



System x solution with open source-based Postgres Plus Advanced Server database from EnterpriseDB



Highlights

- Realize enterprise security, availability, performance and manageability with EnterpriseDB® Postgres Plus® Advanced Server database on System x servers
- Improve application/VM performance with three times more memory capacity¹
- Gain a solution stack cost advantage through the comparatively lower cost of the open source-based software, licensing and support versus traditional software
- Migrate Oracle applications easily with a convenient Postgres migration toolkit

New technology, innovative solutions and forward-thinking business and IT managers have propelled the data center forward as a contributor to long-term business and strategic value. As IT managers address the demands for greater performance, infrastructure upgrades and increasingly hard-to-attain results on smaller budgets, the data center environment has begun a transformation.

Realizing significant savings from open source-based solutions across the enterprise stack, IT managers are bringing such solutions into today's data center. The result is lower costs, additional savings that can be applied to new projects, higher performance and greater flexibility to structure the data ecosystem.

The rising cost of managing data—whether from organic growth or hardware upgrades—has become a formidable challenge for IT leaders. Together, System x X6 servers and the EnterpriseDB Postgres Plus Advanced Server database offer a comprehensive solution that enables IT leaders to efficiently and effectively meet the constantly evolving demands of today's exploding data loads and diverse data. Postgres Plus Enterprise Edition is a unique, open source-based software offering that features database compatibility for Oracle® environments at an attractive cost versus competitive offerings. And to make the transition from Oracle easy, Postgres Plus also contains a migration toolkit. Combining world-class performance and simple-to-use transition tools, Postgres Plus on System x servers is an ideal solution for your most demanding database workloads.

"Postgres Plus optimizes price-performance for Lenovo customers while taking advantage of System x scalability to eight sockets."

— **Ethan O'Rafferty**,
Vice President, Alliances and Channels
EnterpriseDB



“We see Lenovo’s newest enterprise servers as the perfect foundation for our customers, who are now able to take advantage of performance, capacity and throughput.”

—Theo Long,
NA Managing Director,
Integrated Systems

With x86-based System x X6 server technology—including Intel Xeon enterprise-class processors—IT leaders get the high performance required in today’s data centers. The combination of System x enterprise servers and the powerful, open source-based Postgres Plus Advanced Server database from EnterpriseDB offers a cost advantage in the form of a less expensive overall solution stack. This is thanks to the comparatively lower cost of the open source-based software and its licensing and support model versus traditional software.

System x servers: Fast database performance

Built on the Intel Xeon processor E7-4800/8800 v2 product families, System x X6 enterprise servers offer extraordinary performance for database, big data, analytics, cloud computing and virtualization, and business logic/enterprise resource planning (ERP)/customer relationship management (CRM) workloads. X6 servers can provide:

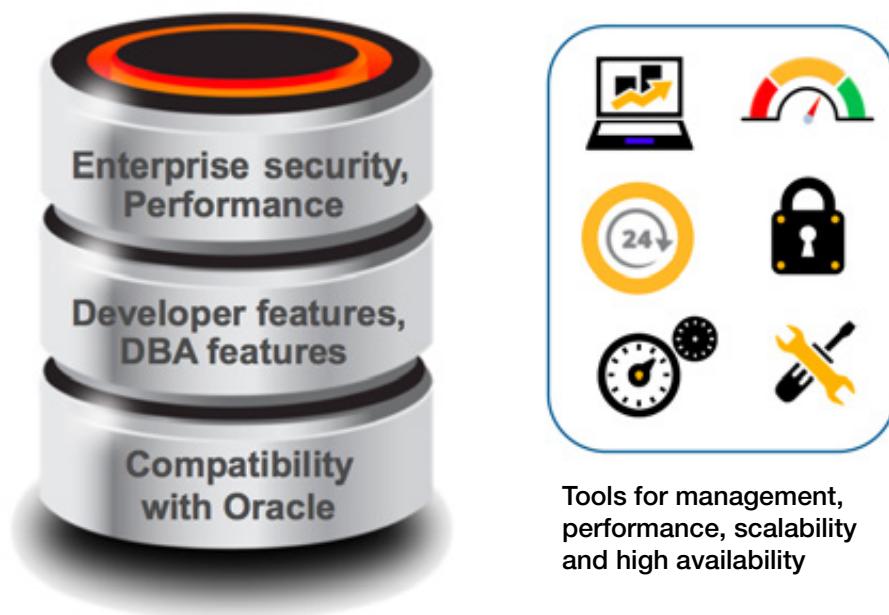
- Three times more memory capacity for increased application/VM performance
- Lower latency for significantly faster database performance

