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# *Shared Accounting Module Trading Partner Integration Guide*

*Document Version 2.2*

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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 Fiscal Service (FS) 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 types of SAM services are available, and what options are available for these services?
- What is SAM's role in supporting the US Treasury and the Central Accounting Reporting System (CARS)?
- 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: 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 2: SAM Technical Overview*** describes the technical architecture necessary to support SAM.

***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: 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.

SAM currently provides three shared services to authorized trading partners. They are Reference Data Service, Verification Service and Classification Service. All three are covered below.

### **Reference Data Service**

SAM has been authorized by FMS 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 the Bureau of Fiscal Service.

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. Those options are discussed below the overview.

- **Reference Data Service** will deliver information based on a configurable profile in SAM established for each trading partner.

- 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://fiscal.treasury.gov/data/>.
- 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.
- 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.
  - **Pull Reference Data.** Automated pull type services are currently limited to a Web Service data transfer method. 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* below).
  - **Push Reference Data.** 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 scheduled. SAM can accommodate any recurring frequency (e.g., weeknights at 1 AM, every Saturday at 10 PM, etc.).
    - A push of reference data may be initiated automatically when changes to the data type are received from the source.
    - A push of reference data can also be sent on demand by the SAM team.

### Reference Data Service Options:

The Table below describes the Reference Data Service options currently available from SAM.

Data Type	Service	Data Format	Full File or Changes (Deltas) only	Triggers
ALC	Push	XML, CSV, Fixed	Full	Scheduled
ALC	Push	XML, CSV, Fixed	Changes	Immediate
ALC	Pull	XML	Full	On demand
TAS-BETC	Push	XML, CSV, Fixed	Full	Scheduled

## Reference Data Filter Options:

The table below 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. Introducing a filter limits the transmissions to those records that match one of the filter values supplied. Multiple values may be supplied for each record filter and multiple filters may be used. The omission of a filter allows all records of that type to pass.

Data Type	Record Filter	Comments or Description
ALC	ALC Type	e.g., NTDORPT
ALC	Agency	Treasury agency code ... e.g., 010, 014
ALC	State	Currently Active or Not Expired (includes future dated)
TAS-BETC	System Type	Collection, Payment, NTDO Payment or Intragovernmental
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)

## Other Reference Data Options:

The following table describes the Other Reference Data Options that are available for data delivery.

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.
Validate Before Transmission	SAM has an option to validate the XML output before it is transformed and distributed to the partner. If any invalid entries are found, the transmission will be flagged in error.	This option is most useful for XML messages, but the same concept may be applied to stop other formats. Note that SAM will accept invalid reference data (from CARS) as long as it does not interrupt its services.
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 a unique ID, transmission number, date/time of source update, operating environment, etc.	Normally XML transmissions include a SOAP envelope. The SOAP envelope is required for all "pull" requests. An XML schema is available upon request.

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	A Failure on the SAM side would trigger an alert. The severity would be set according to the partners specification.	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.

## Reference Data Connectivity and Data Transfer:

The table below 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.

Operating Environment	Connectivity Options	Data Transfer Method
TWAI	Direct	Web Services
TWAI	Direct	Connect:Direct
TWAI	Direct	Message Queue (MQ)
TWAI	Direct	Secure Transport
TWAI	E-mail (TAS-BETC)	
Non-TWAI	Internet	Web Services
Non-TWAI	Internet	Secure Transport
Non-TWAI	VPN over Internet	Connect:Direct
Non-TWAI	VPN over Internet	Message Queue (MQ)
Non-TWAI	E-mail (TAS-BETC)	

## Manual Service

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.

**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 CSV, Excel CSV or XML format.

**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 B – Contact Information* to request a SAM user ID.

## Verification Service

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). The **Verification Service** accepts various CARS 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 TWAI environment.

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 TWAI	Requested on demand	n/a	n/a

## Classification Service

The **Classification Service** accepts a set of financial transactions from a TWAI trading partner in a prescribed XML format through a Message Queue interface. SAM returns the same transactions with a valid set of Treasury accounting codes.

