



A Guide to Lower Database TCO

**How the Open Source Database MySQL[®]
Reduces Costs by as Much as 90%**



A MySQL[®] Business White Paper

December 23, 2003

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Executive Summary

A recent Computerworld article, 'MySQL Breaks Into the Data Center' revealed how MySQL has become the world's most popular open source database and why corporations intent on lowering their cost of operations are using it to further commoditize their IT infrastructure.

Other experts are highlighting what many believe is a new era of databases. Charlie Garry from the Meta Group is confident that: "the future of the database market will be the standardization on MySQL."¹

After harvesting huge efficiencies from using open source software such as Linux and Apache, many companies are now targeting their database infrastructure for the next round of cost savings through commoditization. Indeed, savvy IT managers are exploring the use of an entire enterprise open source software stack known as LAMP (Linux, Apache, MySQL, PHP / Python / Perl) as a way to further improve operational efficiency.

Savings will vary between companies and projects, but on average companies are experiencing per-project savings of between \$250,000 and \$500,000. Larger projects, or enterprise deployments, are expecting savings in excess of \$10 million.

Based on similar studies by IDC², MySQL reduces the Total Cost of Ownership (TCO) of database software by:

- Reducing database licensing costs by over 90%
- Cutting systems downtime by 60%
- Lowering hardware expenditure by 70%
- Reducing administration, engineering and support costs by up to 50%

MySQL complements the use of existing corporate databases such as Oracle, IBM DB2 and Microsoft SQL Server by providing a less complicated solution suitable for widespread application deployment, including those with a high transaction volume. Web-based, Departmental client/server and ERP applications are top priorities for MySQL cost savings and fall into MySQL's "TCO Zone."

There are three key reasons why MySQL is world's most popular open source database:

1. MySQL is a fast, easy-to-use and reliable database developed and marketed at a fraction of the cost of proprietary software by using an open source approach. These cost savings are passed on directly to the customer.
2. MySQL has been battle tested in the market place. It has over 4 million active installations and over 35,000 downloads every day.
3. The MySQL database is supported by MySQL AB, a second generation open source company founded in 1995. The company is profitable, owns and supports all of its code and offers a unique dual licensing approach that gives corporations a choice and makes corporate purchasing easy.

In this white paper, you'll learn how organizations such as Cox Communications, NASA, Sabre Holdings and Yahoo! have improved database reliability, performance and TCO using MySQL. You'll also see how these techniques can apply in your organization.

¹ "MySQL Breaks Into the Data Center," *Computerworld*, October 13, 2003

² TCO Percentages by International Data Corporation, LinuxWorld SFO 2003

Driving Down Software Infrastructure Costs

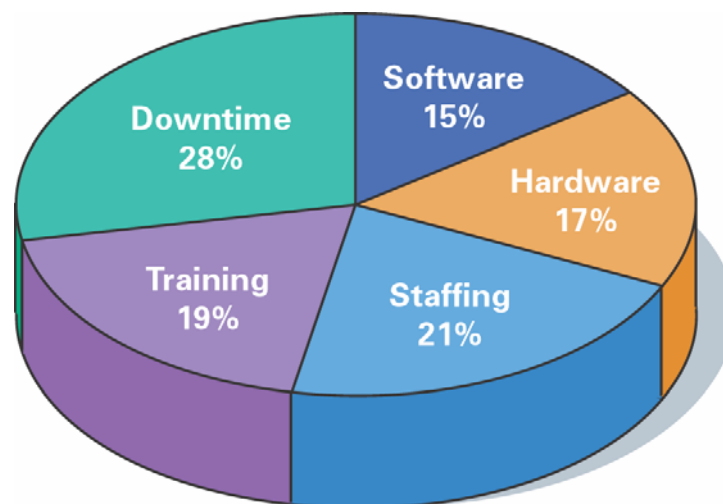
Throughout history, innovations have created new business opportunities, but it's only when these inventions become cost efficient that their potential to change markets is truly realized.

