

A Manager's Guide to Oracle[®] Cost Containment

Economics, Strategies and Field Case Studies

An EnterpriseDB White Paper

for DBAs, Application Developers, and Enterprise Architects

June, 2009

Executive Summary

This white paper provides an overview of the economics, strategies and best practice methodologies of Oracle database cost containment. The paper discusses cost containment solutions available from EnterpriseDB Corporation and the company's Postgres Plus® Advanced Server database product.

Postgres Plus Advanced Server is a high-powered, feature rich commercial distribution of PostgreSQL, the world's most advanced open source database. As discussed below, Postgres Plus Advanced Server includes a breakthrough suite of compatibility technologies that run Oracle applications with little or no changes.

While all database vendors support contemporary levels of ANSI SQL, each vendor wraps their SQL syntax inside of proprietary APIs, functions, stored procedure languages, and utilities, reducing code portability and effectively achieving significant levels of vendor lock-in.

This paper discusses the economic benefits that can be achieved by using Postgres Plus Advanced Server to break that lock-in, particularly in the context of Oracle database applications. It identifies popular Oracle cost containment strategies and provides helpful case studies that illustrate how Oracle costs are being managed in the field today at Sony Online Entertainment and FTD florists.

An in depth discussion targeted specifically to your organization's requirements can be scheduled with an EnterpriseDB domain expert by sending an email to sales@enterprisedb.com.

The Data Management Dilemma

IT organizations face a daunting dilemma. At a time when information demands are exploding, budgets are contracting or, at best, remaining flat. The demand for more and higher quality information is largely a function of internet-related automation. Organizations are using the internet to expand their market reach and enhance their customer service levels. Company websites, online self-service centers and ecommerce destinations generate huge amounts of data that, used effectively, can dramatically improve competitiveness and customer intimacy.

The Data Management Dilemma
Figure 1



Relational database management systems are collectively the workhorse technology behind business software applications. It's therefore no surprise that industry analysts at Forrester Research pegged the global database market at \$19 billion in 2008, with a compound annual growth rate of over 9%. Demand for enterprise-class data management solutions is enormous and growing rapidly, fueled by ongoing operational systems and the new internet-based applications discussed above. However, database vendor lock-in poses a formidable obstacle to business growth.

Proprietary RDBMS Vendor Lock

The RDBMS vendor landscape is dominated by three proprietary software vendors – Oracle, with its namesake database product suite; Microsoft®, with SQL Server®; and IBM® with DB2®. These three vendors compete aggressively with each other for market share and account control.

However, the paucity of other market competitors means that the “Big 3” have enormous pricing power with their customers. Oracle proved that point in 2008, issuing sweeping price increases during a period when IT organizations were scrambling to trim budgets in response to ominous economic forecasts.

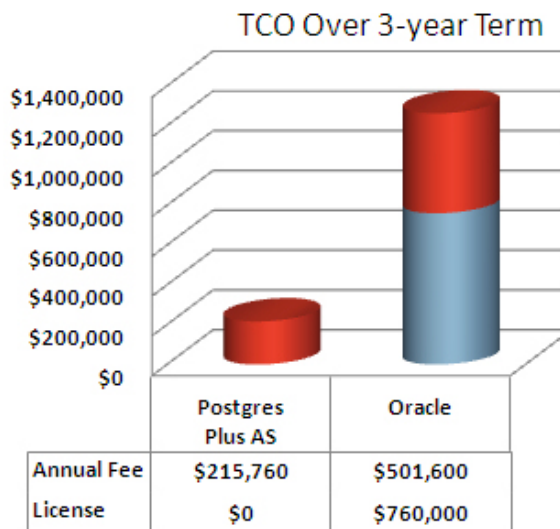
The dirty little secret in the RDBMS community is that, while all vendors support contemporary levels of ANSI SQL, each vendor wraps their SQL syntax inside of proprietary APIs, functions, stored procedure languages, and utilities. Once an organization has deployed a portfolio of applications based on these proprietary constructs, the database vendor achieves significant lock-in.

