

## WHITE PAPER

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# Maximizing Your Investment in Oracle Application Software: The Case for Migrating to Oracle Database 11g

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## IDC OPINION

Oracle Database 11g has been enjoying strong adoption within the Oracle customer base. Despite this fact, some customers have put off upgrading from older versions of Oracle Database to 11g. Their reasons vary: They are concerned about the operational disruption of the upgrade process, they are satisfied with their current version, or they are not ready to learn about new features and procedures. In researching this white paper, IDC found that the upgrade process is smooth, the new version offers key benefits over older versions, and the new features and procedures are easy to learn and well worth implementing.

Users who resist such an upgrade should consider the following points:

- Oracle Database customers who continue to manage their data on Oracle Database 10g or even older versions are failing to take advantage of functionality advances in Oracle Database 11g. There are compelling business, operational, and technical reasons for Oracle application customers to upgrade.
- Enterprise applications, especially those from Oracle, have been architected to take advantage of functionality in the Oracle Database, so upgrading the database allows organizations to take full advantage of the innovations in Oracle Database 11g and reap the benefits for their applications.
- For example, operational improvements in Oracle Database 11g enable better operations with less staff involved, saving both time and money. Similarly, new capabilities in Oracle Database 11g not only make the database more secure and more scalable but also reduce the overall amount of storage required.

## IN THIS WHITE PAPER

This white paper discusses the benefits to organizations of upgrading from older versions of Oracle Database to Oracle Database 11g, with special reference to benefits gained by users of Oracle applications, such as Oracle's PeopleSoft Enterprise applications, Siebel Customer Relationship Management (CRM) applications, and Oracle E-Business Suite. The document includes a review of the improvements to and new features of Oracle Database 11g, lessons learned from conversations with Oracle application users who upgraded to Oracle Database 11g, and case studies involving such upgrades.

## SITUATION OVERVIEW

With Oracle Database 9i, Oracle introduced its scalable clustering option, Real Application Clusters (RAC), and since that time has perfected both that feature and the facilities adjacent to it, such as the Automatic Storage Management (ASM) feature. In addition, facilities that perform compression, query optimization, high availability and disaster recovery, etc., have all undergone continuous improvement. Users who have upgraded to Oracle Database 11g have taken advantage of the evolving capabilities of the product and realized substantial savings in time and effort, as well as increased operational flexibility.

Many users, however, have not yet upgraded and are operating at release levels where they must perform a considerable amount of work to manage clusters and associated network and storage, are consuming more storage than necessary, and are more vulnerable to faults and inefficiencies than they need to be.

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## Upgrading to Oracle Database 11g

### ***General Benefits***

Over the past several release cycles, Oracle Database has become increasingly easy to manage, with many of its more advanced features being deployed and operating almost automatically. Users who have stayed on Oracle Database 9i or 10g may have been reluctant to adopt features such as RAC because of the perceived complexity. With Oracle Database 11g, users report that RAC is very simple to deploy and that ASM makes day-to-day storage management operations much easier.

Oracle Database Enterprise Management Packs, Advanced Compression, and Active Data Guard have made it easy to set up and manage a database that is highly scalable compared with prior versions and make much more efficient use of servers, storage, and networking resources. Data Encryption, Database Vault, and Audit Vault add depth to the security of the database.

### **Ease of Deployment for Lower Operational Cost**

With Oracle Database 11g, RAC and ASM are part of a tiering strategy that enables users to set up pools of servers and storage and let the system manage the details. This approach allows for much more efficient use of physical resources than the old approach of dedicating a specific database to a single server and set of storage volumes. Not only are the resources more efficiently used, but administration of the overall system has become much easier and far less error prone.

### ***Automatic Storage Management (ASM)***

Several major releases have gone by since ASM was first introduced, and users have reported that this feature is completely self-managing. It automates and optimizes the allocation of storage, performs "striping and mirroring everywhere" (SAME), and delivers capacity on demand by enabling users to very easily add volumes to the system while handling the detail of reallocating data across the storage assigned to the database. ASM can also, optionally, mirror volumes for added protection against physical disk failure.

