

Activate the Value of Big Data with SAS® and Intel: Data Preparation and Deployment with Hadoop and an Enterprise Data Warehouse

The challenge of preparing data and operationalizing analytics

The more data you capture for your business, the more potential value awaits you. To unlock this value, however, you need a reliable, scalable way to transform and prepare the data. Storing, transforming, analyzing and understanding all that information requires a strong data preparation and model deployment solution – one that can support fast, in-depth analytics.

Building on more than 20 years of engineering collaboration and problem-solving, SAS and Intel have the answer. SAS world-class analytic capabilities and big data technologies using the Intel® Xeon® processor E7 v2 family and Intel® SSDs provide integrated, scalable enterprise solutions that help you extract maximum value from your data while helping you manage data center space, cooling and power costs.

Hadoop and enterprise data warehouse analytics with SAS® and Intel

Many organizations are moving to Hadoop for data storage and processing – and for good reason. Distributed solutions using Hadoop can more efficiently store, process and analyze large volumes of data while running on industry-standard servers. Companies have also utilized easily scalable, highly available Enterprise Data Warehouses (EDWs) for data processing and analysis.

Traditionally, data management solutions can become unreasonably slow and costly as your data sets grow. By combining SAS software, Intel platforms, Hadoop and EDWs, you can have a faster, more efficient and less costly approach to your data preparation and model deployment workflows.

Data preparation and deployment with Hadoop and an EDW: A SAS® and Intel architecture for big data analytics

As your data sets grow bigger and bigger, performing analytics can become very expensive in terms of both time and resources. To reduce the cost of preparing and analyzing your data, the SAS data preparation and deployment architecture connects a SAS grid and Hadoop, both of which are built on platforms using the Intel Xeon processor E7 v2 family, to an EDW. This architecture delivers:

- Substantial SAS performance improvements through distributed data preparation, data quality and model scoring.
- Lower costs, due to reduced data movement.
- Better scalability of analytic workloads.
- Improved accuracy and governance through centralized data storage, security and administration.

To reduce data movement, it uses SAS Embedded Process, a software component deployed to all nodes, to facilitate the use of SAS Scoring Accelerator, SAS In-Database Code Accelerator and SAS Data Quality Accelerator both in Hadoop and the EDW (note: Teradata only).

By combining SAS grid, Intel platforms, Hadoop and EDW, you can expedite data preparation and model deployment activities and improve data quality, while increasing data analysis productivity. This highly scalable, highly available infrastructure can help you utilize your resources more efficiently, save money and improve your data management strategy.

The power you need for strong analytics

SAS applications provide an integrated environment to solve a variety of complex business problems, so it's no surprise that they require strong computing performance and reliability. Fortunately, they get all that and more

with platforms using the Intel Xeon processor E7 v2 family and Intel SSDs with NVMe.

The Intel Xeon processor E7-4890 v2 brings multiple advantages to analytics, data management and business intelligence. This processor can rapidly process large amounts of data in real time, keeping data in memory to overcome data-demanding workloads. Key gains over previous-generation technology include:

- **Higher core count.** Use fewer servers for the same work with 60 cores per server.
- **Increased memory capacity and I/O** With a capacity of up to 6TB of memory, now solve very large problems through in-memory processing.

- **Increased computational capabilities.** Get both data fidelity and fast analysis.
- **Highly reliable.** Count on world-class uptime with a platform designed for five nines (99.999 percent) of reliability.

Intel Xeon processors E7 v2 work seamlessly with Intel SSDs with NVMe, which provide a fast PCI Express interface improving on previous-generation SATA drives. The Intel SSD DC P3700 Series with NVMe brings high storage performance directly to a server's processors. The Intel SSD DC S3700 Series also combines fast, consistent performance with high endurance and strong data protection.

Systems using the Intel Xeon processor E7-4890 v2 and Intel SSDs provide the flexibility, reliability, memory, storage speed and overall performance you need to enable big data analytics. By using the SAS data preparation and deployment solution with Hadoop and EDW, you can ensure the quality of your data and speed up time to insight.