The costs and risks of refactoring, retesting and redeploying production applications on a competing database solution are simply unpalatable. Incumbent database vendors, therefore, have tremendous pricing power and business leverage with their installed customers.

Open Source Databases Deliver Compelling New Economics

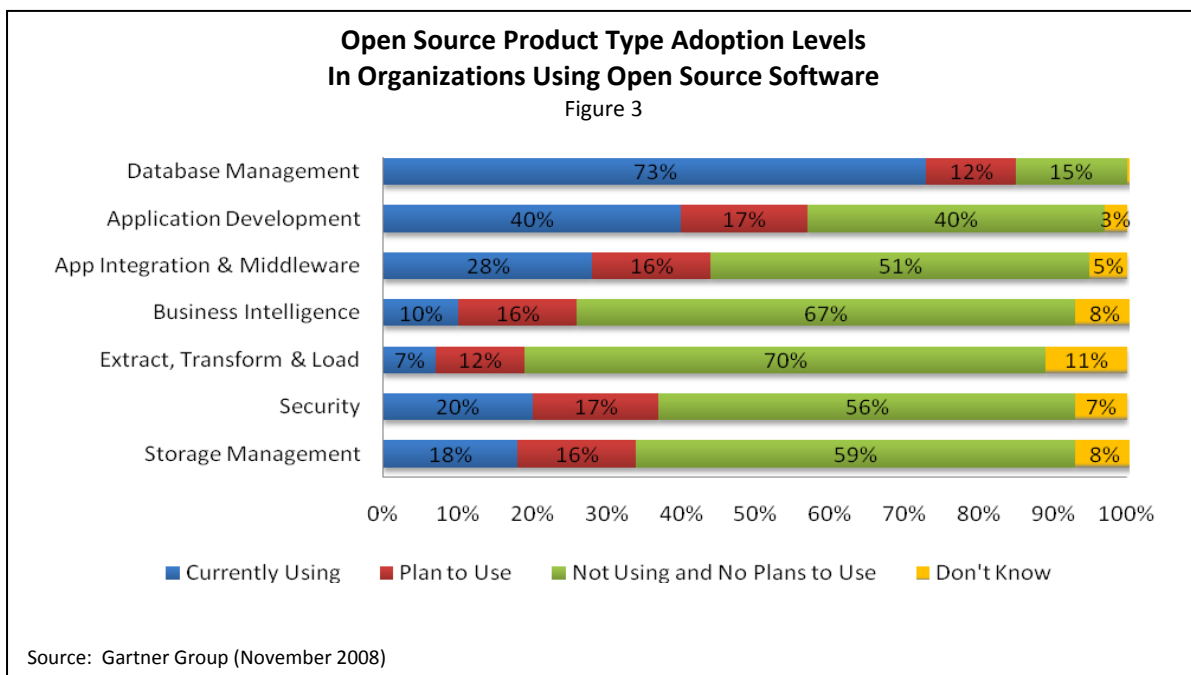
In recent years, two leading open source databases – MySQL® and PostgreSQL – have proven that enterprise-class data management can be achieved at radically lower costs than those demanded by proprietary RDBMS vendors. EnterpriseDB Corporation, author of this white paper, is the commercial distributor of PostgreSQL. A representative cost comparison of EnterpriseDB's Postgres Plus Advanced Server vs. Oracle is provided in Figure 2.

Oracle vs. Postgres Plus Advanced Server
Figure 2



Based on currently published list prices, the TCO of a 16-CPU (four servers, four CPUs/server) Oracle configuration is \$1,261,600 over a three year term. The TCO of a comparably configured Postgres Plus Advanced Server deployment is \$215,760, a TCO savings of \$1,045,840, or 83%.

Even Gartner Group, which has historically given conservative guidance regarding production deployment of open source databases, now recommends their use for selected application classes in a recent research report entitled "The Growing Maturity of Open-Source Database Management Systems". Indeed, recent research from Gartner suggests that organizations are adopting open source databases more aggressively than any other open source technology group (see Figure 3).