### *Real Application Clusters (RAC)*

Users are reporting dramatic improvements in the manageability of RAC. This feature enables users to deploy a database or databases across a cluster of servers, which act as a single logical environment, with the servers transparently sharing storage and coordinating their database activities and caching through a facility called Cache Fusion. If one node fails, the others carry on, and the workload of the failed node is distributed across the others. RAC requires no changes to Oracle applications. Early versions of RAC required detailed knowledge of cluster network management, cluster operating systems, and clustered file systems. This is no longer the case. The RAC environment includes clusterware and clustered storage management built in and manages its resources automatically.

### *Oracle Exadata*

Oracle Exadata represents Oracle's complete, integrated and optimized approach to a RAC deployment. It includes all the previously described features, preconfigured for optimal operation and installed on servers expressly designed for Oracle Database 11g. Oracle Exadata also handles storage I/O in a fundamentally different way from Oracle Database deployed in a non-Exadata environment, in that it colocates base table operations with the data itself. It does this by including specialized systems with internal storage that act as SQL-driven storage machines. These machines, called Oracle Exadata Storage Servers, are tightly networked with the database servers on a private high-speed InfiniBand network, with the Exadata-specific I/O Resource Manager managing I/O usage in that environment. System performance is dramatically improved by offloading SQL processing to the storage layer and using a high-speed InfiniBand network.

Both database servers and storage servers are housed within a single cabinet. Users can get an Oracle Exadata system in a quarter-rack, half-rack, or full-rack configuration. Because the software is preinstalled, and both hardware and software are preconfigured for each other, there is no setup requirement for the user, which reduces both cost and risk in new system deployment. It also supports database consolidation.

### *Oracle's Approach to Private Cloud Deployment*

Oracle regards Exadata as an ideal platform for consolidation, using a private cloud architecture. The flexibility with which it can handle resources, as well as its ability to support a variety of OLTP and data warehousing workloads, gives it an elasticity that mirrors that of elastic cloud computing.

### *Workload and Resource Management*

A key element of the system is the Database Resource Manager (DBRM), which manages workloads discretely in a cluster, allowing the database administrator (DBA) to set priorities and allocate CPU resources on a fine-grained basis through capabilities such as "instance caging," which allocates a specified number of cores to instances, as designated by the administrator (instance caging is a separate tool from DBRM). It can also allocate main memory on the same basis (currently, resource management does not allocate memory). As a consequence, databases can be regarded as services within the managed environment.

## **Operational Improvements**

With Oracle Database 11g, Oracle has introduced a number of operational improvements that make the database easier to set up and use, more efficient, and more scalable.

### *Oracle Database Enterprise Management Packs*

Spanning applications, middleware, and database management, Oracle Enterprise Manager's "top down" management approach allows IT departments to focus on what matters to the business — greater agility, better service quality, and lower operational costs. Oracle Enterprise Manager allows Oracle customers to manage their applications at every level — from monitoring service levels to proactively isolating business exceptions before they escalate and remediating issues at any level of the IT stack. To provide comprehensive management, Oracle has also introduced Application Management Packs for E-Business Suite, Siebel, PeopleSoft, and JD Edwards applications.

### *Active Data Guard*

The introduction of Oracle Active Data Guard with Oracle Database 11g allows a physical standby database to be open for read-only access. Instead of having an idle physical standby database for disaster recovery, and potentially another standby database for reporting and rolling upgrades, Active Data Guard allows offloading of ad hoc queries, reporting, and fast incremental backups from the primary database to the same standby site. The results are lowered costs, improved performance, and better overall utilization — all while continuing to ensure the system is protected from data loss and downtime.