The pace of this evolution from invention to commodity varies -- steam engines took over 100 years, cell phones took 20 years, web servers less than five -- but the basis for change remains the same. The radical change is not the product's ability to do a job; it's the cost of doing it. Open source technology further accelerates commoditization by driving the widespread adoption of new technologies at a decreasing cost.

Server systems are a good example. Not long ago all central processing was done on multi-million dollar mainframes. As processing became less expensive, many tasks were moved to cheaper mid-range Unix servers. Now these jobs are being done on what many believe is the ultimate commodity server system -- the Intel Linux server. In fact, a recent survey by Forrester Inc.³ shows over 70% of \$1B+ North American companies are now running the Linux open source operating system.

To be truly efficient, a product must not only have lower up front license costs, but also slash the running costs that make up the total cost of ownership. In a recent study, IDC⁴ found that software cost is only 15% of the total cost of deploying an Oracle 8i Database application -- the hardware was 17%, staffing 21% and training 19%. A full 28% of the total cost of Oracle database deployment is attributed to system downtime.

TCO Breakdown of Database Software



³ Forrester Inc. "Your Open Source Strategy". Schadler, Rustein, Lambert, Tseng, Whitely. September 2003.

⁴ IDC, Maximizing the Business Value of Enterprise Database Applications on a Unix Platform. 2002.

Compared to traditional software, open source offers some key advantages:

Reliability and Performance. A huge community of developers tests the software across a range of platforms and uses before it is certified for production. Bugs are found and fixed quickly. Access to source code ensures a thorough understanding of the system. Developers can also make modifications or performance enhancements as necessary.

Ease of deployment. Because open source software focuses on the most essential capabilities, as opposed to having hundreds of rarely used features, installation and deployment is often easier than proprietary software. Most open source software now comes with easy-to-use installation software, graphical management tools, and on-line help.

Freedom from Platform Lock-in. By providing ready access to source code, open source ensures freedom, thereby preventing lock-in to a single company or platform. Open source software is typically available on dozens of platforms so you can choose the most economical for your project needs.

Security. Because open source software is out in the open, it is typically more secure and suffers fewer vulnerability attacks than proprietary software. When a problem is uncovered, it is addressed quickly.

Millions of Trained and Certified Developers. It's easy to find high-quality, skilled staff. The open source community is self-supportive, with vast product knowledge available on the Web. In addition, there is a large community of certified consultants, third party add-ins, technical books, training courses and so on.

Corporate acceptance of Linux has laid a foundation, both technically and culturally, for the broader adoption of open source technology. Leading organizations are now using open source database technology to further increase operational efficiency by driving down the cost of ownership for new and existing applications.

Beyond Linux – Databases Go Open Source

Just as Linux helped drive down the price of proprietary Unix servers by offering lower-cost, more reliable Intel and AMD based commodity servers, many believe that the time is ripe for change in the \$6.6 billion⁵ database market. The market has been dominated by three large incumbents, each consumed with introducing new "upgraded" proprietary technology at ever increasing prices year after year. Yet, paradoxically, many database users are seeking simpler, easier to use products that provide enterprise functionality at commodity pricing.

With software running about 16% of the TCO of database applications, the annual cost to the economy of running database applications can be estimated at over \$40 Billion. Not surprisingly, CIOs are on a warpath to reduce unnecessary spending by introducing open source database technology.

Charlie Garry, an analyst at Meta Group Inc. claims that as the leading open source database, MySQL is "a disruptive technology."⁶ According to Garry, the question is no longer whether companies will use open source databases, but rather "which open source database will they deploy."

⁵ Gartner Group. 2002 Database Market Estimates.