Although open source economic advantages and adoption rates appear to be compelling, real adoption is severely gated by the proprietary RDBMS vendor lock-in realities discussed above. The remainder of this white paper discusses EnterpriseDB's compatibility solutions, which eliminate the lock-in problem for Oracle RDBMS users, and discusses customer best practices for adopting Oracle compatibility solutions. The document also includes two case studies – Sony Online Entertainment and FTD florists – that illustrate the compatibility best practices discussed below.

Oracle Compatibility Challenges and Solutions

By any measure, Oracle's namesake database is the world's proprietary database market leader. Oracle commands premium prices for perpetual software licenses and annual maintenance/support. Historically, however, Oracle customers seeking alternative database alternatives have faced three primary types of switching costs:

1. Technology

As described earlier, existing Oracle database applications are usually implemented using a variety of Oracle's call interfaces, data types, functions, stored procedures, built-in packages, and other proprietary constructs. The manual conversion effort needed to migrate catalog structures, application programs and physical data from Oracle to an alternative database almost always outweighs the associated migration benefits.

2. People

Organizations often invest heavily to retain Oracle DBAs and application developers. Replacement or retraining of these skilled IT professionals represents a formidable cost and introduces the risk of organizational friction – some people cannot or will not make the transition successfully.

3. IT Operations

The Oracle database includes extensive utilities that support every day database operations, including interactive SQL tools, bulk database copy utilities and database replication servers. These technologies are frequently integrated into IT organizations' operational processes and would be risky to replace with functionally incomplete alternatives.

Postgres Plus Advanced Server – the Oracle Compatibility Breakthrough Solution

EnterpriseDB has invested hundreds of man-years of effort to overcome the Oracle switching costs and risks. At its core, EnterpriseDB's Postgres Plus Advanced Server is a commercial implementation of PostgreSQL, the world's most advanced open source database. PostgreSQL represents more than 20 years of open community development, and it is the power plant behind some of the world's most complex and demanding database applications.

Leveraging this core database, EnterpriseDB has implemented a comprehensive suite of Oracle-compatible database constructs, interfaces and utilities. The combination of PostgreSQL and EnterpriseDB's

compatibility technologies allows Postgres Plus Advanced Server to achieve functional, performance and operational parity with Oracle, while also delivering the economic benefits illustrated in Figure 2 earlier.

Postgres Plus Oracle Migration Solutions

Figure 4

Point-and-Click Migration		
PL/SQL » Triggers » Functions » Stored Procedures » Packages » Built-in Packages	Built-in Functions	OCI
	SQL Syntax	Views
	Data Dictionary	Database Links
	SQL*Plus	Synonyms
	SQL*Loader	Sequences



Sony Online Entertainment, FTD, the US Federal Aviation Administration, EPBS and many other global organizations are running Postgres Plus Advanced Server Oracle compatibility solutions in production today. Through numerous customer deployments, EnterpriseDB has developed a compatibility roadmap that helps organizations implement Oracle compatibility strategies that best fit their specific objectives.

Oracle Compatibility Strategies and Best Practices

When it comes to Oracle cost containment, there is no “one size fits all” strategy. Organizations use Postgres Plus Advanced Server in a variety of configurations to reduce their Oracle database costs.

New Application Deployment

Organizations can immediately cut Oracle database costs simply by deploying new applications using Postgres Plus Advanced Server in place of Oracle. This strategy leverages the existing skills of Oracle DBAs and developers because Postgres Plus Advanced Server provides compatibility for all key Oracle APIs, data structures and stored procedure syntax/semantics.

Many organizations select an initial application with which to prove the functional equivalence of Postgres Plus Advanced Server's compatibility features and to gain confidence in the overall strategy. Once the initial application has been developed, tested and deployed, the team is in a good position to decide which other applications are the best candidates for Postgres Plus Advanced Server in place of Oracle. See the Sony Online Entertainment case study below for a field example of deploying new applications on Postgres Plus Advanced Server.

Replication for Reporting and BI

Query, reporting and BI activities can significantly degrade the performance of OLTP applications. Many organizations address this dilemma by replicating business transactions from a primary (Oracle) database to a replica (Postgres Plus Advanced Server) database. In this configuration, the primary database continues to deliver OLTP services to associated business applications, while the replica database supports high volume query and reporting activities.

