SAS® Integration Technologies

Expand your choices for integrating SAS® analytics and reporting

What does SAS® Integration Technologies do?

SAS Integration Technologies expands the choices available for exploiting and integrating SAS analytics and reporting within existing enterprise architectures.

Why is SAS® Integration Technologies important?

SAS Integration Technologies saves time and reduces costs by giving IT more flexibility and simplicity to exploit and integrate SAS intelligence within existing architectures.

For whom is SAS® Integration Technologies designed?

SAS Integration Technologies is designed for IT managers who must quickly deliver strategic intelligence applications to business users and keep costs down by reusing existing infrastructure and resources.

IT managers live in a world of heterogeneous software systems with a great variety of platforms and operating systems that often cannot communicate and cooperate easily with one another. Each time a new software system is needed, IT managers must integrate it with the other diverse systems to solve critical business problems.

As a result, intelligence applications are often delivered late and over budget because new interfaces have to be created and maintained, additional hardware and software must often be bought, and developers sometimes have to be trained in new programming methods. Integration issues tie up a great deal of resources, making it impossible to predict timelines or the costs to develop applications and deliver information.

SAS Integration Technologies solves these challenges by expanding the choices available for exploiting and integrating SAS analytics and reporting within existing enterprise architectures. It delivers a comprehensive set of additional capabilities to ensure IT staff members have the options they require, irrespective of technology or delivery mechanism.

SAS Integration Technologies allows IT managers to quickly implement intelligence applications using standards-based communication mechanisms and application programming interfaces (APIs).

At the same time, it enables IT to deliver information on time to the people who need it. A complete and robust publishing framework guarantees that information is distributed to users as soon as it is available.

Key Benefits

- **Intelligence applications delivered on time and on budget.** Only SAS is able to deliver an intelligence platform with such a comprehensive set of supported industry standards and software systems. This enables customers to implement solutions based on existing architectures faster and more cost-effectively.

- **Timely delivery of information to the people who need it.** The Publishing Framework of SAS Integration Technologies provides a complete and robust publishing environment for enterprisewide information delivery. The timely distribution of information to those who need it improves decision-making processes and optimizes performance of the enterprise.

- **Flexibility and simplicity to exploit SAS analytics and reporting.** The SAS Stored Process Server provides enterprises with a simple way to deliver SAS business analytics and intelligence to users – no matter their location, preferred user interface or output format. This flexibility saves IT departments valuable time and increases the productivity of business analysts and other users who can work self-sufficiently.

Product Overview

SAS Integration Technologies provides a large collection of APIs that enable access to SAS business analytics and intelligence from industry standard platforms such as Java 2 Platform Enterprise Edition (J2EE) and the Microsoft world of Component Object Model (COM), Distributed Component Object Model (COM), .NET and the Web services frameworks that all of these platforms support.

In addition, the software provides API support for the leading message-oriented middleware (MOM) software, the Lightweight Directory Access Protocol (LDAP) and Web Distributed Authoring and Versioning (WebDAV). SAS Integration Technologies delivers a framework for building SAS applications, a complete and robust publish-ing framework to distribute information across the enterprise to the people who need it, and a server for executing SAS applications from a variety of environ-ments, including the Web.

SAS® Foundation Services

An extensive set of infrastructure and extension services provides support for the development of integrated, scalable and secure Java-based applications.

Publishing Framework

The Publishing Framework of SAS Integration Technologies provides a complete and robust publishing envi-ronment for enterprisewide information delivery. The framework consists of SAS CALL routines and GUIs that enable both users and applications to pro-actively publish SAS f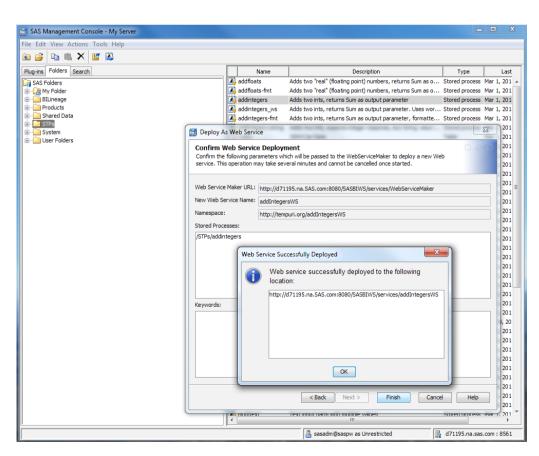iles, other digital content and system-generated events to a variety of destinations. Users can subscribe to receive information that is of interest to them and ready to view, and SAS programs can receive pack-ages with SAS data sets that could trig-ger additional analysis on the data.

Application messaging interface

The application messaging interface supports IBM WebSphere MQ, Microsoft Message Queuing Services (MSMQ), the Java Message Service (JMS) and Tibco Rendezvous messag-ing queuing software. This enables or-ganizations to use SAS capabilities from within other systems via synchronous and asynchronous message queuing.

SAS® Stored Process Server

The SAS Stored Process Server ex-ecutes stored processes, which are SAS programs that are stored centrally

With SAS Integration Technologies, you can integrate analysis results into your applications or your business workflows by deploying a stored process as a Web service.

on a server. A client application can then execute the program and receive and process the results. Stored processes enable organizations to centrally maintain and manage code, have better control over changes, enhance security and application integrity, and ensure that every client executes the latest version of code that is available.

