

SAS® Viya™

A powerful, open platform designed for your analytical challenges



## Overview

Whether it's a team of data scientists or mobile applications providing real-time answers, how can organizations keep pace with accelerating analytical demands and deliver fast results that fuel the best actions? Several things are needed:

- Superfast processing for data manipulation, exploration and advanced analytics.
- A unified software environment that can be easily managed, maintained and governed.
- Scalable, dynamic analytics processing that doesn't stop, even when jobs fail.
- Direct access to a comprehensive suite of analytics for any data, of any size, for multiple users.

SAS Viya is an open, cloud-enabled, in-memory platform that delivers everything you need for quick, accurate and consistent results - all of the time. Elastic, scalable and fault-tolerant processing addresses the complex analytical challenges of today and effortlessly scales to meet your future needs. SAS Viya provides:

- A powerful, cloud-ready analytics platform from the analytics market leader.
- A single, open and unified analytics environment with a standardized code base that bonds SAS and other leading analytical programming languages.
- A comprehensive and adaptive architecture for public cloud, private cloud and operating system implementations.

## Benefits

SAS Viya enables your organization to conquer all kinds of analytical challenges.

- Easily assemble and share insights derived from embedded analytical services.
- Build governed models, centralized for efficient deployment.
- Quickly deliver answers and consistently get the best results.

Welcome to the new world of SAS Viya. This open platform serves everyone from data scientists and business analysts to application developers and domain experts. It also provides the reliable, scalable and secure analytics inventory management and governance necessary for agile IT.

Now your organization can handle the ever-changing and ever-growing range of analytical demands – regardless of how many simultaneous users you have, what size your data is or how often it's refreshed. SAS Viya is designed with resilient, in-memory distributed processing for optimizing complex analytical workloads.

### Reduce the cost of maintaining and managing multiple code bases

From a single, centrally managed environment, all analytical tasks are united in a common base. There's no need to use different tools to manage data access, manipulation, interactive exploration, statistics, forecasting, optimization, machine learning and other advanced model development and deployment activities.

Score code is automatically generated from the interface or directly from programs built by coders. And because code doesn't have to

be redefined for different deployments or data volumes, analytical assets are portable. You can spend more time solving the next question – instead of rewriting code.

### Easily govern and maintain all of your analytical assets

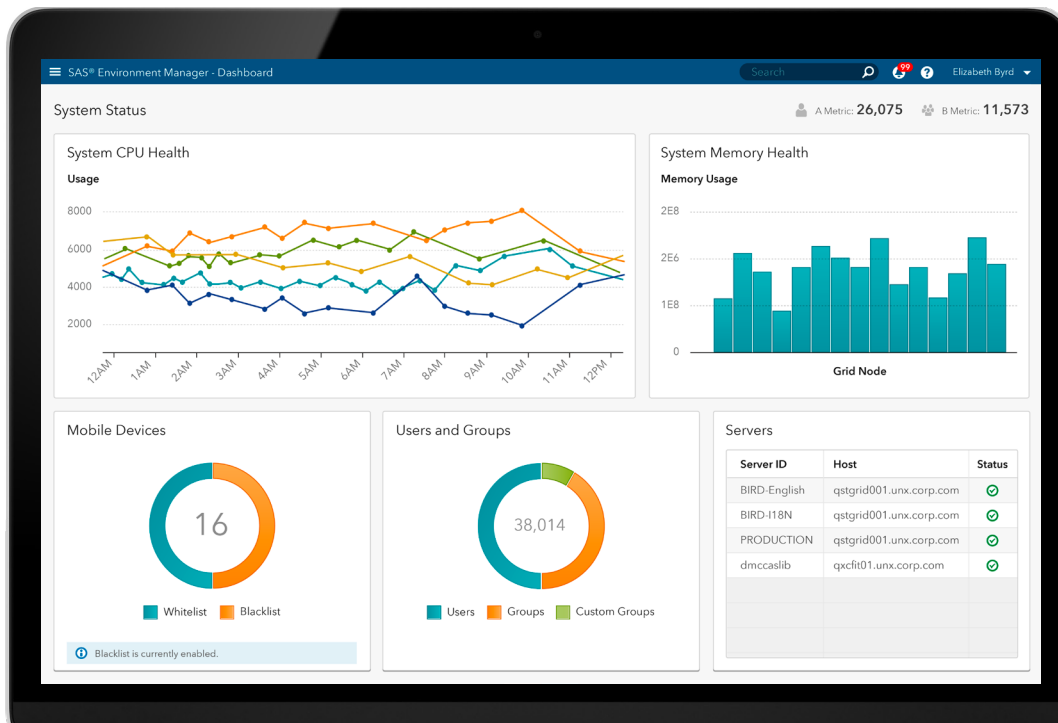
With SAS Viya, it's possible to integrate all elements needed to build and deploy analytics – whether they are defined in SAS, or written from other programming languages like Python, Java, R or Lua, or called from public REST APIs. Access the power of SAS from one, cohesive place, with a traceable inventory of all analytical assets. Monitor the degradation of models in production and solve synchronization issues arising from different code bases. With a central backbone for analytics, the cost of updates between different software versions is eliminated. You can spend less time worrying about version discrepancies and more time innovating.