⁶ "MySQL Breaks Into the Data Center," *Computerworld*, October 13, 2003

Second Generation Open Source

MySQL AB can be characterized as 'Second Generation' open source company:

- MySQL AB is a commercial company. It develops the software in-house and owns all the relevant source code, patents, copyrights and trademarks. As a result, MySQL AB provides the support customers expect from a trustworthy vendor.
- The software is proven in very large deployments. MySQL customers such as NASA and Sabre Holdings use the software for very large applications that are critical to their business.
- An established user community backs MySQL. With over 4 million active installations and over 35,000 downloads per day, it is deployed as widely as any proprietary database software.
- MySQL provides dual licensing which enables corporations to purchase cost-effective licenses for commercial use, while offering open source licensing for open source projects.
- MySQL AB stands behind the software with 7 x 24 support, training, certification and consulting.

Among the factors that distinguish MySQL, one has become the defining difference: the business model. MySQL is maintained by a for-profit company.

MySQL's promotion by a company, rather than an organization, makes all the difference for customers, Meta Group Analyst Charlie Garry said. "That makes Global 2000 companies feel a lot better. It's a model they understand."

Enterprises know that MySQL has a codified support structure. "And, more importantly, because MySQL owns the rights, there is one definitive place to get MySQL," he said.

Enterprise Linux Today

Dual Licensing

The MySQL database is available at no cost for open source projects through an Open Source / Free Software General Public License (GPL), and is also available through a commercial license backed by MySQL. Under the commercial license option, companies can develop and distribute applications without opening their source code to the public.

This "quid pro quo" solution benefits everyone. The open source GPL license has created a huge user community with millions of developers. The testing and feedback from this community continually improves the product.

Since most corporations are neither willing nor able to publish their intellectual property, the commercial licensing option provides the benefits and support they need for a modest fee.

Why Over-Engineered Software Increases TCO

For years, proprietary database companies have been adding new features that are seldom, if ever, used. What's worse is that the continued addition of unnecessary features has resulted in overly complicated systems that are slower, more resource intensive, harder to maintain and more prone to failure.

Proprietary database companies continue to hit corporations with a double burden. Complicated, unused features push up both licensing costs and the cost of ownership.

Some number of applications will have high functional requirements and in these cases, Oracle, IBM DB2 or Microsoft SQL Server is appropriate. However, for many applications, MySQL is much less expensive to own and run. It is also faster and more reliable – even at very high levels of users and transactions.

Major Companies Recognize Lower TCO

For **Sabre Holdings**, any database downtime translates directly to large sums of lost revenue. The S&P 500 Company is one of the world's leading travel retailers, also providing distribution and technology solutions for the travel industry.

Its Air Travel Shopping Engine (ATSE) platform provides sophisticated fare searches to millions of customers every day. When you book a fare online with Travelocity or through a travel agent, you're almost certainly using the Sabre application. The system uses HP's NonStop servers and database for a core; all searching functions run on Linux, using MySQL.

By using MySQL in ATSE, Sabre Holdings will recognize multi-million dollar savings for the company. These savings are a combination of low license fees, low-cost 7 x 24 support, and reduced downtime.

Sabre has found MySQL to:

- Be highly reliable
- Deliver high performance
- Lower TCO
- Be easy to set up

According to Systems Architect Alan Walker, "We looked at all applicable products on Unix and Linux, and we benchmarked about five different configurations on two or three hardware platforms. MySQL ran faster or as fast as any commercial database we tested. It never crashed. It was the fastest to get working, taking us two or three days to port our whole code base to it and get going.

"Then, of course, MySQL saved us millions of dollars. We were quite happy to use a commercial database if it would make our core systems work. At Sabre, if you can't find the low fare or price a ticket, we can't sell a ticket to you.

"Now, if you are pricing a ticket on Sabre's system, you are pricing it on C++ code on MySQL and Linux. You're not pricing it on the mainframe anymore."⁷

NASA's Acquisition Internet Service (NAIS) has grown to be a vital component of its business, saving over \$4 million per year by managing large acquisitions online.

Dwight Clark, an IT Specialist and Systems Analyst at NASA says that when their previous database vendor decided to restructure its license program, NASA was faced with fees that would cost "more than twice their total annual budget" – for a simple upgrade.