BI Web services

These services enable client applications to execute SAS Stored Processes via a Web services interface. There are two implementations available: a Java implementation, which requires a servlet container, and an implementation that uses the .NET framework. The Simple Object Access Protocol (SOAP) is used as the communication protocol, and the Web Services Description Language (WSDL) is used to describe the services.

Directory services interface

The directory services interface enables you to incorporate LDAP service functions into your SAS programs. Through this interface, distributed SAS applications can share a common enterprise directory with components that might be executing in other run-time environments across your enterprise.

SAS® Web Infrastructure Kit

This framework contains an API for creating SAS Web applications and components. It provides support for single sign-on, role-based views, the SAS security model and more.

Integrated Object Model (IOM)

The Integrated Object Model in SAS Integration Technologies provides developers with distributed object interfaces to SAS features. IOM enables you to use industry standard languages, programming tools and communication protocols to develop client applications that access SAS services and features on IOM servers.

Key Features

Integration of synchronous and asynchronous business processes

- APIs to use the market-leading message queuing products: Microsoft's MSMQ, IBM's WebSphere MQ, the Java Message Service (JMS) and Tibco's Rendezvous.
- Integrate asynchronous processes with the SAS platform via SAS CALL routines.
- Publish information to message queues using the SAS Publishing Framework.

Interoperability with enterprise directory servers

- Support for industry standard Lightweight Directory Access Protocol (LDAP)-compliant directories such as Microsoft Active Directory, Sun ONE, IBM SecureWay and Netscape Directory Server.
- SAS CALL routines read as well as write metadata in/from an enterprise directory server.
- The information service, a Java API, allows easy access to metadata stored in LDAP repositories from a Java program.

Publishing Framework for targeted information delivery

- Supports publishing information of any form, including data sets, OLAP data, HTML reports, any MIME-type (PDF, XLS, Word documents, etc.).
- SAS CALL routine for publishing that information.
- The SAS Publishing Service is a Java API to support publishing of information from Java programs.
- Publishing to different targets (email, storage, message queues, SharePoint, WebDAV repositories, etc. Interested people can subscribe to information channels. Published information is delivered automatically to subscribers.

Service-oriented architecture via Web services, REST, JMS and messaging queues

- SAS Stored Processes can be called via Web services or a SAS program.
- Any client can make use of SAS capabilities via SAS BI Web services, a middleware broker component available for J2EE and .NET frameworks.
- Java Message Service (JMS) message queues can be monitored, and SAS programs can be started to fulfill queues' requests:
  - Support for object transport via plain XML, JSON and SOAP.
  - Dynamically invoke generated Web services.

SAS® Foundation Services: a comprehensive set of infrastructure services

- Connection service is a Java API to access SAS servers.
- Information service is a Java API to access the SAS Metadata Server and read/write metadata such as modifying the role of a user.
- Publish service is a Java API to publish information to email, channels, the Web via WebDAV, etc.
- Stored process service is a Java API to run SAS code and return results.
- The event broker service allows dynamic, event-driven runstreams and alerting.
- Security services help manage users, security, sessions and logging.
- Developers can use the services' APIs to easily extend and add additional services.
- A zero-configuration workspace server can be launched without specifying any connection information or configuring server metadata.

SAS® Stored Process Server

- Centrally manage stored processes in the SAS Metadata Repository using SAS Management Console.
- Define input and output parameters:
  - Name/value pairs.
  - Data streams (XML streams, data sets, HTML, PDF, etc.).
  - Result packages containing multiple entries including text, images, data sets, etc.

Key Features (continued)

- Exploit stored processes from any client (Web clients, Java applications or Windows applications) via the stored process service API.
- Surfaced via any of the SAS BI tools such as SAS Information Map Studio or SAS Add-In for Microsoft Office.
- Search stored processes or stored process reports by name, description or keyword.
- Cache stored process output for review without rerunning the process.

Powerful scalability options

- Load balancing: allows distributing workload across multiple processes, processors and machines.
- Pooling: allows clients to share "pooled" connections instead of restarting SAS servers with every single request.
- Fault tolerance: during server downtimes, the workload can be redirected to another server in the chain.

SAS® Web Infrastructure Kit

- A framework to build SAS Java Web applications that support single sign-on and role-based business views.
- Uses the SAS security model and metadata.
- Ability to execute and display content such as stored processes, reports, links and Web applications.

Choice of programming languages with the Integrated Object Model (IOM)

- Deliver SAS capabilities to virtually any client across an enterprise.
- Utilizes open communication protocols for both Windows clients and Java clients to give developers the ability to use SAS analytical power whether they are programming in Java, C++, C#, VisualBasic.Net, Delphi or other languages.
- SAS jobs and runstreams can be called easily and executed remotely without requiring developers' knowledge of the SAS programming language.

SAS® Integration Technologies System Requirements

To learn more about system requirements for SAS Integration Technologies, download white papers, view screenshots and see other related material, please visit www.sas.com/inttech.