### Scale up and out as needed

SAS Viya is designed for elastic cloud processing and easy scalability. Your organization can start with a small implementation and expand as needed with no concern about being locked in with one cloud provider. The code is the same, so you can run your applications anywhere without rewriting.

### Streamline day-to-day workloads and increase productivity

With SAS Viya, analytical teams can explore the same data at the same time using a visual, coding or REST interface – the choice is theirs. Reaching solutions faster with their preferred method reduces learning curves and accelerates results. With one consistent code base, collaboration is accelerated and staff are empowered to get the insights they need.



Interactive dashboards give administrators visibility across the entire SAS Viya analytical environment, including current server usage, system health and user activity.

## Challenges

- **Computational issues with big data.** Data continues to grow and problems get more complex each day. You need a way to analyze diverse data, improve performance and get fast answers to any analytical question.
- **Pressure to provide scalable solutions within constrained budgets.** IT organizations with unlimited budgets for technologies just don't exist. Does an affordable, agile enterprise architecture exist that can keep pace with user demands?
- **Ever-changing everything.** Constantly evolving business requirements and an onslaught of emerging technologies – how do you determine the best long-term solution that can adjust to your changing needs?
- **Lack of analytical governance.** Open source technologies are dispersed, need customized support and often aren't integrated. This lack of control over data and analytics heightens risks associated with maintenance, hidden costs, governance and compliance.
- **Difficulty managing portfolios of diverse technologies.** Multiple tools are used for managing data and applications across organizations. As a result, it's hard to trace data lineage and know what version of a model is in use, whether it reflects current deployments and if it's being refreshed as needed.
- **Suboptimal technologies impede decision making.** Slow tools and technology silos make it impossible to consistently discover insights and move from innovation to operations in a timely manner.

### Increase collaboration among teams

Analytical professionals often spend too much time explaining business context or finding a common ground for communicating about data and insights. A consistent code base underlying the consolidated HTML5 web-based interface for visual data interrogations and an interactive coding environment for popular programming languages provide a consistent foundation for communicating – no matter which approach is used to derive insights. Multiple users can analyze data how and when they need it, interactively collaborating during the data discovery and model-building process.

## Capabilities

### Cloud-enabled, elastic and scalable

SAS Viya is built to be elastic and scalable for both private and public clouds. Complex analytical, in-memory calculations are optimized for unconstrained environments and automatically adjust in constrained environments. The elastic processing effortlessly adapts to burst processing using available resources – scaling computing capacity as needed. This elasticity lets you quickly experiment with different scenarios and apply more sophisticated approaches to increasing amounts and speeds of data.

### Open analytics coding environment

Empower your data scientists and statisticians with a breadth of analytics capabilities that are easily available from the coding language of their choice. Whether it's SAS, Python, Java, R or Lua, analytical professionals can access the power of SAS for data manipulation, interactive data interrogations and advanced analytics.

Designed as an open development platform, SAS Viya also includes public REST APIs to all underlying functionality, so software developers can add proven SAS Analytics to applications. And all

analytical assets are united within a common environment to provide a single, managed inventory across your organization.

### Fast, distributed in-memory processing

SAS Viya provides a highly available, distributed processing platform crafted to handle multiple users and complex analytical workloads. Computing operations are automatically distributed across the cores of a single server or the nodes of a massive compute cluster. If a node fails, fault-tolerant processing ensures blazingly fast speed is retained.

All data, tables and objects are held in memory as long as required and for whomever is using them. Independent sessions ensure optimized processing for everyone. The SAS Viya runtime engine provides a secure, scalable multiuser environment for concurrent access. Users can collaborate to simultaneously explore the same data, probe findings and identify analytically sound actions.

There's no need to rewrite code for processing on different systems. Portable code can be defined once, run anywhere and scaled to solve any size data problem. Code built on SAS Viya runs in stream, in database, in memory, in Hadoop, in public and private clouds, and even in device. You get the idea: no infrastructure lock-in.

