CoSign Signature APIs

Developer's Guide

Version 7.1

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cosign by arx The Digital Signature Company

CoSign Signature APIs Developer's Guide

CoSign offers a variety of APIs to meet your various digital signature integration requirements:

- CoSign Signature Local – These API functions are implemented as C/C++ libraries and as a COM Object. The library is full featured with all the capabilities for signing files, verifying signatures, and managing signers. The library is highly performant because parts of some API functions are implemented locally.
- CoSign Signature SOAP – This is an HTTPS/SOAP network API which provides a complete set of signing and user management functions. The API offer a full feature set for all scenarios, using any language and any platform.
- CoSign Signature – This is a RESTful web network API. CoSign Signature can be used to easily sign documents and verify signatures.
- CoSign Web Agent – CoSign Web Agent API is a network API. It provides the fastest and easiest way to add digital signatures to your application. The API includes a full User Experience (UX) layer for signing. Your app communicates with the API via HTTPS calls using XML to pass the signing options.

CoSign Overview

Over the last four decades, the biggest challenge of IT departments in many organizations was moving to a paperless work environment. Seemingly, there was tremendous success in this regard. Today, most transactions in the business world are performed electronically:

- Documents are written using word processing programs.
- Messages are sent via email.
- Inventories and purchases are tracked using Enterprise Resource Planning (ERP) systems.
- Medical information is stored in Electronic Medical Record (EMR) systems.

Although these transactions are performed in a paperless environment, organizations have still not managed to find an easy way to get rid of the paper used for data authentication (signing the authenticity of the data). Today, although organizations have invested large amounts of funds and other resources in creating paperless environments, their workers are still printing every transaction, signing it, and saving the printed copy. These organizations require a digital method for data authentication.

By moving to a viable electronic data authentication system, organizations can reduce their printing, archiving, shipping, and handling costs. In addition, better and more competitive customer service can often be provided.

Requirements for Data Authentication Systems

A viable data authentication system must meet the following specifications:

- **Security** – The system must ensure that no one other than the data creator can tamper with or change the data in any way.
- **Third-party validation** – The system must enable any third party to validate the authenticity of the data. If a dispute arises between the parties (the data creator and recipient), any third party must be able to validate the data authenticity in order to settle the dispute.
- **System independence** – Data authentication must be independent of the system that created the data. Users must be able to validate the authenticity of the data using a known standard that is independent of any specific system.
- **Validation over time** – Users must be able to validate data authenticity at any point in time. Authenticity cannot expire at any point.

Currently, the only data authentication method known to support all of these requirements is the Public Key Infrastructure (PKI) method of authenticating data, simply called “digital signatures”.

Introduction to CoSign

CoSign is a PKI-based, off-the-shelf digital-signature solution that can be integrated with a wide range of applications. In this way, CoSign enables organizations to embed digital signatures in various documents, forms, and transactions. CoSign is a turnkey, hardware-based solution that is easily and quickly deployed in the network and provides cost-effective digital-signature capabilities for the organization.

CoSign includes all the components needed for PKI-based digital-signature deployment. You do not need to install any other device or integrate any other component for the system to work.

Environments Supported by CoSign

CoSign integrates with leading user management systems, including Microsoft Active Directory and a variety of LDAP (Lightweight Directory Access Protocol) based directories, such as IBM Tivoli. This integration ensures no overhead in managing the digital-signature system and signature credentials (i.e., the private keys that are needed in a PKI environment), solving one of the main problems of legacy digital-signature systems. System managers, network managers, and end-users can continue to use the IT infrastructure in the same manner as before CoSign was installed.

CoSign stores the signature credentials in a secure server, ensuring that the signer has exclusive access to his or her signature credentials, while still maintaining a centrally managed solution. This is necessary in order to fulfill the security requirement of the data authentication system.

Another option is to use the CoSign Cloud service. An organization can register its users to the service and thus enable them to digitally sign content without having to deploy the CoSign appliance on the organizational premises.

Applications that Work with CoSign

An increasing number of applications can work with CoSign as their digital-signature layer without needing any further integration, including:

- Microsoft Office 2007/2010/2013 (Word, Excel, and PowerPoint)
- Microsoft InfoPath 2007/2010/2013
- Adobe Acrobat
- Microsoft SharePoint 2007/2010/2013
- XML
- TIFF files
- Word Perfect
- Microsoft Outlook and Outlook Express
- Adobe Server forms (for signing web forms)
- AutoCAD
- Lotus Notes
- Microsoft BizTalk
- FileNet eForms
- Verity Liquid Office
- ERP systems (e.g., SAP)
- OpenText
- Oracle
- Crystal Reports
- Web applications
- Any application that has a *print* option can use CoSign to generate a PDF file and sign it.

For information on using CoSign with other applications, contact ARX technical support.

CoSign Components

CoSign includes the following components:

- **CoSign appliance** – The CoSign appliance hardware and software, connected to the organization's network.
- **Client** – The CoSign Client software, installed on the users' computers.
- **Administrator** – The CoSign Administrative software that includes the CoSign Microsoft Management Console (MMC) snap-in, installed on the administrative computer.
- **CoSign Connector for SharePoint** – This connector enables adding digital signature functionality to documents managed by Microsoft SharePoint, or using digital signatures within any workflow procedure that is based on Microsoft SharePoint.
- **CoSign Web App** – This application is deployed in the Microsoft Web Server of the organization and enables users to sign documents in their web browsers without installing any software. CoSign Web App can use either a CoSign appliance or the CoSign Cloud for signing services. Developers can use the CoSign Web Agent API to integrate CoSign Web App with their applications.
- **CoSign Cloud** – A CoSign cloud-based application that provides digital signature services to users who register for the services. The CoSign cloud supports single users as well as groups of users.
- **CoSign Signature APIs** – Developers can use local and network APIs to integrate their applications with CoSign Central appliances and the CoSign Cloud service.

CoSign Components

For the 7.1 release, CoSign has introduced a new API and renamed its current APIs. The new API names are:

New Name	Old Name
CoSign Signature Local	SAPI
CoSign Signature SOAP	SOAP-based Web Services
CoSign Signature	A new API for release 7.1
CoSign Web Agent	CoSign Web App API

"CoSign Signature APIs" refers to the entire set of APIs from CoSign.

Each API is discussed in its own section of this manual.

CoSign Guides

CoSign documentation includes the following guides:

- *CoSign Administrator Guide* – Provides all the information necessary for an administrator to install and manage the CoSign appliance in the various environments in which CoSign can operate.
- *CoSign User Guide* – Provides all the information necessary for an end user to use CoSign. Includes information about special add-ins for various applications such as Microsoft Office.
- *CoSign Connector for SharePoint User Guide* – Provides all the information necessary for implementing and using the CoSign Connector for SharePoint.
- *CoSign Web App User Guide* – Provides all the information necessary for deploying the CoSign Web App in the organization's environment.
- *CoSign Signature APIs Developer's Guide* – Provides all the information necessary for a developer to integrate their application with CoSign.

Intended Audience

This guide is intended for developers looking to integrate desktop applications, enterprise systems, and web applications and services with CoSign Digital Signatures capabilities.

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CoSign Signature Local

This section includes the following topics:

- Introduction
- Signature Local Signing/Verifying API
- Signature Local User Management API
- Signature Local COM Methods for Signing and Verifying
- Signature Local COM Methods for User Management

Introduction

CoSign Signature Local is an application programming interface (API) that provides digital signature services for desktop applications, enterprise systems, and web applications. In conjunction with CoSign Central or CoSign Cloud, CoSign Signature Local provides a set of functions that allows flexible digital signing of data and documents, avoiding the complexity that is typical for PKI-based digital signatures.

CoSign Signature Local can be used by applications that are not PKI-aware and do not wish to use a full-blown cryptographic API. Developers can use CoSign Signature Local to include support for digital signatures in customized processes, homegrown applications, and integration with third-party applications, systems, and directory services.

This chapter describes the functionality of the CoSign Signature Local API. It is available in two types of programming interfaces:

- *C/C++ libraries for MS Windows applications* – The relevant DLLs are supplied as an add-on to the CoSign client.
- *COM Object for Microsoft developers* – This enables COM based developers such as VB or ASP developers to interface with the CoSign appliance. Also, this COM object can be used by any .NET development language such as VB.NET or C# to enable digital signature functionality. The COM interface is very similar to the C/C++ libraries interface.

The CoSign SAPI Local API includes four components:

- SAPICrypt provides signing and verification methods.
- SAPIUM provides user management methods. This library does not work with CoSign Cloud.
- SAPICryptCOM is the same as SAPICrypt, but provides a COM interface to the methods.
- SAPIUMCOM is the same as SAPIUM, but provides a COM interface to the methods.

CoSign Signature Local Components and Capabilities

CoSign Signature Local is comprised of two API components:

- The **signing and validating API**. This API enables signing files and data buffers, managing and retrieving information about the user's certificates, and other signature-related operations. For a detailed overview of this API, refer to Capabilities of Signing and Validating API.
- The **User Management API (SAPI-UM)**. This API enables managing the CoSign users and groups, synchronizing users with third-party directory services, and other user management functionality. For an overview of this API, refer to Capabilities of User Management API (SAPI-UM).

Capabilities of Signing and Validating API

This API enables signing files and data buffers, managing and retrieving information about the user's certificates, and other signature-related operations. This API enables you to:

- Sign/Validate a signature field in a supported application (Word, PDF, etc.).
- Batch sign files (e-Invoices, e-Archiving, etc.).
- Create a signature field in a file (in supported applications).
- Enumerate signature fields in a file (in supported applications).
- Check signature field parameters.
- Enumerate certificates.
- Set the default certificate for a user with multiple certificates.
- Check certificate validity.
- Retrieve certificate fields (such as CN, e-mail, etc.).
- Sign/Validate a single file or data buffer.
- Manage the graphical images of a user that can be embedded inside a graphical signature.

Supported File Types

This API enables you to sign and verify signature inside the following types of files:

- PDF documents. After performing digital signature, the signatures can be viewed using PDF viewers such as Acrobat Reader.
- Office 2007/2010/2013 documents such as Word 2007/2010/2013 (.docx files) or Excel 2007/2010/2013 (.xlsx files).
- Tiff documents.
- XML files.
- Word XP/2003 documents, where the signature is based on an Entire File signature.
- InfoPath 2007/2010/2013 forms.

The purpose of the signature and validation API is to provide all the necessary tools to perform proper signature and validation operations.

Managing Fields Inside a Document

As an initial step, it is mandatory to generate empty fields inside a document. These fields, placed in various locations inside the document, will eventually contain the digital signatures. The formats of the field and of the digital signature adhere to the document type. For example, the digital signature field in a PDF file adheres to PDF standards.

Note: *CoSign Signature Local also supports* Non Visible *digital signatures. These are digital signatures that are not visually embedded inside the document.*

The following field management functionality is available:

- Creating and naming a new empty signature field.
- Removing an existing signature field.
- Enumerating all signature fields inside a document.

- Retrieving the information of a signature field.

Managing Graphical Images

CoSign can handle multiple graphical images per user. A graphical image is a bitmap image that is based on BMP or JPG format and contains a graphical signature of the end user.
In addition, the user account can also include a graphical image for the user's initials or a graphical image for a logo. Starting from CoSign version 5.4, each user is permitted a single logo.
Several Graphical signatures/Initials can be kept and incorporated into the signature field during digital signature operation.

The following graphical image management functionality is provided:

- Creating a new graphical image.
- Enumerating existing graphical images of the user.
- Updating an existing graphical image of the user.
- Deleting an existing graphical image.

Managing User Certificates

CoSign can handle multiple keys and certificates per user. The X509 certificate contains non-cryptographic parameters such as the Distinguish Name of the user of the certificate, expiration of the certificate, and the name of the CA who provided the certificate.

CoSign Signature Local provides mechanisms for selecting the certificate to be used in digital signature operation, as follows:

- Enumerating all existing certificates.
- Retrieving information from a certificate.
- Specifying the default certificate for the user.

Signing and Validating Signature Fields in a Document

CoSign Signature Local provides the mechanism to sign an empty digital signature field. Upon a successful digital signature operation, the signature field contains the digital signature. The digital signature field is visible in the document.

The following API is provided for signing and validating a digital signature:

- Signature generation API for signing an existing empty field.
- Checking whether a certain field is signed.
- Clearing a field that contains a digital signature.
- Validating an existing signature field.

Starting from CoSign version 5.4, a standard signature ceremony dialog is available in CoSign. This dialog is used by all CoSign applications and add-ins such as OmniSign and ARX Signature Line Provider for Office 2007/2010/2013. Through the standard signature ceremony dialog, signature components such as reason or graphical signature can be entered or selected. These signature components are used by the digital signature operation and embedded into the visible signature. This signature ceremony also supports electronic signatures in PDF files.

Buffer Signature and Validation Operation

CoSign Signature Local provides the mechanism to generate a digital signature upon a given data buffer and verify an existing signature upon a given data buffer.
This mechanism also provide methods for signing a given hash value or validating a signature based on a given hash.
The calling application must specify with which certificate to perform the signature operation.
The generated signature is based on either the PKCS#7 standard or the PKCS#1 standard.
The PKCS#7 or PKCS#1 signature is then validated using the signature validation function.

Note: *New security regulations recommend using SHA-2 (SHA-256, SHA-384 or SHA-512) as part of the digital signature generation. SHA-2 is supported in CoSign Signature Local for the signature mechanism and the verification mechanism, for machines with XP SP3 or Windows 2003 SP2 and later.*

The following API is provided:

- Signature generation API for signing a data buffer.
- Validating an existing signature field.

User Signing Using a Web Application or an Application Server

CoSign Signature Local can be integrated with a web server or application server built on the Windows platform.

To sign data or documents, the end user uses a browser to communicate with the web server. The end user must supply credentials such as a User ID and password. These credentials are used with the SAPILogon API.

Within the Logon/Logoff session, documents are submitted to be signed. The application uses the SAPILogoff function after the signature operations are completed.

In addition, you can execute a third party signature code which is wrapped by the SAPILogon and SAPILogoff API calls. Any existing library that accesses the Microsoft Store and performs a digital signature operation can be activated as part of the user context.

On non-Windows platforms, web applications can use the CoSign Signature and Signature SOAP APIs instead of CoSign Signature Local.

You can use CoSign Signature Local on a PDF file or XML file residing in memory buffers. It is not required to save the file to a web server's disk before using CoSign Signature Local to operate on the saved file.

Advanced Digital Signatures

One of the common usages of digital signatures is to sign documents for long term archiving. This necessitates the following enhancements:

- Including a secure timestamp as part of the digital signature's administrative information.
- Including a certificate status at the time of signing by attaching an OCSP response from the CA as part of the digital signature's administrative information.

The purpose of the secure timestamp is to bind a countable time to the digital signature operation. In this case, you can configure CoSign Signature Local to communicate with a secure timestamp server that provides the secure timestamp. The timestamp is incorporated into the digital signature based on a standard time-stamping protocol called RFC-3161.
As part of the verification procedure, you can use the exact time of the signature to present the signature time, and you can execute a signature validation procedure to evaluate the exact status of the user certificate at the time of the signature.
You can also enhance the created digital signature with current OCSP (Online Certificate Status Protocol) information. OCSP can provide information related to the status of the signing certificate. You can use this indication as part of the signature verification to make sure that the signing certificate was valid at the time when the signature was performed.

Note: *The embedding of the OCSP information is based on PDF definitions.*

For more information on advanced signatures, refer to the following standards:

- For information on CAdES (CMS Advanced Electronic Signatures) – refer to RFC 5126.
- For information on XAdES (XML Advanced Electronic Signatures) – refer to http://www.w3.org/TR/XAdES/.

Using CoSign in Common Criteria Mode

The CoSign appliance can be installed in a Common Criteria EAL4+ mode of operation. CoSign Common Criteria deployments must be installed in a Directory Independent environment. In this mode of operation, the following additional procedures and activities are required from the end user:

- Any digital signature operation must be authorized by presenting the user's password and an OTP displayed by the user's OTP device.
  This means that any digital signature interface that is used must also be provided with an extended authentication parameter that includes both the static password of the user and a One Time Password (OTP).
- All first-time users must activate their account before they can perform any operation in the account, such as generating a signature key or signing. For that either the CoSign client user interface or a User Activation API is required to be used.

User Activation

In a Common Criteria EAL4+ mode, the first time you wish to use your CoSign account you must first perform an activation operation. This operation must be performed only once.

During activation you must supply the given activation password (existing password), the new desired password, and the OTP as it appears in your personal OTP device.

Please make sure you received you activation password and your OTP device from the organization in a secure manner.

Note*: If you perform an activation procedure and receive a message that the account was already activated, inform the organization immediately.*

Protection of Data/Documents during Signing

It is important to make sure malicious software does not alter the data to be signed between the moment the user initiates a signature operation and until the moment the data is actually signed by the CoSign appliance. This section provides some guidelines for preventing non-trusted software from modifying content to be signed.

- CoSign client installation is signed by *Algorithmic Research's* code signing key. Please make sure that when the product is installed, a relevant message appears indicating that the CoSign client software is indeed protected.
- Every DLL and EXE file of the CoSign Client is signed with *Algorithmic Research's* code signing key. It is advised to regularly check that the signature is valid by viewing the *digital signatures* tab provided as part of the file properties of the CoSign's installation DLLs and EXE files.

