data points in particular highlight the database availability challenges faced by mid-market companies: 42 percent of respondents currently experience challenges in meeting database SLAs (
Figure 5) and two-thirds have had to work overnight sometime in the past year due to a database emergency (Figure 6).

Figure 5: Are you currently experiencing challenges in meeting database Service Level Agreements? (N=234)

Figure 6: In the past year, have you had to work overnight due to a database emergency? (N=234)
Insights from In-Depth Interviews

The in-depth interviews illuminated several aspects of the database availability challenge for mid-market companies. First, the IT resources at such companies are likely to be stretched thin as the staff struggles to maintain existing systems while responding to new business demands. The IT department may be forced to accept less than optimal deployment, test, QA, or maintenance strategies, which can affect database performance and availability. A good example of this is furnished by the DBA at the financial services company, who commented that “it’s a challenge to get staff members who are familiar with their application to test it in the new environment and make sure it works. The problem is that they’re busy with their normal jobs.”

One way that smaller companies may deal with SLA challenges is to specify more planned downtime to allow for more maintenance time. The systems engineer at the engineering and manufacturing firm reported that his team was not having trouble with performance degradation affecting SLAs, but added, “Our SLA is designed to give us a good maintenance window, especially for patching, so it’s not too hard to keep up.” While this may indeed help prevent unplanned downtime, even planned downtime can have a similar effect on revenue, productivity, and customer satisfaction.

Finally, it should be noted that the fact that two-thirds of respondents have had to work overnight for a database emergency may actually underestimate the availability problems of mid-market companies, since a serious service interruption can strike at any time of day, as noted by the systems engineer at the engineering and manufacturing firm: “Fortunately, our worst emergency—file corruption that delayed closing on our ERP system for a day—happened at 9 AM rather than 9 PM.”

Overcoming Availability Challenges with Oracle Database Appliance

The Oracle Database Appliance is a fully-redundant integrated system that greatly simplifies the deployment, management, and support of high-availability database workloads. It eliminates the costs and complexities involved in assembling and managing components from multiple vendors, and puts high-availability within easy reach of mid-sized companies for a wide range of applications. It seamlessly protects databases from server and storage failures with Oracle Real Application Clusters and Automatic Storage Management. The pre-engineered and pre-assembled hardware and software of the Oracle Database Appliance not only deliver faster time to production, but guarantees that high-availability best practices are built-in and available at the push of a button.

- Customers have the choice of running Oracle Real Application Clusters (Oracle RAC) in either “active-active” or “active-passive” database server configurations.
- High-availability operation includes redundant server nodes, internal redundant 1 GbE interconnects, triple-mirrored storage, redundant power and cooling, and many hot swappable components.
- Appliance Manager software keeps DBAs on top of availability issues with automated, one-button patching, diagnosis, and support.
"We like the fact that the appliance is a complete Oracle engineered system, which includes two server nodes, software, networking, and storage, in a single box, so we don't need to work with multiple hardware and software vendors."

— Jianlian Wu, Vice Chief Engineer, Beijing Cable TV

Database Deployment

Database deployment is an essential part of corporate growth, both to scale up existing applications and to support new business processes and initiatives. But as the survey reveals, it can be a daunting and time-consuming task for mid-sized companies, especially when high-availability database workloads are involved. Deployment concerns such as cost and the need to coordinate multiple IT teams rank high, and the burden imposed by the need to assemble a database solution from multiple vendor offerings is apparent in the number of subject matter experts (SMEs) generally involved in deployment.

"As the main database administrator, my top challenge is the coordination needed with other non-database specialists."

— Systems Engineer, engineering and manufacturing firm

As Error! Reference source not found. shows, the top concerns among respondents when deploying or provisioning a new database, adding database capacity, or introducing new database features were the expense and the amount of coordination required between different SMEs. Close behind these were hardware capacity limits (licensing concerns play into this as well, as discussed in Error! Reference source not found., below) and the amount of time consumed.
Figure 7: What are your primary concerns in deploying/provisioning a new database, adding database capacity, or introducing a new database feature? (N=234)

44 percent of respondents said that it took three or more SMEs to deploy or provision a new database on a new server.

Deploying high-availability databases for mission-critical applications of course takes even more time. Almost a third of respondents stated that database deployment in a HA environment required more than 40 percent more time than a non-HA environment.

1 Respondents were allowed to choose multiple categories.
Insights from In-Depth Interviews

The in-depth interviews revealed a very similar picture. Two of the four interviewees noted SME coordination as a pain point. At the financial services company, the database administrator noted that it took four people to deploy a database.

