
Shared Accounting Module Trading Partner Integration Guide

Document Version 1.8

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How to Use This Document

The purpose of the SAM Trading Partners Integration Guide is to communicate how the bureau of Financial Management Service (FMS) will bring aboard trading partners to use Shared Accounting Module (SAM) services on behalf of the United States Department of Treasury (US Treasury). This document addresses three categories of questions that are typically asked by potential trading partners:

- What is SAM's role in supporting the US Treasury and the Government-Wide Accounting (GWA) modernization project?
- What types of SAM services are available, and what options are available for these services?
- What steps must be taken to establish a system interface that utilizes a SAM service?

The document is intended for the trading partner's business and technical resources, who will be working with the extended SAM Team to devise a way to implement an automated interface with SAM. To address the questions stated above, this guide is organized into the following sections:

Section 1: SAM Overview describes the business purpose and technical capabilities of SAM.

Section 2: Services and Options define the various methods used for obtaining services from SAM. This information will be used to select the most effective interface options for each trading partner.

Section 3: Getting Started provides some guidance and a list of SAM contacts, to help a trading partner begin interfacing with SAM services.

Section 1: SAM Overview

1.1 SAM Business Overview

The Shared Accounting Module serves two major purposes for GWA:

- SAM allows Federal Agencies to set up the classification keys and default rules necessary to translate or default a financial transaction to valid GWA accounting codes (i.e., TAS-BETC). SAM then provides services that validate, translate or default Treasury accounting codes, based on each agency's rules.
- SAM has been authorized by GWA to distribute accounting reference data to other organizations requiring such data. Currently SAM can distribute Agency Location Codes (ALC) and Treasury Account Symbols (TAS-BETC) on behalf of GWA. SAM can also distribute ABA Routing Numbers. Additional data types may be added in the future.

SAM currently provides three shared services to authorized trading partners:

1. **Verification Service** – accepts various accounting codes from a trading partner and returns a verdict on whether or not the requested codes are valid.
2. **Classification Service** – accepts financial transactions from a trading partner and returns the same transactions with a valid set of Treasury accounting codes.
3. **Reference Data Service** – delivers a set of commonly used accounting codes, based on a configurable profile established for each trading partner.

1.2 SAM Technical Overview

Figure 1 (SAM High-Level Logical Architecture) depicts the technical architecture that provides the security and functionality necessary to support the various SAM services.

The technical architecture supports the following major functions:

- XML Gateway
- E-Mail Server
- User/System Provisioning
- SAM Database
- Authentication Subsystem
- User/System Directory
- Secure File Transport
- Business Logic

SAM utilizes a combination of secure direct file transfers and secure web services to deliver information to a trading partner. For some services, these delivery options are customizable for each trading partner, as shown in Appendix B.