### *End-to-End Compression*

The Advanced Compression option enables the data to be transparently compressed on disk, "in motion," and in memory. Compression used to be thought of as something that saves space but adds CPU overhead. This compression feature not only saves space on disk and in memory but also, because messages are smaller and memory is more easily managed, can make the database run *faster*. Using it can result in a reduction of disk and memory space usage by as much as 75%. One of its features, OLTP Table Compression, reduces the associated compression overhead of write operations, making it suitable for transactional or OLTP environments as well. As a result, OLTP Table Compression, extends the benefits of compression previously reserved for "performance insensitive" applications to all application workloads.

### *Comprehensive Partitioning*

Oracle Database 11g supports flexible database partitioning, including range, list, hash, interval, and composite partitioning as well as virtual column partitioning. This flexibility addresses a multitude of different performance, manageability, and availability issues, giving the DBA more tuning options and enabling data management according to business-meaningful segmentations.

### *Oracle's Information Lifecycle Management (ILM) Approach*

Information Lifecycle Management involves the appropriate management of data according to its place in the lifecycle. Active transaction data is generally kept in tier 1 storage with access optimized for strong I/O performance. Inactive data (such as completed or canceled orders, terminated employees, discontinued products, etc.), which is kept for historical purposes — but no longer updated and/or infrequently accessed — can be kept on cheaper storage.

Oracle's approach to ILM is to move such data to a partition defined for lower-cost storage with local indexes. The DBA can set access to such data at a lower priority in order to ensure that high-priority update orders are not impacted as the database grows. Also, because the partition contains data that does not change, it does not participate in incremental database backups, allowing for much smaller backup windows, which do not increase, even as the database grows.

### **Database Security**

Oracle Database 11g contains a number of enhancements that greatly improve the ability of enterprises to protect sensitive data and keep track of its use. Such capabilities are vital at a time when, increasingly, organizations are finding the need to establish data governance practices to ensure the trustworthiness of their data and to avoid the legal liability that could result from mishandled data.

#### *Access: Database Vault and Label Security*

**Oracle Database Vault** helps address regulations and similar global directives that call for separation of duties, least privilege, and other preventive controls to ensure data integrity and data privacy. With Oracle Database Vault, organizations can safeguard application data stored in the Oracle database from being accessed by privileged database users. Application data can be further protected using Oracle Database Vault's multifactor policies that control access based on built-in factors such as time of day, IP address, application name, and authentication method, preventing unauthorized ad hoc access and application bypass.

**Oracle Label Security** is a powerful and easy-to-use tool for classifying data and mediating access to data based on its classification. Designed to meet public sector requirements for multilevel security and mandatory access control, Oracle Label Security provides a flexible framework that both government and commercial entities worldwide can use to manage access to data on a "need to know" basis in order to protect data privacy and achieve regulatory compliance.

#### *Monitoring: Database Firewall*

Oracle Database Firewall acts as the first line of defense for both Oracle and non-Oracle databases, helping prevent internal and external attacks from reaching the database. Using a SQL grammar-based technology, which reduces millions of SQL statements into a set of manageable SQL characteristics, it monitors database activity on the network to help prevent unauthorized access, SQL injections, privilege or role escalation, and other attacks. The firewall has multiple enforcement policies, including block, substitute, alert and pass, or log unauthorized SQL statements. The firewall is designed for performance and security. It enforces both positive (white list) and

negative (black list) security models for high accuracy. It enables organizations to address regulatory compliance associated with databases and includes dozens of built-in customizable reports to demonstrate compliance.

#### *Auditing: Audit Vault and Total Recall*

**Oracle Audit Vault** automates the collection and consolidation of audit data across both Oracle and non-Oracle databases using a secure and scalable audit warehouse. Oracle Audit Vault enables centralized management and monitoring of customizable reports, analysis, and threat detection on audit data. In addition, it helps enforce privacy policies, guard against insider threats, and address regulatory requirements such as Sarbanes-Oxley and PCI DSS. Users can monitor before and after transaction logs and set up automated alerts to notify of suspicious activity across the enterprise.