PDF Signature Support

The most extensive support for digital signatures is provided for PDF files, mainly due to the rich native support of digital signatures in PDF documents.
All CoSign Signature Local operations conform to the PDF standard (refer to *ISO 32000-1 Document Management – Portable document format – Part 1: PDF 1.7*).
Using CoSign Signature Local, you can create signature fields in a PDF document, sign existing fields, and verify signatures in existing fields. You can also create multiple signature fields, and define whether each signature field is visible.
Starting from CoSign version 6, a PDF file residing in a memory buffer can be used as well as a PDF file saved on the disk.

Office 2007/2010/2013 Signature Support

CoSign Signature Local provides the signature creation and signature verification support for Office 2007/2010/2013 documents based on the Microsoft Signature Line provider standard. The following operations are supported:

- Signing an existing signature field.
- Clearing an existing signature.
- Verifying an existing signature field.

The signing and clearing operations conform to the Office 2007/2010/2013 standard. Thus, you can, for example, sign an Office 2007/2010/2013 document using CoSign Signature Local, and validate the signature using the Office 2007/2010/2013 application.
The certificate that is used for signing must be fully trusted. This means that the certificate chain must be trusted and all CRLs of the certificates in the certificate chain must be accessible.
Failing to trust the entire certificate chain and the certificate CRLs may cause the entire digital signature process to fail.

Starting from CoSign version 6, you can also create an empty signature field and then sign it using any of the following: CoSign Signature Local, the ARX signature line provider for Office 2007/2010/2013, or the Microsoft signature line provider for Office 2007/2010/2013.
Signature fields can be added only in the first page or last page of the document.

Word XP/2003 Signature Support

CoSign Signature Local provides partial support for Word XP/2003 documents. Only the following operations are supported:

- Signing an existing signature field of type *Entire File*.
- Clearing an existing signature.
- Verifying an *existing* signature field.

The *signing and clearin*g operations conform to the ARX add-in for Word XP/2003. Thus, you can, for example, sign an Office XP/2003 document using CoSign Signature Local, and validate the signature using the ARX Word add-in.

Since creating an empty signature field is not supported, you will need to prepare in advance empty signature fields inside an Office XP/2003 document and then use CoSign Signature Local to enable applications to sign these signature fields.

TIFF Signature Support

CoSign Signature Local provides extensive support for signing TIFF files, although there is no digital signature standard for TIFF files.
The Tiff tag used by CoSign Signature Local for identifying the digital signature is 50685.
Both visible and invisible signatures are supported. Only one visible signature is supported. The visible signature operation actually replaces the visible content of the TIFF document with the visible signature content.

InfoPath 2007/2010/2013 Signature Support

CoSign Signature Local provides signature creation and signature verification support for InfoPath 2007/2010 forms. The following operations are supported:

- Signing an existing signature field.
- Clearing an existing signature.
- Verifying an existing signature field.

The signing and clearing operations conform to the InfoPath 2007/2010/2013 standards. This means that you can, for example, sign an InfoPath 2010 document using CoSign Signature Local, and validate the signature using the InfoPath 2010 application.

Because the creation of an empty signature field is not supported by CoSign Signature Local, you will need to prepare in advance empty signature fields in InfoPath 2007/2010/2013 forms and then use CoSign Signature Local to enable applications to sign these signature fields.

The CoSign Signature Local signature conforms with XAdES-BES (refer to http://www.w3.org/TR/XAdES/), which is supported in InfoPath 2010/2013 and provides an Advanced Digital Signature format.

XML Signature Support

Starting from version 5, CoSign Signature Local supports attaching a digital signature to XML content based on the XML digital signature standard, as described in http://www.w3.org/TR/xmldsig-core/).
In XML, the generated digital signature is not visible. In addition, the digital signature operation generates a signature field and signs it in the same action.

The current implementation enables a single digital signature for a given XML file.
Starting from CoSign version 6, XML data residing in a memory buffer can be used as well as an XML file saved on the disk.

The XML signature standard defines the following three types of digital signatures: Enveloped, Enveloping, and Detached.
The current implementation supports only the Enveloped and Enveloping types.

The basic XML signature is limited and is not useful for long term archival. To address this, a standard called XAdES (XML Advanced Electronic Signature) was defined to enable using XML signatures for long term archival (refer to http://www.w3.org/TR/XAdES/). The XML advanced signature standard defines several levels of conformity. CoSign Signature Local supports the following levels: XAdES-BES and XAdES-PES.

Capabilities of User Management API (SAPI-UM)

This API provides mechanisms for managing CoSign users and groups (mainly in a Directory Independent environment), synchronizing users with third-party directory services, and other user management functionality. This API enables:

- Adding, updating and deleting users
- Adding, updating and deleting groups
- Retrieving user information
- Retrieving group information

Typical CoSign Signature Local Scenarios

The scenarios below are intended to help developers in planning how to activate CoSign Signature Local for their purposes.

Note: *The term* SAPI session *is relevant only when using the C/C++ based CoSign Signature Local and SAPI-COM.*
The idea of a SAPI session is to create a C/C++/COM context in which all CoSign Signature Local operations are executed within the session.
The ability to establish sessions and assign each session to a certain user through a proper login operation enables CoSign Signature Local to provide digital signature API to server applications, where the server application requires support of many users in parallel.
In the case of Web Services deployment, there is no contextual information for the CoSign Signature Local operations.

Signing Forms using a Desktop Application

This scenario applies to an application which:

- Serves a single user, the user currently logged into the PC.
- Captures the user data into one of a predefined set of forms in which the signature is always located in the same place, regardless of the content entered by the user. Thus, the signature field is actually already created in the form template.

This type of application can use CoSign Signature Local to sign forms, using the following procedure:

1. Create a SAPI session.
2. Find the signature field in the file using the field enumeration function.
3. Sign the signature field.
4. Repeat the above step for all the fields in the document.
5. End the SAPI session.

Verifying a Signature in a File

This scenario applies to an application that needs to verify a signed file. The application can use CoSign Signature Local as follows:

1. Create a SAPI session (if relevant).
2. Find the signature field in the file using the field enumeration function.
3. Verify the signature field.
4. End the SAPI session (if relevant).

If the file contains more than one signature field, repeat steps 2-3 for each signature field.

You can optionally retrieve the signature field information in case the application wants to display some information about the signature, or in case the application wants to check whether the field is signed before trying to verify its signature. To retrieve signature field information, use the Field information retrieval function.

You can check whether a field is signed without actually verifying its signature or enumerating its signature fields. This can be very helpful for applications wishing to display different icons or colors for different file types or wishing to offer different menu options according to the file status, without actually performing a verification procedure.

Signing a File using the Web Services Interface

This scenario applies to an application in which the web server communicates with the CoSign appliance through the web services interface and provides user credentials as part of the digital signature operation.

This type of application can use CoSign Signature Local to sign files, using the following procedure:

1. Find the signature field in the file using the field enumeration function.
2. Sign the signature field inside the document while providing the signers' credentials. The whole file is transmitted to the CoSign appliance.
3. Repeat the above step for all fields in the document.

Signing a File using the Web Services Interface without Passing the Whole File

This scenario applies to an application in which the web server communicates with the CoSign appliance through the web services interface and provides user credentials as part of the digital signature operation.

This type of application can use CoSign Signature Local to sign files without passing the whole file, using the following procedure:

1. Find the signature field in the file using the field enumeration function.
2. Compute a hash of the file using any external cryptographic library.
3. Sign the signature field inside the document while providing the signers' credentials. Only the hash of the file is transmitted to the CoSign appliance.
4. Repeat the above step for all the fields in the document.

Signing Transaction Data

This scenario applies to an application that needs to sign short raw data, such as transaction data. It can use CoSign Signature Local as follows:

1. Create a SAPI session (if relevant).
2. Sign the raw data using the SAPI Buffer Signing operation.
3. Store the signature data for later verification.
4. End the SAPI session (if relevant).

Verifying Transaction Data

This scenario applies to an application that needs to verify the signature of short raw data, such as transaction data. It can use CoSign Signature Local as follows:

1. Create a SAPI session (if relevant).
2. Verify the signature against the raw data using the SAPI Buffer validation operation.
3. End the SAPI session (if relevant).

Signing Long Raw Data

This scenario applies to an application that needs to sign long raw data such as long byte streams, binary files, etc.

This type of application can use CoSign Signature Local as follows:

1. Create a SAPI session.
2. Start the signing operation using SAPIBufferSignInit.
3. Sign each portion (i.e., buffer) of data using SAPIBufferSignCont. Call the SAPIBufferSignCont function as many times as needed, pointing each time to one portion of the data to be signed.
4. End the signing operation and retrieve the signature data using SAPIBufferSignEndEx.
5. Store the signature data for later verification.

6. Sign the raw data using the SAPI Buffer Signing operation.
7. Store the signature data for later verification.
8. End the SAPI session.

Verifying Long Raw Data

This scenario applies to an application that needs to verify a signature of long raw data such as long byte streams, binary files, etc.

Note: *This scenario is relevant only for C/C++ SAPI and SAPI-COM.*

This type of application can use CoSign Signature Local as follows:

1. Create a SAPI session. Start the verifying operation using SAPIBufferVerifySignatureInit.
2. Send each portion (i.e., buffer) of data for verification using SAPIBufferVerifySignatureCont. Call the SAPIBufferVerifySignatureCont function as many times as needed, pointing each time to one portion of the data to be verified.
3. Retrieve the verification result and the signing certificate status using SAPIBufferVerifySignatureEnd.
4. End the SAPI session.

Central File Signing by Different Users

This scenario applies to an application server or a web application that serves different users, and allows them to sign files of different types using their own certificates and graphical signatures. This type of application can use CoSign Signature Local as follows:

1. Create a SAPI session (if relevant).
2. Logon to CoSign with the users credentials using SAPILogonEx (relevant only to SAPI C/C++ and SAPI-COM).
3. Create a signature field in a specific location in the file. If the file is a PDF or XML file, it can alternatively reside in a memory buffer.
4. Sign the signature field.
5. Repeat steps 3-4 for each additional file you wish to sign.
6. Close the authenticated user session using SAPILogoff (relevant only to SAPI C/C++ and SAPI-COM).
7. End the SAPI session (if relevant).

If the files already contain a signature field, the application can sign the existing field rather than creating a new one.

Batch Signing of Files

This scenario applies to an application that needs to sign multiple files, either attended or unattended. The application can use CoSign Signature Local as follows:

1. Create a SAPI session (if relevant).
2. For each file that needs to be signed:
   a. Create a signature field in a specific location in the file.
   b. Sign the signature field.
3. End the SAPI session (if relevant).

The certificate of the application's owner is used for signing files. For a regular application, the owner is the user under which this application runs. If the application is a service, you can set the user credentials in the service properties, otherwise the service runs with the local system credentials. If the signing certificate belongs to a user other than the application's owner, the application can use **SAPILogon** to logon with these user credentials right after the SAPI session handle is acquired. It then uses **SAPILogoff** to log off when all the files are signed.

In the case of a Web services interface, each file should be sent to be signed in the CoSign appliance via the web services interface.

A Workflow Application for Signing a Document Multiple Times

This scenario applies to an application used for signing a document multiple times by different users having different roles, and which uses a document with existing signature fields. This application can use CoSign Signature Local for each signing operation, as follows:

1. Create a SAPI session (if relevant).
2. Enumerate the signature fields. Check each signature field's information to locate the specific field that needs to be signed according to the workflow logic.
3. Sign the signature field.
4. End the SAPI session (if relevant).

If the workflow logic requires verification of all previously signed fields in the file prior to the signing action, the application can verify the fields based on the API calls described in Verifying a Signature in a File

Introduction to the SAPICOM Interface

The SAPICOM interface is very similar to the SAPICrypt interface. Like SAPICrypt, SAPICOM is comprised of the Crypt and User Management API components. The SAPICryptCOM, as well as the SAPIUMCOM, are registered during the installation of the CoSign client.

Note: *The version of SAPICOM and SAPIUMCOM is displayed as 3.21. However, both of these libraries are part of the latest version of the CoSign client.*

Following are some differences between the SAPICOM and SAPICrypt interfaces:

- The `SAPI` prefix of the function name is removed for all of the functions.
- All of the `unsigned char*` arrays are replaced by the `SAPIByteArrayInterface` type.

- All the `char*` strings and `wide char` strings are replaced with `BSTR*`.
- All structures are replaced with an interface with a similar name.
- All `void` parameters are replaced with `VARIANT` parameters.
- In most cases, the COM data types that are used implicitly indicate the length of the data they store. Therefore, all length parameters are omitted, such as the `ValueLen` parameter in the SAPIConfigurationValueGet function.
- The `progress` callback function cannot be set using the ConfigurationValueSet method.
- The C/C++ SAPIStructRelease function is not applicable for the COM interface.

Signature Local Signing/Verifying API

The following sections describe in detail the SAPICrypt Signing and Verifying API.

Using SAPICrypt

This section provides a detailed explanation of SAPICrypt. SAPICrypt refer to the C/C++ Signature Local Signing/Verifying functions. It explains the basic entities such as a SAPI Session and then explains each SAPICrypt function in detail.
This is followed by typical scenarios and corresponding code samples. These scenarios can help application developers determine how to call the API functions in order to integrate digital signature features in their applications.

The SAPICrypt API .h files are on the SAPI SDK CD, under the `SAPI\include` directory. They include:

- *SAPICrypt.h* – Contains all the SAPICrypt API functions.
- *SAPIConsts.h* – Contains all the constants used by the SAPICrypt API.
- *SAPITypes.h* – Contains all the SAPICrypt API types.
- *SAPIEnums.h* – Contains all the SAPICrypt API enumerated types.
- *SAPiErrors.h* – Contains all the possible SAPICrypt API error codes.

The SAPICrypt DLL is part of the CoSign client installation and is located in the `<Program Files>\ARX\ARX Signature API` directory.

The SAPICrypt library file is part of the CoSign SK CD and is located in the `SAPI\lib` directory.

SAPI Session

The SAPI session functions described in this chapter are general functions intended for various scenarios. These functions can be called by applications that perform signing, verification, signature fields' management, or certificate browsing.

Following are some general usage guidelines:

- The SAPIInit function must *always* be the first function to be called, and SAPIFinalize must always be called when all work with CoSign Signature Local is completed. After calling SAPIFinalize, the only CoSign Signature Local function that can be called is SAPIInit.
- SAPIHandleAcquire must be called before any other function that uses the SAPI session handle. SAPIHandleAcquire begins a session that is terminated only by calling SAPIHandleRelease with the session handle as a parameter. An application can have more than one SAPI session handle opened with CoSign Signature Local, and is usually used by server applications that serve multiple users in parallel. A typical single-threaded CoSign Signature Local application starts by calling SAPIInit followed by a call to SAPIHandleAcquire. It ends by calling SAPIHandleRelease followed by SAPIFinalize.
- A SAPI session handle is created with default behavior settings. These settings can be retrieved by calling SAPIConfigurationValueGet with the relevant configuration value ID, and can be modified by calling SAPIConfigurationValueSet. The new configuration values influence all CoSign Signature Local function calls processed after the change. When a session is released, all the modified configuration values are also released. Modifying a SAPI session handle has no impact on other SAPI sessions open now or opened later.
- Both Server applications serving multiple different users, as well as single-threaded applications, that wish to avoid the display of dialog boxes call the SAPILogonEx function. Calling SAPILogonEx ensures that for the current SAPI session, CoSign Signature Local only uses certificates and graphical images belonging to the CoSign user whose credentials were passed to this function. Even in environments in which a user credentials dialog box appears upon calling certain CoSign operations (i.e., Directory Independent environments or when the prompt for logon is set), the dialog box does not appear if the user credentials supplied to SAPILogonEx are correct.
  Calling SAPILogoff returns the SAPI session handle to the state it was in before calling SAPILogonEx.
  You can invoke third-party libraries that perform digital signature operations within the scope of a user that is defined using the SAPILogonEx API call. You must set the SAPI_ENUM_CONF_ID_LOCK_USER configuration value to 1, so that when the third-party application accesses the Windows Store, it will use certificates that belong to the user that performed the SAPILogonEx operation.
- Some of the CoSign Signature Local functions allocate resources and return them to the application for further use. When these resources are no longer required by the application, they must be released. Resources can be structures, contexts and handles, and the functions that release them are SAPIStructRelease, SAPIContextRelease and SAPIHandleRelease, respectively.

