

# TAKE YOUR RETAIL BUSINESS TO THE NEXT LEVEL

MODERNIZE YOUR DATA CENTER TO MAXIMIZE DATA-DRIVEN BUSINESS VALUE

With Intel® Xeon® Scalable processors and Intel® SSDs



## ACCELERATE THE ONLINE SHOPPING PROCESS TO KEEP CUSTOMERS FROM STRAYING

Customers get impatient when ordering screens take too long to load. Upgrading to new servers with Intel® Xeon® Scalable processors cuts wait times significantly, making it more likely your customer buys from you instead of going to a competitor.



Up to **75%** faster real-time access to data<sup>1</sup>

by upgrading from Intel® Xeon® processor E7-8890 v4 to Intel® Xeon® Platinum 8180 processor



## MEET DEMAND DURING PEAK SALES PERIODS

Cyber Monday can make or break a business. Choosing servers with Intel® Xeon® Scalable processors means you're better able to keep up with demand.

Up to **3.48x** more customer change orders per second<sup>2</sup>

by upgrading from Intel® Xeon® processor E5-2690 to Intel® Xeon® Platinum 8180 processor

Up to **38%** faster SAP HANA® Query performance<sup>3</sup>

by upgrading from Intel® Xeon® processor E7-8894 v4 to Intel® Xeon® Platinum 8180 processor



## BUILD DATA-DRIVEN INSIGHTS INTO THE CUSTOMER EXPERIENCE

Effective analytics can improve retailers' efforts to understand shopper behavior in and across channels. Stepping up to Intel® Xeon® Scalable processors and Intel® Optane™ SSDs for data center can double the amount of data you can sift through to increase sales and visits.

Up to **2x** performance for analytics over prior generations<sup>4</sup>

by upgrading from Intel® Xeon® processor E5-2699 v4 and Intel® NVMe SSDs to Intel® Xeon® Platinum 8180 processor and Intel® Optane™ SSDs for data center



## MAKE BETTER BUSINESS DECISIONS WITH FASTER INSIGHT INTO TRENDS

Having the freshest data lets you predict future sales, build better campaigns and deliver the right service and support.

Up to **4x** more transactions in near real-time<sup>5</sup>

by upgrading from Intel® Xeon® processor E5-2697 v3 + Aerospike Server Enterprise 3.6.4 to Intel® Xeon® Platinum 8180 processor + 10 gigabit Ethernet controllers+ Aerospike Server Enterprise 3.12.1

## OPTIMIZE SALES EFFORTS WITH PERSONALIZED ADVERTISING

Insights gleaned from sales patterns, history and trends let you create more effective ads.

Up to **1.48x** increased location filtering throughput<sup>6</sup>

by upgrading from Intel® Xeon® processor E7-8890 v4 to Intel® Xeon® Platinum 8180 processor

To learn more about Intel® Xeon® Scalable processors and our ISV partners, visit [intel.com](http://intel.com)

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit <http://www.intel.com/benchmarks>.

1 Altibase 7.1\* : Altibase 7.1\* workload. OS: CentOS® 7.3 kernel 3.10.0-514. Testing by Intel and Altibase May 2017. BASELINE: 2S Intel® Xeon® processor E5-2699 v4, 2.2GHz, 22 cores, turbo and HT on, BIOS SE5C610.86B.01.01.0014.121820151719, 128GB total memory, 8 slots / 16GB / 2400 MT/s / DDR4 LRDIMM, 1TB HDD(SATA 7200rpm), CentOS 7.2 kernel 3.10.0-327. NEW: 2S Intel® Xeon® Platinum processor 8180, 2.5GHz, 28 cores, turbo and HT on, BIOS SEC5C620.86B.01.00.0265.083120160756, 192GB total memory, 12 slots / 16GB / 2666 MT/s / DDR4 LRDIMM, 800GB SSD (Intel® SSD DC S3710), CentOS 7.3 kernel 3.10.0-514. Intel Compiler 17.0.2. BASELINE: 4S Intel® Xeon® processor E7-8890 v4, 2.2GHz, 24 cores, turbo and HT on, BIOS BRBDXD1.86B.0338.R00, 512GB total memory, 32 slots / 16GB / 1600 MT/s / DDR4 LRDIMM, 800GB Intel® S3700 SSD DC 2EA in RAID 0, CentOS 7.2 kernel 3.10.0-327. NEW: 4S Intel® Xeon® Platinum processor 8180, 2.5GHz, 28 cores, turbo and HT on, BIOS PLYDCRB1.86B.0087.D0B.160524155, 768GB total memory, 24 slots / 32GB / 2666 MT/s / DDR4 LRDIMM, 1.2TB SSD(Intel® SSD DC S3710), CentOS 7.3 kernel 3.10.0-514. Intel Compiler 17.0.2