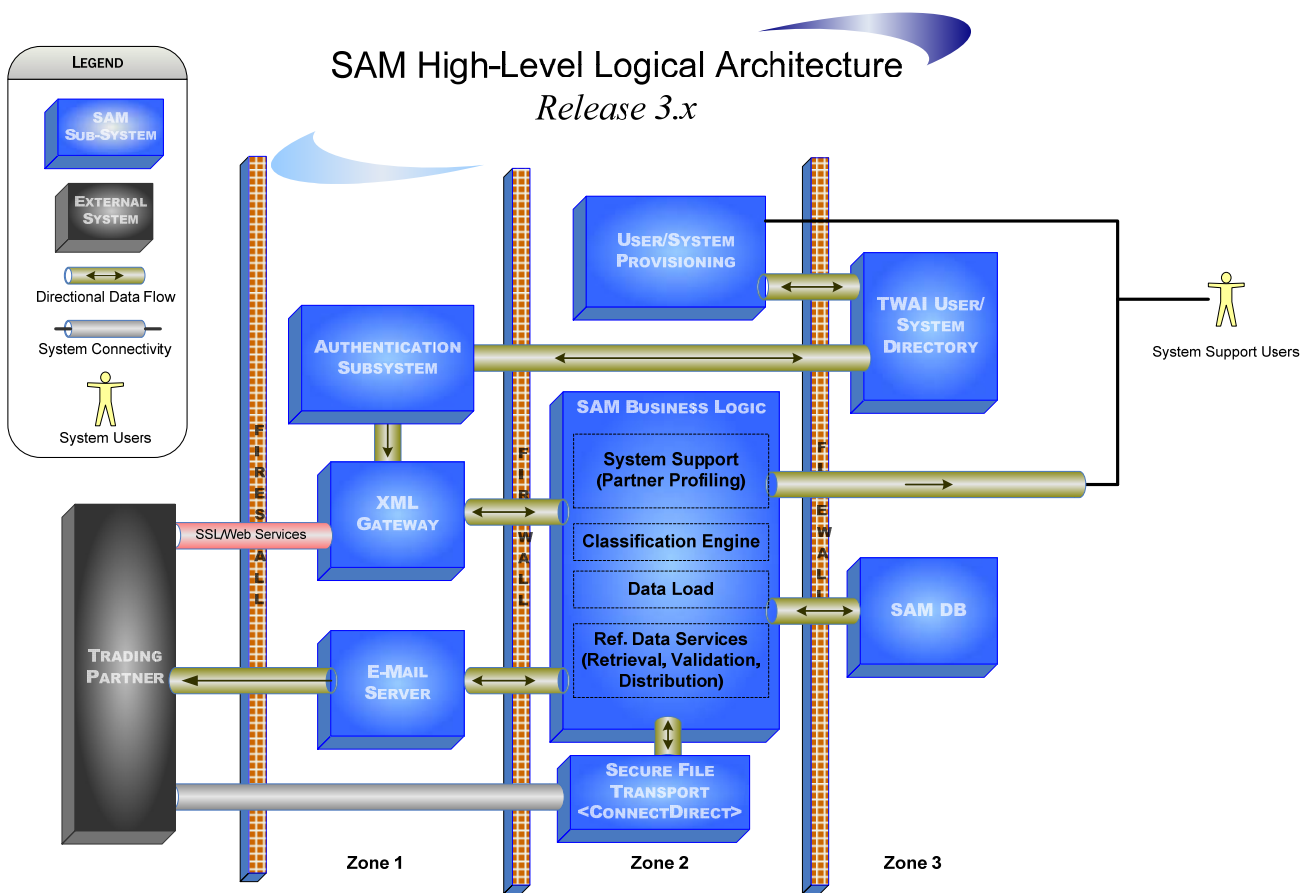


Figure 1. SAM High-Level Logical Architecture

1.2.1 XML Gateway

The XML Gateway is a Service Oriented Architecture (SOA) appliance that is used to secure and accelerate XML & Web Services processing. The XML Gateway provides a variety of functionality, including terminating the server side SSL connection between a web service client and the TWAJ infrastructure. For SAM trading partners, the SSL is a two-way SSL connection requiring both a client and a server digital certificate to authenticate both ends of the connection. Without a valid client

certificate, the XML Gateway will not establish the connection between SAM and an external trading partner, and access to services will be denied.

Once the two-way SSL connection has been established, the XML Gateway provides the same client digital certificate used to establish the connection to the Authentication System, which authenticates the client to the application/web service.

1.2.2 Authentication Subsystem

The Authentication system utilizes the client digital certificate to look up the web services client in the User/System directory, by subject name. Finding the web services client in the User/System directory authenticates the client to the web service. Otherwise the client is not authenticated and the Authentication System instructs the web services client that it is not authorized for SAM services.

1.2.3 E-Mail Server

The e-mail server is used to distribute reference data via e-mail attachments. If the trading partner's Profile indicates that data is to be distributed via e-mail, the Reference Data Service creates a file in the format specified in the profile. The profile contains the e-mail address where the attached data is sent. Presently, the (TWA) operating environment only supports outbound e-mail messages.

1.2.4 User/System Directory

The User/System directory is an LDAP-based directory that contains information for all users and systems requiring access to Treasury infrastructure and applications. Once a user or system is authenticated, authorization information from the LDAP is provided to the application for additional security and other application functionality.