- An application can call SAPILibInfoGet to find out the CoSign Signature Local version, and thus make use of specific functionality that is implemented only in new versions. The SAPILibInfoGet function also returns within its information structure an indicator of whether CoSign Signature Local can be called for signing operations, or whether it can be used for signatures verification only.
- All the non-void CoSign Signature Local functions return `SAPI_OK` if they succeed and a CoSign Signature Local error code in case of failure. Although the error code usually provides information about which operation failed and why, it is possible and recommended to call SAPIExtendedLastErrorGet for additional information about the reason for failure.
- In a Directory Independent installation, a user can change his CoSign user password by calling SAPICredentialChange with the old and new passwords.
- When CoSign is deployed in Common Criteria EAL4+ configuration, the user can activate his/her account by calling SAPIUserActivate with the old and new passwords and an OTP (One Time Password).
- Applications wishing to install the CoSign CA certificate, or to publish the CoSign CRL, call SAPICAInfoGetInit and SAPICAInfoGetCont to retrieve the Certificate and CRL data, and then call SAPICACertInstall to install it in the Windows trust store. Note that in an Active Directory installation, the publication is automatically done by the operating system, and these functions are not called.
- In a high availability environment, client applications can use the SAPIGetTokenID and SAPISetTokenID to get information about the currently used CoSign Appliance, or set to which appliance to connect.
- You can retrieve the current time from CoSign by calling SAPITimeGet.

SAPIInit

The **SAPIInit** function initializes the SAPI library and must be called before any other function in the library.

```
SAPI int SAPIInit ();
```

Parameters

This function has no parameters.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_FAILED_TO_INIT_REG_KEY`	Could not find the install path of the SAPI DLL in the registry. A possible reason is CoSign Signature Local is not installed.
`SAPI_ERR_FAILED_TO_INIT_LOAD_MODULE`	Failed to load the SAPI DLL. A possible reason is that the SAPI DLL was moved from the location specified during CoSign Signature Local installation.

Remarks

When no additional CoSign Signature Local function needs to be called, call SAPIFinalize in order to close the library and free the library resources.

See Also

SAPIFinalize

SAPIHandleAcquire

The **SAPIHandleAcquire** function acquires a SAPI session handle. This returned handle is then used to make calls to all CoSign Signature Local functions that require such a handle. Configuration values, the default certificate, the graphical image, are all objects that can be set for a specific session handle and influence all subsequent function calls with the handle.

```
SAPI int SAPIHandleAcquire (
  SAPI_SES_HANDLE            *Handle
);
```

Parameters

Handle

[out] Pointer to a handle of a SAPI session.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	NULL value for *Handle* is not allowed.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the new handle. This might be due to a shortage in system resources.

Remarks

When the handle is not required anymore, it should be released by calling the SAPIHandleRelease function. Releasing the session handle frees all the resources related to the handle, and the handle becomes invalid.

See Also

SAPIHandleRelease, SAPIConfigurationValueGet, SAPIConfigurationValueSet

SAPIConfigurationValueGet

The **SAPIConfigurationValueGet** function retrieves one of the configuration values that are defined in SAPI_ENUM_CONF_ID.

```
SAPI int SAPIConfigurationValueGet (
  SAPI_SES_HANDLE                 Handle,
  SAPI_ENUM_CONF_ID               ConfValueID,
  SAPI_ENUM_DATA_TYPE             *ConfValueType,
  Void                            *Value,
  unsigned long                   *ValueLen,
  SAPI_BOOL                       SessionValue
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

ConfValueID

[in] The identifier of the value being retrieved.

ConfValueType

[out] Pointer to value that receives a code indicating the type of data that is stored as the required configuration value. For a list of the possible type codes, see SAPI_ENUM_DATA_TYPE. The *ConfValueType* parameter can be NULL if the type code is not required.

Value

[out] Pointer to the returned configuration value. The *Value* parameter is of the same type as the expected configuration value type. This parameter can be NULL if it is required for querying the length of the returned parameter.

ValueLen

[in/out] Pointer to a value that specifies the size, in bytes, of the data type pointed to by the *Value* parameter. When the function returns, this value contains the size of the data copied to *Value*, or, if *Value* is NULL, the size that needs to be allocated for the *Value* parameter.

SessionValue

[in] A flag indicating whether the required value is a session value or a global value. Currently only session values are supported, so this parameter must be true.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.

Value	Meaning
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*ValueLen* is NULL and must not be NULL.
SAPI_ERR_CONF_VALUE_NOT_FOUND	The value of *ConfValueID* is not one of the supported configuration ID values.
SAPI_ERR_PARAMETER_LEN_IS_TOO_SHORT	The length of the actual allocated space is shorter than the space needed for proper retrieval of the value.

Remarks

The *Value* parameter must be of the same type as the expected configuration value type.

Currently, only session values can be retrieved.

If not set, a default configuration value is returned for each value defined by SAPI_ENUM_CONF_ID.

A configuration value with an ID that is not one of the IDs defined in SAPI_ENUM_CONF_ID, can be retrieved only if it was previously set by the SAPIConfigurationValueSet function.

See Also

SAPIHandleAcquire, SAPIConfigurationValueSet

SAPIConfigurationValueSet

The **SAPIConfigurationValueSet** function sets one of the configuration values that are defined in SAPI_ENUM_CONF_ID. All subsequent calls with the same SAPI session handle are influenced by the new value set.

```
SAPI int SAPIConfigurationValueSet (
  SAPI_SES_HANDLE                  Handle,
  SAPI_ENUM_CONF_ID                ConfValueID,
  SAPI_ENUM_DATA_TYPE              ConfValueType,
  Void                             *Value,
  unsigned long                    ValueLen,
  SAPI_BOOL                        SessionValue
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

ConfValueID

[in] The identifier of the value being set.

ConfValueType

[in] A code indicating the type of data stored as the configuration value. For a list of the possible type codes, see SAPI_ENUM_DATA_TYPE.

Value

[in] Pointer to the value of the configuration value being set.

ValueLen

[in] A value that specifies the size, in bytes, of the data type pointed to by the *Value* parameter.

SessionValue

[in] A flag indicating whether the value is a session value or a global value.
Currently only session values are supported, so this parameter must be true.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*Value* is NULL and must not be NULL.
`SAPI_ERR_FAILED_TO_SET_CONF_VALUE`	A general error occurred while setting the configuration value. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

Currently only session values can be set.

If a configuration value is set with an incorrect type, then, when this value is required by other CoSign Signature Local internal functions, the value is ignored and in some cases this can lead to an error.

You can set a configuration value with an ID that is not one of the IDs defined in SAPI_ENUM_CONF_ID, but it cannot be used by any of the CoSign Signature Local internal functions.

See Also

SAPIHandleAcquire, SAPIConfigurationValueGet

SAPIContextRelease

The **SAPIContextRelease** function releases all the resources related to any kind of CoSign Signature Local context. This function is called whenever the application finishes using a context, to avoid unnecessary allocation of resources.

```
SAPI void SAPIContextRelease (
  SAPI_CONTEXT              *Context
);
```

Parameters

Context

[in] Any kind of context that was created by any of the CoSign Signature Local context creation functions, such as SAPICAInfoGetInit, SAPISignatureFieldEnumInitEx, SAPIBufferSignInit, SAPIBufferVerifySignatureInit, and SAPICertificatesEnumInit.

Return Values

This function has no return values.

Remarks

Using many contexts without calling the **SAPIContextRelease** function can lead to a shortage of system resources, and in some cases prevent CoSign Signature Local from allocating new resources.

After calling the **SAPIContextRelease** function, you may not use the context anymore. Using a released context can lead to unexpected behavior.

Calling the last function call of an enumeration operation does not automatically release the context. Calling the **SAPIContextRelease** function is mandatory, whether the enumeration operation was successful or not.

See Also

SAPICAInfoGetInit, SAPISignatureFieldEnumInit, SAPIBufferSignInit, SAPIBufferVerifySignatureInit, SAPICertificatesEnumInit

SAPIStructRelease

The **SAPIStructRelease** function releases a structure that was previously allocated by *CoSign Signature Local* Currently, the functions that can allocate a structure are: SAPIGraphicSigImageInfoGet, SAPISignatureFieldInfoGet, and SAPIGraphicSigImageGet.

```
SAPI void SAPIStructRelease (
  void                      *Struct,
  SAPI_ENUM_STRUCT_TYPE     StructType
);
```

Parameters

Struct

[in] Pointer to the structure that was allocated by *CoSign Signature Local*

StructType

[in] The structure type. The following options are defined:

Parameter value	The structure type pointed by *Struct*
SAPI_ENUM_STRUCT_TYPE_SIGNED_FIELD	SAPI_SIGNED_FIELD_INFO
SAPI_ENUM_STRUCT_TYPE_GR_IMAGE	SAPI_GRAPHIC_IMAGE_STRUCT
SAPI_ENUM_STRUCT_TYPE_GR_SIG_INFO	SAPI_GR_IMG_INFO

Return Values

This function has no return values.

Remarks

The structure itself is either statically defined or dynamically allocated by the application. Only the structure's fields are allocated and released by *CoSign Signature Local*.

The structures that are allocated by CoSign Signature Local are only released by this function. The application must not try to release the structure fields independently.

See Also

SAPIGraphicSigImageInfoGet, SAPISignatureFieldInfoGet

SAPIHandleRelease

The **SAPIHandleRelease** function releases all the resources related to any kind of SAPI handles. This function is called whenever the application finishes using a handle, to avoid unnecessary allocation of resources.

```
SAPI void SAPIHandleRelease (
  Void                      *Handle
);
```

Parameters

Handle

[in] Any handle that was created by any of the SAPI handle creation functions, such as SAPIHandleAcquire, SAPISignatureFieldEnumCont, SAPISignatureFieldCreate, and SAPICertificatesEnumCont

Return Values

This function has no return values.

Remarks

Using many handles without calling the **SAPIHandleRelease** function can lead to a shortage of system resources, and in some cases prevent CoSign Signature Local from allocating new resources.

After calling the **SAPIHandleRelease** function, you may not use the handle anymore, and it is recommended to set its value to NULL.

See Also

SAPIHandleAcquire, SAPISignatureFieldEnumCont, SAPISignatureFieldCreate, SAPICertificatesEnumCont

SAPIFinalize

The **SAPIFinalize** function ends the work with SAPI library, and releases all the global resources of CoSign Signature Local . The **SAPIFinalize** function is called when there are no more calls to CoSign Signature Local functions. Once the **SAPIFinalize** function is called, a call to any of the CoSign Signature Local functions can lead to unexpected results.

```
SAPI int SAPIFinalize ();
```

Parameters

This function has no parameters.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

See Also

SAPIInit

SAPIExtendedLastErrorGet

The **SAPIExtendedLastErrorGet** function retrieves the calling application's extended last-error code value. The extended last-error is often, although not always, different from the error code that was returned in the last function call, and is useful for getting more information about what caused the last function to fail.

```
SAPI int SAPIExtendedLastErrorGet();
```

Parameters

This function has no parameters.

Return Values

The return value is the calling application's last error code value. Internal CoSign Signature Local functions set this value whenever an error occurs.

Remarks

For a complete list of error codes, see the `SAPIErrors.h` file under the `SAPI\include` folder in the CoSign SDK CD.

Call the **SAPIExtendedLastErrorGet** function immediately when a function's return value description recommends using this call to return additional data. Immediacy is important because subsequent function calls can reset this value, wiping out the error code set by the most recently failed function.

SAPILibInfoGet

The **SAPILibInfoGet** function returns some general information about the library.

```
SAPI int SAPILibInfoGet(
  PSAPI_INFO_STRUCT          SAPIInfoStruct
);
```

Parameters

SAPIInfoStruct

[out] A pointer to the SAPI_INFO_STRUCT structure, which holds some general library information.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

SAPILogonEx

The **SAPILogonEx** function performs a login to CoSign using the provided credentials. This function is called in either of the following two scenarios:

- In an environment in which CoSign automatically displays a login dialog for a new session, but the application wants to avoid this popup, either because it has its own popup or because the operation is not interactive.
- When the application runs under certain credentials but wants to login to CoSign under different credentials. For example, a web server application that serves many different users.

```
SAPI int SAPILogonEx (
  SAPI_SES_HANDLE            Handle,
  SAPI_LPCWSTR               UserLoginName,
  SAPI_LPCWSTR               DomainName,
  unsigned char              *Password,
  long                       PasswordLen,
  unsigned long              Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

UserLoginName

[in] The name under which this session is logged in.

DomainName

[in] In an active directory environment – the name of the domain to which UserLoginName belongs.

In a Directory Independent environment or LDAP environment – this parameter is ignored and its value is NULL.

Password

[in] The password of UserLoginName.

Note that the password value is represented as a wide char string.

PasswordLen

[in] The length in bytes of the password, including the NULL terminator.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Flags used by the SAPILogonEx Function.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
SAPI_ERR_SESSION_IS_NULL	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
SAPI_ERR_TOKEN_HANDLE_NOT_INITALIZED	SAPI session handle is corrupt.
SAPI_ERR_HANDLE_ALREADY_LOGGED_ON	The session is already logged on. This could be because either: • The SAPILogonEx function was already called, and no call to SAPILogoff was made, or • This SAPI session handle was used to access CoSign using the default user.
SAPI_ERR_FAILED_TO_LOGON	An error occurred while trying to logon to CoSign. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

After calling **SAPILogonEx**, it is impossible to use the same SAPI session handle in order to access CoSign using the default user. If you do wish to access CoSign using the default user, the application must either call SAPILogoff, or create a new SAPI session by calling SAPIHandleAcquire.

If the application performs an operation that accesses CoSign with the default user, the application must acquire a new SAPI session before calling the **SAPILogonEx** function, otherwise it causes the **SAPILogonEx** function to fail.

Call SAPILogoff when there are no other operations that need to be done under the provided user's credentials.

See Also

SAPIHandleAcquire, SAPILogoff

SAPILogon

The **SAPILogon** function is the older version of the SAPILogonEx function.

```
SAPI int SAPILogon (
  SAPI_SES_HANDLE            Handle,
  SAPI_LPCWSTR               UserLoginName,
  SAPI_LPCWSTR               DomainName,
  unsigned char              *Password,
  long                       PasswordLen,
);
```

SAPILogoff

The **SAPILogoff** function ends the session with CoSign under a specific user's credentials. The **SAPILogoff** function is only called if the SAPILogonEx function was previously called, and after ending all work with CoSign under the specific user credentials.

```
SAPI int SAPILogoff (
  SAPI_SES_HANDLE            Handle
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire and is the same handle used for the SAPILogonEx function call.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Remarks

It is recommended to call the SAPIHandleRelease function right after calling the **SAPILogoff** function. After calling the **SAPILogoff** function, any subsequent CoSign Signature Local APIcall uses CoSign with the user default credentials, as if the SAPILogonEx function was never called.

Calling the **SAPILogoff** function does not automatically release the contexts and handles that were allocated by CoSign Signature Local API functions. These resources must be released by SAPIContextRelease and SAPIHandleRelease, respectively.

See Also

SAPIHandleAcquire, SAPIContextRelease, SAPIHandleRelease, SAPILogonEx

SAPIUserActivate

The **SAPIUserActivate** function performs an activation of the user account. This process is mandatory for every account in cases where CoSign is deployed in Common Criteria EAL4+ mode. The function first verifies that the old password (Activation password) is correct and that the OTP is correct, and then stores the credentials calculated from the new password in the CoSign users database.
CoSign does not store the clear user password but rather a hash value of the password and a unique salt generated by the function, to prevent similar passwords from having similar credential hash values.

```
SAPI int SAPIUserActivate (
  SAPI_SES_HANDLE                 Handle,
  SAPI_LPCWSTR                    UserLoginName,
  unsigned char                   *Password,
  unsigned long                   PasswordLen,
  unsigned char                   *NewPassword,
  unsigned long                   NewPasswordLen,
  unsigned char                   *ExtCred,
  unsigned long                   ExtCredLen,
  unsigned long                   Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

UserLoginName

[in] The name of the user whose credentials are to be changed.

Password

[in] The user's old password.

Note that the old password value is represented as a wide char string.

PasswordLen

[in] The length in bytes of the old password, including the NULL terminator.

NewPassword

[in] The user's new password.

Note that the new password value is represented as a wide char string.

NewPasswordLen

[in] The length in bytes of the new password, including the NULL terminator.

ExtCred

[in] The user's OTP (One Time Password).

ExtCredLen

[in] The length in bytes of the OTP, including the NULL terminator.

Flags

[in] Reserved for future use.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_TOKEN_HANDLE_NOT_INITALIZED`	SAPI session handle is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*Password* or *NewPassword* is NULL and must not be NULL.
`SAPI_ERR_FAILED_TO_VERIFY_USRPWD`	An error occurred while trying to validate the given password. Call SAPIExtendedLastErrorGet for more information about the exact problem.
`SAPI_ERR_USER_ALREADY_ACTIVATED`	The user was already activated.

Remarks

This function can be called only in a Directory Independent environment.

See Also

SAPIHandleAcquire, SAPIExtendedLastErrorGet

SAPICredentialChange

The **SAPICredentialChange** function changes a user's credentials. The function first verifies that the old password is correct, and then stores the credentials calculated from the new password in the CoSign users database.
CoSign does not store the clear user password but rather a hash value of the password and a unique salt generated by the function, to prevent similar passwords from having similar credential hash values.

```
SAPI int SAPICredentialChange (
  SAPI_SES_HANDLE                 Handle,
  SAPI_LPCWSTR                    UserLoginName,
  unsigned char                   *OldPassword,
  unsigned long                   OldPasswordLen,
  unsigned char                   *NewPassword,
  unsigned long                   NewPasswordLen,
  SAPI_CALC_CREDENTIALS_CALLBACK  CalcCredentialFunc
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

UserLoginName

[in] The name of the user whose credentials are to be changed.