Postgres Plus Advanced Server's Oracle replication server provides asynchronous, near real-time data warehousing at a fraction of the cost of Oracle's replication solutions, eliminating Oracle OLTP performance problems while delivering time critical information to business stakeholders. In contrast with traditional data warehousing solutions, which stage data into the warehouse database at predetermined (e.g., nightly) intervals, Postgres Plus Advanced Server replica databases are updated in near real-time. See the FTD case study below for an example of Oracle cost containment using database replication.

It is noteworthy that EnterpriseDB offers a "packaged service" consulting engagement, called Replication Setup, specifically for customers who need to quickly implement database replication infrastructures. More information about this service is available on EnterpriseDB's website.

Application Migration

Postgres Plus Advanced Server has proven to be a crucial solution for organizations seeking to aggressively or selectively replace existing Oracle databases. Customers that need to systematically replace Oracle databases often begin by migrating non-mission critical applications to

achieve rapid cost savings while proving the feasibility of their migration strategies.

Driven by M&A and consolidation activities, some organizations need to migrate large-scale mission critical applications to less expensive infrastructures. Postgres Plus Advanced Server combines deep Oracle compatibility with a proven, high-performance OLTP database foundation to support the most demanding Oracle migration needs.

All Oracle migrations require careful planning and execution. EnterpriseDB's Oracle migration domain experts work closely with customer DBAs and developers to develop a migration roadmap that optimizes customer resources and priorities. EnterpriseDB's best practice migration methodologies reduce project costs and risks by identifying the tasks, resources, milestones and dependencies associated with each migration project. In some migration scenarios, EnterpriseDB works with customers through the project strategy and planning stages, and is then available for mentoring and consultation throughout the project's duration. Based on available customer skills and resources, EnterpriseDB consultants also sometimes perform key migration tasks directly.

Conclusion

Modern IT organizations face the daunting dilemma of contracting budgets and exploding information demands. Practical economics dictate that these demands simply cannot be serviced through the traditional application of expensive, proprietary database technology. Fortunately, PostgreSQL, an open source database that can be cost-effectively deployed for transactional and mixed-load applications, has now reached functional parity with proprietary counterparts such as Oracle.

EnterpriseDB distributes Postgres Plus Advanced Server, the commercial distribution of PostgreSQL, that includes breakthrough Oracle compatibility solutions. Using Postgres Plus Advanced Server, Oracle shops have overcome three categories of switching costs – technology, people and IT operations – that have traditionally locked out competing databases. When combined with EnterpriseDB's compatibility best practices, Postgres Plus Advanced Server gives IT organizations a continuum of cost-effective Oracle compatibility alternatives, including new application deployment, replication for reporting and BI, and application migration.

The remaining pages of this white paper discuss two customer case studies – Sony Online Entertainment and FTD florists – that illustrate how

Postgres Plus Advanced Server is being used to effectively manage Oracle database costs. Sony and FTD have been joined by dozens of Oracle shops worldwide that are using Postgres Plus Advanced Server in production today to optimize their database spends.

For more information about EnterpriseDB's Oracle compatibility solutions:

- Visit: <http://www.enterprisedb.com>
- Call: +1.978.589.5700
- Email: info@enterprisedb.com

About EnterpriseDB

EnterpriseDB is the leading provider of enterprise class products and services based on PostgreSQL, the world's most advanced open source database. The company's Postgres Plus Advanced Server products are ideally suited for transaction-intensive applications requiring superior performance, massive scalability, and compatibility with proprietary database products. Postgres Plus Advanced Server also provides an economical open source alternative or complement to proprietary databases without sacrificing features or quality. EnterpriseDB has offices in North America, Europe, and Asia. The company was founded in 2004 and is headquartered in Westford, MA. For more information, please call +1.978.589.5700 or visit <http://www.enterprisedb.com> .

Sony Online Entertainment Replaces Oracle with Postgres Plus

Sony Online Entertainment LLC (SOE) is a recognized worldwide leader in massively multiplayer online games, with millions of gamers around the globe having enjoyed the company's products over the years. SOE has developed or published many ground-breaking and genre-defining games, including EverQuest[®], EverQuest II[®], Star Wars Galaxies[®], PlanetSide[®], The Matrix Online[®], and many more.