Open source for the data center

Postgres Plus Advanced Server extends the open source database PostgreSQL with the enterprise security, performance and manageability enhancements global organizations require. Robust and scalable, Postgres successfully supports mission-critical applications at some of the world’s most recognizable brands, including more than half of the Fortune 100.

Advances in recent years have added powerful new features and capabilities for supporting mission-critical enterprise workloads and helping database administrators (DBAs) manage large numbers of deployments. The latest release adds Resource Management, allowing DBAs to place governors on selected workloads and assign priorities to their access to system CPU and I/O resources. This prevents any single process from consuming resources and negatively affecting other more important processes. Other enhancements have emphasized processor core scalability, partitioning, sorting, indexing, lock management and optimizer hints to enable the EnterpriseDB Postgres Plus Advanced Server database to handle applications across all mission tiers (see Figure 1). Other performance enhancements include hierarchical queries, extended array handling, nested tables and a SQL Profiler for diagnosing and optimizing burdened SQL workloads.

Postgres Plus Advanced Server



Tools for management, performance, scalability and high availability

Figure 1. Postgres Plus Advanced Server adds enterprise security, performance, availability and manageability to the open source PostgreSQL database.

Postgres Plus Advanced Server also features two characteristics relevant to cost savings and meeting the demands of today's data-driven initiatives.

Migrate Oracle applications easily

Postgres Plus Advanced Server features database compatibility for Oracle, and supports popular Oracle data types and catalog views and a procedural language that executes Oracle PL/SQL and understands Oracle SQL extensions and syntax. This, along with the EnterpriseDB Migration Toolkit, enables organizations to migrate from Oracle to Postgres Plus Advanced Server and continue to utilize much of their investment in PL/SQL applications, tools and training. Postgres was born from the same technical heritage and designed to solve the same problems as Oracle, IBM DB2 and Microsoft SQL Server. Unlike the aforementioned databases, Postgres adheres closely to the ANSI-SQL: 2008 standard, making it more predictable and transportable for DBAs and developers alike.

- **EDB Postgres Enterprise Manager:** Enterprise monitoring, alerting, tuning and management for large-scale Postgres deployments from a graphical console.
- **EDB xDB Replication Server:** Versatile single-master and multi-master configurations solve a wide variety of data center needs.
- **EDB Failover Manager:** Minimizes database downtime by providing health monitoring, failure detection/notification, and automatic failover required in various 9s high-availability solutions.
- **EDB Backup and Recovery Tool:** Eliminates error-prone scripting and manual tasks with simple commands, retention policies, and a systemwide catalog across local and remote Postgres servers.
- **EDB SQL/Protect:** DBA-managed protection for your database against multiple types of SQL Injection attacks.



NoSQL capabilities

Postgres can support virtually all of today's modern data types as well as unstructured and semi-structured data. In fact, the web and mobile development capabilities in Postgres (that is, geospatial support, JSON documents, Key-Value store, XML and JavaScript support) enable it to achieve most of what NoSQL technologies have been designed to do.

The Postgres object-relational design provides an adaptable architecture that supports multiple programming languages (Java, C, C++, Python and so on), modern data types (JSON, Spatial, Key-Value), sophisticated indexing schemes (for example, B-tree, Hash, GiST, SP-GiST and GIN) and easy integration with other databases all without compromising performance or any of its Atomicity, Consistency, Isolation, Durability (ACID) properties for classic relational applications.

Database toolkit

EnterpriseDB has also developed enterprise-class tools for performance, scalability, high availability, and management. These tools enable database administrators to easily manage more and bigger Postgres database deployments.

One such tool critical for enterprise deployments is Postgres Enterprise Manager. It allows DBAs to efficiently manage, monitor and tune large numbers of Postgres servers en masse. Monitoring agents report back from each host to a global at-a-glance dashboard and send customized alerts to personnel through Simple Network Management Protocol (SNMP) or Simple Mail Transfer Protocol (SMTP) channels. The tool also monitors replication, reporting on lag time and conflicts, as well as performance, with features to help you optimize deployments.