With MySQL, NASA not only found a solution to their licensing problem, they uncovered a number of other unexpected benefits:

- **MySQL averaged 28% faster than their existing proprietary database.** Clark says that compared to other databases, "MySQL was not a machine resources hog."
- **Upgrading the application was simple.** "To switch to MySQL we only had to install the MySQL database driver module and change the connect call to the database interface module. Once this was done, we literally had to change one line of code out of 15,000 lines to begin using MySQL

A Selection of MySQL Customers

Yahoo!
Google
Cox Communications
DaimlerChrysler
The Associated Press
Earthlink
Alcatel SEL
Ericsson
Hoover's Online
Lufthansa
NASA
Caterpillar
Omaha Steaks
Powell's Bookstore
Sabre Holdings
Texas Instruments
United Parcel Service
US Census Bureau

⁷ "Innovation, cost-saving highlight mainframe-to-Linux move," *SearchEnterpriseLinux.com*, December 17, 2003

in our first application,” said John Sudderth, Senior Computer Scientist of Computer Sciences Corporation, who was the lead developer on the conversion project.

- **Support costs were slashed.** “The cost of the optional technical support for MySQL was about a fraction of that for the commercial product previously used.”
- **Extreme reliability.** “We’ve been up and running for 3 years now without any data loss or downtime. That’s just incredible,” said Sudderth.

NASA’s story is not uncommon. Many companies discover MySQL when looking for more cost-effective licensing deal, but end up reaping savings across a broad range of areas.

For example Mark Cotner, manager of network application development at **Cox Communications Inc.** in Atlanta used MySQL in a large data warehousing application. It runs across 27 collection servers with over 3,600 MySQL tables. MySQL’s replication feature is used to keep five copies of the database distributed across several large servers. The MySQL application currently has over 2 billion rows doing about 4 million inserts every two hours and the database is expected to grow to over 600GB in size.

By selecting MySQL, Cotner was able to budget just \$14,000 per year for license fees and maintenance compared to \$300,000 for a proprietary database. In fact, the whole set of database servers including hardware and license cost Cotner less than \$98,000.”

Measuring the TCO Benefits of MySQL

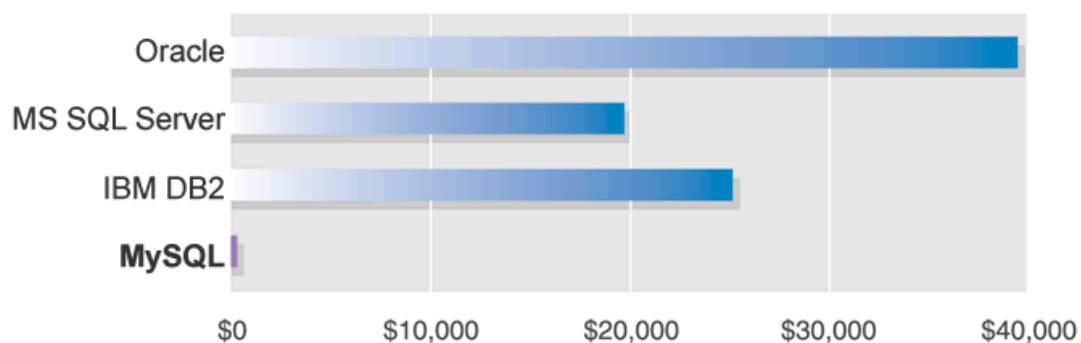
Major corporations have found that MySQL delivers costs savings in many different areas of their business. In this section, we’ll take a more detailed look at four major sources of cost savings that you can expect to see in your business:

1. Reduced database license fees
2. Better reliability avoids expensive downtime
3. Improved performance reduces hardware expenditure
4. Reduced administration, engineering and support costs

1. Reducing Database License Fees

A study by Meta Group into comparative database costs (detailed in the chart below) shows that MySQL can be **at least 90% less expensive** than products from other vendors.⁸

Comparing Database License Costs



⁸ “MySQL Breaks Into the Data Center,” *Computerworld*, October 13, 2003

Using MySQL helps companies free up budget for other projects and enables them to implement systems that were previously cost prohibitive.

