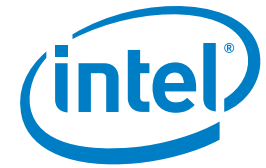


CASE STUDY

Intel® Cache Acceleration Software
Performance: Data-Intensive Computing
Non-Volatile Memory Solutions Group

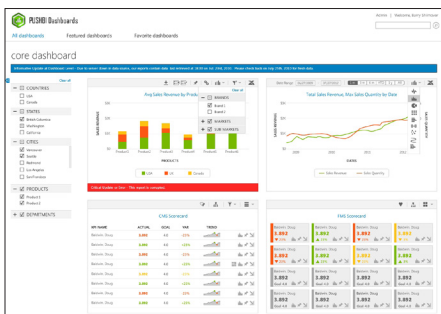


Turn Hot Data into Business Intelligence Faster with Intel® Cache Acceleration Software

Intel® Cache Acceleration Software with Intel® Data Center Solid-State Drives increases application performance with intelligent caching to enable up-to-date business intelligence while decreasing time and cost.

Extended Results* delivers end-to-end business intelligence (BI) solutions and consulting services, helping customers gain new insights and improve business operations to positively affect their bottom line. In 2010, the company debuted on Inc. Magazine's list of fastest growing privately held companies in the U.S.

Extended Results relies on a dedicated set of servers to cache and test the speed of database query results that populate their dashboard reporting solutions. In the past, Extended Results utilized two hard disk drives along with Microsoft* SQL Server* 2012 Enterprise software to read simulated data sets and populate dashboard solutions. Extended Results tested the querying load time of their existing setup with HDDs against Intel® Cache Acceleration Software (Intel® CAS) with the Intel® Solid-State Drive Data Center S3700 Series. Extended Results experienced lengthy load times when querying large data sets and was intrigued to see the impact Intel® CAS with Intel® Solid-State Drives (SSDs) would make.



"At Extended Results we work with our customer's Big Data every day by delivering innovative BI solutions and services. By utilizing Intel® CAS and the Intel® SSD DC S3700 Series within our business intelligence software products, we found an extra 3x in performance when processing that Big Data. This is an exciting opportunity, not just for our software products, but for providing Big Data insight enabling our customers to make informed business decisions quickly."

*- Patrick Husting,
Founder/CEO, Extended Results, Inc.*

CHALLENGES

- **Reduced productivity.** The existing hard disk drives and software in the test servers experienced significant lag when querying on data sets larger than five million records. This forced developers to spend additional time waiting for queries to load.
- **Less efficient customer data analysis.** Lengthy query load times impact the quantity and timeliness of customer-ready BI data analysis.

SOLUTION

- **Intel® CAS and Intel® SSD DC S3700 Series.** Testing developers added two Intel® SSD DC S3700 Series to their server configuration and deployed Intel® CAS.

IMPACT

- **Enhanced developer productivity lowers costs.** Intel® CAS paired with the Intel® SSD DC S3700 Series enabled developers to perform queries in significantly less time with queries for data sets with more than 10 million records loading between two and three minutes faster, allowing them to complete testing faster and reduce costly load waiting time. Overall query load times are up to three times faster and were achieved without data migration effort or administrative overhead.
- **Faster, more scalable customer data analysis.** Utilizing Intel® CAS with the Intel® SSD DC S3700 Series has increased the speed of querying and data population during customer data analysis, which has helped Extended Results sales and marketing efforts.

While the term "business intelligence" (BI) was once a term mainly reserved for enterprises, the need to gain the right insights to make timely, informed decisions is now a priority for businesses of all sizes. At the same time, BI solutions cannot demonstrate their full value unless they are adopted, utilized and evangelized by their users. As a solution provider and consultancy,

Extended Results strives to personalize BI for their customers to ensure their data is always up-to-date and accessible to inform decision making.