**Oracle Total Recall** helps organizations address regulatory oversight such as Sarbanes-Oxley, HIPAA, and Basel II, as well as internal audits that require historical data to be retained for many years. With Oracle Total Recall, each data update, including before and after values, is automatically captured and efficiently stored in tamperproof archives within the database. Companies have real-time access to all historical application data for forensic analysis and recovery in the event of a data breach. As a secure and application-transparent solution, Oracle Total Recall requires no application changes or rewrites to implement.

#### *Encryption and Masking*

**Oracle Advanced Security** transparently encrypts all application data or specific sensitive columns, such as credit card or Social Security numbers, in order to help organizations comply with industry and government regulations that require encryption of personally identifiable information (PII). Using Transparent Data Encryption that can be implemented without application changes, Oracle Advanced Security protects data at rest in the database as well as whenever it leaves the database over the network or via backups. For added protection, it provides a built-in, two-tier key management architecture that eliminates the complexity traditionally associated with key management solutions.

**Oracle Data Masking** de-identifies nonproduction data in order to comply with data privacy and protection mandates that restrict the use of actual customer data. With Oracle Data Masking, sensitive information such as credit card or Social Security numbers can be replaced with realistic values, allowing production data to be safely used for development, testing, or sharing with outsource or offshore partners for other nonproduction purposes. Oracle Data Masking uses a library of templates and format rules, consistently transforming data in order to maintain referential integrity for applications.

#### *Complete Protection for the Database Environment*

**Oracle Configuration Management** helps organizations increase the security of their Oracle databases and comply with IT control frameworks such as CobiT and the Committee of Sponsoring Organizations of the Treadway Commission (COSO) "Internal Control - Integrated Framework" as required by Sarbanes-Oxley and similar global directives. Oracle Configuration Management combines discovery, vulnerability

scanning, compliance benchmarking, and central management of database configuration to detect and prevent configuration drift or unauthorized configuration changes. Additionally, Oracle Configuration Management's Critical Patch Update Advisory feature alerts customers to critical patches issued by Oracle and immediately identifies systems across the enterprise that may require the new critical patch, optionally invoking the patch wizard to automatically deploy the patch, ensuring application databases are always up to date and protected.

### ***Benefits Specific to Oracle Application Users***

In addition to the general benefits that the previously mentioned enhancements, features, and options deliver to Oracle Database users, the various Oracle applications have been developed to take advantage of many of these capabilities without requiring any special effort on the part of the administrator. Needless to say, all Oracle applications support Oracle Database 11g.

### **Integration of Database Feature Management in Applications**

It is also useful to know that E-Business Suite, PeopleSoft, and Siebel applications have all been enhanced to take explicit advantage of the following Oracle Database 11g options. It should be noted that most of these Oracle Database options are completely transparent to the applications and only in a few, rare cases require manual steps to be taken during setup or upgrades.

- ☒ **Real Application Clusters and Active Data Guard.** Some administrative setup is required.
- ☒ **Partitioning.** Only E-Business Suite supports out-of-box partitioning. Manual customization is required by Siebel and PeopleSoft.
- ☒ **Advanced Compression and Advanced Security.** An upgrade to the current application version is required. Oracle provides scripts for setting up simple Database Vaults for all applications. Oracle also provides Data Masking packages for all Oracle standard applications.

### ***Customer Experiences***

IDC conducted a number of interviews with Oracle application customers who had upgraded to Oracle Database 11g in order to both validate Oracle claims and learn from the customer experiences. Key takeaways from those interviews include the following:

- ☒ A major financial services company in Australia upgraded its mortgage aggregator business to Oracle Database 11g late last year. It uses Siebel, E-Business Suite, and Oracle Business Intelligence Enterprise Edition (OBIEE). The firm replaced its previous Oracle Database installation with a quarter-rack deployment of Oracle Exadata Database Machine. A measured test found that Siebel's performance improved by 8 times (800%). The job that moves the Siebel data to the data warehouse for analysis used to take 8 hours to run; now it is finished in 2 hours. The total E-Business Suite batch operations time was reduced from 18 hours to 3 hours.