OldPassword

[in] The user's old password.

Note that the old password value is represented as a wide char string.

OldPasswordLen

[in] The length in bytes of the old password, including the NULL terminator.

NewPassword

[in] The user's new password.

Note that the new password value is represented as a wide char string.

NewPasswordLen

[in] The length in bytes of the new password, including the NULL terminator.

CalcCredentialFunc

[in] A pointer to a user-defined callback function that gets the new password and returns the user credentials. Currently this parameter is not supported, and its value is NULL.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
SAPI_ERR_SESSION_IS_NULL	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
SAPI_ERR_TOKEN_HANDLE_NOT_INITALIZED	SAPI session handle is corrupt.
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*OldPassword* or *NewPassword* is NULL and must not be NULL.
SAPI_ERR_FAILED_TO_UPDATE_CREDENTIAL	An error occurred while trying to change user credentials. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

This function can be called only in a Directory Independent environment.

See Also

SAPIHandleAcquire

SAPIGetTokenID

The **SAPIGetTokenID** function retrieves a Token ID that identifies the CoSign Appliance currently used by the SAPI Session. This enables more control over the flow of operations. The function is relevant for cases where several Primary CoSign appliances are used and the application would like to control and specify which appliance to use for the digital signature operations.

```
SAPI int SAPIGetTokenID (
  SAPI_SES_HANDLE                Handle,
  char                           *TokenID);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

TokenID

[out] The identification of the CoSign appliance used by this SAPI Session.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_TOKEN_HANDLE_NOT_INITALIZED`	SAPI session handle is corrupt.

See Also

SAPIHandleAcquire, SAPIExtendedLastErrorGet, SAPISetTokenID

SAPISetTokenID

The **SAPISetTokenID** function sets the Token ID that defines which CoSign Appliance should be used by the SAPI Session. This enables more control over the flow of operations. This function is relevant for cases where several Primary CoSign appliances are used and the application would like to control and specify which appliance to use for digital signature operations.

The command should be called before the SAPILogon command.

```
SAPI int SAPISetTokenID (
  SAPI_SES_HANDLE                 Handle,
  char                            *TokenID);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

TokenID

[in] The identification of the CoSign appliance that should be used by this SAPI Session.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_TOKEN_HANDLE_NOT_INITALIZED`	SAPI session handle is corrupt.

See Also

SAPIHandleAcquire, SAPIExtendedLastErrorGet, SAPIGetTokenID

SAPICAInfoGetInit

The **SAPICAInfoGetInit** function initializes the continuous operation of retrieving CoSign's internal CA publication information. CoSign CA publication information can be a CRL or CoSign's CA certificate. The **SAPICAInfoGetInit** function also returns the CDP (CRL Distribution Point) and AIA (Authority Information Access), according to the information type required.

```
SAPI int SAPICAInfoGetInit (
  SAPI_SES_HANDLE            Handle,
  SAPI_CONTEXT               *CAInfoContext,
  SAPI_LPWSTR                CAPublishLocation,
  long                       *CAPublishLocationLen,
  SAPI_ENUM_CA_INFO_TYPE     CAInfoType
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

CAInfoContext

[out] Pointer to the SAPICAInfoGet operation context. This context contains internal information about the operation. The information in this context is passed in all subsequent calls to SAPICAInfoGetCont. Changing the value of *CAInfoContext* by the application is not allowed and can lead to unexpected behavior.

CAInfoContext must be released by the SAPIContextRelease function when it is not being used anymore.

CAPublishLocation

[out] A wide char string containing either the CDP or the AIA, as shown in all the certificates created by the CoSign CA. The value of *CAPublishLocation* depends on the value of *CAInfoType*. If *CAPublishLocation* is NULL, the function returns the length of the string in *CAPublishLocationLen*.

CAPublishLocationLen

[in/out] Pointer to a value specifying the size, in bytes, of the buffer pointed to by the *CAPublishLocation* parameter. When the function returns, the value contains the number of bytes actually stored or to be stored in the buffer.

CAInfoType

[in] The information type that the SAPICAInfoGet operation returns. The following options are defined:

Parameter value	Content returned by the SAPICAInfoGet operation
SAPI_ENUM_CA_INFO_CRL	The most updated CRL is retrieved. *CAPublishLocation* contains the CDP – the location where the CRL is published.
SAPI_ENUM_CA_INFO_AIA	The CoSign CA certificate is retrieved. *CAPublishLocation* contains the AIA – the location where the CoSign CA certificate is to be published.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*CAPublishLocationLen* or *CAInfoContext* is NULL and must not be NULL.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the new operation context. This might be due to a shortage in system resources.
`SAPI_ERR_TOKEN_HANDLE_NOT_INITALIZED`	SAPI session handle is corrupt.
`SAPI_ERR_FAILED_TO_GET_CA_INFO`	A general error occurred while initializing the CAInfo retrieval operation. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

In an Active Directory environment, CoSign automatically publishes its internal CA root certificate as part of the installation process, and the CRL on a daily basis.

In a Directory Independent environment or LDAP environment, it is the application's responsibility to publish the CRL and root certificate in the location returned in *CAPublishLocation.* The value of the publication location is defined during CoSign installation.

If the administrator decided to use HTTP as the mechanism for publishing the CoSign CA Certificate or CoSign CA CRL, it is the application's responsibility to publish the CRL and root certificate in the location returned by *CAPublishLocation.*

See Also

SAPIHandleAcquire, SAPICAInfoGetCont, SAPIContextRelease

SAPICAInfoGetCont

The **SAPICAInfoGetCont** function continues the CAInfo retrieval operation, and returns a portion of the CA publication information that is to be retrieved. Concatenating all portions of information creates either a valid CRL or a certificate, according to the value of *CAInfoType* in the call to SAPICAInfoGetInit.

```
SAPI int SAPICAInfoGetCont (
  SAPI_SES_HANDLE            Handle,
  SAPI_CONTEXT               *CAInfoContext,
  unsigned char              *CAInfoBlock,
  long                       *CAInfoBlockLen,
  SAPI_BOOL                  *LastBlock
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

CAInfoContext

[in] Pointer to the SAPICAInfoGet operation context created using SAPICAInfoGetInit.

CAInfoContext must be released by the SAPIContextRelease function when it is not being used anymore.

CAInfoBlock

[out] A buffer containing a portion of the information being retrieved. If *CAInfoBlock* is NULL, the function returns the length of the remaining data that still needs to be retrieved.

CAInfoBlockLen

[in/out] Pointer to a value specifying the size, in bytes, of the buffer pointed to by the *CAInfoBlock* parameter. When the function returns, the value contains the number of bytes actually stored, or the remaining data in case *CAInfoBlock* is NULL.

LastBlock

[out] Pointer to a flag indicating that all the data was retrieved, and there is no need for additional calls to the **SAPICAInfoGetCont** function.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*CAInfoContxt*, *CAInfoBlockLen* or *LastBlock* is NULL and must not be NULL.

Value	Meaning
SAPI_ERR_CONTEXT_NOT_INITALIZED	*CAInfoContxt* was not initialized correctly, or is corrupt.
SAPI_ERR_TOKEN_HANDLE_NOT_INITALIZED	SAPI session handle is corrupt.
SAPI_ERR_FAILED_TO_GET_CA_INFO	A general error occurred while getting the CA information. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

When retrieving the last CA information block, *CAInfoBlock* must point to a memory that is 16 byte longer than the actual required length, and the value of *CAInfoBlockLen* is to be set accordingly.

See Also

SAPIHandleAcquire, SAPICAInfoGetInit, SAPIContextRelease

SAPICACertInstall

The **SAPICACertInstall** function installs a certificate in either the Root store or the CA store, within either the user system store or the local machine store, according to the SystemStoreType parameter. If the certificate is a root certificate (i.e., the "issued to" is identical to the "issued by"), it is stored in the Root store. Otherwise, the certificate is an intermediate CA certificate, and is stored in the CA store.

Note: *To install a certificate in the local machine store, a user must have local administrative privileges and no confirmation dialog pops up. To install a certificate in the user system store, the user needs no special privileges, but a security alert pops up.*

```
SAPI int SAPICACertInstall (
  SAPI_SES_HANDLE            Handle,
  unsigned char              *RootCert,
  long                       RootCertLen,
  SAPI_ENUM_STORE_TYPE       SystemStoreType
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

RootCert

[in] A buffer containing the data for the certificate to be stored.

RootCertLen

[in] The length of the certificate's data.

SystemStoreType

[in] The system store type where the certificate is going to be installed. It can be one of the following values:

Parameter value	The system store where the certificate is to be stored
SAPI_ENUM_STORE_USER	User store. **Note:** A security alert pops up.
SAPI_ENUM_STORE_LOCAL_MACHINE	Machine store. **Note:** Requires administrative privileges.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*RootCert* is NULL and must not be NULL.
`SAPI_ERR_ILLEGAL_STORE_TYPE`	Only SAPI_ENUM_STORE_USER and SAPI_ENUM_STORE_LOCAL_MACHINE can be used as system store types.
`SAPI_ERR_BUFFER_CONTAINS_NO_CERT`	The data in RootCert is not valid certificate data.
`SAPI_ERR_FAILED_TO_INSTALL_CA_CERT`	A general error occurred while installing the CA certificate. Call SAPIExtendedLastErrorGet for more information about the exact problem.

See Also

SAPIHandleAcquire, SAPICAInfoGetInit, SAPICAInfoGetCont

SAPITimeGet

The **SAPITimeGet** function retrieves the current time in CoSign. If CoSign is not available or if the signing certificate is taken from another token, the time retrieved is the time of the local machine.

```
SAPI int SAPITimeGet (
  SAPI_SES_HANDLE                  Handle,
  SAPI_FILETIME                    *SystemTime
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SystemTime

[out] The current time in CoSign. If CoSign is not available or if the signing certificate is taken from another token, *SystemTime* contains the current time of the local machine.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SystemTime* is NULL and must not be NULL.
`SAPI_ERR_TIME_CONVERT`	A general error occurred while retrieving the time. Call SAPIExtendedLastErrorGet for more information about the exact problem.

See Also

SAPIHandleAcquire

CoSign Signature Local Signature Field

Signing and verifying a file in the context of CoSign Signature Local means signing and verifying a signature field in a file. Thus, a prerequisite to signing a file is to first create signature fields and then sign the fields. When working with signature fields, keep in mind that different file types can behave differently, depending on the different capabilities of the file format and the applications used for viewing the file. For example, you cannot have multiple graphical signatures in a TIFF file.

Typically, there are two alternate methods of signing a signature field:

- *If a signature field does not exist*:
  Create the signature field using SAPISignatureFieldCreate, and then use the returned signature field handle as input for the SAPISignatureFieldSign function.
  Alternatively, you can use the SAPISignatureFieldCreateSign function that performs the two operations.
- *If the file contains signature fields*:
  Enumerate the signature fields using the SAPISignatureFieldEnumInit and SAPISignatureFieldEnumCont functions, and then call SAPISignatureFieldInfoGet to retrieve the signature field information. The signature field information assists you in selecting the field to be signed. Finally, call the SAPISignatureFieldSign function.

To verify a file, enumerate the signature fields using the SAPISignatureFieldEnumInit and SAPISignatureFieldEnumCont functions, then select the field to be verified using SAPISignatureFieldInfoGet to retrieve the signature field information. Finally, call SAPISignatureFieldVerify.

The SAPISignatureFieldInfoGet function can also be used for checking whether a signature field is signed (so it can be verified), or not signed (so it can be signed).

Starting from CoSign version 6, when working with PDF or XML file it is possible to read the file from a memory buffer, perform the CoSign Signature Local operations, and then continue to work with the updated memory buffer. For more information see SAPICreateFileHandleByMem, SAPICreateFileHandleByName, SAPIGetFileMemData and SAPIGetFileHandleType.

CoSign version 6 also introduces a new functionality in PDF documents, enabling the extraction of location information based on user-embedded field locator strings. This new functionality can enable automated generation of PDF signature fields.
The functions SAPISignatureFieldLocatorEnumInit and SAPISignatureFieldLocatorEnumCont enable this functionality. These functions do not delete the field locator strings as part of their functionality.

The SAPISignatureFieldDetailsGUIGet function displays information of a signed field. The information includes the status of the signature and the status of the signing certificate.

Starting from CoSign version 5.4, you can call a standard signature ceremony dialog to select or enter a signature element that will be encapsulated in the digital signature, as well as embedded in the visible signature. The SAPISigningCeremonyGUI function displays the signature ceremony dialog.

Note: *When working with Word XP/2003 files, it is recommended to use MS Word to create and remove the signature fields, and use CoSign Signature Local for all other actions such as signing, verifying, clearing, etc. If you do wish to create or remove a signature field in a Word XP/2003 document using CoSign Signature Local, contact ARX technical support.*

Note: *Starting from CoSign version 6, you can create an empty signature field in a .docx or .xlsx file. The new field can be either an ARX signature line provider field or a Microsoft signature line provider field. You can sign the new signature field using either CoSign Signature Local or Microsoft Office. Additional operations such as signing, verifying or clearing a signature field in .docx/.xlsx files are already supported in previous versions of CoSign Signature Local.*

Note: *When working with Word/Excel 2007/2010/2013 (.docx or .xlsx) files, you must have .Net Framework 3 installed on the machine if you wish to perform operations such as digitally signing an Office 2007/2010/2013 file. To create signature fields, you must have .Net Framework 3.5 installed in the machine.*

Note: *When working with XML files, you must have .Net Framework version 2 or above if you wish to perform operations such as digitally signing an XML file.*

SAPICreateFileHandleByMem

The **SAPICreateFileHandleByMem** function creates a new file handle based on a given memory buffer. This file handle identifies the content of the file in memory and is used by various CoSign Signature Local functions (such as SAPISignatureFieldEnumInit).

```
SAPI int SAPICreateFileHandleByMem (
  SAPI_FILE_HANDLE                *Handle,
  SAPI_ENUM_FILE_TYPE             FileType,
  unsigned long                   Flags,
  unsigned char                   *FileMemBuffer,
  unsigned long                   FileMemBufferLen
);
```

Parameters

Handle

[out] Output handle that identifies the file content.

FileType

[in] File type. Refer to SAPI_ENUM_FILE_TYPE.

Flags

[in] Reserved for future use.

FileMemBuffer

[in] Pointer to the file content in memory.

FileMemBufferLen

[in] The size of the content in memory.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_INVALID_HANDLE`	The specified handle is invalid.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the new handle. This might be due to a shortage in system resources.

Remarks

When the handle is not required anymore, it should be released by calling the SAPIHandleRelease function. Releasing the file handle frees all the resources related to the handle, and the handle becomes invalid.

This function is applicable only for PDF files and XML files.

See Also

SAPIGetFileMemData, SAPIGetFileHandleType, SAPIHandleRelease, SAPICreateFileHandleByName

SAPICreateFileHandleByName

The **SAPICreateFileHandleByName** function creates a new file handle based on a given file path. This file handle identifies the file used by the various CoSign Signature Local operations such as the SAPISignatureFieldEnumInitEx function.

```
SAPI int SAPICreateFileHandleByName (
  SAPI_FILE_HANDLE                *Handle,
  SAPI_ENUM_FILE_TYPE             FileType,
  unsigned long                   Flags,
  SAPI_LPCWSTR                    FileUNC
);
```

Parameters

Handle

[out] Output handle that identifies the file content.

FileType

[in] File type. Refer to SAPI_ENUM_FILE_TYPE.

Flags

[in] For future use.

FileUNC

[in] File name.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_INVALID_HANDLE`	Given Handle is invalid.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the new handle. This might be due to a shortage in system resources.

Remarks

When the handle is not required anymore, it should be released by calling the SAPIHandleRelease function. Releasing the file handle frees all the resources related to the handle, and the handle becomes invalid.

See Also

SAPIGetFileMemData, SAPIGetFileHandleType, SAPIHandleRelease, SAPICreateFileHandleByMem

SAPIGetFileMemData

The **SAPIGetFileMemData** function retrieves the updated file content from a given memory buffer.

```
SAPI int SAPIGetFileMemData (
  SAPI_FILE_HANDLE                *Handle,
  unsigned long                   Flags,
  unsigned char                   *FileMemBuffer,
  unsigned long                   *FileMemBufferLen
);
```

Parameters

Handle

[in] The given file handle.

Flags

[in] Reserved for future use.

FileMemBuffer

[out] The application memory buffer that gets the current file content. If this parameter is NULL, the *FileMemBufferLen* parameter will contain the length of the file content in memory.

FileMemBufferLen

[in/out] The input must be the size of the allocated *FileMemBuffer*. The output contains the size of the actual content.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_INVALID_HANDLE`	The specified handle is invalid.
`SAPI_ERR_PARAMETER_LEN_IS_TOO_SHORT`	The specified buffer is too short.

See Also

SAPICreateFileHandleByMem, SAPIGetFileHandleType, SAPIHandleRelease

SAPIGetFileHandleType

The **SAPIGetFileHandleType** function retrieves the type of the given file handle.

```
SAPI int SAPIGetFileHandleType (
  SAPI_FILE_HANDLE                *Handle,
  SAPI_ENUM_FILE_HANDLE_TYPE      *FileHandleType
);
```

Parameters

Handle

[in] The given file handle.