Service	Data Types	Data Format	Connectivity and Data Transfer	Triggers	Record Filters	Other Options
Classification Service	TAS-BETC, C-KEY	XML	MQ within the TWAI	Requested on demand	n/a	n/a

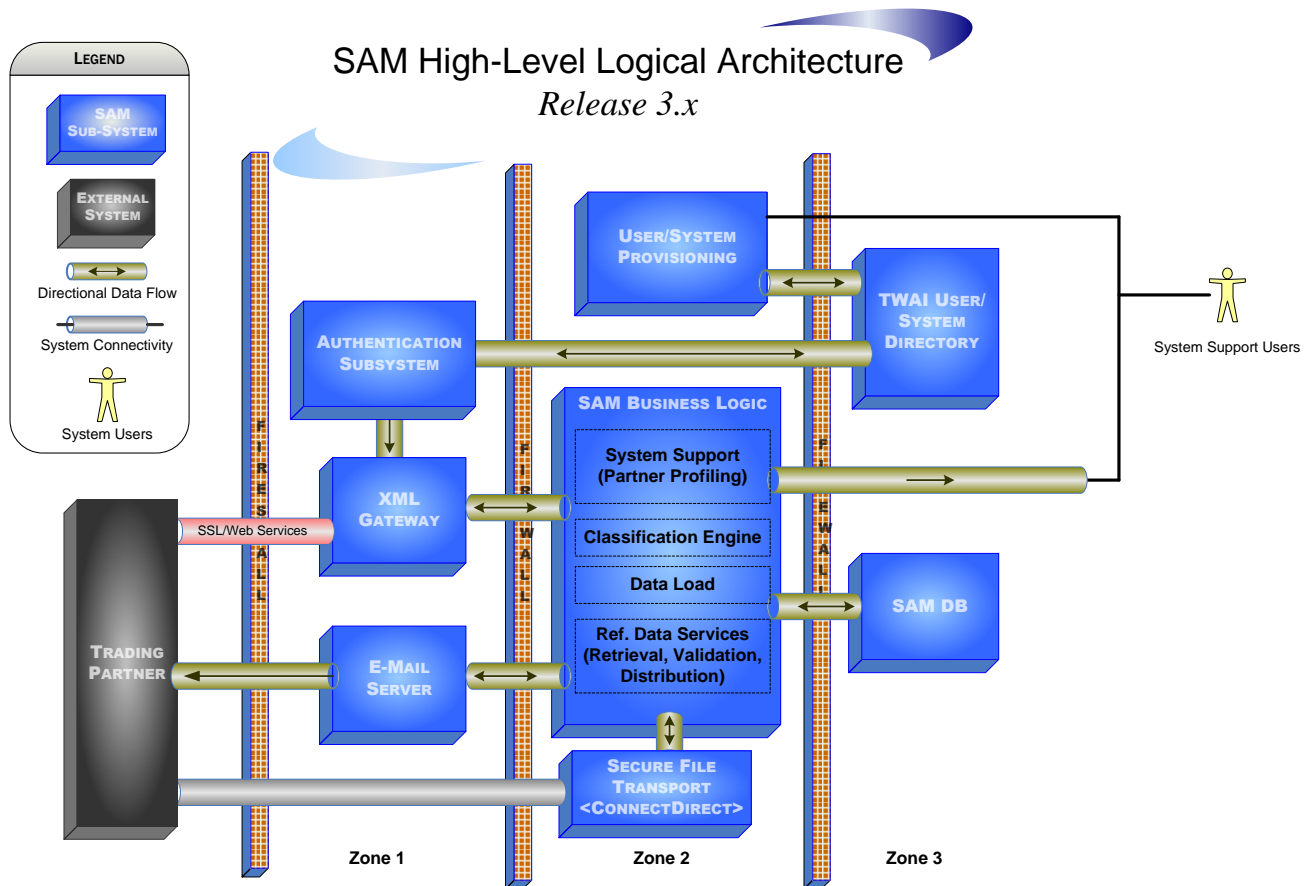
## Section 2: SAM Technical Overview

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.



**Figure 1. SAM High-Level Logical Architecture**

## 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 TWAI 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.

## 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.



### **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 (TWAI) operating environment only supports outbound e-mail messages.

### **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.

### **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.

### **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.

### **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.

### **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.

- a. **Data Load** components are used to manage reference data provided to the SAM application by CARS. 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.
- b. **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.
- c. **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.
- d. **Reference Data Services** and their options are described in detail in *Section 1*. SAM is available 24x7 to provide these services.

