Optimizing Open Source DBMS and DBaaS for Digital Business

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Introduction

New, more complex data sources, higher performance demands, and the need for greater access to data has put increasing pressure on data center managers to accomplish more with their data infrastructures. Data center managers seek new ways to support today's faster application development models and look for new solutions that are flexible, highly performant, and innovative.

Open source software (OSS) has long been recognized as an opportunity to drive innovation in the enterprise, and its success in supporting operations and reducing costs is well documented: Linux for operating systems, Xen and KVM for virtualization, and JBoss and Apache for middleware. Recent advances in Postgres and the performance, security, and manageability enhancements that EnterpriseDB® (EDB™) has integrated into the database for its EDB Postgres™ Platform have produced a powerful open source-based alternative for the database layer. In addition, EDB provides EDB Ark™ for managing Postgres in various database-as-a-server (DBaaS) public, private, and hybrid cloud configurations, and delivering the benefits of the cloud to IT and business organizations for their database management system (DBMS) deployments.

Emerging best practices among some of the world's largest brands that are deploying EDB Postgres call for leveraging the open source-based DBMS for a range of workloads and retiring or reallocating licenses for more costly, proprietary solutions. Enterprises are using EDB Postgres to support new applications, cloud re-platforming, application modernization, and legacy DBMS replacement. They're reserving expensive commercial licenses to accommodate growth due to hardware upgrades for packaged applications tightly bound to the legacy DBMS and enterprise resource planning (ERP) expansions.

Today, the performance and stability of open source-based database management systems has been recognized by industry analysts. According to Gartner, "Open-source relational DBMSs (RDBMSs) have matured and today can be considered as a standard infrastructure choice for a large majority of new enterprise applications."[1]

The new enterprise data infrastructure model calls for open source-based and proprietary solutions to coexist, and database administrators targeting problems with their DBMS solutions that are best suited to the need and offer the agility required while being cost-effective.

Stumbling Blocks in the Data Center

Few things strike more uncertainty within an enterprise IT organization than adopting new database solutions, especially a relational database management system. The prominent view is that the RDBMS comprises the foundation of the data infrastructure and any disruption could bring enterprise operations to a standstill.

Adding to this resistance is the huge investment these systems require to operate and maintain. While the largest

RDBMSs are standards-based, each has proprietary data types, SQL extensions, semantic conventions and operational utilities. Application developers use these proprietary features extensively, and they often feel wed to a selected RDBMS product and vendor because of application and knowledge lock-in. CIOs understandably resist changing vendors; doing so increases technology risks and threaten to reduce developer productivity.

Rip-and-replace migrations have also been historically expensive and time consuming. Depending on the size and complexity of the database and dependent applications, migrations are thought to take months, years, or simply too long to even comprehend. So many CIOs have not even considered legacy database replacement as a viable database alternative.

Factors Forcing Change

Resisting change in the data center, however, is no longer an option. Some of the reasons should be quite familiar by now. First, there is the data – growing data volumes; new data types driven from social and mobile applications; new devices gathering and using data, such as smart grids, smart homes, smart machines, and others in the expanding 'Internet of Things'; and finally, growing demands across the enterprise for greater access to data that is not siloed.

Database administrators are also expected to manage larger and more complex data stores as enterprises adopt more specialized database solutions, such as NoSQL data stores, to tackle specific data challenges. These Big Data solutions, so-called for their ability to store and manage the vast accumulations of data acquired and analyzed at high velocity, have brought a host of new challenges and levels of complexity to IT.

The digitalization of technology to address new data-driven demands has also put new pressure on IT departments to modernize legacy infrastructure and applications. Organizations must refactor many applications to function

The Advance of the EDB Postgres Platform

PostgreSQL has emerged as the leading alternative to proprietary RDBMS products. Advances in recent years have added powerful new features and capabilities for evolving data challenges extending PostgreSQL beyond

Compounding the concerns is the growing complexity of data centers given the addition of new, NoSQL solutions for specific applications. Many data centers have become a patchwork of disparate solutions that don't integrate well and data silos that threaten long-term data integrity.

on more flexible, more scalable, and more efficient technology platforms such as hybrid clouds. These applications must support a growing array of users, from mobile users to new analytical and decision-making applications. They also must try to preserve as much value from legacy assets even as they implement new technologies.