FileHandleType

[out] The type of the given file handle. For more information, refer to SAPI_ENUM_FILE_HANDLE_TYPE.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_INVALID_HANDLE`	The specified handle is invalid.

See Also

SAPICreateFileHandleByMem, SAPICreateFileHandleByName

SAPISignatureFieldEnumInitEx

The **SAPISignatureFieldEnumInitEx** function initializes the continuous operation of retrieving all the signature fields in a specific file.

```
SAPI int SAPISignatureFieldEnumInitEx (
  SAPI_SES_HANDLE                  Handle,
  SAPI_CONTEXT                     *SigFieldContext,
  SAPI_ENUM_FILE_TYPE              FileType,
  SAPI_LPCWSTR                     FileUNC,
  SAPI_FILE_HANDLE                 FileHandle,
  unsigned long                    Flags,
  long                             *SignatureFieldsNum
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SigFieldContext

[out] Pointer to the signature field enumeration operation context. This context contains internal information about the operation. The information in this context is passed in all subsequent calls to SAPISignatureFieldEnumCont. The application may not change the value of *SigFieldContext*; doing so may lead to unexpected behavior.
SigFieldContext must be released by the SAPIContextRelease function when there is no further need to call the SAPISignatureFieldEnumCont function.

FileType

[in] File type. Refer to SAPI_ENUM_FILE_TYPE.

FileUNC

[in] File name. It is recommended to use the *FileHandle* parameter instead and provide "" as an input parameter.

FileHandle

[in] File handle. The SAPI file handle to be used for the enumeration operation. The file handle can be created using either the SAPICreateFileHandleByName function or the SAPICreateFileHandleByMem function. If this value is NULL, the *FileUNC* parameter is used.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Flags when Enumerating Signature Fields.

SignatureFieldsNum

[out] Pointer to a value that holds the number of signature fields that currently exist in the file.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
SAPI_ERR_SESSION_IS_NULL	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
SAPI_INVALID_HANDLE	The specified handle is invalid.
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*SigFieldContext*, *SignatureFieldsNum*, or *FileUNC* is NULL and must not be NULL
SAPI_FAILED_TO_ALLOCATE_MEMORY	CoSign Signature Local failed to allocate the necessary memory for the new operation context. This might be due to a shortage in system resources.
SAPI_ERR_FAILED_TO_INIT_ENUM_SF	A general error occurred while initializing the Signature Field Enumeration operation. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

The following is relevant if CoSign Signature Local is accessing a file that was saved on the disk (rather than a file residing in a memory buffer): After calling the **SAPISignatureFieldEnumInitEx** function and until the last call to SAPISignatureFieldEnumCont, or until the last usage of one of the signature fields' handles, it is recommended not to change the file using an application other than CoSign Signature Local. Doing so may lead to unexpected behavior.

See Also

SAPIHandleAcquire, SAPISignatureFieldEnumCont, SAPIContextRelease

SAPISignatureFieldEnumInit

The **SAPISignatureFieldEnumInit** function is the older version of the SAPISignatureFieldEnumInitEx function. In the **SAPISignatureFieldEnumInit** function, a File Handle type is not defined.

```
SAPI int SAPISignatureFieldEnumInit (
  SAPI_SES_HANDLE                  Handle,
  SAPI_CONTEXT                     *SigFieldContext,
  SAPI_ENUM_FILE_TYPE              FileType,
  SAPI_LPCWSTR                     FileUNC,
  unsigned long                    Flags,
  long                             *SignatureFieldsNum
);
```

SAPISignatureFieldEnumCont

The **SAPISignatureFieldEnumCont** function continues the Signature Field Enumeration operation and returns a pointer to a single signature field handle. Every call returns a new Signature Field handle until the end of the list is reached.

```
SAPI int SAPISignatureFieldEnumCont (
  SAPI_SES_HANDLE                  Handle,
  SAPI_CONTEXT                     *SigFieldContext,
  SAPI_SIG_FIELD_HANDLE            *SignatureFieldHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SigFieldContext

[in] Pointer to the Signature Field Enumeration operation context created using SAPISignatureFieldEnumInit.
SigFieldContext must be released by the SAPIContextRelease function when there is no further need to call the SAPISignatureFieldEnumCont function.

SignatureFieldHandle

[out] Pointer to a handle of a single signature field. This handle can be used when calling other signature field functions, such as SAPISignatureFieldInfoGet, SAPISignatureFieldClear, SAPISignatureFieldRemove, SAPISignatureFieldSign and SAPISignatureFieldVerify.
SignatureFieldHandle is released by calling the SAPIHandleRelease function, when there is no further use for the handle.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SigFieldContext* and *SignatureFieldHandle* are NULL and must not be NULL.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the new Signature Field Handle. This might be due to a shortage in system resources.
`SAPI_ERR_CONTEXT_NOT_INITALIZED`	The Signature Field Enumeration Context is either not initialized or is corrupt.

Value	Meaning
SAPI_ERR_FAILED_TO_CONT_ENUM_SF	A general error occurred while retrieving the next signature field handle. Call SAPIExtendedLastErrorGet for more information about the exact problem.

See Also

SAPIHandleAcquire, SAPISignatureFieldEnumInit, SAPISignatureFieldInfoGet, SAPISignatureFieldClear, SAPISignatureFieldRemove, SAPISignatureFieldSign, SAPISignatureFieldVerify, SAPIContextRelease, SAPIHandleRelease

SAPISignatureFieldInfoGet

The **SAPISignatureFieldInfoGet** function returns all the information related to a specific signature field. The information is returned in two structures:

- *SignatureFieldSettingStruct* holds data related to the non-cryptographic information, such as appearance.
- *SignedFieldInfoStruct* holds crypto data for signed fields.

```
SAPI int SAPISignatureFieldInfoGet (
  SAPI_SES_HANDLE                 Handle,
  SAPI_SIG_FIELD_HANDLE           SignatureFieldHandle,
  PSAPI_SIG_FIELD_SETTINGS        SignatureFieldSettingStruct,
  PSAPI_SIGNED_FIELD_INFO         SignedFieldInfoStruct
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignatureFieldHandle

[in] The handle of the signature field. This handle was created by SAPISignatureFieldEnumCont.

SignatureFieldSettingStruct

[out] Pointer to the SAPI_SIG_FIELD_SETTINGS structure. This structure holds all the non-crypto information of a signature field.

SignedFieldInfoStruct

[out] Pointer to the SAPI_SIGNED_FIELD_INFO structure. This structure holds the relevant information for signed fields. If the signature field is not signed, the only relevant field in the structure is *IsSigned*.
SignedFieldInfoStruct is allocated (either statically or dynamically) by the application, only the structure's fields are allocated by the SAPISignatureFieldInfoGet function and are released by calling the SAPIStructRelease function.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignatureFieldHandle*, and either *SignatureFieldSettingStruct* or *SignedFieldInfoStruct*, are NULL and must not be NULL.

Value	Meaning
SAPI_ERR_FAILED_TO_GET_SIGNATURE_FIELD_INFO	A general error occurred while retrieving the Signature Field information. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

The *SignatureFieldSettingStruct* and *SignedFieldInfoStruct* structures are defined by the application and their pointers are passed as parameters to the function.

See Also

SAPIHandleAcquire, SAPISignatureFieldEnumCont, SAPIStructRelease

SAPISignatureFieldCreateEx

The **SAPISignatureFieldCreateEx** function creates a single signature field in the specified file. The signature field is created with attributes according to the value of *NewSignatureFieldStruct*. The function optionally returns a handle to the newly created signature field.

```
SAPI int SAPISignatureFieldCreateEx (
  SAPI_SES_HANDLE                  Handle,
  SAPI_ENUM_FILE_TYPE              FileType,
  SAPI_LPCWSTR                     FileUNC,
  SAPI_FILE_HANDLE                 FileHandle,
  PSAPI_SIG_FIELD_SETTINGS         NewSignatureFieldStruct,
  unsigned long                    Flags,
  SAPI_SIG_FIELD_HANDLE            *SignatureFieldHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

FileType

[in] File type.

FileUNC

[in] File name. It is recommended to use the *FileHandle* parameter instead and provide "" as an input parameter.

FileHandle

[in] File handle. The SAPI file handle to be used for the field creation operation. The file handle can be created using either the SAPICreateFileHandleByName function or the SAPICreateFileHandleByMem function. If this value is NULL, the *FileUNC* parameter is used.

NewSignatureFieldStruct

[in] Pointer to the SAPI_SIG_FIELD_SETTINGS structure. This structure holds all the non-crypto information of the newly created signature field. Note that one of the fields in the structure is the AppearanceMask field which is a bit mask indicating which information is displayed when the signature field is signed (graphical image, signer, reason, date). The mask values are described in SAPI_ENUM_DRAWING_ELEMENT.

Flags

[in] Flag values bit mask. For more information, refer to the following sections in Appendix D: Flags when Creating a Signature Field in Office 2007/2010/2013 Documents and Flags when Creating a Signature Field in PDF Files.
Note that some signature field flags are passed as part of the function call, while others are passed as part of the signature field SAPI_SIG_FIELD_SETTINGS structure to which the function points. The relevant sections in Appendix D note which flags are passed as part of the function and which are passed as part of the signature field structure.

SignatureFieldHandle

[out] Pointer to a handle of the newly created signature field. If *SignatureFieldHandle* is NULL, the handle is not returned. If *SignatureFieldHandle* is returned, it must be released by the SAPIHandleRelease function.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_INVALID_HANDLE`	The specified handle is invalid.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*NewSignatureFieldStruct* or *FileUNC* is NULL and must not be NULL
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the new Signature Field Handle. This might be due to a shortage in system resources.
`SAPI_ERR_FAILED_TO_CREATE_SIGNATURE_FIELD`	A general error occurred while creating the new Signature Field. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

- By default, you cannot create a signature field in a Word XP/2003 file using CoSign Signature Local. It is recommended to create signature fields using the Word application and the ARX Legacy Word plug-in, and use CoSign Signature Local only for signing. If CoSign Signature Local must be used to create signature fields, contact ARX support for instructions on how to enable this feature.
  This is relevant only for Entire File signatures.
- In the case of ARX Legacy signatures for Word/Excel XP/2003, application-based signatures are not supported using CoSign Signature Local. Therefore, only Word XP/2003 Entire File signatures are supported using CoSign Signature Local.
- Starting from CoSign version 6, you can create a signature field in an Office 2007/2010/2013 file using CoSign Signature Local. The newly created field can only appear on the first page or last page of the document. To add a signature field on the last page of the document, specify page number -1.
- To add a signature field on the last page of a PDF document, specify page number -1. To add a signature field on the penultimate page of the document, specify page number -2, and so on.
- For PDF files, use the AR_PDF_FLAG_FIELD_NAME_SET flag. When this flag is set, the application can set the name of the created signature field. The desired name should be entered in the *Name* field in the *NewSignatureFieldStruct* parameter.

- In TIFF files, only the first visible signature field is displayed.
- You cannot create an empty signature field in an XML file. Use the SAPISignatureFieldCreateSign function for creating and signing the XML file.

See Also

SAPIHandleAcquire, SAPIHandleRelease

SAPISignatureFieldCreate

The **SAPISignatureFieldCreate** function is the older version of the SAPISignatureFieldCreateEx function. In the **SAPISignatureFieldCreate** function, a File Handle type is not defined.

```
SAPI int SAPISignatureFieldCreate (
  SAPI_SES_HANDLE                 Handle,
  SAPI_ENUM_FILE_TYPE             FileType,
  SAPI_LPCWSTR                    FileUNC,
  PSAPI_SIG_FIELD_SETTINGS        NewSignatureFieldStruct,
  unsigned long                   Flags,
  SAPI_SIG_FIELD_HANDLE           *SignatureFieldHandle
);
```

SAPISignatureFieldLocatorEnumInit

The **SAPISignatureFieldLocatorEnumInit** function initializes the operation of enumerating the field locator strings inside a PDF document. These field locator strings can subsequently be used to automate the creation of new signature fields using the SAPISignatureFieldCreate function.
Note that the **SAPISignatureFieldLocatorEnumInit** function is currently supported only for PDF files.

When preparing a file by inserting field locator strings into the desired locations, keep in mind the following:

- Make sure to use the same opening pattern (such as "<<<") and closing pattern (such as ">>>") in all field locator strings.
- You can use the following string directives between the opening pattern and closing pattern:
  - "W=*number*" or "w=*number*" – the width of the intended signature field
  - "H=*number*" or "h=*number*" – the height of the intended signature field
  - "N=*text*" or "n=*text*" – the name of the intended signature field
  - "A=*number*" or "a=*number*" – the appearance mask of the intended signature field. For more information about the appearance mask, refer to SAPISignatureFieldCreateEx.
- The string directives must be separated using semi-colons. In addition, insert a semi-colon just before the closing pattern.
- The **SAPISignatureFieldLocatorEnumInit** function and its subsequent SAPISignatureFieldLocatorEnumCont function do not delete the field locator strings. It is therefore recommended that the field locator strings be hidden.
- If the PDF file was created by converting a file of a different type to PDF, you can insert the field locator strings in the original file on condition that the strings will remain intact when the file is converted to PDF.

The following is an example of a field locator string: "<<<W=100;H=120;N=employee;A=1;>>>"

```
SAPI int SAPISignatureFieldLocatorEnumInit (
  SAPI_SES_HANDLE                   Handle,
  SAPI_CONTEXT                      *SigFieldLocatorContext,
  SAPI_FILE_HANDLE                  FileHandle,
  SAPI_LPCWSTR                      OpeningPattern,
  PSAPI_SIG_FIELD_SETTINGS          ClosingPattern,
  unsigned long                     Flags,
  long                              *SignatureFieldLocateNum
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SigFieldLocatorContext

[out] Pointer to the signature field locator enumeration operation context. This context contains internal information about the operation. The information in this context is passed in all subsequent calls to SAPISignatureFieldLocatorEnumCont.
The application may not change the value of *SigFieldLocatorContext*; doing so may lead to unexpected behavior.
SigFieldLocatorContext must be released by the SAPIContextRelease function when there is no further need to call the SAPISignatureFieldLocatorEnumCont function.

FileHandle

[in] File handle. The SAPI file handle to be used for accessing the PDF file content.

Opening pattern

[in] The pattern that indicates the start of the embedded field locator string. All given parameters will be located right after the opening pattern.

Closing pattern

[in] The pattern that indicates the end point of the embedded field locator string. This parameter can be NULL. When it is NULL, the retrieved location information will include only the position of the signature field (X,Y) but will not include any other information such as Width or Height.
In cases where the orientation of the field locator string differs from the orientation of the page, this parameter must be NULL.

Flags

[in] Flag values bit mask. If this value is 0, the function assumes that the text direction is from the left to right. If the flag contains the value AR_LOCATOR_TEXT_DIRECTION_AS_PAGE_ROTATION, the function assumes that the orientation of the field locator string is the same as the orientation of the page.

SignatureFieldLocatedNum

[out] The number of markers that are found in the PDF document.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_INVALID_HANDLE`	The specified handle is invalid.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SigFieldLocatorContext* or *FileHandle* or *OpeningPattern* are NULL.
`SAPI_ERR_INVALID_HANDLE`	The handle that was passed to the function is not valid.
`SAPI_ERR_FILE_TYPE_NOT_SUPPORTED`	Currently only PDF files are supported.

Value	Meaning
SAPI_PDF_ERR_NO_DOC_PERMISSION	The permissions of the file that is processed do not allow performing the requested operation.
SAPI_ERR_LOCATOR_INVALID_CONTEXT	Invalid context handed to enum field locators.
SAPI_ERR_LOCATOR_COULD_NOT_INIT_FILE	Failed to parse the file as PDF file. This can occur due to a wrong file name, the file is missing, or in cases where the file is encrypted the failure can occur if the owner password and the user password are wrong.

Remarks

- The following is relevant if CoSign Signature Local is accessing a file that was saved on the disk (rather than a file residing in a memory buffer): After calling the **SAPISignatureFieldLocatorEnumInit** function and until the last call to SAPISignatureFieldEnumCont, or until the last usage of one of the signature fields' handles, it is recommended not to change the file using an application other than CoSign Signature Local. Doing so may lead to unexpected behavior.
- The Closing Pattern must be NULL if the orientation of the field locator string differs from the orientation of the page.
- If the file is protected, you will need to set either SAPI_ENUM_CONF_ID_PDF_OWNER_PWD or SAPI_ENUM_CONF_ID_USER_PWD values prior to calling this function.

See Also

SAPISignatureFieldLocatorEnumCont, SAPIHandleRelease

SAPISignatureFieldLocatorEnumCont

The **SAPISignatureFieldLocatorEnumCont** is used for getting the SAPI_SIG_FIELD_SETTINGS structure as well as the field locator string that was embedded in the file, for each field locator string. This information can be used to create new signature fields inside the PDF document using the SAPISignatureFieldCreate function.

Note that the **SAPISignatureFieldLocatorEnumCont** function is currently supported only for PDF files.