1.2.5 User/System Provisioning

In order for the user or system information to be contained within the user/system directory, there is another process that provisions users as well as external systems (such as web service clients). The User/System Provisioning system automates the process of provisioning user information required by the Authentication Subsystem and application to perform authentication and authorization functions.

The information provisioned for an external system (e.g., web service client) includes system identification information as well as the client digital certificate and web service-related information. Currently this process is manual for system provisioning and automated for user provisioning.

SAM Administrators are primarily responsible for utilizing the User/System Provisioning interface to provision SAM users and external trading partners. Coordinating with the trading partner, the SAM System Support User ensures all information required by SAM services is provisioned in to the User/System Directory.

1.2.6 Secure File Transport

For file-oriented processing, the SAM architecture supports two-way secure file transfer from a trading partner to/from the SAM application. Files will be securely transmitted from specified locations within the trading partner's infrastructure to the SAM application infrastructure.

1.2.7 SAM Database

The SAM database is a repository that contains the necessary reference data, partner profiles, classification rules and interface communication status. The database is fully replicated and clustered to handle scalability and fault tolerance requirements.

1.2.8 Business Logic

Contained within the SAM web application is the business logic that drives SAM capabilities. The business logic is broken out into the following areas.

- 1.2.8.1 Data Load** components are used to manage reference data provided to the SAM application by multiple data sources. The Data Load component uses stored procedures and temporary database tables to efficiently compare old and new reference data copies. Changes are logged to support automated communication to users and trading partners.
- 1.2.8.2 Classification Engine** consists of (a) *classification rules* which are used to translate federal program agency financial transactions to valid accounting codes based on default rules and classification keys, and (b) *default rules* that are applied to financial transactions that otherwise would result in invalid Treasury accounting codes. Both sets of rules are maintained by the Federal Agencies.
- 1.2.8.3 System Support** provides the user interface and functionality for support personnel to customize a trading partner's profile. The profile information is used by the SAM application to identify the content and format needs of a trading partner's interface.
- 1.2.8.4 Reference Data Services** and their options are described in detail in *Section 2*. SAM is available 24x7 to provide these services.

Section 2: Services and Options

This section provides an overview of the SAM service delivery and connectivity options for trading partners. Trading partners should use this information to determine how best to interact with SAM to utilize its shared services. While most of this section is devoted to SAM's automated services, there are two manual services whereby a user may pull reference data from SAM as needed.

2.1 Manual Data Downloads

- 1.1.2 TAS-BETC** reference data is available through a public website hosted by SAM on behalf of FMS - <https://www.sam.fms.treas.gov/sampublic>. From this site any Internet user may download TAS-BETC reference data in either CSV or XML format.
- 1.1.3 ALC** reference data may be downloaded directly from the SAM application by an authorized user. This data is available in PDF or MS-Excel formats. See *Appendix E – Contact Information* to request a SAM user ID.

2.2 Automated Services

- 2.2.1 **Verification Service** accepts various GWA accounting codes (i.e., ALC, TAS, BETC, TAS-BETC) from a trading partner and returns a verdict on whether or not the code is valid and active at the present time. Currently this functionality is supported only as a web service for trading partners operating in the same (TWA) environment as SAM.
- 2.2.2 **Classification Service** accepts a set of financial transactions from a TWA trading partner in a prescribed XML format through a Message Queue interface, and returns the same transactions with a valid set of Treasury accounting codes.
- 2.2.3 **Reference Data Service** will deliver information based on the settings saved in the trading partner’s profile. A dynamic database query is built when a request is initiated by a trading partner or a when scheduled delivery is triggered. The query is created from metadata stored with the partner profile. SAM extracts a standardized XML document containing the requested reference data. The standard XML schemas are described at <http://fms.treas.gov/eda/>.

Depending on the partner’s needs, the standard XML may be transformed via XML stylesheet created for each unique data format. Utilizing XML stylesheets provides the SAM application flexibility for accommodating a wide variety of formatting needs without application changes.

Finally, SAM may apply additional features such as compression and SOAP wrappers, as specified by the partner’s profile. See *Appendix D – Other Reference Data Options*.