“Deploying a new database in a new server requires four different people: the DBA, the network SME, the SAN expert, and someone from infrastructure.”

— Database Administrator, financial services company

At the supply-chain management firm, the database team manager, who commanded a larger workforce than the other interviewees, said, “My primary concerns in deployment are cost and hardware capacity.” He also highlighted capacity planning details as a reason for the additional deployment time needed for HA. “High-availability deployment puts more stress on capacity planning and your awareness of just what’s running on the database and what kind of load is typical, to make sure the failover node—that means network and storage, too—can handle it.”

Overcoming Deployment Challenges with Oracle Database Appliance

Oracle Database Appliance radically accelerates deployment compared to “DIY” assembly of a database solution from multiple vendors. With the Oracle Database Appliance, deployment takes only two hours: simply unpack the appliance, plug it in, and run the wizard-driven Oracle Appliance Manager to configure and install your databases—either single-instance or high-availability—based on Oracle best practices. (Scaling up is equally easy, as discussed under Database Administration, below).

Since the network and storage components are pre-integrated, a single DBA can handle deployment without the need for coordination with other specialists. Pay-as-you-grow licensing makes sizing the
solution much easier, and pre-integration eliminates many of the tasks required by a multi-vendor approach, such as:

- Researching best practices
- Assembly
- Installation, patching, and configuration
- Testing unique configuration
- Resolving issues

“The Oracle Database Appliance was up and running in 20 percent of the time it takes us to roll out a typical 2 node RAC. 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

Database Administration

Of course, rapid deployment is just the beginning of the story for database administrators: they spend far more time managing ongoing operations. DBAs have many different concerns when it comes to their day-to-day work, but for survey respondents, SLAs were most likely to be top of mind (Figure 10). As noted above, when asked to identify the top concerns or challenges for DBAs at their company, 58 percent chose “database performance degradation affecting Service Level Agreement (SLA).”

This is in line with the finding that over 40 percent of respondents were having trouble meeting SLAs. More than a third of respondents picked unscheduled downtime, patch management, and coordination with non-database administrators as top concerns, again, in line with the responses to other questions discussed earlier.
Many performance problems can be addressed by scaling up database services: not only adding or expanding storage, adding CPUs or cores, and or adding memory, but often buying more licenses, as discussed in Error! Reference source not found., below. So it is alarming to note that almost 40 percent of respondents claimed that it generally took over 6 days to scale up their database configuration when required (Error! Reference source not found.).

Figure 10: What are the top concerns or challenges for Database Administrators (DBA) at your company?\(^2\) (N=234)

Figure 11: How quickly can you scale up your database configuration when required (i.e., add/expand storage, add CPU power, add more memory)? (N=234)

\(^2\) Respondents were allowed to choose multiple categories
"If the server is falling short, we’ll just replace it with a faster one. That takes about a week: two days to spec and decide, another two days to get it, and about three days to get it set up and everything moved over."

— IT Director, cosmetics firm

Insights from In-Depth Interviews

Scalability, especially as regards deployment speed, was a particular concern for all four of the in-depth interviewees. “Being able to quickly add database capacity is going to be one of my biggest concerns as adoption increases,” said the IT director at the cosmetics firm.

Three of the interviewees estimated something close to six days for a worst-case deployment: for instance, if the resource needed (e.g., a server or storage) was procured from a third party. This was the case at the cosmetics firm: “If the server is falling short, we’ll just replace it with a faster one,” said the IT director. "That takes about a week: two days to spec and decide, another two days to get it, and about three days to get it set up and everything moved over.” His attitude speaks to the cost of administration, as well: in some cases, replacing an entire server is likely to be more cost-effective than trying to scale up an existing system.

Overcoming Administration Challenges with Oracle Database Appliance

With the Oracle Database Appliance, DBAs spend far less time on maintenance and troubleshooting, and have more time for higher-value or more strategic tasks. Its extensive one-button automation of provisioning, patching, and diagnosis simplifies every aspect of database administration for both single-instance and high-availability database workloads.

- Appliance Manager software gives DBAs one-button, automated patching of the entire database stack—firmware, operating system, and database—with a thoroughly tested and optimized update, which is required only once a quarter.

- Oracle Automatic Storage Management automatically configures, manages, and monitors the disks for maximum performance and availability.

