

# Centralized Automation for SAS®

## Strategy Guide for IT Decision Makers



### Summary

Well-architected automation of the business intelligence solution SAS® can improve the efficiency and productivity of an organization. If you face the challenge of producing the same reports and analyses over and over again, or if you struggle with various scripts needed to integrate SAS into your IT infrastructure, you should consider the advantages of an enterprise job scheduling solution.

SAS users and administrators who leverage a centralized job scheduling solution in their IT environment gain the ability to:

- Build sophisticated workflows that include processes from both SAS and other platforms
- Schedule jobs according to virtually any time or date condition
- Trigger jobs based on file transfers, system startups and the completion of other jobs
- Receive detailed job status alerts by email, voice or text
- Control access to scheduled SAS jobs with granular permissions

### Cross-Platform & Cross-Application Scheduling

Enterprise job scheduling solutions orchestrate the execution of processes in SAS and across multiple platforms and applications with ease. The integration of SAS jobs with data stored in systems such as Oracle and various ERP platforms unlocks a wealth of opportunities for real-time analysis of business data.

### Automating SAS Processing

Two methods may be used for processing SAS:

- Using the Command Execution Method to process SAS executables
- Creating a SAS execution method and storing the SAS program in the job definition

Employing either of these methods provides superior parameter handling in which the job scheduling parameters are stored in the source of the SAS program. A modern enterprise job scheduling solution handles the execution of SAS.exe directly through the SAS command line, giving the user full-control over each action.

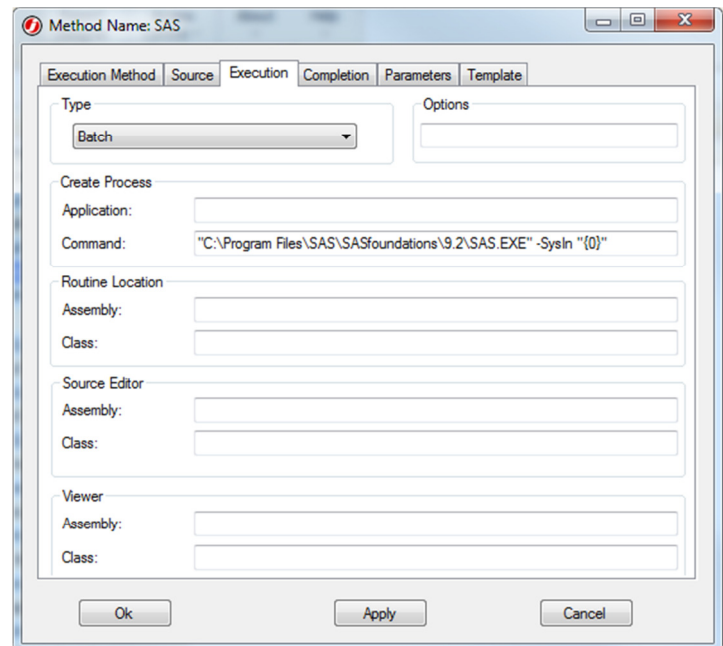


Figure 1: SAS Execution Method Dialog Box

### Working Example: Data Warehouse Loads

Organizations can use **triggers and dependencies** to initiate SAS jobs once specific business conditions are met. Underlying source data may reside on platforms such as Oracle or in the SAS Data Warehouse, rendering the notification of successful data loads unavailable. Extensible job scheduling solutions can be leveraged with custom views to integrate Data Warehouse loads. In one configuration, you could create a view in Oracle that monitors daily loads. The view starts with an “n” flag for each data table load process. As each data table is loaded successfully, its “n” flag is updated to “y”. Once data tables are loaded, the scheduler proceeds to run the dependent SAS reporting jobs.

## Date Specifications...

Date specifications enable analysts and administrators to establish detailed parameters for running scheduled jobs. Solutions that use natural language date specifications, as opposed to complicated or proprietary codes, bring clarity and transparency to BI reports and processes. Natural language date specifications may include:

- “WEEKDAYS”
- “FIRST DAY OF MONTH”
- “LAST DAY OF MONTH”
- “3RD WORKDAY OF PERIOD”
- “2ND TUESDAY OF NOVEMBER”

## ...And Custom Date Specifications

When scheduling SAS jobs, organizations often need to consider custom date and time specifications, like blackout periods and company holidays. Enterprise job scheduling solutions handle these exceptions with ease.

## Schedule Reports

Whether you are running one report daily, or distributing dozens of SAS reports, centralized job scheduling provides you with reliability and control. Common scenarios for reporting include:

- Delivering reports to business users every morning at predefined times
- Delivering reports at various milestones in a SAS automated marketing campaign
- Summarizing the production of SAS processes that run overnight

Generating reports based solely on the time/date may work in some instances, but a much greater level of efficiency can be achieved through enterprise job scheduling. SAS reports can be triggered by the delivery of a file or the completion of another SAS job. Once a SAS report has been generated, users have the option of delivering and archiving reports automatically. In today’s distributed IT environment, processes from a variety of platforms and applications may signal the start of a SAS activity. A centralized job scheduling solution enables you to run processes on those systems and deliver SAS reports in the unique context of your organization’s infrastructure.