2.3 Service Options

Table 1 – SAM Service Options describes all the ways SAM can deliver data. The Reference Data Service provides the most flexibility, where multiple formats, filters and other options are supported. Depending on the service, several connectivity and data transfer options are available. All system interfaces can respond to customer requests. In addition, the reference data delivery may be scheduled or triggered by data changes from reference data sources.

Table 1. SAM Service Options

Service	Data Types	Data Format	Connectivity and Data Transfer	Triggers	Record Filters	Other Options
Verification Service	ALC, TAS, BETC, TAS-BETC	XML	Web service within the TWA	Requested on demand	n/a	n/a
Classification Service	TAS-BETC, C-KEY	XML	MQ within the TWA	Requested on demand	n/a	n/a
Reference Data Service	ABA, ALC, TAS-BETC	XML, CSV, Fixed	See <i>Appendix B - Ref. Data Connectivity & Data Transfer</i>	On demand (pull) Scheduled (push) Immediate (push)	See <i>Appendix C – Ref. Data Record Filters</i>	See <i>Appendix D – Other Ref. Data Options</i>

As previously mentioned, the Reference Data Service currently provides greater flexibility as compared to the other two services. To further describe these options, the following tables are provided:

- ❖ **Appendix B** describes the **Reference Data Connectivity and Data Transfer** options. Connectivity options describe the transport mechanism used to move data from SAM to the trading partner. Data transfer methods describe the technology used to transport the data. For trading partners operating within the TWAI environment, direct connectivity is available. For trading partners operating outside the TWAI, connectivity options include Internet and VPN (IPSec over Internet). For Internet connections, data transfer method is via Web Services (SOAP over HTTPS). For VPN connections, a Connect:Direct file transfer method is available.
- ❖ **Appendix C** lists the various **Reference Data Record Filters** available for each data type. Record Filters are used to reduce the number of reference data records transmitted. Multiple values may be supplied for each record filter. The omission of a filter allows all records of that type to pass. Introducing a filter limits the transmissions to those records that match one of the filter values supplied.
- ❖ **Appendix D** describes **Other Reference Data Options** available for data delivery. Reference data may be compressed to reduce transmission sizes by 80-90 percent. Normally, data transmissions are wrapped in a SOAP envelope, containing attributes such as a unique ID and date/time of transmission.

Triggers and Frequency dictate how and when the Reference Data Service is started. Trading partners may choose to pull reference data from SAM, or may want SAM to push data to them. Automated pull type services are currently limited to a Web Service data transfer method. Requests for a full set of any type of reference data are supported, given the record filters and security limitations that may be enforced. SAM also supports a service for pulling selected ALCs. Trading partners residing outside the TWAI environment who choose to pull reference data from SAM must be issued a digital certificate to be presented with each web service request. (See *XML Gateway* above).

There are several options for triggers and frequency of automated interfaces involving a push of reference data from SAM to a trading partner. A push of reference data may be: (a) scheduled, (b) run on demand, or (c) initiated automatically when updates arrive from the source. If the interface is to be scheduled, any recurring frequency may be accommodated (e.g., weeknights at 1 AM, every Saturday at 10 PM, etc.).

Section 3: Getting Started

The SAM Team can help you answer any questions you might have pertaining to SAM services. Once all the options are understood and selected, the SAM Team can establish a test window and a Go-Live date for production. Most interfaces can be configured very quickly. Lead time may be required for trading partners to acquire and install any new products and establish connectivity with the TWAI environments. There may be a delay if the trading partner requires a custom data format, or some other special consideration.

Step by Step Instructions

1. Contact one or more of the resources listed in Appendix E to get your initial questions answered.
2. Contact someone on the SAM Team to initiate a *SAM Service Request*.
3. Review the Trading Partner Integration Guide, preparing to select connectivity options.
4. Assist the SAM Team in completing a full *SAM Service Request*, including connectivity options, test dates, etc.
5. If required, work with the SAM Team to create a Memo of Understanding, outlining the level of service required.
6. Procure any hardware and/or software necessary to establish connectivity to the Treasury Web Application Infrastructure (TWAI) QA and Production environments.
7. Issue any required certificates, providing system access to SAM or trading partner's application.
8. Work with the TWAI team to establish and test connectivity to your Test and Production environments.
9. Test your automated interface(s) with the SAM Team. (See *Testing Considerations* below).
10. Support the new interface(s) throughout the Go-Live period.
11. Monitor your interface(s) on an ongoing basis.