```
SAPI int SAPISignatureFieldLocatorEnumCont (
  SAPI_SES_HANDLE                  Handle,
  SAPI_CONTEXT                     *SigFieldLocatorContext,
  SAPI_SIG_FIELD_SETTINGS          *SigFieldSettings,
  SAPI_LPWSTR                      EncodedMessage,
  long                             *EncodedMessageLength
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SigFieldLocatorContext

[in] Pointer to the signature field locator enumeration operation context created using SAPISignatureFieldLocatorEnumInit.
SigFieldLocatorContext must be released by the SAPIContextRelease function when there is no further need to call the SAPISignatureFieldLocatorEnumCont function.

SigFieldSetting

[out] Pointer to the SAPI_SIG_FIELD_SETTINGS structure. This structure contains all signature field information that can be used by the SAPISignatureFieldCreate function to create a new signature field.

EncodedMessage

[out] The text that is contained inside the opening and closing patterns. If this parameter is NULL, the EncodedMessage parameter is not retrieved.

EncodedMessageLen

[in/out] The length of the EncodedMessage.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.

Value	Meaning
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*SigFieldLocatorContext*, *SigFieldSettings*, or *EncodedMessageLength* are NULL.
SAPI_ERROR_NO_MORE_ITEMS	Reached the last located item.

See Also

SAPISignatureFieldLocatorEnumInit, SAPISignatureFieldCreate, SAPIHandleRelease

SAPISignatureFieldSignEx

The **SAPISignatureFieldSignEx** function signs a specific signature field in a specific file. The file name and type, as well as the attributes for the signing operation, are all derived from the *SignatureFieldHandle*. Use this function also when the *prompt for sign* feature is enabled.

```
SAPI int SAPISignatureFieldSignEx (
  SAPI_SES_HANDLE            Handle,
  SAPI_SIG_FIELD_HANDLE      SignatureFieldHandle,
  unsigned long              Flags,
  unsigned char              *Credential,
  unsigned long              CredentialLen
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignatureFieldHandle

[in] Pointer to the Signature Field handle that represents the field to be signed. The Signature Field handle was created by either the SAPISignatureFieldEnumCont function or the SAPISignatureFieldCreate function.

SignatureFieldHandle must be released by the SAPIHandleRelease function.

Flags

[in] Flag values bit mask. For more information, refer to the following sections in Appendix D: Flags when Signing Word Documents, Flags when Signing PDF Files, Flags when Signing TIFF Files, and Time-Stamping/OCSP and Miscellaneous Signature-Related Flags.

Credential

[in] Pointer to a wide char buffer that holds the user credentials required for the signing operation. Contact ARX support for more information. If no special credential is needed, a NULL value can be supplied. However, if the *prompt for sign* feature is enabled, you must supply credentials.

CredentiaLen

[in] The length in bytes of the content of *Credential*, including NULL separators and/or terminators. If no special credentials are needed, a value of 0 can be supplied.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignatureFieldHandle* is NULL and must not be NULL.

Value	Meaning
SAPI_ERR_NO_CERT_TO_SELECT_FROM	No certificate was found. This might be due to incorrect credentials, networking problems, or because the preferred certificate could not be found.
SAPI_ERR_TOO_MANY_CERTS_TO_SELECT_FROM	More than one certificate is available, and CoSign Signature Local cannot choose between them. Use either SAPICertificateSetDefault or SAPIConfigurationValueSet to set the certificate with which CoSign Signature Local works.
SAPI_ERR_FAILED_TO_SIGN_FILE	A general error occurred while signing the file. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

The certificate that the **SAPISignatureFieldSignEx** function uses for signing is either the one set as the default certificate (for example, by calling the SAPICertificateSetDefault function), or a certificate that the function automatically chooses. See the SAPICertificateGetDefault function for more information about the automatic algorithm for choosing a certificate.
To improve performance, if no default certificate is set prior to the signing operation, CoSign Signature Local stores the certificate it used for this operation as the default for the purpose of certifying the next signing operation in the current SAPI session. If this behavior is not required, set the configuration value of SAPI_ENUM_CONF_ID_CERT_SET_DEFAULT to 0 before the initial call to **SAPISignatureFieldSignEx** in the current session.

- If a graphical image is required by the signature field attribute and there is only one graphical signature stored in CoSign, it is retrieved automatically by the **SAPISignatureFieldSignEx** function. If more than one graphical signature is stored in CoSign, use SAPIGraphicSigImageSetDefaultEx to set a default image, or use SAPIConfigurationValueSet with the *SAPI_ENUM_CONF_ID_GR_SIG_PREF_NAME* parameter to set the graphical image to use.
- If a logo is required by the signature field attribute and there is only one graphical signature stored in CoSign, it is retrieved automatically by the **SAPISignatureFieldSignEx** function. If more than one logo is stored in CoSign, use SAPIGraphicSigImageSetDefaultEx to set a default logo, or use SAPIConfigurationValueSet with the *SAPI_ENUM_CONF_ID_LOGO_PREF_NAME* parameter to set the logo to use.
  Note that starting from version 5.4, only one logo is permissible for a given account.
- If an initials image is required by the signature field attribute and there is only one graphical signature stored in CoSign, it is retrieved automatically by the **SAPISignatureFieldSignEx** function. If more than one initials image is stored in CoSign, use SAPIGraphicSigImageSetDefaultEx to set a default initials image.
  If a reason is attached to the signature field, it must be set as a configuration value using the SAPIConfigurationValueSet function prior to calling the **SAPISignatureFieldSignEx** function.
- If a title is attached to the signature field, it must be set as a configuration value using the SAPIConfigurationValueSet function prior to calling the **SAPISignatureFieldSignEx** function.

- In the case of ARX Legacy signatures for Word/Excel XP/2003, application-based signatures are not supported using CoSign Signature Local. Therefore, only Word XP/2003 Entire File signatures are supported using CoSign Signature Local.
- In the case of PDF files, the maximum allowed sizes of Graphical signatures, Logo or Initials is one megabyte.

See Also

SAPIHandleAcquire, SAPICertificateSetDefault, SAPICertificateGetDefault, SAPIConfigurationValueSet, SAPIHandleRelease, SAPISignatureFieldCreate, SAPISignatureFieldEnumCont, SAPIGraphicSigImageSetDefault, SAPISignatureFieldSign

SAPISignatureFieldSign

The **SAPISignatureFieldSign** function is the older version of the SAPISignatureFieldSignEx function.

```
SAPI int SAPISignatureFieldSign (
  SAPI_SES_HANDLE            Handle,
  SAPI_SIG_FIELD_HANDLE      SignatureFieldHandle,
  unsigned long              Flags
);
```

SAPISignatureFieldCreateSignEx

The **SAPISignatureFieldCreateSignEx** function both creates a new field and signs that field. This function, created for convenience, internally calls the SAPISignatureFieldCreateEx and SAPISignatureFieldSignEx functions. For more information, refer to the descriptions of these two functions.

```
SAPI int SAPISignatureFieldCreateSignEx (
  SAPI_SES_HANDLE                 Handle,
  SAPI_ENUM_FILE_TYPE             FileType,
  SAPI_LPCWSTR                    FileUNC,
  SAPI_FILE_HANDLE                FileHandle,
  PSAPI_SIG_FIELD_SETTINGS        NewSignatureFieldStruct,
  unsigned long                   Flags,
  unsigned char                   *Credential,
  unsigned long                   CredentialLen);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

FileType

[in] File type.

FileUNC

[in] File name. It is recommended to use the *FileHandle* parameter instead and provide "" as an input parameter.

FileHandle

[in] File handle. The SAPI file handle to be used for the field creation and signature operation. The file handle can be created using either the SAPICreateFileHandleByName function or the SAPICreateFileHandleByMem function. If this value is NULL, the *FileUNC* parameter is used.

NewSignatureFieldStruct

[in] Pointer to the SAPI_SIG_FIELD_SETTINGS structure. This structure holds all the non-crypto information of the newly created signature field.

Flags

[in] Flag values bit mask. For more information, refer to the following sections in Appendix D: Flags when Creating a Signature Field in PDF Files, Flags when Signing PDF Files, Flags when Creating a Signature Field in Office 2007/2010/2013 Documents, Flags when Signing XML Documents, and Time-Stamping/OCSP and Miscellaneous Signature-Related Flags.
Note that some of the signature field flags are passed as part of the function call, while others are passed as part of the signature field SAPI_SIG_FIELD_SETTINGS structure to which the function points. The relevant sections in Appendix D note which flags are passed as part of the function and which are passed as part of the signature field structure.

Credential

[in] Pointer to a wide char buffer that holds the user credentials required for the signing operation. Contact ARX support for more information. If no special credential is needed, a NULL value can be supplied. However, if the *prompt for sign* feature is enabled, you must supply credentials.

CredentiaLen

[in] The length in bytes of the content of *Credentials* including NULL separators and/or terminators. If no special credential is needed, a value of 0 can be supplied.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_INVALID_HANDLE`	The specified handle is invalid.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignatureFieldHandle* is NULL and must not be NULL.
`SAPI_ERR_NO_CERT_TO_SELECT_FROM`	No certificate was found. This might be due to incorrect credentials, networking problems, or because the preferred certificate could not be found.
`SAPI_ERR_TOO_MANY_CERTS_TO_SELECT_FROM`	More than one certificate is available, and CoSign Signature Local cannot choose between them. Use either SAPICertificateSetDefault or SAPIConfigurationValueSet to set the certificate with which CoSign Signature Local operates.
`SAPI_ERR_FAILED_TO_SIGN_FILE`	A general error occurred while signing the file. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

See the description of the two base functions: SAPISignatureFieldCreate and SAPISignatureFieldSignEx.
Any limitations that apply to SAPISignatureFieldCreate and/or SAPISignatureFieldSignEx, apply to this function as well. Therefore, carefully read the description of these two functions.

This function is relevant only for PDF and XML file types. If you wish to create and sign new signature fields in other file types, you must call two separate functions: SAPISignatureFieldCreate for creating a signature field, and SAPISignatureFieldSignEx for signing the newly created signature fields.

See Also

SAPIHandleAcquire, SAPICertificateSetDefault, SAPICertificateGetDefault, SAPIConfigurationValueSet, SAPIHandleRelease, SAPISignatureFieldCreate, SAPISignatureFieldEnumCont, SAPIGraphicSigImageSetDefault, SAPISignatureFieldSignEx

SAPISignatureFieldCreateSign

The **SAPISignatureFieldCreateSign** function is the older version of the SAPISignatureFieldCreateSignEx function. In the **SAPISignatureFieldCreateSign** function, a File Handle type is not defined.

```
SAPI int SAPISignatureFieldCreateSign (
  SAPI_SES_HANDLE                  Handle,
  SAPI_ENUM_FILE_TYPE              FileType,
  SAPI_LPCWSTR                     FileUNC,
  PSAPI_SIG_FIELD_SETTINGS         NewSignatureFieldStruct,
  unsigned long                    Flags,
  unsigned char                    *Credential,
  unsigned long                    CredentialLen);
```

SAPISignatureFieldVerify

The **SAPISignatureFieldVerify** function verifies the validity of a single signature field. The function returns `SAPI_OK` if the signature is valid. If the signature is valid, it also checks the certificate status, and returns its value in *CertificateStatus*.

```
SAPI int SAPISignatureFieldVerify (
  SAPI_SES_HANDLE            Handle,
  SAPI_SIG_FIELD_HANDLE      SignatureFieldHandle,
  SAPI_CERT_STATUS_STRUCT    *CertificateStatus,
  unsigned long              Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignatureFieldHandle

[in] Pointer to the Signature Field handle that represents the field to be verified. The Signature Field handle was created by the SAPISignatureFieldEnumCont function.
SignatureFieldHandle must be released by the SAPIHandleRelease function.

CertificateStatus

[out] The validity status of the certificate. This parameter must be supplied.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Flags when Verifying a Signature.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignatureFieldHandle* is NULL and must not be NULL.
`SAPI_ERR_FAILED_TO_VERIFY_FILE`	A general error occurred while verifying a signature. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

It is recommended to carefully check the certificate status and make sure its value is as expected. For example, whereas in some environments the inability to check a CRL can be a real problem, in other environments it cannot be checked at all.

- To control the attributes to be checked when verifying a certificate, set SAPI_ENUM_CONF_ID_CERT_CHAIN_FLAGS to a desired value (see SAPI_ENUM_CONF_ID), using the SAPIConfigurationValueSet function. Contact ARX for information about which value to pass.
- To check if the certificate is revoked, set SAPI_ENUM_CONF_ID_CHK_CRL_VERIFY or SAPI_ENUM_CONF_ID_CHK_CRL_ENUM (see SAPI_ENUM_CONF_ID) to `True`, using the SAPIConfigurationValueSet function.

When verifying a signed file, you can use the SAPIFileIsSigned function before enumerating the signature fields, to ensure that the file is signed (i.e., there is at least one signed signature field).

If time-stamping is used, the returned certificate status will be based on the status of both the user certificate as well as the time-stamping server certificate.
If the user's certificate is not valid, this will be reflected in the certificate status.
If the user's certificate is valid, then the time-stamping certificate status will be retrieved. A SAPI_ENUM_CERT_STATUS_OK means that both the user and the time-stamping server certificates are OK.
To retrieve the exact time-stamping certificate status, use the SAPI_ENUM_CONF_ID_SECURED_TS_CERT_STATUS configuration value retrieval.

See Also

SAPIHandleAcquire, SAPISignatureFieldSign, SAPIHandleRelease, SAPISignatureFieldEnumCont, SAPIConfigurationValueSet, SAPIFileIsSigned

SAPIFileIsSignedEx

The **SAPIFileIsSignedEx** function returns true in *IsSigned* if *FileUNC* has at least one signed signature field. Otherwise, *IsSigned* is false.
This function is useful for applications that display a special icon for signed files, or that enable the Verify menu option upon right-clicking the file name, etc.

```
SAPI int SAPIFileIsSignedEx (
  SAPI_SES_HANDLE            Handle,
  SAPI_ENUM_FILE_TYPE        FileType,
  SAPI_LPCWSTR               FileUNC,
  SAPI_FILE_HANDLE           FileHandle,
  unsigned long              Flags;
  SAPI_BOOL                  *IsSigned
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

FileType

[in] File type. Refer to SAPI_ENUM_FILE_TYPE.

FileUNC

[in] File name. It is recommended to use the *FileHandle* parameter instead and provide "" as an input parameter.

FileHandle

[in] File handle. The file handle can be created using either the SAPICreateFileHandleByName function or the SAPICreateFileHandleByMem function. If this value is NULL, the *FileUNC* parameter is used.

Flags

[in] Reserved for future use and must be zero.

IsSigned

[in] A pointer to a flag specifying whether the file has at least one signed signature field (true), or not (false).

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_INVALID_HANDLE`	The specified handle is invalid.

Value	Meaning
SAPI_ERR_FILE_TYPE_NOT_SUPPORTED	The file type provided in *FileType* is not one of the supported file types.
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*FileUNC* or *IsSigned* is NULL and must not be NULL.
SAPI_ERR_FAILED_IN_IS_FILE_SIGNED	A general error occurred while checking whether the file is signed. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

This function does not verify the signature fields in the file, it only indicates whether there are signed signature fields in the file.

See Also

SAPIHandleAcquire, SAPISignatureFieldSign, SAPISignatureFieldVerify

SAPIFileIsSigned

The **SAPIFileIsSigned** function is the older version of the SAPIFileIsSignedEx function. In the **SAPIFileIsSigned** function, a File Handle type is not defined.

```
SAPI int SAPIFileIsSigned (
  SAPI_SES_HANDLE            Handle,
  SAPI_ENUM_FILE_TYPE        FileType,
  SAPI_LPCWSTR               FileUNC,
  unsigned long              Flags;
  SAPI_BOOL                  *IsSigned
);
```

SAPISignatureFieldClear

The **SAPISignatureFieldClear** function clears a signature field. This means that all the cryptographic-related information is cleared as well as its visual objects, but the field and its attributes remain unchanged.

```
SAPI int SAPISignatureFieldClear (
  SAPI_SES_HANDLE                Handle,
  SAPI_SIG_FIELD_HANDLE          SignatureFieldHandle
  unsigned long                  Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignatureFieldHandle

[in] Pointer to the Signature Field handle that represents the field to be cleared. The Signature Field handle was created by either the SAPISignatureFieldEnumCont function or the SAPISignatureFieldCreate function.

SignatureFieldHandle must be released by the SAPIHandleRelease function.

Flags

[in] Flag values bit mask. The available values are:
AR_WORD_CLEAR_DEPENDENT_SIGNATURES_FLAG and
AR_WORD_CLEAR_ALL_SIGNATURES_FLAG for Word files (see Flags when Clearing or Removing Signature Fields for more information).

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignatureFieldHandle* is NULL and must not be NULL.
`SAPI_ERR_FAILED_TO_CLEAR_SIGNATURE_FIELD`	A general error occurred while clearing the Signature Field. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

A signature field that was cleared can be signed again using the same Signature Field handle.

See Also

SAPIHandleAcquire, SAPISignatureFieldEnumCont, SAPISignatureFieldCreate, SAPIHandleRelease

SAPISignatureFieldRemove

The **SAPISignatureFieldRemove** function removes a signature field from the file.