## Logging and Auditing

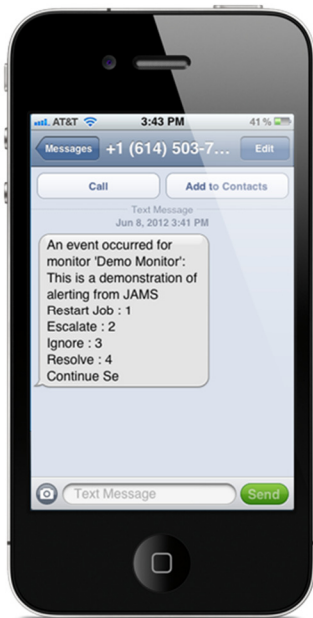
Centralizing SAS job scheduling helps organizations maintain a high standard of auditability and helps IT staff identify and respond to issues quickly. With an enterprise job scheduling solution, a record of all executed, pending, stalled and held jobs is readily available. Centralized logging also streamlines troubleshooting procedures since SAS administrators need only search a single log file to identify a problematic point in a complex workflow.

STDOUT and STDERR from all applications in your BI environment provide you with easy-to-parse historical data on your processes.

## Real-time Notifications

An enterprise job scheduling solution for SAS protects your investment from issues or problems that may occur within your IT infrastructure. It can quickly notify you when:

- Jobs fail
- Jobs complete successfully
- Jobs take too long to complete
- Jobs stall
- Jobs run too quickly

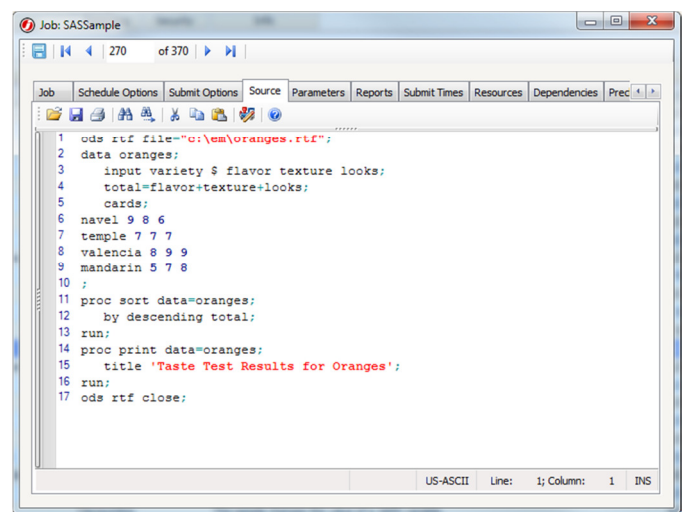


**Figure 2: Job Notifications via SMS**

Centralizing your notification schema enables you to receive job notifications via voice call, text message or email. Advanced notification solutions also provide you with controls for responding directly to a job's exit code.

## Keep Variables and Parameters Centralized

The dynamic nature of many SAS parameters and source files creates a challenge for administrators and analysts alike. Storage and version control are essential to maintaining accuracy, over time and across distributed teams. With an enterprise job scheduling solution, an organization can see exactly what changes were made to the SAS job, when they were made and who made the change.



**Figure 3: SAS Source Code in JAMS**

### Working Example: Batch Jobs in SAS Enterprise Guide

Centralizing batch automation enables you to leverage multiple SAS execution methods. This is especially useful in automating SAS Enterprise Guide, which is limited in that its commands cannot be run in batch mode. Instead, an object model, provided by SAS, can be called using PowerShell to execute scheduled Enterprise Guide jobs. SAS Enterprise Guide can cause jobs within automated workflows to fail, even when the SAS job's return code indicates success. This is due to the non-standard error codes generated by SAS Enterprise Guide. Using custom variables and PowerShell, an enterprise job scheduling solution scans job logs for custom error codes, checking for the presence of errors and proceeding with appropriate workflows.

## Security

Detailed access control keeps SAS data secure, while simultaneously permitting multiple users to run or even administer SAS jobs. For example, a user may be able to submit a job without being able to see the job definition. Granular permissions provide selective access to view the properties of jobs, delete jobs and manage them (i.e. scheduling, restarting and canceling).

## About JAMS for SAS®

JAMS Job Scheduler is a full-featured enterprise job scheduling system for SAS as well as a host of other platforms and applications. JAMS is the only job scheduling system built on a .NET framework. JAMS is the first enterprise job scheduling system that can be leveraged by both IT Operations Personnel and Application Developers. With its roots in Windows, JAMS also supports running processes across a variety of operating systems (UNIX, Linux, System i, OpenVMS, etc.) and applications (SAS, SAP, SQL, Oracle, PeopleSoft, Symitar, Ecometry, etc.)

**To learn more about JAMS, please visit [www.JAMSScheduler.com](http://www.JAMSScheduler.com) or call 800-261-JAMS.**



## About MVP Systems Software, Inc.

For more than 20 years, MVP Systems Software, Inc. has provided leading-edge batch job scheduling and workload automation solutions to its more than 750+ customers. Customers include household names like JPMorgan Chase, UCLA, Boeing, FINRA, Manulife Financial, Kaiser Permanente, The Hartford, and the US Postal Service. MVP's solutions are delivered in traditional software as well as SaaS models. You can learn more about MVP Systems Software at [www.mvpsi.com](http://www.mvpsi.com).