- ☒ Athens International Airport (AIA) use E-Business Suite on Oracle Database 11g r2 with Real Application Clusters. AIA upgraded from Oracle Database 9i on a Sun Enterprise Server v480 3-node cluster to Oracle Database 11g on a 2-node M5000 Sun server cluster. AIA immediately realized an 800% performance improvement for reporting and long queries. AIA's finance department reported the ability to generate reports at a rate of 3 to 5 times faster than was the case previously. While some of this improvement may certainly be ascribed to the hardware upgrade, a substantial portion rests with the improved database server software. AIA also cited the usefulness of Active Data Guard in ensuring continuous operation as well as detecting and correcting errors. It also found great utility in Audit Vault and Database Vault and in the fact that E-Business Suite had been designed to take advantage of those features. Previously, availability and performance were impacted by user errors such as runaway queries. This is no longer the case. Also, some reports that had taken as long as 3 days to run are now finished in just 2 hours. Athens International Airport indicated that its use of Oracle E-Business Suite with Oracle Database 11g has helped make it more capable in its important mission to be a major contributor to the Greek economy and an important manager of domestic, regional, and international airline passenger travel and cargo. Oracle technology is assisting AIA in its effort to achieve continuous organization improvement and to provision airport-related services effectively and efficiently to the airport community and the passengers, thus increasing value to the company's stakeholders.
  
- ☒ Georgian College is a college of applied arts and technology. It uses PeopleSoft for its human resources management and Oracle Database for a wide range of applications. The college migrated from Oracle Database 9i on VMS to Oracle Database 11g RAC on a 4-node Dell n600 cluster. It realized a great performance boost, but the biggest benefit was in administration. Thanks to ASM, it has not needed to expend effort managing database storage. The new system is also very efficient. The Oracle Database 9i had hit the wall on VMS, whereas the new system "barely hits 20% utilization." Obviously, part of this boost is due to the higher-capacity system in place, but the software is a big part as well. The school has seen a 33% jump in enrollment over the past 2 years, yet registration processes have been reduced from 8 days to 3 days.
  
- ☒ Zebra Technologies develops and sells products that perform asset tracking and identification. It uses Siebel, E-Business Suite, and a host of other applications on Oracle Database. The company upgraded E-Business Suite (from version 12 to 12.1) and Oracle Database (from 10g to 11g) over the same weekend. The RDBMS was upgraded on a 3-node HP cluster for both versions. Both the Siebel application, which required a separate database installation, and its associated database server were upgraded. The upgrades of both application and RDBMS (running RAC on a 2-node HP-UX rack) took place over a 10-hour period, including cold backups and the upgrade steps. The schedule allowed extra time for fallback if needed (it wasn't). The company has continued to keep current and noticed that the newer versions of the applications are much easier to maintain and upgrade. The DBA team indicated that RAC is much more stable than the previous version and that ASM frees up system time while delivering better flexibility.

## CHALLENGES/OPPORTUNITIES

The greatest challenge posed to Oracle with respect to the issue of upgrades is the stability of old releases. As an Oracle executive once put it, "One of our biggest competitors is our own older software; people get content and don't want to go through the hassle of an upgrade." The "if it ain't broke, don't fix it" mentality is shortsighted, however, because new business challenges and requirements for Oracle application users are applying pressures that an upgrade to Oracle Database 11g can effectively address. In every upgrade scenario, user satisfaction and loyalty are tested. In this case, however, the upgrade scenario is an opportunity for Oracle to demonstrate commitment to customers through both a smooth upgrade process and software enhancements that make the upgrade well worth it.

