



**The SAS<sup>®</sup> Enterprise Intelligence Platform:  
SAS<sup>®</sup> Scalable Intelligence Server**

*A flexible and scalable storage solution optimized  
for business and analytic intelligence*

**SAS<sup>®</sup>9**



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## Executive summary

The emergence of analytic and business intelligence applications has introduced new data access and usage patterns that are straining traditional relational database management systems (RDBMS). These systems were not designed to search large tables of information for small amounts of user-requested data. They also were not designed to produce the summarized reports demanded by modern business intelligence applications, nor to support the intensive simulation and modeling requirements of advanced analytic intelligence applications.

**SAS Scalable Intelligence Server** is a dedicated solution designed from the outset to efficiently disseminate information for business intelligence and analytic intelligence applications. SAS offers relational and OLAP (online analytical processing) storage options to suit all types of application profiles. This includes everything from simple reporting and OLAP dissemination to advanced forecasting and data mining. An open, integrated metadata framework enables these storage and dissemination options to be provided transparently to a wide range of applications and environments.

SAS Scalable Intelligence Server is an element of the SAS Enterprise Intelligence Platform, an integrated platform that delivers enterprise intelligence while extending the value of existing hardware and software infrastructures.

Read on for more about the challenges of data storage in an enterprisewide intelligence architecture, and how SAS solutions address those challenges.

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## Key challenges of enterprise intelligence storage

Data has taken on a life of its own and reached new levels of importance in business and society. As our reliance on data technologies has expanded and evolved, so have the underlying requirements for managing, protecting and distributing that data.

In spite of the advances of the last two decades in computing power and capacity, Information Technology (IT) groups are still hard-pressed to keep pace with burgeoning data requirements. For every storage capacity gain and for every advance in CPU processing power, there has been a commensurate leap in the horsepower demanded by applications and the volume of data they generate and use.

And today's emphasis on business intelligence and analytics as competitive differentiators is redefining the very nature of how applications use data — evolving from transactions to insights and from list reporting to derived intelligence. In transforming data storage architectures to reflect these changes, IT teams face a number of challenges.

**Tracking transactions or generating intelligence — the data requirements are different.**

The fundamental physical-row storage architecture of relational database systems has been optimized for transactional processing. Such systems were not designed to search large tables of information for small amounts of user-requested data. Neither were they designed to produce the summarized, slice-and-dice reports demanded by modern business intelligence applications, or the intensive “what-if” simulation and modeling requirements of advanced analytic intelligence applications.

**Information resides in incompatible operational silos.**

Many organizations have evolved an IT architecture where information resides in operational and historical “silos” distributed around the business, often stored on various platforms in inconsistent formats, with various definitions and usage conventions. Individual departments often purchase applications and storage independent of a corporate IT plan.

As businesses have grown organically and through mergers and acquisition, many have evolved into multichannel operations in which operational data has been captured in a wide variety of sources and formats, such as ERP systems, RDBMS systems, flat files and Web logs. Such disparate information must be collated from these distributed, heterogeneous silos in order to be useful to decision makers.

**Data integrity throughout the enterprise is crucial but elusive.**

Business intelligence and analytic intelligence applications support reliable and effective decisions, but only if they’re working with reliable and effective data. As organizations decentralize the decision-making process, IT managers have to give individual business units and their many users access to the same unified view of all information held throughout the whole organization. This information dissemination capability must provide a unified view that spans multiple operational systems, such as order-processing and manufacturing systems, without interfering with the current functions of those systems.

**Data must be efficiently disseminated to many different types of applications.**

The IT infrastructure typically must service many different types of applications that need access to data in many different forms, while minimizing the costs of tuning and maintenance, maximizing performance — and without upsetting the data collection strategy.

RDBMS systems handle the data collection problem, but now IT needs a way to address the dissemination issues that are critical to many organizations’ success. The storage capability must be able to efficiently disseminate information to corporate intelligence applications throughout the organization using open standards, regardless of vendor.

Storage solutions must be able to efficiently disseminate information to corporate intelligence applications throughout the organization using open standards, regardless of vendor.