2 Up to 3.48x claim based on Brokerage Firm OLTP: 1-Node, 2 x Intel® Xeon® Processor E5-2690 with 256 GB Total Memory on Windows Server® 2008 R2 Enterprise using SQL Server® 2008 R2 Enterprise Edition. Data Source: Request Number: 251, Intel Benchmark: Brokerage Firm OLTP, Score: 1714 Higher is better vs. 1-Node, 2 x Intel® Xeon® Platinum 8180 Processor with 764 GB Total Memory on Windows Server® 2016 RTM Standard using SQL Server 2016 Data, Score: 5979 tps for OLTP. Higher is better

3 SAP/Lenovo®: Comparing the Intel® Xeon® Platinum 8180 processor results for the SAP BW Edition for SAP HANA® (SAP BW/4HANA®) Standard Application Benchmark from June 2017 to the Intel Xeon processor E7-8894 results for the SAP BW edition for SAP HANA Standard Application Benchmark from February 2017 (See [www.sap.com/documents/2017/02/2732a32-a77c-0010-82c7-eda71af511fa.html](http://www.sap.com/documents/2017/02/2732a32-a77c-0010-82c7-eda71af511fa.html) or <https://lenovopress.com/lp0616-x3850-x6-sapbw4hana-benchmark-result-2017-02-07>). Configurations: BASELINE CONFIGURATION: Lenovo® System x3850 X6, 4 processor / 96 cores / 192 threads, Intel® Xeon® Processor E7-8894 v4, 2.40 GHz, 64 KB L1 cache and 256 KB L2 cache per core, 60 MB L3 cache per processor, 2048 GB main memory for the SAP BW benchmark in February 2017; SAP HANA 1.0 and SAP NetWeaver® 7.50 and SuSE Linux Enterprise Server® 11. Query throughput (higher is better): 4,273; query runtime (lower is better): 154; data load (lower is better): 14,939. NEW CONFIGURATION: Lenovo ThinkSystem SR950, 4 processor / 112 cores / 224 threads, Intel® Xeon® Platinum 8180 Processors, 2.50 GHz, 1792 KB L1 cache for the SAP BW/4HANA Standard Application Benchmark in June 2017, 28672 KB L2 cache and 39424 MB L3 cache per processor, 1536 GB main memory. SAP HANA 1.0 and SAP NetWeaver 7.50 and SuSE Linux Enterprise Server 12. Query throughput: 5,921 (38.50 percent improvement); query runtime: 143 (7 percent improvement); data load: 14,302 (4 percent improvement).

4 SAS Business Analytics®: SAS 9.4 m4 application running the 30 session SAS Mixed Analytics workload. OS: CentOS 7.2 kernel 3.10.0. Testing by Intel and SAS May 2017. BASELINE: 2S Intel® Xeon® processor E5-2699 v4, 2.2GHz, 22 cores, turbo on, HT off, BIOS 275.R01.1603300531, 256GB total memory, 16 slots / 16GB / 2133 MT/s / DDR4 LRDIMM, 7 x 800GB Intel® SSD DC S3700, 1 x 2TB P3700 Intel® SSD Data Center Family for NVMe®, CentOS® 7.2 kernel 3.10.0. NEW: 2S Intel® Xeon® Platinum processor 8180, 2.5GHz, 28 cores, turbo on, HT off, BIOS 01.00.0412.020920172159, 384GB total memory, 24 slots / 16GB / 2666 MT/s / DDR4 LRDIMM, 4 x 800GB, Intel SSD DC S3710 + 4 x 375GB P4800X Intel® Optane™ SSDs, CentOS® 7.2 kernel 3.10.0.