## **Section 3: Getting Started**

The SAM Team can help you answer any questions you might have pertaining to SAM services. We will arrange meetings with your team to discuss the options available.

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 someone on the SAM Team or one of the resources listed in Appendix E to get your initial questions answered.
2. Meet with the SAM Team to discuss your business requirements. Discuss the information in this guide to choose data format and connectivity options.
3. Work with the SAM Team if you require documentation such as Memo of Understanding or Interface Specifications.
4. Work with the SAM and TWAI teams to establish and test connectivity to your Test and Production environments.
5. Procure any hardware and/or software necessary to establish connectivity to the Treasury Web Application Infrastructure (TWAI) Test and Production environments.
6. Issue any required certificates, providing system access to SAM or trading partner's application.
7. Test your automated interface(s) with the SAM Team. (See *Testing Considerations* below).
8. Support the new interface(s) throughout the Go-Live period.
9. Monitor your interface(s) on an ongoing basis.

***Testing Considerations***

Testing ensures that all chosen interface options are completely understood, are configured properly and support the needed reference data transmissions in the production environment. 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. SAM also has a Functional Test (FT) environment available for testing.

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
2.0	K. Hood	3/11/2013	Re-write---removed ABA reference data, TAS-BETC changes. Added validate before transmission
2.1	K. Hood	12/2/2013	Remove CGAC only filter for TAS-BETCs
2.2	K. Hood	7/7/2015	Added Secure Transport

## Appendix B: Contact Information

Topic	Contact	Role/Resp.	Phone #	Address
More Information on FMS	FMS Website			<a href="http://www.fiscal.treasury.gov/">http://www.fiscal.treasury.gov/</a>
More Information on CARS	CARS Website			<a href="http://fiscal.treasury.gov/cars/">http://fiscal.treasury.gov/cars/</a>
More Information on SAM	SAM Website			<a href="http://www.fiscal.treasury.gov/sam/index.html">http://www.fiscal.treasury.gov/sam/index.html</a>
Standard FMS XML Schemas	EDA Website			<a href="http://fiscal.treasury.gov/data/">http://fiscal.treasury.gov/data/</a>
TAS-BETC Manual Download	SAM Public Website			<a href="https://www.sam.fms.treas.gov/sampublic">https://www.sam.fms.treas.gov/sampublic</a>
SAM Business	Cyndi Pham	FMS Business	(202)874-8947	<a href="mailto:Cyndi.Pham@fiscal.treasury.gov">Cyndi.Pham@fiscal.treasury.gov</a>

Guidance		Owner		
SAM Business Guidance	Harold Grice	SAM Business Manager	(314)444-4238	<a href="mailto:harold.g.grice@stls.frb.org">harold.g.grice@stls.frb.org</a>
SAM Technical Guidance	Karen Hood	SAM Technical Analyst	(314)444-8648	<a href="mailto:sam.testing@stls.frb.org">sam.testing@stls.frb.org</a>
XML Schemas	Marcel Jemio	Enterprise Data Architecture	(202)874-6838	<a href="mailto:Marcel.Jemio@fiscal.treasury.gov">Marcel.Jemio@fiscal.treasury.gov</a>
ALC Manual Download	Treasury Support Center	Provide new SAM user ID	(877)440-9476	<a href="mailto:sam_tsc@stls.frb.org">sam_tsc@stls.frb.org</a>
Request Automated Interface	Karen Hood	Service Request Processing	(314) 444-8648	<a href="mailto:sam.testing@stls.frb.org">sam.testing@stls.frb.org</a>
Establish TWAI Connectivity	Jerome Downing	Customer Relationship Mgr.	(804)697-7738	<a href="mailto:Jerome.Downing@frit.frb.org">Jerome.Downing@frit.frb.org</a>
Test Automated Interface	Karen Hood	Service Request Processing	(314)444-8648	<a href="mailto:sam.testing@stls.frb.org">sam.testing@stls.frb.org</a>
Problems with Auto. Interface	Treasury Support Center	Service Request Processing	(877)440-9476	<a href="mailto:sam_tsc@stls.frb.org">sam_tsc@stls.frb.org</a>

## **Appendix C: Glossary**

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

CARS – Central Accounting Reporting System, the US Treasury’s core accounting systems

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

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