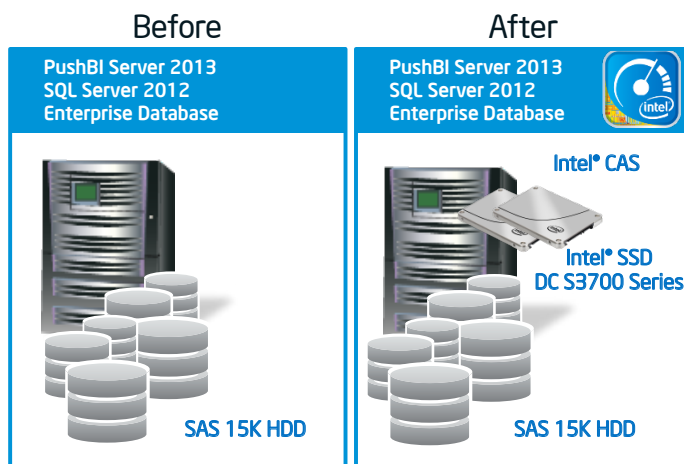
Extended Results previously relied on a 500GB 15K SAS hard disk drive-based configuration for their solution testing servers consisting of Windows Server 2012 Enterprise and Microsoft SQL Server 2012 Enterprise. The company's PushBI* Server executes database queries that correspond to dashboard reports at scheduled intervals and caches the query results. This enables PushBI Server to quickly and effectively populate the BI dashboard solutions, including their most innovative personal business intelligence, to PushBI. Extended Results tested the caching capabilities and query loading speed of their existing hard disk drives compared to Intel® CAS with the Intel® SSD DC S3700 Series. "Our hard disk drive-based configuration was able to cache and load test query results at a reasonable pace when pulling from our smaller data sets, but became noticeably slower when pulling from data sets larger than five million records," says Srinu Nallapareddy, BI Solutions Architect at Extended Results. "We were curious to find out what Intel's caching solution could do to help us save time and money."

"Implementing Intel caching solutions in our test server configuration has allowed us to reduce costs and be more efficient. Our developers are able to spend less time waiting for queries to populate and they get more done in less time, which saves money for the business."

*- Srinu Nallapareddy,
BI Solutions Architect, Extended Results*

CONFRONTING REAL-LIFE BI CHALLENGES WITH INTEL® CAS

Testing developers added two Intel® SSD DC S3700 Series to their server configuration and deployed Intel® CAS. Developers performed two unique queries on both the existing hard disk drive-based configuration and Intel® SSD-based configuration with Intel® CAS. The first query involved simulated yearly sales data, comparing sales amounts to order quantities sold. The second query simulated promotion effectiveness, comparing sales stemming from promotions to sales unrelated to promotions. Sample data sets used for the querying tests contained 5, 7.5, 10, 15, and 20 million records.



SPOTLIGHT ON EXTENDED RESULTS

Founded in 2006, Extended Results provides Business Intelligence (BI) consulting and develops personalized tools, leveraging customers' existing investments to deliver cost effective, easy to deploy and simple to understand solutions. The company serves customers in a variety of industries – including media/entertainment, financial services, government, healthcare, manufacturing, high technology, marketing and retail—and develops solutions ranging from dashboards and mobile BI to integration with Microsoft SharePoint and Microsoft SQL Server. Extended Results is positioned as an industry leader in developing and providing personal BI solutions. Extended Results is headquartered in Redmond, WA. For more information, visit extendedresults.com.

ACCELERATED DATA POPULATION WITHOUT ADDITIONAL OVERHEAD

Both test queries were executed multiple times to measure how Intel® CAS with Intel® SSDs could supplement the existing SQL Server disk caching. Developers found the most significant improvements in querying data sets with more than 10 million records, with some queries loading between two and three minutes faster. Queries with 10 million records were aggregated to return a dataset containing 1,122 rows with 5 columns and queries with 20 million records were aggregated to return a dataset of 644 rows with 8 columns. The combination of installing Intel® CAS on the servers and using Intel® SSDs in place of hard disk drives allows Extended Results to cache and read “hot data” faster by migrating data between DRAM and SSDs based on I/O intensity. Query load times are up to three times faster for their BI applications and were achieved without migration effort or administrative overhead. Extended Results used the default configuration for Intel® CAS making implementation easy.

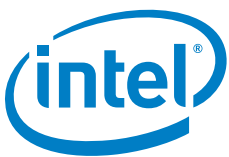
REDUCED DEVELOPMENT COSTS

As a result of faster querying times, Extended Results has been able to continually develop solutions faster by utilizing Intel® CAS and Intel® SSDs, in turn reducing development costs. “Implementing Intel caching solutions in our test server configuration has allowed us to reduce costs and be more efficient”, says Nallapareddy. “Our developers are able to spend less time waiting for queries to populate and they get more done in less time, which saves money for the business.” In addition to faster testing and development, implementing Intel® CAS and Intel® SSDs in their server configuration has enabled Extended Results to better demonstrate the scalability of their solutions, helping the company market their solutions to new and existing customers.

Learn how Intel Cache Acceleration Software can seamlessly accelerate target applications, prioritize application performance, increase storage performance and more at intel.com/content/www/us/en/softwareintel-cache-acceleration-software.

Find the Intel® Solid-State Drive that’s right for you. Visit intel.com/go/ssd for product information.

To learn more about other Intel business solutions, please visit the Reference Room at intel.com/references.



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