About SAS and Intel

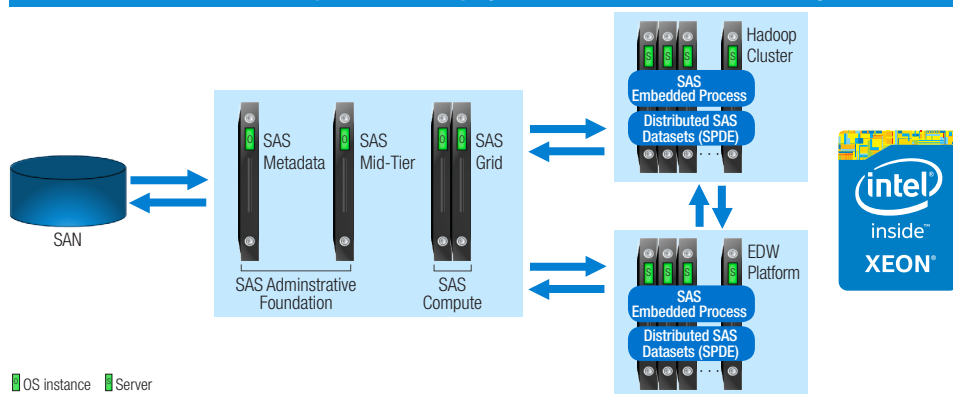
SAS is the leader in business analytics software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions, SAS helps customers at more than 70,000 sites improve performance and deliver value by making better decisions faster. Since 1976 SAS has been giving customers around the world THE POWER TO KNOW®.

Intel (NASDAQ: INTC) is a world leader in computing innovation. The company designs and builds the essential technologies that serve as the foundation for the world's computing devices. Additional information about Intel is available at intel.com.

Learn more

To learn more about how SAS and Intel can help you maximize the value of your data, contact your SAS or Intel representative or visit sas.com/intel.

SAS® Distributed Data Preparation and Deployment Architecture – Medium Configuration



SAS Distributed Data Preparation and Deployment Architecture			
SAS Administrative Foundation		SAS Compute	Hadoop Cluster
SAS Metadata	SAS Mid-Tier	SAS Grid	Cloudera or Hortonworks
RHEL 6.5	RHEL 6.5	RHEL 6.5	RHEL 6.5
1 OS instance (min) (Physical or Virtualized)	1 OS instance (min) (Physical or Virtualized)	2 OS instances (Physical or Virtualized)	4 servers (min)
2 sockets/server (min) Intel® Xeon® E5-2640 v3 (16 cores)	2 sockets/server (min) Intel Xeon E5-2640 v3 (16 cores)	4 sockets/server Intel® Xeon® E7-4890 v2 (60 cores)	Intel® Xeon® E5-2690 v3 (24 cores)
Starting at 128GB per OS instance	Starting at 128GB per OS instance	Starting at 256GB per OS instance	256GB/server (min)
8+ active cores per OS instance	8+ active cores per OS instance	Up to 60 active cores per OS instance	
Multiple OS instances may share a single physical machine to best leverage resources. Intel recommends 2 Boot Intel SSD DC S3700 Series - 200GB per OS instance running SAS.			
SAS Distributed Data Preparation and Deployment Architecture – Storage and Network			Hadoop Cluster
Starts at 800GB Intel® SSD DC S3700 per OS instance	Starts at 800GB Intel SSD DC S3700 per OS instance	Starts at 4 Intel® P3700 1.6TB SSD (PCIe) per OS instance - reference SAS I/O and file system requirements	Starts at 4 Intel SSD DC S3700 (800GB each)
Total Intel SSD DC P3700 Series 1.6TB: 8+, Total Intel SSD DC S3700 Series - 800GB: 6+, Network recommendation: 10Gb Ethernet minimum.			
Software			
SAS Configuration	Cloudera Hadoop	Hortonworks Hadoop	Third Party
SAS Grid Manager, SAS Data Management, SAS Enterprise Model Management, SAS In-Database Code Accelerator, SAS Data Quality Accelerator, SAS Scoring Accelerator, SAS/ACCESS® Interface to Hadoop, SAS/ACCESS Interface to Impala, SAS Office Analytics	Impala, Core Components, Cloudera Manager	Ambari, HDFS, MapReduce, Nagios, Ganglia, Hive	MS Office 2013, PuTTY, MobaXterm
The sample architecture referenced in the table above is for informational purposes only, is not a performance benchmark, and does not constitute a performance guarantee. SAS and Intel recommend that customers engage in a formal sizing exercise before acquiring hardware.			



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