The accelerated pace of digital business has rendered obsolete traditional IT practices, and many organizations have adopted more cloud resources. Traditional IT practices that required provisioning hardware and software, configuring the network, and essentially recreating resources that developers need repeatedly for new projects fall short of supporting DevOps models of application delivery. These methods also hamper an organization's ability to respond to changes in the business environment at the speed required to remain competitive. Yet moving applications to the cloud have introduced a host of new challenges for IT to control and manage the resources and for legal teams to unravel complex new licensing policies.

relational to a multi-model DBMS. EDB has further extended the community open source version of PostgreSQL with performance, security, developer, and manageability enhancements that global enterprises require in order to

deploy open source reliably and at scale.

Recent performance enhancements have emphasized processor core scalability, partitioning, sorting, indexing, lock management, and optimizer hints to enable the EDB Postgres™ Advanced Server database to handle applications across all mission tiers. In addition, database compatibility for Oracle in EDB Postgres Advanced Server provides popular Oracle data types and catalog views and a procedural language that executes Oracle PL/SQL and understands Oracle SQL extensions and syntax. This enables organizations to migrate from Oracle to EDB Postgres and continue to utilize much of their existing investment in applications, tools, and training. Further, EDB Postgres is SQL standards-based and, having been originally designed from the same research that produced Oracle, is comparable in many ways to Oracle so many DBA skills transfer.

Database compatibility for Oracle also speeds and eases the migration of Oracle databases so that EDB users have completed database migrations in hours or days. But it's also important to note that EDB Postgres deployments for new applications or migrations of non-Oracle databases have disproved the common belief that deploying a new RDBMS is time-consuming or too impossible to even consider. Postgres is a very extensible database. It is architected to support many different plug-ins such as procedural languages (e.g., PL/Java, C/C++, Python and more), index types, authentication schemes, and contrib modules.

Oracle compatibility is not just for legacy DBMS replacement projects. Developers and DBAs, long used to using Oracle and honing their skills, find EDB Postgres an easy-to-learn and productive platform for digital business projects such as new applications, application modernization, and cloud-replatforming initiatives as well.

Further, EDB has developed enterprise-class tools to enable database administrators to easily manage more, and bigger, Postgres database deployments. These tool suites and the database comprise the EDB Postgres Platform. The EDB Postgres Platform combines a tested and proven database with the enterprise capabilities necessary to manage multi-model data, connect with existing systems, and deploy rapidly across multiple environments. With EDB's flexible subscription model, organizations have the freedom and flexibility to deploy across any configuration that meets business demands, whether cloud (public, private, hybrid), infrastructure-as-a-service (IaaS), integrated with a platform-as-a-service (PaaS), containers, virtualization, or bare metal.

To assist organizations as they move data into the cloud, EDB developed EDB Ark. EDB Ark is a DBaaS for hybrid cloud deployments of Postgres to private and public clouds. EDB Ark gives IT managers and database administrators the combination of deployment flexibility with centralized control and monitoring. At the same time, it gives developers greater independence. Users can create databases using a graphical management console for self-service in minutes instead of waiting days or weeks, thereby supporting continuous delivery models required for today's accelerated strategic objectives. It is the only product that gives DBaaS users public cloud manageability for their private or hybrid clouds.

The EDB Postgres Platform has achieved widespread market acceptance. Among EDB's thousands of customers are 85 of the Fortune 500 and 169 of the Forbes Global 2000. They include ABN AMRO Clearing, Ericsson, Infor, KT Corporation, Nokia Siemens, Philippine Stock Exchange, Inc., Prudential Corporation Asia, Sony Online Entertainment, and UniGroup, among others. Governments worldwide also have been aggressive in their adoption of EDB Postgres. In the United States alone, EDB works with more than 150 Civilian, Defense, and Intelligence customers, many in the Department of Defense (DoD), including the Defense Information Systems Agency (DISA), as well as the Army, Navy, and Air Force. The EDB Postgres Advanced Server database was also the first

open source-based database with a DoD Security Technical Implementation Guide (STIG). Working with EDB, DISA evaluated EDB Postgres Advanced Server against the DoD's

stringent security requirements and developed the guide to define how EDB Postgres can be deployed and configured to meet security requirements for government systems, providing a roadmap for agencies to speed to deployment.