Testing Considerations

Testing the interface between the TWAI Quality Assurance (QA) environment and the trading partner's test environment is mandatory for all trading partners, prior to migration to the production. Testing ensures that all chosen interface options are completely understood, are configured properly and support the needed reference data transmissions in the production environment. Sufficient lead-time should be included to establish connectivity to the test environment(s), based on both TWAI and trading partner resource availability. All available technologies for data transfer are available for testing in the QA environment, including full support for all security controls applied.

Appendix A: Revision History

Ver.	Author	Revised	Description
1.0	W. Schmidt	11/24/2007	Initial version --- architecture section by Dave Baganski
1.1	W. Schmidt	12/8/2007	Minor changes suggested by SAM mgt.
1.2	W. Schmidt	1/21/2008	Enhanced to include SAM 3.7 functionality
1.3	W. Schmidt	2/26/2008	Updated contact info.
1.4	W. Schmidt	2/15/2009	Enhanced to include SAM 3.8 functionality and show new business owners
1.5	W. Schmidt	8/31/2009	Drafted version 2.0 (as v1.5) – describing <u>all</u> SAM services
1.6	W. Schmidt	9/18/2009	Changes based on input from IPAC (for v1.4) and CBAF (for v1.5)
1.7	W. Schmidt	4/27/2010	Updated contact info and removed the Access Group record filter for ALCs
1.8	W. Schmidt	7/21/2010	XML over HTTPS is no longer an option ... always wrapped in SOAP

Appendix B: Reference Data Connectivity and Data Transfer

Operating Environment	Connectivity Options	Data Transfer Method
TWAI	Direct	Web Services
TWAI	Direct	Connect:Direct
TWAI	Direct	Message Queue (MQ)
Non-TWAI	Internet	Web Services
Non-TWAI	VPN over Internet	Connect:Direct
Non-TWAI	VPN over Internet	Message Queue (MQ)

Appendix C: Reference Data Record Filters

Data Type	Record Filter	Comments or Description
ALC	ALC Type	e.g., NTDORPT
ALC	Agency	Treasury agency code ... e.g., 10, 14

ALC	State	Currently Active
ALC	CGAC Only	Prevents the distribution of non (CGAC) compliant data
TAS-BETC	System Type	Collection, Payment or IPC (Intragovernmental)
TAS-BETC	Business Event Type	COLL, DISB
TAS-BETC	Main Account	e.g., 0100
TAS-BETC	Debit/Credit	e.g., Debit (only)
TAS-BETC	Agency	Treasury agency identifier ... e.g., 010, 014
TAS-BETC	State	Currently Active or Not Expired (includes future dated)
TAS-BETC	CGAC Only	Prevents the distribution of non (CGAC) compliant data
ABA	Include ABAs Active As Of (date)	Cut-off date for including "Active" records only. Date may be fixed or floating (i.e., TODAY).

Appendix D: Other Reference Data Options

Name	Description	Comments
Changes Only (ALCs)	SAM detects reference data changes and limits transmissions to partners to just the information that has changed since the last transmission	This method limits the amount of data transmitted. The ability to process a full file is required, to seed the partners database and keep SAM and partner in sync.
Compression	Win-zip may be applied to reduce transmission sizes.	Compression rates of 80-90 percent are typical, depending on the data format.
SOAP Envelope	The optional SOAP wrapper contains attributes such as transmission number, date/time of source update, operating environment, etc.	An XML schema is available upon request. The SOAP envelope is required for all "pull" requests.
Date/time in file name	For transmissions involving a file (e.g., Connect:Direct, e-Mail), the date and time of file generation may be included in the file name.	The partner must decide if the new file is to overlay the previous one, or if each file is to have a distinct name.
Alert Level	Set in accordance with the severity should SAM detect a failure to deliver a transmission.	Partners must choose whether alerts (to SAM support) should be sent immediately, or if a "wait until morning" approach is acceptable.
Presentation Options	XML stylesheets may be created and applied to transform standard XML to a custom XML, a CSV file or a fixed length format.	Standard XML is recommended, and a business case is required (from the trading partner) to deviate from the norm.
Pull Some (ALCs)	A web service is available by which a trading partner may pull ALC reference data pertaining to one or more ALC numbers requested.	This service will support the population of ALC data onto a user interface, such as a report or a web page.

