Linux Databases: DB2 vs. Oracle
Executive Summary

July 2003

Important Notice

Introduction

This is a report prepared by Branham Group Inc. that compares the two leading commercial database software packages for Linux: Oracle 9i version 9.2 Enterprise and IBM DB2 version 8.1.2 ESE. Comparison is based on cost of ownership, ease-of-use, reliability, and scalability. The results of the report have been condensed in this executive summary.

The modern database plays a critical role in any business, large or small. The ability to provide reliable, safe, and efficient data services to an organization is a high priority for any CEO or IT Manager. Meeting this need while responding to increasing budget pressure can be challenging. Because of its powerful, reliable, low-cost, and open nature, businesses are choosing to host their corporate data assets on Linux-based database servers.

Due to the rapid growth of the Linux operating system in the datacenter, many vendors are starting to provide database software for Linux servers. IBM DB2 for Linux allows organizations to leverage the power and reliability of Linux with a database solution that is cost effective, efficient, and reliable.

Ease of Use

DBAs favor DB2 because it requires fewer preparation steps than Oracle before the software is installed on a server. DB2 is also more efficient during the installation process, with fewer steps and less time required than the slower and more cumbersome Oracle setup. Once installed, DB2 allows common tasks to be completed quickly and easily; the advantage of DB2 is even greater when dealing with large database clusters. The benefit of DB2 is easier training, reduced training expenses, and reduced staffing costs.

Standalone Installation

During installation, DB2 saves time and effort by providing an easy-to-use setup procedure. DB2 takes half the steps and usually one-third the time to install that Oracle requires. Oracle requires additional steps to create specialized user ids on the server. DBAs must create special use disk mounting points, and configure additional environment variables. These cumbersome tasks increase the expense of an installation, staff frustration, and the probability of installation failures.

Cluster Installation

Many modern datacenters operate clusters of database servers for increased performance, and availability. Management of clusters with DB2 is more reliable, faster and more efficient than on Oracle.

The installation of an Oracle database using Real Application Clusters (RAC) is far more complex and requires significantly more time than the DB2 counterpart. A clustered installation of Oracle RAC magnifies the slower, single instance installation and requires additional component installations. At least

three major additional software components and a shared disk system must be installed and configured in order to operate an Oracle cluster; this is in addition to the complex base installation. DB2 simply requires that the installation is repeated on each node with a few simple steps to configure the cluster.

In addition, the Oracle RAC documentation is over 1000 pages in length. This is a considerably large amount of documentation for an administrator to search through for information. The size of the documentation also points to the complexity of using RAC technology.

Conversely, DB2 clustering is simple to configure and requires far less documentation. Administrators are much more likely to be successful in clustering database servers with the simple and clean installation of DB2.

Once configured, a cluster of DB2 servers is easier to manage due to DB2's intuitive and powerful GUI administration tools. These tools make managing a cluster of servers nearly as simple as managing a single standalone server.

Administration

The GUI based administration tools for DB2 allow easier management of databases and result in lower operating costs.

For example, DB2 allows the DBA to quiesce a user, instance, or database from the GUI tool. Oracle DBAs, on the other hand, must open a console window and enter manual commands. This latter case increases the likelihood of an error and the possibility of an accidental outage.

DB2 also provides more tools for administration of databases. The configuration advisor and performance tools are only available for DB2 databases. Oracle does not have tools that duplicate this valuable functionality and rely on manual optimizations or wizards that are less capable.

Finally, DB2's autonomic features can recommend or even take corrective action in a range of situations, such as table space becoming full or sub optimal memory utilization. This feature improves the productivity of DBAs and reduces reliance on their specific skill sets.

Total Cost of Ownership

DB2 offers significant value and does so at a reduced cost; this complements the cost savings and performance of Linux. DB2 on Linux outperforms Oracle in two areas: administration and licensing costs.

Administration Costs

On Linux, the average Oracle database installation takes a minimum of 20-30 minutes longer than the equivalent DB2 installation on the same hardware. This time contributes directly to the personnel costs associated with an installation. Combined with the more efficient pre-installation task list provided by DB2, an organization could save significant labor costs from their IT

budget.

The ability to rapidly build DB2 Linux servers reduces the time that administrators must spend when establishing a new database server. This reduces the administrative costs for an organization with a cluster of database servers.