```
SAPI int SAPISignatureFieldRemove (
  SAPI_SES_HANDLE                 Handle,
  SAPI_SIG_FIELD_HANDLE           SignatureFieldHandle,
  unsigned long                   Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignatureFieldHandle

[in] Pointer to the Signature Field handle that represents the field that is going to be removed. The Signature Field handle was created by either the SAPISignatureFieldEnumCont function or the SAPISignatureFieldCreate function.

SignatureFieldHandle must be released by the SAPIHandleRelease function.

Flags

[in] Flag values bit mask. The available values are:
AR_WORD_CLEAR_DEPENDENT_SIGNATURES_FLAG and
AR_WORD_CLEAR_ALL_SIGNATURES_FLAG for Word files (see Flags when Clearing or Removing Signature Fields for more information).

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignatureFieldHandle* is NULL and must not be NULL.
`SAPI_ERR_FAILED_TO_REMOVE_SIGNATURE_FIELD`	A general error occurred while removing the Signature Field. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

- A signature field that was removed cannot be used. The only operation allowed for the Signature Field Handle is SAPIHandleRelease.
- A signature field can be removed whether it is signed or not.
- By default, you cannot remove a signature field in a Word 2003 file using CoSign Signature Local. It is recommended to remove signature fields using the Word application and the ARX

Legacy Word add-in, and use CoSign Signature Local only for signing or clearing fields. If CoSign Signature Local must be used for signature fields removal, contact ARX support for instructions on how to enable this feature.

- You cannot remove an Office 2007/2010/2013 signature using CoSign Signature Local. You must remove signatures using the Office 2007/2010/2013 application.

See Also

SAPIHandleAcquire, SAPISignatureFieldEnumCont, SAPISignatureFieldCreate, SAPIHandleRelease

SAPISignatureFieldDetailsGUIGet

The **SAPISignatureFieldDetailsGUIGet** displays information related to the signature status and the signing certificate.

```
SAPI int SAPISignatureFieldDetailsGUIGet (
  SAPI_SES_HANDLE            Handle,
  SAPI_SIG_FIELD_HANDLE      SignatureFieldHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignatureFieldHandle

[in] Pointer to the Signature Field handle that represents the signed field. The information that is displayed on screen is related to this signed field.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignatureFieldHandle* is NULL and must not be NULL.

See Also

SAPIHandleAcquire, SAPISignatureFieldSign

SAPISigningCeremonyGUI

The **SAPISigningCeremonyGUI** displays the standard signing ceremony dialog.

The values that the end-user enters in the dialog are saved in CoSign Signature Local, and will appear as the default values the next time this dialog is displayed.

```
SAPI int SAPISigningCeremonyGUI(
  SAPI_SES_HANDLE                          Handle,
  SAPI_SIG_FIELD_HANDLE                    SignatureFieldHandle,
  unsigned long                            flags,
  unsigned long                            DisplayComponentsMask,
  unsigned long                            GraphicFormatsPermitted,
  SAPI_LPCWSTR                             InstructToSigner,
  SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE   ImageSelection,
  SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE   CertSelection,
  SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE   ReasonSelection,
  SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE   TitleSelection,
  SAPI_ENUM_GR_IMG_SELECT_MODE             GraphicalSelectionMode
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignatureFieldHandle

[in] Pointer to the Signature Field handle that represents the specific signature field. The specific signature field settings determine which signature components appear in the displayed signing ceremony dialog.
If NULL is passed, then the list of signature components to display is derived from the *DisplayComponentsMask*.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Flags when Using the Signing Ceremony API.

DisplayComponentsMask

[in] This parameter is relevant if *SignatureFieldHandle* is NULL. The value is built as a mask, based on the SAPI_ENUM_DRAWING_ELEMENT enum. In this way, you can specify the exact structure of the signing ceremony dialog.

GraphicFormatsPermitted

[in] Specify which types of graphical images to present for selection. You can send one of the following values:

```
AR_GR_FLAG_IMAGE_TYPE,
AR_GR_FLAG_INITIALS_TYPE,
AR_GR_FLAG_IMAGE_TYPE | AR_GR_FLAG_INITIALS_TYPE
```

InstructToSigner

[in] Displays text that provides instructions about the digital signature act.

ImageSelection

[in] Instructs the signing ceremony whether to include the graphical signature selection component. Use the `SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE_BY_APPEARANCE_MASK` value.

CertSelection

[in] Instructs the signing ceremony whether to include the certificate selection component. Use the `SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE_BY_APPEARANCE_MASK` value.

ReasonSelection

[in] Instructs the signing ceremony whether to include the reason selection component. Use the `SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE_BY_APPEARANCE_MASK` value.

TitleSelection

[in] Instructs the signing ceremony whether to include the title selection component. Use the `SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE_BY_APPEARANCE_MASK` value.

GraphicalSelectionMode

[in] Based on SAPI_ENUM_GR_IMG_SELECT_MODE.
Use SAPI_ENUM_GR_IMG_SEL_MODE_SELECT for a regular signature ceremony procedure.

Use SAPI_ENUM_GR_IMG_SEL_MODE_VIEW_USER for managing a user's graphical signatures. This option is used by the graphical signatures utility in user mode.

Use SAPI_ENUM_GR_IMG_SEL_MODE_VIEW_KIOSK for managing a user's graphical signatures. This option is used by the graphical signatures utility in administrative mode.

To use SAPI_ENUM_GR_IMG_SEL_MODE_VOLATILE, contact ARX for more information.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignatureFieldHandle* is NULL and must not be NULL.

See Also

SAPIHandleAcquire, SAPISignatureFieldSign

CoSign Signature Local Certificates

This chapter describes the functions related to certificates. These functions fall into two groups:

- *Retrieving certificate information* – Functions for retrieving information from a given certificate. This group includes the SAPICertificateGetFieldByBlob and SAPIPKCS7BlobGetValue functions, and in some special scenarios it includes the SAPICertificateGetFieldByHandle and SAPICertificateGetDefault functions, which are generally grouped in the second group.

  The SAPIPKCS7BlobGetValue function retrieves the certificate data from a PKCS#7 formatted signature blob (either after signing data or before verifying signed data). The SAPICertificateGetFieldByBlob function retrieves various data (such as expiration dates, certificate's owner, certificate's issuer, etc.) from a specific certificate. This function can be useful in cases where an application needs to know the identity of the signer of a certain record, and it is not relevant for obtaining the identity of the signer of a file.

  The SAPICertificateGetFieldByHandle function is identical to the SAPICertificateGetFieldByBlob function, except that instead of using the raw certificate data as the information source, it uses a CoSign Signature Local certificate handle. The certificate handle is returned by SAPICertificateGetDefault in a single-certificate environment, while in a multi-certificates environment you might use the enumeration functions (SAPICertificatesEnumInit and SAPICertificatesEnumCont). The SAPICertificateGetFieldByHandle function is called when the certificate information must be retrieved before the signing operation, unlike the SAPICertificateGetFieldByBlob function that is usually called after the data was signed.
- *Selecting a certificate in a multi-certificate environment* – Functions for environments in which a user has multiple certificates. In most cases, users have a single certificate, and this certificate is automatically selected by CoSign Signature Local for signing. However, in multi-certificate environments, a default certificate (or its unique identifiers) must be set prior to the signing operation, otherwise CoSign Signature Local is not able to select a certificate with which to work. Use the functions in this group only if there is a possibility that more than one certificate exists.

  This group of functions includes:

  - The enumeration functions, SAPICertificatesEnumInit and SAPICertificatesEnumCont, which return all the certificate handles one by one.
  - SAPICertificateGUISelect for selecting a certificate from a list using Windows' *Select Certificate* dialog box.
  - SAPICertificateSetDefault for setting a specific certificate as the default certificate for all subsequent signing operations.
  - SAPICertificateGetFieldByHandle and SAPICertificateGetDefault, described in the context of the first group.

SAPICertificatesEnumInit

The **SAPICertificatesEnumInit** function initializes the certificates enumeration operation. This operation is used in environments where there might be more than one available certificate. A call to the SAPICertificatesEnumInit function is followed by a call to the SAPICertificatesEnumCont function until all the certificates are retrieved, or until the required certificate is found. To get more information about a specific certificate, call the SAPICertificateGetFieldByHandle function.

```
SAPI int SAPICertificatesEnumInit (
  SAPI_SES_HANDLE                 Handle,
  SAPI_CONTEXT                    *CertContext,
  unsigned long                   Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

CertContext

[out] Pointer to the Certificates Enumeration operation context. This context contains internal information about the operation. The information in this context is passed in all subsequent calls to SAPICertificatesEnumCont. Changing the value of *CertContext* by the application is not allowed and can lead to unexpected behavior.
CertContext must be released by the SAPIContextRelease function when the certificates enumeration operation is finished.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Flags when Enumerating Certificates.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*CertContext* is NULL and must not be NULL.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the new operation context. This might be due to a shortage in system resources.
`SAPI_ERR_FAILED_TO_INIT_CERT_ENUM`	A general error occurred while initializing the certificates enumeration operation. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

SAPICertificatesEnumInit builds an internal list of certificates according to the available certificates at the moment it is called. Only certificates from the list are returned by the SAPICertificatesEnumCont function. Therefore, new certificates that become available after the **SAPICertificatesEnumInit** returns, do not affect the certificate handles that are retrieved by the SAPICertificatesEnumCont function. However, removing certificates after **SAPICertificatesEnumInit** returns, can cause SAPICertificatesEnumCont to fail.

In environments in which there is only one certificate, or when the required certificate can be identified by its serial ID or by its public key's hash value (Subject Key Identifier), the certificates enumeration operation is unnecessary.

Use the PERFORM_EXTENDED_VALIDATION constant to enforce the extended certificate path validation tests. Only certificates that pass the validation tests can be used for signature operations.

See Also

SAPIHandleAcquire, SAPIContextRelease, SAPICertificatesEnumCont, SAPICertificateGetFieldByHandle, SAPICertificateGetDefault

SAPICertificatesEnumCont

The **SAPICertificatesEnumCont** function continues the certificates enumeration operation and returns a pointer to a single certificate handle from the internal certificates list built by the SAPICertificatesEnumInit function. Every call returns a new certificate handle until the end of the list is reached.

```
SAPI int SAPICertificatesEnumCont (
  SAPI_SES_HANDLE                  Handle,
  SAPI_CONTEXT                     *CertContext,
  SAPI_CERT_HANDLE                 *CertHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

CertContext

[in] Pointer to the Certificate Enumeration operation context created using SAPICertificatesEnumInit. *CertContext* must be released by the SAPIContextRelease function when there are no more certificates to retrieve or when the required certificate was found.

CertHandle

[out] Pointer to a handle of a certificate. This handle can be used when calling other certificate functions, such as SAPICertificateGetFieldByHandle and SAPICertificateSetDefault.
When *CertHandle* is not in use anymore, it is released by calling the SAPIHandleRelease function.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*CertContext* or *CertHandle* is NULL and must not be NULL.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the certificate handle. This might be due to a shortage in system resources.
`SAPI_ERR_CONTEXT_NOT_INITALIZED`	The certificates enumeration context is either not initialized or is corrupt.
`SAPI_ERROR_NO_MORE_ITEMS`	There are no more certificates to retrieve.

Value	Meaning
SAPI_ERR_FAILED_TO_CONT_CERT_ENUM	A general error occurred while continuing the certificates enumeration operation. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

SAPICertificatesEnumCont returns only the certificates that were available when SAPICertificatesEnumInit was called.

In order to retrieve the whole certificate list, **SAPICertificatesEnumCont** is called until SAPI_ERROR_NO_MORE_ITEMS is returned.

See Also

SAPIHandleAcquire, SAPIContextRelease, SAPICertificatesEnumInit, SAPICertificateGetFieldByHandle, SAPICertificateSetDefault

SAPICertificateGetFieldByHandle

The **SAPICertificateGetFieldByHandle** function retrieves a single field from a certificate pointed to by a certificate handle.

```
SAPI int SAPICertificateGetFieldByHandle (
  SAPI_SES_HANDLE                 Handle,
  SAPI_CERT_HANDLE                CertHandle,
  SAPI_ENUM_CERT_FIELD            FieldID,
  unsigned char                   *Value,
  unsigned long                   *ValueLen,
  SAPI_ENUM_DATA_TYPE             *FieldType
);
```

Parameters

Handle

[in] Handle of the SAPI session created by SAPIHandleAcquire.

CertHandle

[in] Handle of a certificate created using SAPICertificateGetDefault or SAPICertificatesEnumCont.

FieldID

[in] The ID of the certificate field to be retrieved. A description of all available IDs is contained in SAPI_ENUM_CERT_FIELD.

Value

[out] Pointer to a buffer holding the data retrieved according to the value of *FieldID*. This parameter can be NULL if only the value length is required.

ValueLen

[in/out] Pointer to a value that specifies the size allocated for the *Value* parameter. When the function returns, this value contains the size of the data copied to *Value*, or if *Value* is NULL, the size that needs to be allocated for *Value*.

FieldType

[out] Pointer to a value that receives a code indicating the type of data that was returned in *Value*. For a list of the possible type codes, see SAPI_ENUM_DATA_TYPE. The *FieldType* parameter can be NULL if the type code is not required.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*ValueLen* or *CertHandle* is NULL and must not be NULL.

SAPI_ERR_CERT_HANDLE_NOT_INITALIZED	The certificate handle is either not initialized or is corrupt.
SAPI_ERR_PARAMETER_LEN_IS_TOO_SHORT	The size of *Value* is too short to hold the required certificate field.
SAPI_ERR_UNSUPPORTED_CERT_FIELD	The required field is not supported by the function.
SAPI_ERR_CERT_FIELD_VALUE_NOT_FOUND	The value of the required field was not found in the certificate. This error code is usually returned for SAPI_ENUM_CERT_FIELD_EMAIL.
SAPI_ERR_FAILED_TO_GET_CERT_FIELD	A general error occurred while retrieving the certificate field. Call SAPIExtendedLastErrorGet for more information about the exact problem.

See Also

SAPIHandleAcquire, SAPICertificatesEnumCont, SAPICertificateGetDefault, SAPICertificateGetFieldByBlob

SAPICertificateGetFieldByBlob

The **SAPICertificateGetFieldByBlob** function retrieves a single field from a certificate's raw data (ASN1 encoded).

```
SAPI int SAPICertificateGetFieldByBlob (
  SAPI_SES_HANDLE                 Handle,
  unsigned char                   *EncodedCertificate,
  unsigned long                   EncodedCertificateLen,
  SAPI_ENUM_CERT_FIELD            FieldID,
  unsigned char                   *Value,
  unsigned long                   *ValueLen,
  SAPI_ENUM_DATA_TYPE             *FieldType
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

EncodedCertificate

[in] A buffer holding the ASN1 certificate.

EncodedCertificateLen

[in] The length in bytes of *EncodedCertificate*.

FieldID

[in] The ID of the certificate field to be retrieved. A description of all available IDs is contained in SAPI_ENUM_CERT_FIELD.

Value

[out] Pointer to a buffer holding the retrieved data according to the value of *FieldID*. This parameter can be NULL if only the value length is required.

ValueLen

[in/out] Pointer to a value that specifies the size allocated for the *Value* parameter. When the function returns, this value contains the size of the data copied to *Value*, or if *Value* is NULL, the size that needs to be allocated for *Value*.

FieldType

[out] Pointer to a value that receives a code indicating the type of data that was returned in *Value*. For a list of the possible type codes, see SAPI_ENUM_DATA_TYPE. The *FieldType* parameter can be NULL if the type code is not required.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
SAPI_ERR_SESSION_IS_NULL	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*EncodedCertificate* or *ValueLen* is NULL and must not be NULL, and *EncodedCertificateLen* must be greater than 0.
SAPI_ERR_PARAMETER_LEN_IS_TOO_SHORT	The size of *Value* is too short to hold the required certificate field.
SAPI_ERR_UNSUPPORTED_CERT_FIELD	The required field is not supported by the function.
SAPI_ERR_CERT_FIELD_VALUE_NOT_FOUND	The value of the required field was not found in the certificate. This error code is usually returned for SAPI_ENUM_CERT_FIELD_EMAIL.
SAPI_ERR_FAILED_TO_GET_CERT_FIELD	A general error occurred while retrieving the certificate field. Call SAPIExtendedLastErrorGet for more information about the exact problem.

See Also

SAPIHandleAcquire, SAPICertificateGetFieldByHandle

SAPIPKCS7BlobGetValue

The **SAPIPKCS7BlobGetValue** function retrieves a single field from a PKCS#7 formatted signature blob. One of the fields that can be retrieved is the signing certificate value. From the certificate value, the application can obtain some information about the signer. This can be useful after signing data (as opposed to a file), or before verifying signed data.

```
SAPI int SAPIPKCS7BlobGetValue(
  SAPI_SES_HANDLE                 Handle,
  unsigned char                   *PKCS7Blob,
  unsigned long                   PKCS7BlobLen,
  SAPI_ENUM_PKCS7_FIELD           FieldID,
  unsigned char                   *Value,
  unsigned long                   *ValueLen,
  SAPI_ENUM_DATA_TYPE             *FieldType
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

PKCS7Blob

[in] A buffer holding the PKCS#7 formatted signature blob.