Appendix E: Contact Information

Topic	Contact	Role/Resp.	Phone #	Address
More Information on FMS	FMS Website			http://www.fms.treas.gov/
More Information on GWA	GWA Website			http://fms.treas.gov/gwa/
More Information on SAM	SAM Website			http://www.fms.treas.gov/sam/index.html
Standard FMS XML Schemas	EDA Website			http://fms.treas.gov/eda/
TAS-BETC Manual Download	SAM Public Website			https://www.sam.fms.treas.gov/sampublic
SAM Business Guidance	Cyndi Pham	FMS Business Owner	(202)874-8947	Cyndi.Pham@fms.treas.gov
SAM Business Guidance	Becky Baumhoegger	SAM Business Manager	(314)444-8667	Rebecca.S.Baumhoegger@stls.frb.org
SAM Technical Guidance	Bill Schmidt	SAM Technical Analyst	(314)444-4241	William.E.Schmidt@stls.frb.org
XML Schemas	Marcel Jemio	Enterprise Data Architecture	(202)874-6838	Marcel.Jemio@fms.treas.gov
ALC Manual Download	Treasury Support Center	Provide new SAM user ID	(877)255-9033	sam_tsc@stls.frb.org
Request Automated Interface	Treasury Support Center	Service Request Processing	(877)255-9033	sam_tsc@stls.frb.org
Establish TWAI Connectivity	Jerome Downing	Customer Relationship Mgr.	(804)697-7738	Jerome.Downing@frit.frb.org
Test Automated Interface	Ray Speed	Service Request Processing	(314)444-8371	Raymel.G.Speed@stls.frb.org
Problems with Auto. Interface	Treasury Support Center	Service Request Processing	(877)255-9033	sam_tsc@stls.frb.org

Appendix F: Glossary

ABA – American Bankers Association, which provides ABA routing numbers, a type of reference data provided by SAM

ALC – Agency Location Code, which identifies a virtual or physical location of a Federal agency

BETC – Business Event Type Code, which describes the purpose of a financial transaction (e.g., collection adjustment)

CAFÉ – Central Accounting Front End, which is a module of GWA that accepts financial transactions from systems reporting to the US Treasury

C-Key – Classification Key, which may be used to translate a Federal agency’s accounting codes to the US Treasury’s accounting codes

CSV – Comma Separated Value, which is a data format commonly used as input to spreadsheet applications

ERD – Enterprise Reference Data, which is fairly static information commonly used to report transactional data

FMS – Financial Management Service, which is a bureau of the US Treasury

GWA – Government wide Accounting, which is a project to replace the US Treasury’s core accounting systems

LDAP – Lightweight Directory Access protocol, which is used to house access information

MS – Microsoft, the vendor that supports the Excel spreadsheet product

PDF – Portable Document Format, which is primarily used for formatting print documents

SAM – Shared Accounting Module

Service Request – A form completed by the SAM team for each system interface established between SAM and a trading partner. This service request forms the basis of a Partner Profile.

SOA – Service Oriented Architecture, whereby common business needs are automated in one place

SSL – Secure Sockets Layer, which provides security and data integrity for communications over the Internet

TAS – Treasury Account Symbol, which is a budgeted account for a financial transaction. Beginning in 2010, the “symbol” is being replaced by a set of eight business keys, commonly known as TAS components.

Trading Partner – a system with which SAM has an automated exchange of data

TWAI – Treasury Web Application Infrastructure, which is the environment in which the SAM application runs

UPS – User Provisioning Service, used by SAM and other TWAI applications to control access

URL – Uniform Resource Locator, which is a Web address

XML – eXtensible Markup Language, which is a self-describing format of data