**Reports are ad hoc and virtually impossible to anticipate.**

Getting meaningful intelligence out of operational data systems is difficult. Insights are hidden in all that accumulated data, but are not readily translated into reports that help run the business. IT can't give users free range to query operational data stores themselves because they could adversely affect performance, bring the systems down or interfere with the operational integrity of the data. And the IT group can't anticipate every possible report that might be requested by business users, and predefine a complete library of ready-to-use report templates. So, end users constantly rely on IT to create customized extracts in all kinds of formats. This effort redirects IT resources from other critical projects.

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**Data warehouse loading takes too long.**

In spite of investments in high-performance hardware to accelerate data integration processes, jobs often cannot be completed during the available time window. Jobs run into the next day and affect users' abilities to report on current business activity. The problem intensifies at month-end, quarter-end and year-end — and so does the visibility and consequence of delays or failures. Furthermore, the longer it takes data integration processes to run, the greater the caretaking obligation and risk of failure. Faster throughput would ease the burden on IT staff and computing resources, and would please users with faster response times.

**In a point-and-click culture, users won't accept sit-and-wait reporting.**

In virtually all organizations, end users have come to expect information delivery with the immediacy of a mouse click. Waiting even a day for results of a query is becoming unpopular, and users are pressing management to fulfill their rising expectations. With legacy data storage structures, IT departments are hard-pressed to meet new expectations for query and reporting response times across business and analytical areas. Resources must be devoted to workarounds and customizations — expensive, stopgap fixes at a time when IT budgets are lean.

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## **Toward a new data storage paradigm**

All data storage devices and designs are not alike, as many organizations that are attempting to create intelligence from massive quantities of data have discovered. Today's organizations need storage options that are flexible, and that leverage current hardware investments while providing avenues for growth as storage needs expand.

The data storage solution must be able to collate information from distributed, heterogeneous silos and transactional/operational systems, distill subsets of this information in a way that is useful for decision makers and then disseminate a unified view to many different types of clients across the organization.

End users constantly rely on IT to create customized extracts in all kinds of formats. This effort redirects IT resources from other critical projects.

This data storage solution must support the advanced analytic and reporting capabilities users require, including real-time interaction with the data. It should help ensure the data integration processing times and ad hoc query turn-around times IT and users expect. Furthermore, the solution must be open to support integration with a wide range of software architectures across a variety of platforms and operating systems.

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## Optimize your existing infrastructure with the integrated SAS Enterprise Intelligence Platform

SAS has developed an integrated platform for delivering enterprise intelligence. This platform, which we call the SAS Enterprise Intelligence Platform, optimally integrates individual technology components within your existing infrastructure into a single, unified system. The result is an information flow that transcends organizational silos, diverse computing platforms and niche tools — and delivers access to the insights that drive value for your organization.

The SAS Enterprise Intelligence Platform extends the value of your existing systems while setting the stage for new levels of enterprisewide intelligence not previously possible. In the process, you'll jump-start the evolution of the IT organization from cost center to strategic partner.

### Components of the SAS Enterprise Intelligence Platform

The SAS Enterprise Intelligence Platform allows you to optimally configure the technology components within your architecture to deliver intelligence throughout the organization at the lowest total cost of ownership and with the fastest time to intelligence.

- **SAS Data Integration** provides prebuilt, high-performance capabilities for data connectivity, data quality, ETL (extract, transform and load), data migration, data synchronization and data federation.
- **SAS Scalable Intelligence Server** is a dedicated solution that efficiently stores and disseminates information for business intelligence and analytic requirements, offering relational and OLAP storage options from the same foundational inputs.
- **SAS Analytic Intelligence** is an integrated environment for predictive and descriptive modeling, forecasting, optimization, simulation, experimental design and more. SAS Analytic Intelligence leverages existing data and infrastructure to support effective decision making and integration into business intelligence environments.
- **SAS Business Intelligence** delivers a set of BI capabilities that enable different types of users to surface meaningful intelligence from consistent, companywide data.

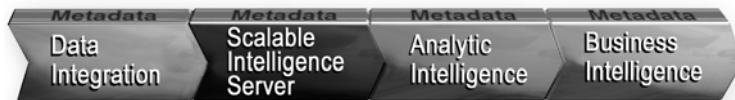
As part of an integrated platform, all components and services are managed from a single point, reducing the administrative effort for maintenance of applications, users and security. Data consistency is assured because metadata is stored in a single metadata repository and is shared across all SAS technologies and solutions. Supporting a wide range of open standards, the SAS Enterprise Intelligence Platform has been designed to facilitate integration with existing IT infrastructures.

