When you think about big data, you might think of operations analysis or getting a 360° view of your customers. But your company is probably already producing tons of actionable data right now without realizing it: your machine-generated data. Needles of insights to help with user activity, information security, compliance, and IT audit are hiding in your haystacks of machine data—if you can find them.

Latest generation of Intel® Xeon® processors and Intel® Solid-State Drive (SSD) storage can deliver much faster time to insight when compared to previous-generation Intel® hardware. And Splunk Enterprise* can help you find the value in your machine data and transform how your company gains insights on everything from managing and securing IT to customer and service trends.

This data is growing but more slowly than other types of data. And the technologies to manage it are capable and widely used. There is also human-generated data, such as documents, text messages, and video. Technologies such as those offered by Google* are very good at harvesting, indexing, and managing human-generated data. In addition, document-management systems handle some of this information, and those technologies are well known and mature.

However, a whole realm of data that has been around for years but rarely analyzed for insights is machine-generated data. Part of the challenge to handling machine data is the massive volumes of data that are being generated by devices, such as servers, web streams, and mobile devices. This data comes in a huge variety of formats that range from highly structured to unstructured—and time is a critical dimension. This is the kind of data that Splunk Enterprise harnesses.
Splunk Enterprise—Exploring Machine Data

Splunk is a first mover in helping unlock the actionable insight that is locked up in your machine data. Machine data is an incredibly valuable resource, but organizations like yours might not know how to extract value from it. Existing data analysis, management, and monitoring solutions are simply not engineered for this type of data.

Take information management as an example. Data warehouses and relational database management systems are based on rigid schemas and are designed for structured, consistent data. They provide historical analysis but not real-time visibility. Enterprise search is great for human-generated data such as documents and web pages but is not up to handling unstructured machine data. Machine data is an order of magnitude more challenging in both scale and diversity.

On the other hand, IT management tools and security information and event management are siloed and designed for only one level of an organization. They provide a narrow view of the underlying data and are hard-wired for specific data types and sources. Or they monitor across systems, with serious gaps in the data they collect. And they can’t provide historical context.

Finding a better way to sift, distill, and understand the vast amounts of machine data your company generates can transform how your IT organization manages, secures, and audits IT. It can also provide valuable insights for the business on trends and the behaviors of your customers and services.

Splunk Enterprise is the industry-leading platform to unlock operational intelligence from the massive streams of machine data that are generated by your IT systems and technology infrastructure—physical, virtual, and in the cloud. Examples of types of machine data and the insights they can provide include:

- **Application logs** can provide critical information for reporting business and user activity, detecting fraud, and monitoring and reporting application performance.
- **Business process logs** record customer activity across multiple channels and, when combined other logs, can help provide full business activity monitoring.
- **Call detail records (CDRs)** log telecommunications and network switch events that can be used for marketing intelligence.
- **Clickstream data** captures user Internet activity that is valuable for usability analysis, marketing, and general research.
- **Database audit logs and tables** can provide insight for security (who is accessing and changing data) and query optimization (how do applications use the database).
- **File system audit logs** provide vital data for monitoring and investigating access to sensitive data.
- **Packet/flow data** can help identify network performance degradation, timeouts, bottlenecks, or other suspicious activity for stronger security.
- **Supervisory control and data acquisition (SCADA) data** can be used to identify trends, patterns, and anomalies in industrial equipment in fields like energy, transport, oil and gas, water, and waste control to help save energy and money.
- **Sensor data** can capture environmental conditions, such as temperature, sound, pressure, power, and water levels that can power myriad practical applications.
- **Syslog** records the state of network connections and can yield insight for network troubleshooting, analysis, and security auditing.
- **Web access logs** can produce marketing insights through web analytics reports, such as daily counts of visitors and most requested pages.
- **Web proxy logs** are a vital component of effective corporate network monitoring and data leakage investigation.
- **Windows’ event logs** can provide understanding about problems with business-critical applications, security information, and IT usage patterns.

Splunk Enterprise gives you one place to search, report on, analyze, and visualize all this data.