2. Better Reliability Avoids Expensive Downtime

System downtime is often the most expensive cost of any application. As businesses have moved from batch processing to real-time enterprise systems running critical customer service or online sales systems, the impact of any outage directly impacts the bottom line:

Lost productivity of employees dependent upon the system. On a 1,000 user system, assuming an average loaded salary of \$40,000 per employee, downtime costs \$10,000 per hour, assuming that the employees are 60% productive on other tasks.

Lost revenue. Downtime on transactional systems is counted in lost orders. The average cost in revenue per hour is over \$12,000, although a company retailing over the web will be hit more severely. In such cases, lost revenues could exceed \$200,000 per hour.⁹

Increase in call center load. Companies are increasingly encouraging customers to use online self-service systems rather than costly call centers, saving an estimated \$14 per transaction. The cost impact of an outage is two-fold. First there is the hard cost of the increased volume of transactions being routed to an increasingly overloaded call-center. If two hundred additional calls are fielded per hour, this can easily come to \$2,800 per hour. Even worse is the loss of business from customers who become frustrated and don't call!

Increased IT costs. Outage fire drills have a direct cost to IT support groups. Every hour a team of 10 spend trying to remedy a system outage will cost over \$2,000. This figure can rise rapidly if engineering resources are required to remedy the problem with application upgrades. IDC found that the average annual downtime for a Unix database system is over 22 hours. For a 1,000 user system annual TCO impact starts at \$250,000 and increases dramatically for public ordering and self-service systems.

When e-Week¹⁰ stress tested the top five databases they concluded that only two could run their test for nine hours without crashing. MySQL was one of them.

It's not surprising that reliability is a major motivator for companies moving to MySQL. Using MySQL they can **reduce downtime by at least 60%**. This could result in **savings exceeding \$100,000** for most companies. For larger organizations, the improvements will be measured in millions of dollars of cost avoidance.

"I've got MySQL running on a dozen boxes, and none of them has ever failed since MySQL was installed more than 18 months ago. This kind of stability means that I don't have to worry constantly about database crashes, and then scramble to fix everything if one happens. It's peace of mind."

Rich Allen, MTA

3. Improved Performance Reduces Hardware Expenditure

By improving performance, MySQL applications can typically be run on lower cost, commodity hardware such as Intel based Linux servers. In eWeek's performance tests, compared to Microsoft SQL Server and IBM's DB2 7.2, MySQL was three times faster:

Database Server	Response Time in Seconds
MySQL 4.0.1	31
IBM DB2 7.2 Fix Pack 5	102
MS SQL Server 2000 Ent. Ed. SP2	109

⁹ IDC, Maximizing the Business Value of Enterprise Database Applications on a Unix Platform. 2002.

¹⁰ e-Week. "Sever databases clash"

IDC estimates that deploying on Intel Linux will reduce hardware costs by about 60%. MySQL's efficient performance can enable an additional 20% in savings resulting in **nearly 70% lower hardware-associated costs than running Oracle on Unix.**¹¹

4. Reduced Administration, Engineering and Support Costs

A combination of low complexity, high reliability and a wealth of support resources lowers the cost of developing, maintaining and supporting database applications using MySQL. The elegant and uncomplicated architecture has numerous benefits:

- Engineers are less likely to make mistakes. Complex systems often harbor hard-to-find bugs that are not apparent until deployment. Uncomplicated systems help reduce downtime.
- Non-complex tasks can be allocated to less expensive developers enhancing the overall productivity and cost-effectiveness of the team.
- MySQL training and certification focuses on excellence in core competences, rather than lightweight coverage of many superfluous features. Certified MySQL developers are true masters of their trade.
- Systems administration in MySQL is easier and less expensive. Regardless of skill level, a MySQL administrator will accomplish more in less time. In many cases administration can be handled by existing team members.
- Computerworld's research found that "The MySQL database is also easy to administer. For example, users say that data migration is a snap because administrators simply move their data directly into MySQL."