5 Aerospike Database: The database was populated with 200 M records of 100 bytes each and benchmarked with the Aerospike Java Benchmark tool (<https://github.com/aerospike/aerospike-client-java>). The workload simulated 95%/5% read/update ratio. Two Aerospike instances were launched on a single server forming a cluster. Each Aerospike instance was affinitized to a CPU socket and configured to use one of the 10GB NICs. Each 10GB NIC had its interrupt IRQs affinitized to a CPU socket. BASELINE (HSW-EP): Aerospike Server Enterprise 3.6.4, CentOS 6.7, kernel version 2.6.32-573.3.1.el6.x86\_64, 2 Intel® Xeon® processor E5-2697 v3, 2.6GHz, 28 cores, 128GB DDR4/1866, regular DIMM, 2x 10Gb network Intel X540-AT2 not bonded, no disk used – in memory workload, Clients: 8 client systems were used to concurrently submit queries to the servers and drive the workload. The same clients were used in both "baseline" and "new". The clients were configured as follows: E5-2697 v3 128GB of memory and 10GB Intel X540-AT2 network. The database was populated with 400 M records of 100 bytes each and benchmarked with the Aerospike Java Benchmark tool (<https://github.com/aerospike/aerospike-client-java>). The workload simulated 95%/5% read/update ratio. Two Aerospike instances were launched on a single server forming a cluster. NEXT (BDW-EP, new software): Aerospike Server Enterprise 3.12.1, OS: CentOS 7.2 with kernel updated to 4.4.59, Intel® Xeon® processor E5-2699 v4, 2.2GHz, 22 cores, turbo and HT on, BIOS SE5C610.86B.01.01.0016.033120161139, 128GB total memory, 16 DIMMs / 8GB / Configured Clock Speed: 1866 MHz / DDR4 DIMM, 2 x Intel® 82599ES 10 Gigabit Ethernet Controllers – all 4 ports on the 2 network controllers were bonded for an aggregate 40000Mb/s bond. No storage – in-memory workload. NEW: Aerospike Server Enterprise 3.12.1, OS: CentOS 7.2 with kernel updated to 4.4.59, Intel® Xeon® Platinum processor 8180, 2.5GHz, 28 cores, turbo and HT on, BIOS SEC5C620.86B.01.00.0412.020920172159, 384GB total memory, 12 DIMMs / 32GB / Configured Clock Speed: 2666 MHz / DDR4 DIMM, 2 x Intel® 82599ES 10 Gigabit Ethernet Controllers – all 4 ports on the 2 network controllers were bonded for an aggregate 40000Mb/s bond. No storage – in-memory workload. Clients: 8 client systems were used to concurrently submit queries to the servers and drive the workload. The same clients were used in both "baseline" and "new". The clients were configured as follows: CentOS 7.2 with kernel 3.10.0-327. Intel® Xeon® processor E5-2697 v4, 2.3GHz, 18 cores, turbo and HT on, BIOS SE5C610.86B.01.01.0016.033120161139, 128GB total memory, 8 DIMMs / 16GB / Configured Clock Speed: 2400 MHz, 1 x Intel® 82599ES 10 Gigabit Ethernet Controllers

6 Software AG Apama® Streaming Analytics processing workload. OS: CentOS 7.2\*. These results are all generated with the source of data on a 2 socket Xeon Platinum 8180 system, which sent events over a pair of bonded 10GbE NICs to the 4 socket system under test. The throughput is in millions of events (location updates) per second. Testing by Software AG June 2017. BASELINE: 4S Intel® Xeon® processor Intel® Xeon® E7-8890 v4, 2.2 GHz, BRBDXD1.86B.0338.R00.1603162127, 512 GB memory, 32 \* 16GB DDR4 DIMMs, 1866MHz. NEW: 4S Intel® Xeon® Platinum 8180 processor, 2.5 GHz, PLYDCRB1.86B.0119.R05.1701181843, 1.5TB memory, 24 \* 64GB DDR4 DIMMs, 2666 MHz