SOE's database needs are considerable, and its database applications are the very definition of mission-critical: hundreds of thousands of online users play SOE's games around the clock, and each game is an extraordinarily database-intensive application. Before SOE selected EnterpriseDB, dozens of Oracle 9i RAC clusters were in use. In addition, SOE deploys databases in its back-office operations and to support its user forum and online auction websites.

Examining its business, SOE found that its Oracle databases were extremely expensive and that Oracle's licensing practices were inflexible and restrictive. At the same time, the company experienced a constant demand for the creation and maintenance of additional databases. Like many other companies today, SOE hoped that open source software might provide a solution to this business challenge.

Building on a History of Open Source Success

SOE has a history of success with open source software. The company has already successfully deployed Linux, Tomcat, Apache, and Hibernate. As early as 2005, the company began to investigate open source alternatives to Oracle that would have both a lower TCO and greater licensing flexibility. SOE also sought to leverage their valuable asset of in-house Oracle talent. SOE used four primary criteria in its selection of an open source database:

- Ability to leverage its existing database administrator and developer talent
- Ease of moving SOE's existing Oracle applications to the new database
- Commercial-grade quality and reliability, including backup and recovery standards, to support mission-critical applications
- Scalable, high performance execution

EnterpriseDB: A Clear Winner

At the end of a thorough review and selection process, SOE chose Postgres Plus[®] Advanced Server. An important factor in SOE's decision was Postgres Plus Advanced Server's ability to run database applications written for Oracle. SOE found that 80% of the applications it had selected to move from Oracle ran on Postgres Plus Advanced Server with little or no modification and that its Oracle-trained staff could immediately work comfortably and efficiently with Postgres Plus Advanced Server. Another important factor was Postgres Plus Advanced Server's PostgreSQL foundation, which guaranteed the reliability and stability that SOE required. Finally, Postgres Plus Advanced Server was available for only a small fraction of the cost of Oracle.

From Oracle to EnterpriseDB

SOE has evaluated the move of the massively multiplayer game The Matrix Online from Oracle to Postgres Plus Advanced Server, and the transition is planned for later this year. SOE is very pleased with

the results of its testing to date, and it anticipates that new massively multiplayer online games will be deployed on EnterpriseDB in 2009. When the deployments are complete, Postgres Plus Advanced Server will be running on hundreds of SOE servers around the world.

High Availability on Postgres Plus Advanced Server

SOE's online games require high-availability database solutions. To achieve this, SOE will run Postgres Plus Advanced Server on a multi-node cluster with an idle node available for failover. Tests run by SOE have shown a very reasonable failover time using EnterpriseDB in this configuration when scripted at the operating system level. The renowned stability of PostgreSQL additionally means that Postgres Plus Advanced Server's failover capability will seldom be needed.

Online Game User Forums on Postgres Plus Advanced Server

SOE uses custom J-Forums to power the user forums for its online games. Previously, SOE used a hosted forum solution that ran on MySQL. When SOE found that the hosted solution couldn't easily be modified and new features couldn't easily be added, J-Forum was brought in-house and run on Postgres Plus Advanced Server. The deployment so far has been a resounding success. Half of SOE's online forums are now live on Postgres Plus Advanced Server, and the remainder will go live on EnterpriseDB in the coming months.

World-Class Technical Support

SOE is receiving terrific technical support from the EnterpriseDB team. Callbacks have been rapid, and the abundance of helpful solutions and example code compares very favorably with the technical support SOE receives from Oracle.

What's Next for SOE and EnterpriseDB?

SOE is extremely pleased with the success it has already had with EnterpriseDB and plans to continue moving applications from Oracle to Postgres Plus Advanced Server to realize even greater cost savings. SOE's future massively multiplayer online games are expected to be deployed solely on EnterpriseDB and, within 18 months, hundreds of servers around the world will run Postgres Plus Advanced Server. Open source software from EnterpriseDB has provided SOE with a solution to its business challenge: SOE has found a way to reduce its database TCO by nearly 80% and has realized a licensing flexibility that is critical to its organization.