"Compared to Oracle, MySQL was considerably easier to maintain and tune."

Charlie Garry
Meta Group
Infrastructure Strategies
Server Infrastructure
Strategies, March 2003

In the rare case that administrators or developers need assistance, they find what they need very quickly from the huge volume of information published daily by the MySQL community. Searching for 'MySQL' in Google generates nearly 2 million more responses than searching for the most popular proprietary database. Since developers also have full access to the MySQL source code they can learn how the experts have implemented a feature. There is also a wealth of third-party consultants, partners, books, and certified training courses available. And MySQL provides excellent technical support for much less than typical proprietary database support.

Using MySQL, a mid-size company could easily free up 25-50% of the time of an experienced database administrator and improve the efficiency of development teams by 15%. Assuming a team of five developers and one administrator, savings would be in the region of \$50,000 in loaded salary time and \$10,000 in reduced training costs.

¹¹ IDC, Maximizing the Business Value of Enterprise Database Applications on a Unix Platform. 2002.

MySQL® - Powerful, Uncomplicated Software

Regardless of how inexpensive it is to buy and run, MySQL would have no credibility with corporate customers unless it delivered enterprise scalability. MySQL has the capabilities to handle most corporate database application requirements with an architecture that is extremely fast, reliable and easy to use.

Perhaps MySQL's architectural superiority comes from its Scandinavian origins -- extensive reuse of code and a minimalist approach make it a very clean and well-designed product. It comes with the all of the components for implementing and managing a corporate application.

MySQL CEO Marten Mickos, makes a virtue of his product's stripped-down simplicity. "Software shouldn't be glorified," he says. "We say, 'Let's do this as compactly as possible and then sell it at a price that blows the competition away.'"

The Wall Street Journal

The MySQL Database Server

MySQL includes standard enterprise features plus many innovations:

- A unique multiple storage-engine architecture provides greater flexibility. You can select a fast in-memory database or full transaction support with commit, rollback, sub-selects, crash recovery and low-level locking capabilities.
- Query caching delivers significant performance benefits and with database replication, many slave servers can run off a single master server increasing both speed and robustness.
- A robust security system with advanced permissions and support for SSL transport-layer encryption provides robust application security. Server resources can also be limited on a per server basis.
- Full text indexing and searching enables rapid searching of text fields for words and phrases. This includes relevance rankings, exact phrase matching and Boolean search operators.
- MySQL can be embedded into applications and devices using the Embedded Database Library.
- MySQL offers a high-availability multi-master clustering storage engine for applications that require maximum up time and automatic failover.
- Cross-platform flexibility is a major reason why companies select MySQL. MySQL is available on more than twenty platforms including all major Linux distributions, HP-UX, IBM AIX, Sun Solaris, Mac OS X, Novell NetWare and Microsoft Windows.

MaxDB™ by MySQL

MySQL has recently introduced the MaxDB database for the most demanding enterprise applications. Formerly known as SAP DB, MaxDB is the result of a strategic alliance between MySQL and SAP to jointly develop and market an enterprise-class open source database capable of running high-end business-critical applications including SAP/R3.

MaxDB complements the MySQL database, and is SAP-certified. It includes features such as stored procedures, triggers and views for the most demanding enterprise use.

Today, approximately 5,000 customers are using MaxDB technology globally, including Intel, DaimlerChrysler, Braun, Bayer, Colgate, Yamaha, Deutsche Post and Toyota South Africa.

"MySQL AB is a leading database vendor, with millions of active developers and users in its open source community that will energize MaxDB development and grow MaxDB's customer base."