Additional tools include:

- Failover Manager minimizes database downtime by providing health monitoring, failure detection/notification and automatic failover required in various 9s high-availability solutions.
- Backup and Recovery Tool eliminates error-prone scripting and manual tasks with simple commands, retention policies and a systemwide catalog across local and remote Postgres servers.
- xDB Replication Server replicates data with Oracle or Microsoft SQL Server and Postgres. Single and multi-master configurations solve a variety of data center problems including performance-increasing report servers, backup replicas, data migration, and consolidated reports and updates of integrated geo-dispersed databases in near-real time.

System upgrades that lower costs

Some of the world's most recognizable brands are deploying Postgres. These organizations espouse best practices that call for leveraging the low cost of open source for a range of workloads and retiring or reallocating licenses of more costly proprietary solutions. They are using Postgres to support new, refactored and existing easily migrated applications, while reserving expensive commercial licenses to accommodate growth in other areas due to hardware upgrades and ERP expansions.

Upgrading your systems to the System x Solution with Postgres Plus Advanced Server means you can meet your growing performance demands while reducing costs. With the savings, IT can divert budget to new, data-driven initiatives that make strategic contributions to the organization. The end result is a powerful, low-cost yet high-performing solution that meets today's data challenges and tomorrow's emerging demands.

System x servers: Agile system design

Faster performance is crucial to maintaining your competitiveness; however, it is a business reality that you will undoubtedly require more operational capabilities next year than you do now. Modular X6 servers, based on enterprise X-Architecture®, can meet your current and future demands.

As your business changes and grows, having the ability to address evolving data center needs today with easy-to-deploy solutions that also will deliver flexibility for tomorrow is critical. X6 servers offer long-term flexibility with a modular design that supports processor and memory technology upgrades to the next generation. As workload demands change, this eliminates the need to "rip and replace."

The X6 server portfolio can enable data center leaders to:

- Reduce acquisition costs greatly without compromising capacity or performance
- Realize significantly faster application performance
- Speed server deployment significantly
- Support multiple generations of processor technology within the same chassis²
- Scale up to 8 sockets and 192 DIMMs
- Swap components quickly, including Compute, Storage and full-length and half-length I/O Books as well as fans and power supplies

System x servers: Resilient enterprise platform

Speed and scalability are crucial to maintaining a competitive edge. Because unanticipated or excessive system downtime can neutralize performance and agility advantages, system dependability is equally important.

"The Lenovo 3850 X6 provides great scalability and performance for demanding databases such as Postgres Plus Advanced Server."

—Leo Martins,
Founder and Managing Director,
Pontus Networks

X6 servers have three categories of exceptional reliability, availability and serviceability (RAS) features:

- Memory Page Retire protects your X6 server against unnecessary repair actions and server restarts.
- Consumed Error Recovery keeps the server running in the event of an error and avoids impacting all the other work in process; bad memory can be corrected.
- Upward Integration Modules enable two types of actions to be completed:
 - Automating the movement of a workload from a server that issues a predictive failure alert to a trusted server in the cluster
 - Facilitating rolling firmware updates

System x servers: Fast, agile and resilient

Your enterprise database solution—and its ability to deliver actionable information when and where you need it—is increasingly important to your success. Therefore, your choice of database solution is critical. X6 servers deliver the capabilities you need to positively impact your bottom line. X6 servers are fast, agile and resilient.

For more information

For more information about **Lenovo X6 servers**, contact your Lenovo representative or visit: www.lenovo.com

For more information about **Postgres Plus Advanced Server**, visit:
www.enterprisedb.com/products-services-training/products/postgres-plus-advanced-server



¹ The x3850 X6 supports up to 6 TB maximum memory vs. 2 TB or less for previous-generation competitive 4-socket servers. The x3950 X6 supports up to 12 TB maximum memory vs. 4 TB or less for previous-generation competitive 8-socket servers.

² When a newer generation of processor and memory technology becomes available, Compute Books can be replaced with newer ones. (All Compute Books must use matching technology.)

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