FTD Replicates Oracle to Postgres Plus

Florists' Transworld Delivery (FTD) is the world's leading provider of floral-related products and services. With a network of 50,000 FTD affiliates spanning the globe, Chicago-based FTD processes approximately fifteen million orders annually through about 20,000 retail florists in the United States alone and enjoys revenues in excess of \$450 million.



FTD's database applications are the epitome of mission-critical, especially during key holidays such as Christmas, Valentine's Day, and Mother's Day. In early 2007, FTD deployed a new shipping administration system to support its FedEx-based delivery business. The new system, called ARGO, is supported by a strategically important, external-facing reporting application based on Oracle.

The vendor-facing ARGO system tracks orders for products from more than 200 of FTD's vendors, allowing them to monitor shipments through pre-defined reports. These vendors represent a significant portion of FTD's online business, each running an average of eight to twelve reports per day. During FTD's peak seasons, the daily order volume increases significantly.

Valentine's Day Challenges

FTD typically receives 20 to 25 times the average daily order volume on Valentine's Day. On Valentine's Day, 2007, the ARGO database reporting application was degrading the performance of the company's order-taking database application. Performance slowed considerably as the volume of online inquiries increased, requiring reporting to be handled manually. The existing Oracle-based production infrastructure could not handle the reporting load, which was consuming an average of 90 percent of the 12-processor production system. FTD was forced to run vendor reporting manually to decrease the load on their production order-taking system. It was clear that a new vendor-facing reporting solution was urgently required prior to the Mother's Day holiday.

FTD, a long-term Oracle customer, initially turned to the industry giant, but was displeased with the quoted cost of the new system. The initial proposal for a new system, while discounted from the list price, was still far above the budget allotted for the project. As an alternative, FTD was referred to EnterpriseDB by Sun Microsystems®, provider of FTD's hardware and an EnterpriseDB technology partner.

A Replication Solution

FTD solved its peak-time reporting overload challenge by replicating major portions of the production Oracle database, including the Order table and the Customer table, onto Postgres Plus® Advanced Server using Postgres Plus Replication Server. The reporting application was then run on the Postgres Plus Advanced Server database rather than the Oracle database. No major changes were required to the Oracle reporting application to run it on the Postgres Plus Advanced Server database.

The entire Postgres Plus Advanced Server implementation, from initial technical consulting to production deployment, was completed in approximately six weeks. FTD was fully prepared for the Mother's Day rush.

Standing Ovation for the Mother's Day Triumph

FTD's vendors were ecstatic about the improved response time they experienced while running reports on Postgres Plus Advanced Server during the Mother's Day season. The EnterpriseDB solution had

performed flawlessly. Following Mother's Day, FTD's development staff received a standing ovation from the entire executive team for their rapid deployment of a critical cost- and business-saving solution.

Further Savings

The performance of the servers supporting FTD's order-processing system also improved by 400% after the ARGO application was moved to Postgres Plus Advanced Server. The improvement allowed FTD to postpone purchasing additional hardware to support the system, saving the company even more money.

In addition to Postgres Plus Advanced Server's ability to run most applications written for Oracle unchanged, it also allowed FTD developers to use the Postgres Plus Advanced Server database and its tools without costly re-training.

"A Refreshing Change" in Technical Support Quality

EnterpriseDB offers enterprise-class technical support that is available around the clock. With a rapid average response time and on-call developers providing world-class customer service, EnterpriseDB provides Oracle customers with a compelling alternative.

What's Next for FTD and EnterpriseDB?

Postgres Plus Advanced Server provided FTD with the means to run a mission-critical application with increased performance at 83% less cost than a similar Oracle configuration. Subsequently, FTD has identified two other systems that will be transitioned from Oracle to Postgres Plus Advanced Server because of the anticipated cost and service benefits. As with ARGO, the vendor reporting application, no performance decrease or other technical compromise is expected.

In the future, Postgres Plus Advanced Server will be the first choice for new database deployments at FTD. The company is also considering replacing Oracle completely over the next two to three years.