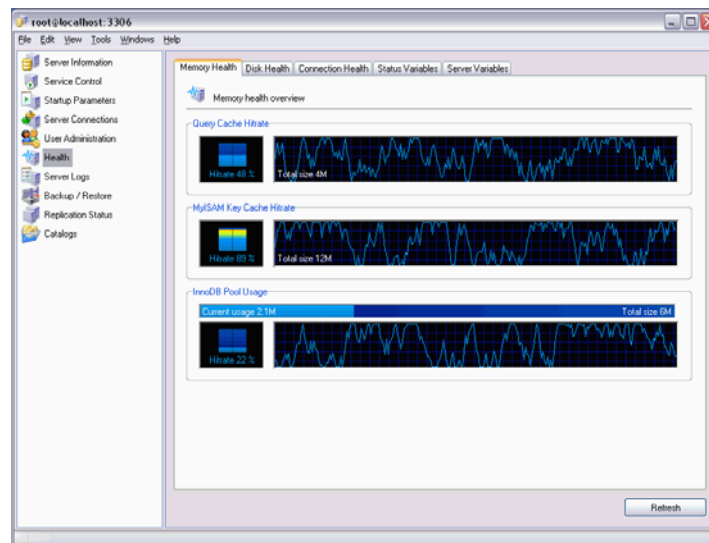
**Karl-Heinz Hess,
Extended Management
Board SAP AG**

Not only does MaxDB provide for high-end enterprise capabilities today, it also ensures that MySQL will continue to evolve. Both products share a common MySQL protocol thereby providing easy interoperability. And, with the joint development agreement, new enterprise features will be added to MySQL ensuring feature parity across products.

MySQL Graphical Tools

MySQL's graphical tools simplify database creation and remote management. SQL queries can be easily written and executed, tables examined and backed-up. MySQL is also supported by a broad range of third-party tools.

MySQL Offers Easy Centralized Management



MySQL Connector Drivers

MySQL provides a wide range of drivers allowing developers to integrate and customize database applications using their corporate tools of choice. Connectors include:

- **MySQL Connector/J** for Java.
- **MySQL Connector/ODBC** for accessing MySQL from applications such as Microsoft Access, Visual Basic or Borland Delphi.
- **MySQL Connector/C++** that provides a high level interface that enables C++ programmers to rapidly integrate MySQL whilst retaining full control and C++ standards compliance.
- **MySQL .Net** support is available through ODBC.Net, as well as ADO.Net solutions. MySQL is easily accessed from C# or other .Net languages.

The range of connectors makes it easy to incorporate MySQL into existing applications.

Using MySQL In Your Company

So would it be possible to derive TCO benefits similar to NASA and Sabre Holdings using MySQL within your organization? The answer is almost certainly “yes.” A significant proportion of your database applications portfolio can be run more cost-effectively using MySQL.

MySQL is most suited to applications that have a low-to-moderate degree of complexity and any level of users or transactions – from low to very high. In most corporations, this makes up an estimated 70-80% of database applications. These applications fall into the MySQL TCO Zone: Web-based, data warehousing, client/server and packaged applications.

Web-based Applications

The Web has become the de facto interface for distributed applications; nearly all Web applications are now database-driven. These applications are often public facing and implemented to provide a new channel for sales or to offset service costs. They must be robust and able to support peak loads without delay; accommodate frequent change and integrate easily to back-end systems.

MySQL is ideally suited to Web-based applications and is driving some of the world’s busiest Internet sites. Indeed, Yahoo!’s financial division and other properties uses MySQL to run a number of the site’s features. Travelocity uses MySQL to search for low-priced air fares.

“Our needs vary considerably, which is one reason why MySQL works very well for us. It handles the high-volume 260 million record databases just as well as the small, low-volume databases. One of our servers handled over a quarter of a billion queries in the last month, and it still has capacity to spare.”

Jeremy D. Zawodny Yahoo

Web-based interfaces are also increasingly used for internal corporate applications, especially corporate portals and intranet applications.

Data Warehousing

One of the fastest growing segments in corporations is the need for data warehousing to help provide greater insight and analysis of business trends. Data warehousing can help provide greater operational understanding of customers purchase habits and service needs enabling more effective sales and better service. Because of MySQL’s high performance, it is ideally suited for data warehousing projects and has been used by organizations to analyze and report on multi-billion row databases with millions of inserts every hour. MySQL’s performance also scales to deal with large databases measuring in the hundreds of gigabytes and terabytes. As a result, analysis can be fast and deal with the latest up-to-date information.