## CONCLUSIONS AND RECOMMENDATIONS

The reasons for upgrading to Oracle Database 11g are urgent and compelling. Its newer features and internal improvements effectively enable customers to address the mounting pressures on data management along three key dimensions:

- ☒ Sheer database performance, reliability, and recoverability improvements that address the service-level agreements (SLAs) of enterprises today and will do so for years into the future
- ☒ Security, traceability, and retained data efficiencies that enable enterprises to satisfy the requirements of data governance initiatives and other business rules and practices
- ☒ Manageability improvements that enable harried database administration staffs to support more, larger, and more complex databases and still find time to help application managers streamline and customize their applications

It is recommended that users of Oracle applications running on back releases of Oracle Database do the following:

- ☒ Examine the new features of current versions of Oracle applications that are not available or are not as effective either because the old DBMS release won't support them or because they can't upgrade their applications. Try to quantify the benefits of those features in terms of business cost.
- ☒ Examine the new features of Oracle Database 11g, and identify those that would generate a clear return on investment (ROI) through performance or usability improvements, both of which can save staff time and enable more effective and timely business management.
- ☒ Examine the new features of Oracle Database 11g, and identify those that would reduce legal risk and enable the achievement of corporate governance objectives; such features would include encryption, audit, and improved access control. Key to management understanding of these features is to find ways to express their benefits in business terms.

- ☒ Try to calculate the cost of an upgrade in terms of system time, redundant equipment, staff time, etc. Use the stories in this white paper as well as the experiences of other Oracle Database 11g customers you may know.
- ☒ Propose the upgrade cost to business management as a one-time investment, representing all the quantifiable and soft benefits indicated earlier as representing the return on investment, and show the term of that return, which is likely to be very short.

As a result of this exercise, the business reasons for upgrading can be measured against the effort required to complete the project. For most, if not all, scenarios, the return on investment will compel an upgrade to Oracle Database 11g.

## CASE STUDIES

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### **Athens International Airport**

#### ***Overview***

The Athens International Airport (AIA) acts both as the principal gateway into Greece and as an important regional hub. The airport must handle passengers, cargo, airlines, vendors, and security operations on a massive scale. As of 2010, the airport supported:

- ☒ More than 320 companies and 5,000 suppliers
- ☒ More than 15,000 employees in the airport community
- ☒ More than 15,400,000 passengers annually
- ☒ 70 airlines
- ☒ 113 international destinations
- ☒ 192,000 flights
- ☒ 96 thousand tons of cargo

The airport's IT system uses Oracle E-Business Suite to meet the requirements of all these various constituents and customers.

#### ***Formerly, a Complex IT Environment for ERP***

The airport had been running a variety of different servers with Oracle Database 9.2.7 on hosts running Solaris, Linux, and Windows. AIA first migrated its systems to Sun Enterprise Servers and enjoyed an immediate improvement in throughput. Then, it moved to standardize its database on 11g.

### ***Upgrading to Oracle Database 11g***

The upgrade itself went smoothly and entailed no downtime. AIA started with the same configuration and options as it had been using with the prior version and is phasing in Oracle Database 11g's advanced features.

After upgrading to 11g, AIA experienced an immediate boost in performance. It reported an 800% improvement in the speed of reports and long queries overall. The airport's finance department reported that it could generate its reports 3 to 5 times faster than it did before the upgrade. A study of application performance, rating database throughput in detail, function by function, showed an 11x performance improvement across the board. Some reports used to take up to 3 days to run; those same reports now run in 2 hours.

AIA found the Automatic Storage Management feature to be a huge benefit, making storage-based performance tuning far easier and freeing the DBA from time-consuming activities such as deep analysis of query performance problems and data allocation to disks. Previously, it had numerous issues with the RAID storage it was using, including logical corruption that needed to be detected and repaired. No such problems arise anymore. The DBA staff is delighted with the fact that storage no longer requires human supervision and with the grid controls of Oracle Enterprise Manager that render management functions through an easy-to-use GUI.

Active Data Guard is used for the airport's mission-critical applications and has enabled AIA to easily catch and correct logical data errors. It has enabled the airport to reduce downtime resulting from errors in its in-house-developed applications from hours to minutes and ensures its ability to recover from even a disastrous failure within 10 minutes. AIA plans to use Audit Vault and Database Vault to enhance the security of the data, which is always an important consideration for a major airport.

