



Pervasive PSQL Summit v10 Highlights
Performance and analytics

A Monash Information Services Bulletin

by

Curt A. Monash, PhD.

September, 2007

Sponsored by:

PERVASIVE[®]

Introduction

PSQL v10 features performance gains and new analytic functionality.

In September, 2007, Pervasive Software is releasing Pervasive PSQL Summit v10. As befits a major product release, v10 boasts a broad variety of enhancements and new features, especially in the areas of performance and query-related functionality.* Most important, Pervasive is tapping into two major industry trends:

1. More -- and more affordable -- RAM.
2. The growing importance of analytic (as opposed to purely transactional) technology.

**There also are important steps in standards compatibility, specifically with several layers of Microsoft operating software, especially Microsoft Vista. But those aren't covered in this paper; please contact Pervasive directly or go to www.pervasive.com for details.*

XIO accelerates performance.

Major releases of a database management system typically boast multiple performance improvements, and PSQL v10 is no exception. Most important are those delivered through a driver called XIO, for “(e)Xtreme I/O.” XIO contains a number of features, but the core idea is this. If you compress data intelligently, you get two big benefits:

- Less data has to flow from disk, so the system has to do less I/O (this is more relevant to analytics than to transaction processing).
- More data fits into cache, so the system often doesn't have to do any I/O at all (this is relevant to all kinds of processing).

The DDF Builder eases business intelligence against PSQL databases.

As well as boosting performance, PSQL boasts significant improvements in relational functionality. In particular, the reintroduced DDF Builder makes it much simpler to connect standard business intelligence tools to PSQL databases, or to build add-on relational-paradigm application modules. View-based security also offers an essential safeguard for those who want to exploit PSQL's relational flexibility.

There are compelling reasons to upgrade to PSQL v10.

Some applications chug away, unaltered, without users ever growing their own businesses or wanting additional functionality. For those, the current versions of PSQL may continue to be just fine. For the rest, however, an upgrade to v10 has much merit. First, better performance is always a good thing, whether it is used to preserve existing hardware investments or to increase the perceived value of new software installations. Second, if you want to add increased application functionality – either to serve new customers or to enhance existing installations – v10 makes it significantly easier to do so. And finally, v10 takes care of a lot of checkmark items in security and standards compliance that matter to a significant fraction of mid-range DBMS customers.

XIO

Better performance is always desirable.

Better software performance has many benefits. It can save costs for a customer, making sales easier or more lucrative. It can prevent the need for annoying and costly hardware upgrades. It can be the difference in whether or not users find new functionality appealing, especially on the analytic side. And sometimes it is just a pointless yet important checkmark item, necessary for making a sale. In v10, Pervasive has introduced a number of valuable performance improvements, many of them via a new module they are calling XIO (Xtreme I/O).

Database performance depends on limiting disk accesses.

Most measures of computer performance double every 1 ½ to 2 years. Disk rotation speed, however, has increased only 12.5-fold in the past 51 years, from 1200 rotations/minute on the first disk drive in 1956, to a top speed of 15,000 rpm today. As a result, by far the greatest limitation on database performance is the time it takes to actually get data on and off of disk. Consequently, a huge fraction of database performance engineering focuses on making disk accesses as rare as possible.

Best is when you don't touch the disk at all.

The ideal performance situation arises when a database sits entirely in RAM, so that the disk barely needs to be accessed at all. The ability to put a database entirely in memory is improving rapidly, for several reasons. Most obviously, 64-bit chips break the previous hard limit of 4 gigabytes of addressable RAM. Beyond that, PSQL v10 and XIO are engineered to make a larger fraction of total RAM available to the database cache than ever was possible before.

Compression helps.

One modern database management trend XIO follows is an increased focus on compression. With the processing power to compress and decompress data having become so cheap, compression is almost pure goodness. Many database operations are faster, because there's simply less data to move around. Even better, more data fits into faster tiers of storage – RAM instead of disk, processor cache instead of separate RAM chips.

XIO is in line with modern DBMS trends.