### Resilient architecture with guaranteed failover

For answers you depend on, you need analytical processing power you can count on. All analytical computations should run without interruption. The fault-tolerant design of SAS Viya automatically detects server failure, even across clusters. Processing is optimized and redistributed as needed. SAS Viya also manages several copies of data on the computing cluster. If a node in the cluster becomes unavailable or fails, the required data is retrieved from another block. These self-healing mechanisms ensure high availability for uninterrupted processing and automated recovery.

# The SAS® Viya™ Difference

- **Unified analytics environment.** SAS Viya delivers a common, cohesive environment for developing, deploying and managing all of your analytical tasks.
- **Open for inclusive development.** Designed as an open platform, SAS Viya supports all of your analytical professionals. All underlying methods for data manipulation and analytics development are available as REST APIs or from SAS and other leading programming languages like Python, Java, R and Lua.
- **Ability to govern a single inventory of models.** Only SAS Viya creates one analytical inventory with comprehensive model governance and management that includes SAS as well as models written in other languages.

- **Scalable to address the largest and most complex analytical problems.** With automated in-memory management and intelligent distributed processing, multiple users can hit the same data without I/O bottlenecks.
- **Fit for agile IT.** SAS Viya is engineered and built to run analytical workload processing whenever it's needed. And to deploy insights wherever needed – whether that's in database, in memory, in stream, in device, in Hadoop, or in private and public clouds. Your analytics architecture is always resilient and secure.
- **A modern architecture to meet analytical needs now and in the future.** SAS Viya provides the optimal architecture for your teams to sustain analytical innovation. Portable code can be defined once and run anywhere, enabling you to scale to any size data problem without recoding or replacing operational software.

## Unified environment for all aspects of analytics

SAS Viya delivers a single, consolidated and cohesive environment that integrates the administration, development and execution of all analytical assets across your organization. Features such as full versioning, authorship, lineage and change management enable comprehensive governance. SAS Viya provides centralized administration and activity tracking of servers, job content and users – securing information based on your existing policies.

## SAS® Viya™ Offerings

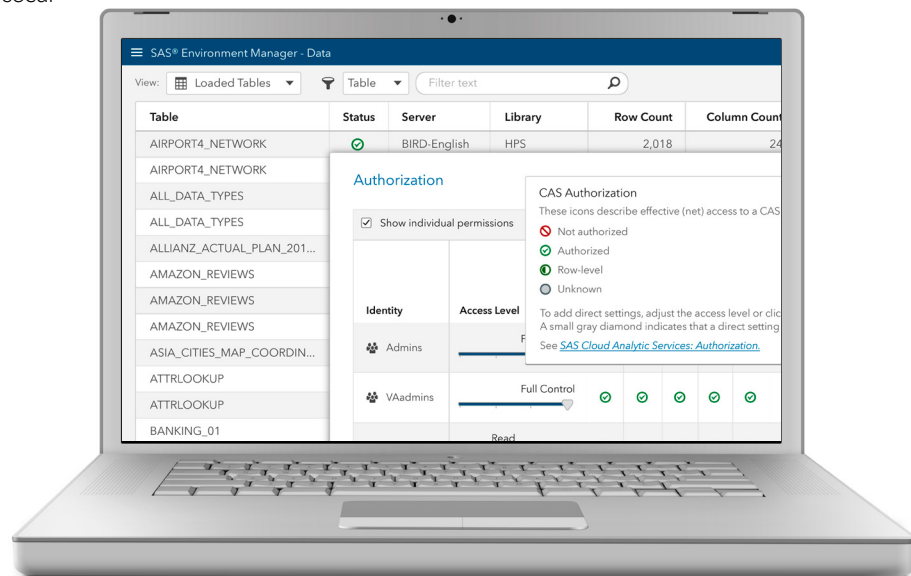
SAS Viya is an underlying foundation for a host of upcoming solutions that will take advantage of this cloud-enabled, open platform. Most offerings include a coding interface as well as an intuitive, visual interface. Current SAS Viya products include:

- SAS® Visual Analytics.
- SAS® Visual Statistics.
- SAS® Visual Data Mining and Machine Learning.
- SAS® Visual Forecasting.
- SAS® Optimization.
- SAS® Econometrics.
- SAS® Visual Investigator.

You can also apply the processing power of SAS Viya to your existing SAS assets, skill sets and experience. Execute SAS®9 code and models in SAS Viya or bring SAS Viya results

into your existing SAS®9 deployments. We've ensured your investment in SAS can continue to meet the analytical challenges of today, while also preparing for the future.

To learn more about SAS Viya, please visit us at [sas.com/viya](https://sas.com/viya).



Using SAS Environment Manager, individual and group permissions can be customized to a granular level. Administrators can drill into access-level categories to further define settings.

Synaptein Solutions Inc.  
8500 Leesburg Pike, Suite 407, Vienna VA 22182

[www.synapone.com](http://www.synapone.com)



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