Intel—Why Your Hardware Matters

The value of your data isn’t the data itself, but the actionable insights you can draw from it—and the speed at which you can do it. Servers built on the Intel® Xeon® processor E5-2600 v2 product family and that are using Intel® SSD DC S3700 series storage can dramatically reduce your time from data to insight and reduce your operating costs for big data workloads through increased server density compared with previous-generation hardware. The Intel Xeon processor E5-2600 v2 is designed for efficiency, power, and security. Intel’s manufacturing process for the Intel Xeon processor E5-2600 v2 delivers tremendous performance improvement and power reduction: this 22-nm processor can have up to 12 cores and a 30-MB cache and delivers up to 45 percent greater energy efficiency over previous-generation Intel Xeon E5 family processors. Intel® Intelligent Power Technology adds to these gains by dynamically optimizing performance versus energy consumption across all operating points. Not only can greater efficiency drive down operational expenses, it can also increase server density—by up to 40 percent per rack with Intel® Datacenter Manager. The Intel Xeon processor E5-2600 v2 can also help protect your data with hardware-embedded features like Intel® Data Protection Technology with Secure Key and Intel® Device Protection Technology with OS Guard.
The right storage can also yield performance benefits for demanding workloads like big data analytics. Big data is big and requires intensive input/output operations on your storage. Intel SSD DC S3700 series storage delivers 4-KB random read performance of up to 75,000 input/output operations per second (IOPS) and 4-KB write performance of up to 36,000 IOPS—all delivered with low active power consumption (less than or equal to 6 watts). In addition to efficient performance, Intel SSD DC S3700 series storage helps protect the fidelity of your data. By combining an advanced error correction scheme in NAND, SRAM, and DRAM memory in the drive, this SSD also protects data in transit through parity checks, cyclic redundancy checks (CRC), and logical block address (LBA) tag validation. With High Endurance Technology (HET), Intel SSD DC S3700 series storage is also designed to meet the demanding write needs of big data workloads, achieving 10 writes per day over a five-year life.\(^{11}\)

**Test Methodology and Results**

Intel and Splunk teamed together to test the specific benefits that the Intel Xeon processor E5-2600 v2 and Intel SSD DC S3700 series storage can bring to Splunk Enterprise workloads. Upgrading to the latest-generation Intel Xeon processor E5-2600 v2 resulted in a 1.4 times speed up over the previous generation Intel Xeon processor E5-2600 for CPU-intensive workloads.\(^{12}\)

**CPU-Intensive Workload**

The results for input/output (I/O)-intensive workloads was even more dramatic. Switching from serial-attached SCSI (SAS) to Intel SSD DC S3700 series storage on latest-generation Intel Xeon E5-2600 v2 processors sped up performance 10.7 times.\(^2\)

**I/O-Intensive Workload**

Coupling Intel hardware with Splunk software also goes beyond raw performance. The energy efficiency of Intel Xeon E5-2600 v2 processors can help you increase server density and decrease operational expenses. Upgrading your hardware to use Intel Xeon E5-2600 v2 processors and Intel SSD DC S3700 series storage can help your business achieve business insights faster from your data. And joining the industry-leading power of Splunk Enterprise to next-generation processors can enable you to unlock the value of your machine data to transform how your company manages, secures, and audits IT while also providing business insights on customer and service trends.

**Splunk Enterprise and Intel Hardware: Better Together**

Your company is producing mountains of valuable data without even knowing it. Machine-generated data coming from your servers, applications, IT infrastructure, websites, and devices can provide insights on business operations and opportunities. The trick is finding the insights buried in the data.

Splunk Enterprise is an ideal platform for this task. It is a first mover in helping companies gain critical insights from the vast amounts of machine data that companies like yours generate. Intel Xeon processor E5-2600 v2 and Intel SSD DC S3700 series storage can help boost the performance of Splunk Enterprise to bring actionable insights to light faster from your data.
Extract Critical Insights from Your Machine Data

1 Test results based on a synthetically generated data set. 'Previous Generation' baseline configuration: 2 Intel Xeon® processors ES-2690 (20M Cache, 2.90 GHz, 8 Cores) using 8x 32GB DDR3-1333 memory (256GB). Score: 3.97 tests per second. 'New Generation' new configuration: 2 Intel Xeon processors ES-2697v2 (30M Cache, 2.70 GHz, 12 Cores) using 8x 32GB DDR3-1333 memory (256GB). Score: 5.59 tests per second. Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.

2 Test results based on a synthetically generated data set. ‘SAS’ baseline configuration: 2 Intel Xeon processors ES-2697 v2 (30M Cache, 2.70 GHz, 12 Cores) using 8x 32GB DDRIII-1333 memory (256GB) with 16x HP 72GB 15K RPM SAS storage configured in RAID 0 and a LSI MegaRAID SAS 9285-8e storage controller connected to LSI Storage Array. Score: 5.56 tests per second. ‘SSD’ configuration: 2 Intel Xeon processors ES-2697 v2 (30M Cache, 2.70 GHz, 12 Cores) using 8x 32GB DDR3-1333 memory (256GB) with 4x 400GB Intel SSD 3370 series (2.5” 6Gb/s SATA) storage configured in RAID 0 and a LSI MegaRAID SAS 9285-8e storage controller connected to LSI Storage Array. Score: 5.97 tests per second. Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.


4 40 percent increase in density per published proof of concept at http://communities.intel.com/docs/DOC-4212.

5 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 information go to http://www.intel.com/performance. Results have been measured by Intel based on software, benchmark, or other data of third parties and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance. Intel does not control or audit the design or implementation of third party data referenced in this document. Intel encourages all of its customers to visit the websites of the referenced third parties or other sources to confirm whether the referenced data is accurate and reflects performance of systems available for purchase.


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9 Both read and write figures are based on the Intel® Solid-State Drive DC S3700 Series Product Specification.


11 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. By using this document, in addition to any agreements you have with Intel, you accept the terms set forth below.

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