The greatest concern AIA had with respect to the migration had to do not with the Oracle applications but with its own in-house-developed applications. AIA did thorough testing of its applications, including a period of parallel testing. AIA's careful approach reduced any concerns users might have and eliminated unpleasant surprises.

AIA was also very pleased with the fact that the airport is assigned one key support contact for both hardware and software, since AIA standardized on Sun hardware (a decision it made prior to Oracle's acquisition of Sun). When problems do arise, they are now resolved very quickly.

An AIA spokesperson said that the airport has enjoyed a performance and stability gain that is of key importance to the Greek economy and AIA's role as the international gateway of passengers and cargo to and from Greece. In AIA's effort to be a reliable and efficient contributor to the Greek economy, the airport IT team is confident that it has made the proper investment in technology. AIA said that it utilizes the Oracle platform in order to perform and excel in its mission both as an organization and as a major contributor to the Greek economy.

The airport DBA staff has the following recommendations for anyone migrating to Oracle Database 11g:

- Test all your custom-developed software thoroughly as part of the migration schedule.
- Use simulations to estimate the actual time required to perform the migration operations at cutover time.
- Execute a dry run or two, and involve key users in the process, including parallel testing.
- Keep users well informed so that there will be no surprises or puzzled questions when the cutover is accomplished.

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## **A Major Financial Services Company in Australia**

The group we spoke with is a mortgage aggregator with 160 employees that supports 2,200 brokers serving over 1 million customers. The brokers use Siebel software to manage their business, writing mortgage applications and sending them to the bank, which draws up the mortgage agreement and sends a commission to the aggregator, which takes its agreed share and uses the rest to pay brokers, referrers, and the rest of the value chain. The firm uses Oracle Business Intelligence Enterprise Edition (OBIEE) to report on data provided by Siebel. The company's general back-office operations are handled by Oracle E-Business Suite together with Siebel CRM and Incentive Compensation Management (ICM).

The aggregator wanted to consolidate its application database operations. Prior to the migration, it had Siebel's database running on a T2000 running Oracle Database 10.2.0.4 on Solaris. E-Business Suite was on another T2000, and OBIEE was also running on a T2000, but its database was already 11g. The firm first considered upgrading its Sun servers and storage array to get better performance as a consolidation target but concluded that the total cost would be similar to Exadata, and the effort and risk made the option unattractive. In the end, it chose to consolidate all three application databases (still as separate instances) on a single Exadata quarter rack, upgrading the Siebel and E-Business Suite databases to 11g in the process.

The company found that Siebel's database performance improved by a factor of 8. The data load from Siebel to OBIEE shifted from 8 hours to 2 hours. The Siebel ICM-driven commissions calculation program still runs on Oracle Database 9i, receiving data from Siebel and then returning it to Siebel after calculating the commissions. This entire process went from 18 hours to 6 hours due to performance improvement in Siebel after the migration. Altogether, commission processing dropped from 37 hours to 9 hours, which was a critical improvement because before, any slight hang-up could cause the company to miss the commissions deadline, which would be a serious breakdown in the business process.

Other performance boosts are as follows:

- Accounts Payable performance was boosted 4x.

- ☒ General Ledger (GL) general performance improved 30x, and the GL export process improved 5x. The GL trail export improved 6x.
- ☒ The publish service improved by 8x.
- ☒ E-Business Suite's invoice load process improved from 204 minutes to 48 minutes, the validation process went from 302 minutes to 19 minutes, and invoice accounting went from 572 minutes to 110 minutes.
- ☒ The total time for E-Business Suite batch processing dropped from 18 hours to 3 hours.

The company used to have 3 staff members dedicated to managing the storage environment, operating systems, and database operations. Now, they can do other things because of the preconfigured and self-managing aspects of Exadata. They also derive great benefit from Real Application Testing.

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