If there are two key trends improving database management system performance across the whole spectrum of products and vendors these days, they're compression and greater use of RAM. (A couple of others, such as massively parallel processing, are perhaps even more important in their particular sphere, but apply mainly to terabyte-scale data warehouses.) XIO is firmly in line with those trends. And so it makes Pervasive PSQL a much better product. And that means it's a strong reason to upgrade to v10.

Relational functionality

SQL functionality is important, especially for analytics.

Pervasive PSQL has been a widely used and effective embedded/OEM DBMS for a long time – indeed, for a long time before it had a relational interface. But while many successful applications have been written to its linked-list transactional interface, there really are some things that go better with SQL. In particular, much of the revenue, more of the growth, and yet more of the marketing pizzazz of the business software industry lies in the area of analytics, especially reporting and other business intelligence. Analytic technology is, deservedly, a huge driver of both initial and add-on software sales. And analytic technology is best and most commonly implemented using SQL.

DDF Builder makes relational functionality more accessible ...

In v10, Pervasive is reintroducing an important module called DDF Builder. DDF Builder lets the application developer create a flexible relational structure on top of a linked-list database. The physical structure may be very nontraditional for a relational system, but for almost all purposes, there's a fully relational logical structure.*

**Unless, of course, you're the kind of relational theory purist who doesn't think SQL is a relational language.*

... to developers and user organizations alike.

DDF Builder has at least four important uses:

- Developers can write add-on modules more easily to PSQL applications.
- Developers can more easily integrate business intelligence and other analytic tools with their PSQL applications.
- End-user organizations can themselves write add-on applications to PSQL applications (this is probably the least important of the four).
- End-user organizations can themselves integrate analytic tools with their PSQL apps.

View-based security provides essential protection.

Of course, flexible software comes at a potential price: If one can do more things more easily, then in particular one can do *bad* things in newer, slicker ways. Thus, better query tools create a greater need for information security. In v10, Pervasive has implemented an industry-standard solution to this problem: *view-based security*. That is, users can be given permission to query only against specific views rather than whole tables, limiting the rows and columns they have access to in any way that makes sense. Managers can be given free access to BI query and reporting – but only for data on their own departments. Users can be given access to colleagues' employment histories -- but not their salaries. Even customers and suppliers can, if desired, be given extranet access to that small subset of information that directly concerns them.

PSQL Summit v10's relational features are important.

Application development cycle times get ever shorter. Analytic capabilities are often installed in days or weeks. Even lightweight transactional capabilities sometimes need to be delivered on similar schedules. For decades, relational technology has been a key tool for delivering such agility. Pervasive PSQL Summit v10's relational upgrades let it benefit from the traditional advantages of SQL-based database management systems.

About the Author

For more than a quarter-century, Curt Monash has been a leading analyst of and strategic advisor to the software industry. Praised by Lawrence J. Ellison for his "unmatched insight into technology and marketplace trends," Curt was the software/services industry's #1 ranked stock analyst while at PaineWebber, Inc., where he served as a First Vice President until 1987. Since 1990 he has owned and operated Monash Information Services, a highly acclaimed technology analysis firm focused on enterprise software. He has been extensively published and quoted in the technology and general business press, and has been a regular columnist for Application Development Trends, Software Magazine, and Computerworld. To get Curt's latest research, please see www.monash.com/feed.php or the database-centric site www.dbms2.com.

Prior to his business career, Curt earned a PhD. in Mathematics (Game Theory) from Harvard University at the age of 19. He has held faculty positions in mathematics, economics and public policy at Harvard, Yale, and Suffolk Universities. For more information please see www.monash.com.

About the Sponsor

Pervasive Software is a global value leader in data infrastructure software. The company's award-winning products enable customers to manage, integrate, analyze, and secure their critical data. Pervasive's strength is evidenced by the size and diversity of its customer base, serving tens of thousands of customers in nearly every industry market around the world. With headquarters in Austin, Texas, Pervasive was founded in 1994 and sells its products into more than 150 countries.

The company can be reached via www.pervasive.com. Information about Pervasive PSQL Summit v10 in particular is at <http://www.pervasive.com/Database/Products/psql/Pages/WhatsNewInv10.aspx>.