When integrated into a single, cohesive technology platform, these components help you optimize your current intelligence environment and better align IT with the strategic objectives of the organization.

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## SAS Scalable Intelligence Server

*The storage component of the SAS Enterprise Intelligence Platform*



SAS Scalable Intelligence Server is a dedicated solution designed from the outset to efficiently disseminate information for business intelligence and analytic intelligence applications to either SAS or third-party intelligence systems. SAS offers relational and OLAP storage options to suit all types of application profiles. This includes everything from simple reporting and OLAP dissemination to advanced forecasting and data mining. An open, integrated metadata framework enables these storage options to be provided transparently to a wide range of applications and environments.

### Components of SAS Scalable Intelligence Server

SAS Scalable Intelligence Server includes a number of interoperable components:

**Relational data storage engine** — a scalable, multithreaded, multi-I/O relational storage option designed for intensive use by focused applications and analytics that require rapid subsetting of large data stores.

**Reduced-overhead database server** — a scalable, high-performance data store capable of storing large volumes of data — such as tables with millions of rows — without hampering system performance. Using the latest parallel process and data server capabilities, this client-server, multi-user data server effectively manages tables beyond the terabyte range in size and serves hundreds of concurrent users across multiple processors.

**Multithreaded, multidimensional database optimized for OLAP** — To make fast decisions in a multidimensional world, you need to see your data from all angles as quickly as possible. The SAS database server enables warehouse data to be packaged into multidimensional data structures, which deliver data to OLAP client software.

The SAS multidimensional database lets you quickly slice and dice large amounts of data from a matrix structure for analysis and reporting. You gain quick, unlimited views of multiple relationships in very large quantities of data.

Traditional relational star schemas — where one fact table is surrounded by a series of related tables — are optimized for transactional processing and queries. In contrast, the SAS multidimensional database lets you quickly slice and dice large amounts of data from a matrix structure for analysis and reporting. You gain quick, unlimited views of multiple relationships in very large quantities of data.

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## Key benefits of SAS Scalable Intelligence Server

### Exploit multiple, flexible storage options

While the data storage provided by SAS data tables is sufficient for many organizations and users, SAS Scalable Intelligence Server provides high-performance, scalable data delivery solutions that are cost-efficient and leverage current computing investments to avoid traditional I/O bottlenecks.

SAS Scalable Intelligence Server provides relational and OLAP storage options to suit all types of application profiles — from simple reporting and OLAP dissemination to advanced forecasting and data mining.

Each of these options is designed to speedily process the ever-increasing amount of data available today. You can also combine any of these storage structures to satisfy unique business requirements.

### Minimize overhead and maximize I/O

Whereas the internal architecture of a general purpose RDBMS is optimized for the secure handling of concurrent updates, SAS Scalable Intelligence Server is designed to minimize overhead and maximize I/O performance. This is achieved using fixed record lengths, advanced indexing, large block sizes and by eliminating 'two-phase commit' processing. Together with multithreading and physical partitioning, these features typically produce order-of-magnitude improvements in loading and query performance compared to orthodox RDBMS configurations.

The reduced-overhead design of SAS Scalable Intelligence Server not only enhances performance; it also simplifies installation and ongoing maintenance by the database administrator.

## **Achieve transparent data integration for end-to-end metadata integrity**

While many other analysis platforms rely on external, tactical data integration tools, SAS Scalable Intelligence Server works seamlessly with powerful SAS Data Integration capabilities through the SAS Enterprise Intelligence Platform — enabling you to access and read all relevant source data formats and preprocess data for efficient collection, transformation, cleansing and organizing in preparation for storage. This integration ensures end-to-end integrity of metadata, accelerates set-up and configuration of data extraction and transformation, and simplifies maintenance and management.