- Seamless single-vendor support for speedy resolution of issues via built-in diagnostics (failures, configuration, and best practices) and the Automatic Service Request feature to automatically log service requests with Oracle Support.

- Easy scalability with pay-as-you-grow licensing (see next section)

“We achieved a better result with the same budget because the majority of my implementation funds were spent in the areas of most importance to the business – developing better sales, financial management, and reporting processes. For a start-up with low cash reserves, this helped our business get off the ground quickly.”

— John Walters, Managing Director, Nextgen Distribution
Database License Management

Managing database licenses, a critical part of both cost management and scalability, appears to be a particular challenge for mid-market companies. The majority of respondents indicated significant concern about unused licenses.

Insights from In-Depth Interviews

All of the in-depth interviewees identified license management as a concern; for two of them it was particularly challenging, despite years of database experience.

Even larger mid-market firms who can afford an “unlimited” enterprise-type license may find unexpected costs involved. A good example was offered by the IT director at the cosmetics firm who said, “We’re using 100 percent because we paid for an unlimited license, but managing the licenses is quite difficult because I don’t really have the tools needed.”

Another important facet of licensing was revealed by the systems engineer at the engineering and manufacturing firm: capacity planning. His IT department revisits database licensing once a year as part of the budgeting process. He comments “Although we do manage to keep our license utilization close to 100 percent, it requires very careful forecasting during the budgeting process, and I only get once chance a year to get it right.”

Overcoming License Management Challenges with Oracle Database Appliance

The Oracle Database Appliance offers a unique pay-as-you-grow licensing plan that makes capacity planning much less stressful and offers push-button scalability via the Appliance Manager software ensuring a rapid response to business needs. You only license the processor cores you plan to use, starting with a minimum of two processor cores up to the system maximum of 24, and purchase additional licenses only as required by business needs. Existing Oracle database licenses may be applied to the Oracle Database Appliance.

“With Pay-as-you-grow, we license 16 cores in our primary data center and only 8 cores in our secondary one, with identical hardware. It also allows us to grow and not have to make the decision about what we’re going to be using in year three, four, or five. So we’re not buying more hardware and hopefully recovering the cost in five years.”

— Perry MacGinnis, IT Manager, Jazz Aviation
Conclusion

As revealed by the survey and follow-up interviews discussed in this white paper, mid-market DBAs and other database-focused IT managers face a number of challenges in deploying and managing database services that support the applications their business depends on, particularly in the areas of availability, deployment, day-to-day administration, and license management. The Oracle Database Appliance is a complete, pre-integrated package of software, server, storage, and networking in a single box that offers the simplicity, reliability, and affordability needed to overcome these challenges.

**Availability.** For mid-market companies struggling to meet database SLAs and avoid both planned and unplanned downtime, the Oracle Database Appliance puts high availability within easy reach by eliminating the costs and complexities involved in assembling and managing components from multiple vendors. It not only delivers faster time to production and built-in best practices to ensure trouble-free operation of both single-instance and clustered Oracle databases, but provides automated, one-button patching and diagnosis to keep DBAs on top of availability issues.

**Deployment.** Many mid-market companies find that deploying or provisioning new databases, additional capacity, or new features is too expensive or requires too much coordination between different subject matter experts in an already-overloaded IT department. The Oracle Database Appliance radically accelerates deployment compared to “DIY” assembly of a database solution from multiple vendors with a wizard-driven configuration and installation process that can be handled by a single DBA in just two hours.

**Administration.** Performance and downtime issues are just two of the issues that plague DBAs at mid-market companies: patch management and coordination with non-database administrators are also significant challenges that leaves little time for strategic tasks and initiatives. The Oracle Database Appliance gives DBAs back this time with one-button patching of the entire database stack; automated storage configuration, management, and monitoring; and speedy resolution of issues with built-in diagnostics and automatic logging of service requests with Oracle Support.

**License Management.** The complexity and difficulty of license management in a multi-vendor database solution means that many mid-market companies use less than their full licensed capacity and find it difficult to add capacity when needed. The Oracle Database Appliance offers a unique pay-as-you-grow licensing plan that makes capacity planning easier and offers push-button scalability for rapid response to business needs. Customers need license only the capacity they plan to use and can easily add licenses as needed.

These capabilities make the Oracle Database Appliance an ideal solution for the database needs of mid-market companies. It can provide a simple, affordable, low-risk path to high-availability for mission-critical applications; an easily-sized, easily-scaled database system for new deployments or hardware refreshes; or simply a cost-effective consolidation platform for smaller databases.