Client/Server Applications

A large proportion of corporate applications is, and will continue to be, client/server based. MySQL is very well suited for client/server applications providing high performance and ease of use. Support for all the major client/server development tools including Microsoft Access, Visual Basic and Borland Delphi makes it easy to use with existing tool suites. There are third party tools, such as PremiumSoft Navicat, which provide automatic “one click” migration of Access databases to MySQL.

Since departmental teams often implement client/server applications, MySQL’s ease of administration can significantly reduce the cost of ongoing maintaining for these applications.

Packaged Applications

Many enterprise applications vendors recognize that by supporting MySQL they pass on significant TCO benefits to their customers. Some have taken a step further and are embedding MySQL in their products as the default database. After all, it's easy to get up and running quickly with MySQL.

Novell Inc. is shipping a full commercial license of MySQL with every version of Netware 6.5. Sun Microsystems ships MySQL as standard with its Sun ONE Active Server Pages product and as the only database option for its Sun Fire servers.

MaxDB is certified specifically for SAP applications and can significantly reduce the TCO of SAP applications. Dr. Rudolf Munz, senior vice president for development platforms at SAP sums up their philosophy: "Infrastructure like databases should be as inexpensive as possible".¹²

Putting MySQL to the Test

MySQL can be used for virtually any database application. To get the fastest results, it's best to use MySQL for new applications or applications which are undergoing a significant upgrade or re-architecture.

- **Deploying New Applications on MySQL.** MySQL should be considered for any new database applications – especially Web based applications. Using MySQL on new projects will reduce the overall project cost and improve time to market.
- **MySQL as a Part of Scheduled Application Upgrades.** Applications are often re-architected to reflect new business requirements. This is a good opportunity to move the application onto MySQL. In most cases migration is surprisingly easy.

Before adopting MySQL on a broad basis, many organizations choose to conduct a technical evaluation and a pilot project as part of their due diligence.

- **Evaluating MySQL.** MySQL makes the full product and source code available for download at www.mysql.com. Evaluators may also download a test suite that will automatically test the limits and capabilities of MySQL or any database server.
- **A Pilot Project.** A pilot project gives an opportunity to evaluate how MySQL performs in a live environment – from prototype to production. Most pilots are run with a real application requirement that can be finished quickly.

Partial List of ISVs Using or Shipping MySQL

Agilent
Alcatel
Apple
Avery Dennison
BMC Software
Cisco
Critical Path
Dell
Ericsson
H-P
Hyperion
LeapFrog
SchoolHouse
Lucent
NEC
Nokia
Novell
Sterling Commerce
Sun

¹² "Vendors Make MySQL Deals, *Computerworld*, October 13, 2003

Conclusion

Adding open source software to the data center has become an increasingly strategic way for CIOs to reduce the total cost of their systems infrastructure -- TCO savings in excess of 75% or more with the dollar savings ranging from \$250,000 to several million dollars.

For thousands of companies worldwide, MySQL has proven lower Total Cost of Ownership (TCO) by:

- Reducing database licensing costs by over 90%
- Cutting systems downtime by 60%
- Lowering hardware expenditure by 70%
- Reducing administration, engineering and support costs by up to 50%

MySQL is fueling the next wave of IT commoditization, enabling leading organizations to develop and deploy new innovative applications more reliably and at lower cost than ever before.

About MySQL

MySQL AB develops and markets a family of high performance, affordable database servers and tools. The company's flagship product is MySQL, the world's most popular open source database with more than 4 million active installations. Many of the world's largest organizations, including Yahoo!, Sabre Holdings, Cox Communications, The Associated Press and NASA, are realizing significant cost savings by using MySQL to power Web sites, business-critical enterprise applications and packaged software. MySQL AB is a second generation open source company, with dual licensing that supports open source values and methodology in a profitable, sustainable business. For more information about MySQL, please go to www.mysql.com.