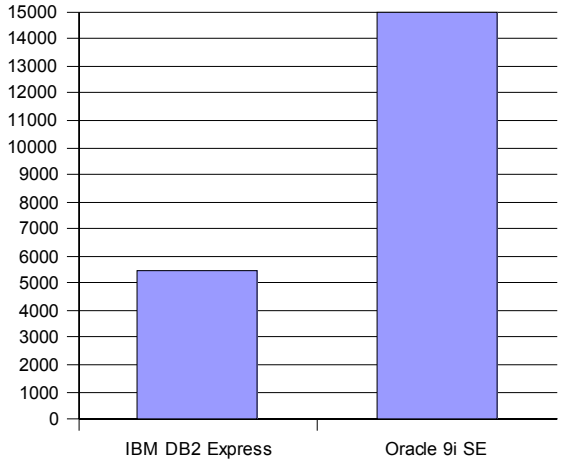
Licensing Costs

A large portion of the initial cost in operating any database is the cost of software licensing. Adding to its advantage, IBM provides its customers with real savings when purchasing licenses.

An organization that chooses Oracle will spend considerable funds acquiring and maintaining the database software. For large or small size business, in particular when using clustered systems, IBM licensing costs are much lower than those for equivalent Oracle software. For some configurations, it is almost 3 times less expensive to purchase DB2 versus Oracle.

For instance, based on list prices which were available on 06/05/2003, an IT department seeking to license database software for a single server serving 50 users would pay $15,000USD for Oracle. The same installation using IBM DB2 for Linux software would only cost $5,449USD. That represents a 63% reduction in the software licensing budget for this installation.

IBM DB2 Express vs Oracle 9i SE Licensing Costs



The option of using DB2 UDB Express on Linux offers even more savings for smaller scale systems. DB2 is the cost effective and affordable solution regardless of the size of database required.

Hardware Costs

Oracle's RAC technology requires a higher hardware investment for a cluster of servers. Additional network switches, servers, and shared disk sub-systems are required to use this feature. These additional purchases further inflate the cost of an installation which uses Oracle technology.

Reliability

Linux provides an organization with a reliable and high-performance operating system. Many Linux servers have uptime measured in months and years. DB2 helps leverage that high availability into a dependable solution. Oracle has a number of security and reliability problems that make it a poor choice for enterprise level, and, in particular,

clustered, database solutions on Linux.

Far from being “Unbreakable”, the Real Application Clusters component of Oracle has been directly linked to at least one serious day-long outage for the online airline booking system run by Orbitz[i]. Despite Oracle's best support efforts, the recovery of the site required the heroic and risky decision to re-architect the online application. Full functionality was only restored once the application was changed to eliminate the RAC technology.

Oracle itself admits that it has little experience in large clusters of database servers, in Linux, or on any other platform. Larry Ellison, the CEO of Oracle, in a keynote speech at the 2002 San Francisco Linux World stated, “We don't have a lot of experience with real big production systems more than 16 nodes.” This should give any CEO or IT manager looking for a scalable, enterprise grade, Linux database solution pause when considering the many issues that Oracle presents.

DB2 provides highly robust clustering technology that scales in a linear fashion. It is highly reliable, with a simple, easy-to-use interface that reduces outages due to operator error and allows applications to easily adapt to changing load conditions. DB2 clusters are able to quickly recover from failures and provide recovery times comparable to Oracle at a fraction of the cost.

Scalability

The scalability of DB2 on Linux and Oracle clusters was compared using publicly available performance information. In an ideal environment, databases would scale in a linear fashion as more processing power is added to the cluster. Oracle demonstrated non-linear scalability as servers were added to a cluster. As a result, the return on the investment for additional servers diminished rapidly. However, DB2 demonstrated near-linear scaling as database servers were added to the cluster. In fact, DB2 is certified for use in clusters of up to 1000 nodes. Clearly, DB2 helps make the most out of the investment in a cluster of database servers.

Conclusion

DB2 on Linux has demonstrated that it is more reliable than Oracle with its usage of simpler and more scalable clustering technology. Oracle is harder to use and costs more to install and administer. DB2 is also significantly less expensive to license than Oracle.

DB2 provides a more reliable, efficient, and cost-effective solution for the database needs of any enterprise. DB2 will provide an exceptional return on any organization's software investment dollar.

Pricing information was vendor supplied for these versions:
Oracle 9.2.1.0 Enterprise Edition
IBM DB2 UDB V8.1.2 ESE (Enterprise)

[i] Orbitz: Oracle to blame for site outage
Linda Rosencrance
Computerworld
July 18, 2003

Orbitz Blames Oracle for Web Site Outage
Lisa Vaas
eWeek
July 17, 2003