Optimizing EDB Postgres for Digital Business

As data demands have evolved, the PostgreSQL community and EDB responded, integrating into the database the kinds of functions and capabilities developers needed in order to work with many new data types. These included key-value support (HSTORE), full text search, a JSON data type/parser/functions, unlogged tables, XML, and large object Blobs. These additions turned PostgreSQL from a traditional relational DBMS to a multi-model DBMS, which is increasingly a requirement to support new digital business applications.

These capabilities support the needs of many companies whose data requirements have not swelled to a massive size or require extreme rates of ingestion speed to require a so-called Big Data solution. However, there are business use cases that call for new solutions, such as those developed around specialized technologies under the NoSQL umbrella.

Examples of these include mobile applications, applications that require data from numerous sources including IoT data stores, translytical use cases, personalization, and context-aware applications. In those cases, the base framework of PostgreSQL, designed from the beginning to be extremely extensible, enable EDB Postgres to integrate well with new tools.

EDB has invested significantly in research and development of Data Adapter to enable the EDB Postgres Platform to integrate easily with other solutions across the data center, including legacy infrastructure as well as NoSQL data stores like MongoDB and Hadoop. Along with this capacity to integrate, the EDB Postgres Platform also has the ability to combine data from structured and unstructured data solutions, and creates a cohesive data management fabric that accommodates a wider range of workloads and tasks.

"EDB Postgres' combination of unstructured and relational database technologies provides us the freedom, flexibility, and performance for handling unstructured and semi-structured data that we needed to optimally run our system."

Suresh Neravati, Database Administrator, Ericsson

Many enterprises have begun by deploying EDB Postgres to support new or refactored applications or easily migrated, whether enterprise-wide or single departmental. As their skills and experience developed and success was realized, enterprises have quickly expanded their EDB Postgres deployments across a larger swath of their digital business and modernization efforts. A survey of EDB customers found

that more users had deployed EDB Postgres for mission-critical applications than for those deemed non-mission-critical.

To help organizations realize success with their initial EDB Postgres deployments, EDB has developed a scoring method for applications. The process factors in such variables as the

number of concurrent users and transactions per second, as well as database size, high availability requirements, and disaster recovery requirements. It is important to note that only a small portion of applications in most enterprise portfolios truly require the specialized features or capabilities of traditional, more costly databases; the bulk can be supported by EDB Postgres.

Conclusion

Organizations are racing to leverage data and new technologies to fuel growth and drive competitive advantage. Speed to market is imperative and requires solutions with greater flexibility and increased effectiveness. The data infrastructure has become central to strategic differentiation and organizations that master the complexities of integrating new, more powerful data management solutions will gain market leadership.

Now more than ever, IT organizations are faced with a complex set of decisions regarding their database management infrastructures. Data volumes are exploding, and new data types are finding mainstream use with increasing frequency; analytics that leverage Big Data to fuel applications are driving competitive advantages; and advanced multi-core hardware footprints are driving license costs through the roof.

Open source-based multi-model DBMS products such as the EDB Postgres Platform offer a mature, cost-effective alternative to achieve digital business goals and objectives.

Let EnterpriseDB help. Contact us at sales@enterprisedb.com.

About EnterpriseDB Corporation

EnterpriseDB® (EDB™), the database platform company for digital business, delivers the premier open source-based data platform for new applications, cloud re-platforming, application modernization, and legacy migration. EnterpriseDB integrates with enterprise technologies and infrastructures for hybrid cloud management, data integration, and data warehousing. Our customers benefit from the highest performing, most reliable, flexible, open, and cost-effective data management platform available. EnterpriseDB is based in Bedford, Massachusetts with 16 offices around the globe. For more information, visit www.EnterpriseDB.com.

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Contact us

Australia	+61 2 8066 0855	**Japan**	+81 50 5532 7038	**United Kingdom**	+44 1494 616093
Germany	+49 241 4056653	**Netherlands**	+31 70 240 0933	**United States**	+1 781 357 3390
India	+91 20 366449600	**South Korea**	+82 2 6007 2500		