## **Shorten data extraction, transformation and load times**

As your data mountain grows, so does the time required to extract, transform and load your data. Unfortunately, batch windows are not getting longer. In some enterprises, processing nights have turned into weekends, which means that analytic and business intelligence applications are often working from stale information. SAS Scalable Intelligence Server was designed to efficiently process massive tables containing hundreds of thousands or millions of rows. No matter how large the volume of data, SAS Scalable Intelligence Server rapidly refreshes data and indexes using leading-edge algorithms and parallel technologies that reduce search and delivery time for the most difficult queries. Response times start fast and stay fast even as data volumes expand.

## **Control data access at whatever level of granularity you require**

In a multi-user environment, where many users have access to the same data, you have to control and restrict access to sensitive data for certain users. SAS Scalable Intelligence Server provides sophisticated security features that enable administrators to control read, write and modification access to tables, rows, columns and cells on a per user or per group basis.

## **Extend the value of IT hardware investments**

SAS Scalable Intelligence Server reduces the time required for storing, loading, organizing and retrieving large volumes of data. This data storage strategy lets you exploit your processing and network architecture to the fullest extent. The faster the server, the less network bandwidth required, and the faster the client. Furthermore, SAS Scalable Intelligence Server effortlessly handles increases in data volumes, changes in your hardware architectures and significant increases in the number of users.

You get unsurpassed data storage and retrieval for all your business intelligence and analytic intelligence applications without sacrificing access speed, security, cost-effectiveness or integration with existing environments.

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## Summary

SAS offers relational and OLAP storage options to suit all types of application profiles. This includes everything from simple reporting and OLAP dissemination to advanced forecasting and data mining.

The emergence of analytic and business intelligence applications has resulted in new strains on traditional RDBMS systems, which were not designed to search large tables of information for small amounts of user-requested data. They also were not designed to produce the summarized reports demanded by modern business intelligence applications, nor to service the unique, intensive simulation and modeling requirements of advanced analytic intelligence applications.

SAS Scalable Intelligence Server efficiently disseminates information for business intelligence and analytic intelligence applications. SAS offers relational and OLAP storage options to suit all types of application profiles. This includes everything from simple reporting and OLAP dissemination to advanced forecasting and data mining. An open, integrated metadata framework enables these storage and dissemination options to be provided transparently to a wide range of applications and environments.

SAS Scalable Intelligence Server provides a solid data foundation on which decision makers can depend. A data storage solution engineered with SAS translates into a number of competitive advantages by enabling you to:

- **Exploit multiple, flexible storage options** — with relational and multidimensional database options optimized for high-performance analytical processing.
- **Minimize overhead and maximize I/O** — using a number of innovations that can produce order-of-magnitude improvements in loading and query performance compared to orthodox RDBMS configurations.
- **Achieve transparent data integration** — preprocessing data from diverse sources for efficient collection, transformation, cleansing and organizing in preparation for storage, while preserving end-to-end metadata integrity.
- **Shorten data extraction, transformation and loading (ETL) times** — using leading-edge algorithms and parallel technologies and hardware that reduce response times, even as data stores grow exponentially.
- **Extend the value of hardware investments** — by using existing communication and processor resources more efficiently, exploiting efficient database management strategies.

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## From SAS, the first name in enterprise intelligence solutions

For nearly three decades, SAS has been helping customers realize the full potential of enterprisewide intelligence. Through listening to our 40,000 customers across every industry — including 96 of the top 100 companies on the FORTUNE Global 500® — SAS has developed an integrated platform for delivering high-value enterprise intelligence.

This platform, which we call the SAS Enterprise Intelligence Platform, optimally integrates individual technology components within your existing infrastructure. SAS is the only vendor that completely integrates leading data integration, storage, analytics and traditional business intelligence applications to create intelligence from massive amounts of data.

SAS Scalable Intelligence Server provides the high-performance storage solution required for business intelligence and analytic intelligence applications. SAS Scalable Intelligence Server collates enterprise data from many disparate silos of information, using integrated tools that improve the timeliness, accuracy and usability of the data that provides the foundation for enterprisewide intelligence.

Let us show you how the SAS Enterprise Intelligence Platform can deliver immediate and sustainable rewards for your organization. Whatever your existing infrastructure, SAS can transform it into a foundation for enterprisewide intelligence and sustainable profitability in an increasingly uncertain world.

For more information about the SAS Enterprise Intelligence Platform and the specific SAS technologies that support it, visit us at [www.sas.com](http://www.sas.com).



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