PKCS7BlobLen

[in] The length in bytes of *PKCS7Blob*.

FieldID

[in] The ID of the field to be retrieved. See SAPI_ENUM_PKCS7_FIELD.

Value

[out] Pointer to a buffer holding the retrieved data according to the value of *FieldID*. This parameter can be NULL if only the value length is required.

ValueLen

[in/out] Pointer to a value that specifies the size allocated for the *Value* parameter. When the function returns, this value contains the size of the data copied to *Value*, or if *Value* is NULL, the size that needs to be allocated for *Value*.

FieldType

[out] Pointer to a value that receives a code indicating the type of data that was returned in *Value*. For a list of the possible type codes, see SAPI_ENUM_DATA_TYPE. The *FieldType* parameter can be NULL if the type code is not required.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
SAPI_ERR_SESSION_IS_NULL	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*PKCS7Blob* or *ValueLen* is NULL and must not be NULL.
SAPI_ERR_PARAMETER_LEN_IS_TOO_SHORT	The size of *Value* is too short to hold the required certificate field.
SAPI_ERR_UNSUPPORTED_CERT_FIELD	The required field is not supported by the function.
SAPI_ERR_FAILED_TO_PARSE_PKCS7_BLOB	A general error occurred while retrieving the certificate from the signature data. Call SAPIExtendedLastErrorGet for more information about the exact problem.

See Also

SAPIHandleAcquire, SAPICertificateGetFieldByBlob

SAPICertificateGUISelect

The **SAPICertificateGUISelect** function displays all the available certificates in a dialog box, enabling the user to view each certificate's details and to select one of the certificates. This function returns the certificate handle of the selected certificate.

```
SAPI int SAPICertificateGUISelect (
  SAPI_SES_HANDLE                 Handle,
  unsigned long                   Flags,
  SAPI_CERT_HANDLE                *CertHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Flags when Displaying Certificate List.

CertHandle

[out] Pointer to a handle of the selected certificate. This handle can be used when calling other certificate functions such as SAPICertificateGetFieldByHandle and SAPICertificateSetDefault. When *CertHandle* is not in use anymore, it is released by calling the SAPIHandleRelease function.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*CertHandle* is NULL and must not be NULL.
`SAPI_ERR_NO_CERT_TO_SELECT_FROM`	No certificate was found. This might be due to incorrect credentials or to networking problems.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the certificate handle. This might be due to a shortage in system resources.
`SAPI_ERR_GUI_SELECT_CERT_OPERATION_WAS_CANCELLED`	The user pressed the Cancel button or the Esc key in the Select Certificate dialog box.
`SAPI_ERR_GUI_SELECT_CERT_RETURNED_NO_CERT`	A general error occurred while looking for a certificate. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

This function can be called only by applications that have the InteractWithDesktop property.

Some of the strings displayed in the Select Certificate dialog box (such as Title and Command) can be controlled by the application. To change these strings, use the SAPIConfigurationValueSet function with one or more of the following configuration values: SAPI_ENUM_CONF_ID_SEL_CERT_TITLE, SAPI_ENUM_CONF_ID_SEL_CERT_CMD.

See Also

SAPIHandleAcquire, SAPICertificateGetFieldByHandle, SAPIHandleRelease, SAPICertificateSetDefault, SAPIConfigurationValueSet

SAPICertificateSetDefault

The **SAPICertificateSetDefault** function sets the certificate pointed to by the certificate handle, as the default certificate. The default certificate is used for all signing operations in the current SAPI session handle. This function is used in the following scenarios:

- To improve signing performance when multiple signing operations must be carried out with the same certificate in the same SAPI session.
- In environments where there is more than one available certificate.

```
SAPI int SAPICertificateSetDefault (
  SAPI_SES_HANDLE                 Handle,
  SAPI_CERT_HANDLE                CertHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

CertHandle

[in] The default certificate handle created using SAPICertificatesEnumCont.
If NULL, this function tries to automatically look for a certificate, and set it as default. See the SAPICertificateGetDefault function for more details about the algorithm for automatic certificate searching.
If not NULL, *CertHandle* is released by calling the SAPIHandleRelease function, when it is not in use anymore.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_CERT_HANDLE_NOT_INITALIZED`	The certificate handle is either not initialized or is corrupt.
`SAPI_ERR_NO_CERT_TO_SELECT_FROM`	No certificate was found. This might be due to incorrect credentials, networking problems, or because the preferred certificate could not be found. **NOTE**: This error can occur only if *CertHandle* is NULL.
`SAPI_ERR_TOO_MANY_CERTS_TO_SELECT_FROM`	More than one certificate is available and CoSign Signature Local cannot choose between them. Use either SAPIConfigurationValueSet or call the certificates enumeration functions and select the certificate with which CoSign Signature Local works.

Value	Meaning
	NOTE: This error can occur only if *CertHandle* is NULL.
SAPI_ERR_FAILED_TO_SET_CERT	A general error occurred while setting the default certificate. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

This function can be called more than once, each time with a different valid certificate handle.

To improve performance, CoSign Signature Local stores the certificate handle in the session's internal cache, as well as additional data that is related to this certificate, such as the certificate chain. Each time this function is called, all the stored data is erased. This means that calling this function twice with the same certificate handle might degrade performances because some of the cached data is recreated.

A certificate can also be set as default by using the SAPICertificateGetDefault function.

When setting a certificate as default, a copy of the certificate handle is created, therefore the application is still responsible for releasing the certificate handle that is passed to this function. The default certificate handle is automatically released when the session is closed.

See Also

SAPIHandleAcquire, SAPIHandleRelease, SAPICertificateGetDefault, SAPIConfigurationValueSet, SAPICertificatesEnumCont

SAPICertificateGetDefault

The **SAPICertificateGetDefault** function employs a selection algorithm to choose a certificate, and returns a certificate handle of the chosen certificate.
The algorithm selects a certificate as follows: the algorithm goes through the following ordered set of criteria. When a criterion is met, the certificate meeting the criterion is the chosen certificate, and the process stops.

1. A certificate was explicitly set as default by SAPICertificateSetDefault, or a certificate was automatically set as default after a signing operation, or even after calling this function.
2. A certificate with a subject key identifier equal to a subject key identifier that was set as a configuration value (SAPI_ENUM_CONF_ID_CERT_SKI).
3. A certificate with a serial ID equal to a serial ID that was set as a configuration value (SAPI_ENUM_CONF_ID_CERT_SERIAL_ID).
4. There is only one available valid certificate.

This function also sets the chosen certificate as the default certificate for the current SAPI session, unless the SAPI_ENUM_CONF_ID_SET_CERT_AS_DEFAULT configuration value is explicitly set to 0.

```
SAPI int SAPICertificateGetDefault (
  SAPI_SES_HANDLE                 Handle,
  SAPI_CERT_HANDLE                *CertHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

CertHandle

[out] Pointer to a handle of the chosen certificate. This handle can be used when calling other certificate functions such as SAPICertificateGetFieldByHandle.
When *CertHandle* is not in use anymore, it is released by calling the SAPIHandleRelease function.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*CertHandle* is NULL and must not be NULL.
`SAPI_ERR_NO_CERT_TO_SELECT_FROM`	No certificate was found. This might be due to incorrect credentials, networking problems, or because the

Value	Meaning
	preferred certificate could not be found.
SAPI_ERR_TOO_MANY_CERTS_TO_SELECT_FROM	More than one certificate is available and CoSign Signature Local cannot choose between them. Use either SAPICertificateSetDefault or SAPIConfigurationValueSet to set the certificate with which CoSign Signature Local works.
SAPI_ERR_FAILED_TO_GET_CERT	A general error occurred while looking for a certificate. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

To prevent the chosen certificate from becoming the default certificate, call the SAPIConfigurationValueSet function with the SAPI_ENUM_CONF_ID_SET_CERT_AS_DEFAULT configuration value set to 0.

If either the SAPI_ENUM_CONF_ID_CERT_SKI or the SAPI_ENUM_CONF_ID_CERT_SERIAL_ID configuration values are set but the respective certificate cannot be found, an error is returned. This is true even in cases where there is only one available certificate that could have been chosen if none of these values had been set.

See Also

SAPIHandleAcquire, SAPICertificateGetFieldByHandle, SAPIHandleRelease, SAPIConfigurationValueSet, SAPICertificateSetDefault

Graphical Image Objects

This chapter describes the functions used for graphical image objects. Graphical image objects are images that are centrally stored within CoSign for every user and are added to the visual representation of a signature field when it is signed. These functions fall into the following groups:

- Selecting and Retrieving Graphical Image Objects
- Managing and Affecting Graphical Image Objects

There are three types of graphical images:

- Graphical signature
- Initials
- Logo. Starting from CoSign version 5.4, a single logo is supported.

All graphical images that were generated prior to CoSign version 4.6 are marked as Graphical signatures.

Starting from CoSign version 5.4, a new standard signing ceremony dialog enables selecting and entering data to be used in the digital signature act. This dialog also enables managing all the user's graphical signatures. From version 5.4, the source of a graphical signature can be either the CoSign appliance or specified local directories of the user. The option of using local directories overcomes the CoSign appliance's strict limitations on image size and on the number of graphical signatures per user.

Selecting and Retrieving Graphical Image Objects

The following functions enable the application to select a graphical image in a multi graphical image object environment and retrieve a selected graphical object.

You can use any one of the following methods for selecting a graphical image:

- Request the default image by calling SAPIGraphicSigImageGetDefaultEx. This method works if:
  - The user has only one graphical image in CoSign.
  - A default graphical image was set earlier in this session by calling either SAPIGraphicSigImageSetDefaultEx, SAPIGraphicSigImageGUISelect, or SAPISigningCeremonyGUI.
- Let the user view all the graphical images and select the desired image by calling SAPIGraphicSigImageGUISelect.
- Enumerate all the graphical objects, retrieve each image's information, analyze the information and choose the one that best fits the user's needs. The image enumeration is done by first calling SAPIGraphicSigImageEnumInit and then making consecutive calls to SAPIGraphicSigImageEnumCont. Retrieval of image information for analysis is done by calling SAPIGraphicSigImageInfoGet.

After the desired image is selected, it can be set as the default, so further calls to the API such as SAPISignatureFieldSignEx use this image, or it can be retrieved and placed elsewhere, depending on the requirements of the calling application.

The following functions are included in this group:

SAPIGraphicSigImageEnumInit, SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageGUISelect, SAPIGraphicSigImageInfoGet, SAPIGraphicSigImageGetDefault, and SAPIGraphicSigImageSetDefault

Note: *If a user has only one graphical image and this image is used by SAPISignatureFieldSign, there is no need to call any of the above functions, since the SAPISignatureFieldSign function automatically selects the only image that exists.*

Managing Graphical Image Objects

The following functions enable the application to create, update, and delete a specific user's graphical image objects.

- To create or update a Graphical signature's image, fill in the fields of the graphical image structure and call SAPIGraphicSigImageInfoCreate and SAPIGraphicSigImageInfoUpdate respectively.
- To create or update an Initials graphical image, fill in the fields of the graphical image structure and call SAPIGraphicSigImageInfoCreate and SAPIGraphicSigImageInfoUpdate respectively.
- To create or update a Logo graphical image, fill in the fields of the graphical image structure and call SAPIGraphicSigImageInfoCreate and SAPIGraphicSigImageInfoUpdate respectively.
- To delete an image, the application selects the desired image for deletion (see Selecting and Retrieving Graphical Image Objects) and then uses the image handle as an input for SAPIGraphicSigImageInfoDelete.

Note: *A user can create, update, and delete one's own graphical images using the Graphical Signatures application found in the CoSign Control Panel. In most cases, it is not necessary to write a proprietary application to manage the user's graphical images. For more information, See* Using the Graphical Signature Management Application *in* Chapter 4: Deploying the CoSign Client *in the* CoSign Administrator Guide.

SAPIGraphicSigImageEnumInit

The **SAPIGraphicSigImageEnumInit** function initializes the graphical images enumeration operation. This operation is used in environments where there may be more than one available image. A call to the **SAPIGraphicSigImageEnumInit** function is followed by calls to SAPIGraphicSigImageEnumCont function until all the images are retrieved, or until the required graphical image object is found. To retrieve more information about a specific graphical image, call the SAPIGraphicSigImageInfoGet function.

```
SAPI int SAPIGraphicSigImageEnumInit (
  SAPI_SES_HANDLE                 Handle,
  SAPI_CONTEXT                    *GraphicImageContext,
  unsigned long                   FormatsPermitted,
  unsigned long                   Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageContext

[out] Pointer to the graphical images enumeration operation context. This context contains internal information about the operation. The information in this context is passed in all subsequent calls to SAPIGraphicSigImageEnumCont. Changing the value of *GraphicImageContext* by the application is not allowed since it can lead to unexpected behavior.

GraphicImageContext must be released by the SAPIContextRelease function when the graphical images enumeration operation is complete.

FormatsPermitted

[in] Bit flag parameter that indicates the formats of the graphical objects that are retrieved by the enumeration operation. You may set one or more bits. For the possible settings for *FormatsPermitted*, see Graphical Signature Image Related Flags.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Flags when Enumerating or Using Graphical Signatures.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageContext* is NULL and must not be NULL.

Value	Meaning
SAPI_FAILED_TO_ALLOCATE_MEMORY	CoSign Signature Local failed to allocate the necessary memory for the new operation context. This might be due to a shortage in system resources.

Remarks

SAPIGraphicSigImageEnumInit builds an internal list of graphical image objects according to the available objects at the moment it is called. Only objects from the list are returned by the SAPIGraphicSigImageEnumCont function. Therefore, new graphical image objects that become available after the **SAPIGraphicSigImageEnumInit** returns do not affect the graphical image object handles that are retrieved by the SAPIGraphicSigImageEnumCont function. However, removing objects after **SAPIGraphicSigImageEnumInit** returns can cause SAPIGraphicSigImageEnumCont to fail.

In environments where there is only one graphical image object, the graphical image objects enumeration operation is unnecessary.

See Also

SAPIHandleAcquire, SAPIContextRelease, SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageGUISelect

SAPIGraphicSigImageEnumCont

The **SAPIGraphicSigImageEnumCont** function continues the graphical image objects enumeration operation. It returns a pointer to a single graphical image object handle from the internal objects list built by the SAPIGraphicSigImageEnumInit function. Every call returns a new object handle until the end of the list is reached.

```
SAPI int SAPIGraphicSigImageEnumCont (
  SAPI_SES_HANDLE                 Handle,
  SAPI_CONTEXT                    *GraphicImageContext,
  SAPI_GR_IMG_HANDLE              *GraphicImageHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageContext

[in] Pointer to the graphical images enumeration operation context created using SAPIGraphicSigImageEnumInit.

GraphicImageContext must be released by the SAPIContextRelease function when there are no more objects to retrieve or when the required object was found.

GraphicImageHandle

[out] Pointer to a handle of a graphical image object. This handle can be used when calling other graphic image functions, such as SAPIGraphicSigImageInfoGet, SAPIGraphicSigImageInfoDelete, and SAPIGraphicSigImageSetDefault.
When *GraphicImageHandle* is no longer in use, it is released by calling the SAPIHandleRelease function.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageContext* or *GraphicImageHandle* is NULL and must not be NULL.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the graphical image object handle. This might be due to a shortage in system resources.

Value	Meaning
SAPI_ERR_CONTEXT_NOT_INITALIZED	The graphical image object enumeration context is either not initialized or is corrupt.
SAPI_ERROR_NO_MORE_ITEMS	There are no more objects to retrieve.

Remarks

SAPIGraphicSigImageEnumCont returns only the objects that were available when SAPIGraphicSigImageEnumInit was called.

In order to retrieve the whole objects list, **SAPIGraphicSigImageEnumCont** is called until SAPI_ERROR_NO_MORE_ITEMS is returned.

See Also

SAPIHandleAcquire, SAPIContextRelease, SAPIGraphicSigImageEnumInit, SAPIGraphicSigImageGUISelect, SAPIGraphicSigImageSetDefault, SAPIGraphicSigImageInfoDelete, SAPIGraphicSigImageInfoGet

SAPIGraphicSigImageGUISelect

The **SAPIGraphicSigImageGUISelect** function displays all the available graphical image objects for the user in a dialog box, enabling the user to view and select an image with which to sign. This dialog box can also be used for adding new graphical image objects from a file or from a special pad, and for deleting and updating existing objects.

```
SAPI int SAPIGraphicSigImageGUISelect (
  SAPI_SES_HANDLE                 Handle,
  unsigned long                   FormatsPermitted,
  unsigned long                   Flags,
  SAPI_ENUM_GR_IMG_SELECT_MODE    Mode,
  SAPI_GR_IMG_HANDLE              *GraphicImageHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

FormatsPermitted

[in] Bit flag parameter that indicates the formats of displayed graphical objects. You may set one or more bits. For the possible settings for *FormatsPermitted*, see Graphical Signature Image Related Flags.

Flags

[in] Reserved for future use and must be zero.

Mode

[in] This parameter indicates in which mode the graphic image selection dialog box opens. There are three different modes, as described in SAPI_ENUM_GR_IMG_SELECT_MODE:

- **Selection as part of the signature ceremony** – This mode enables the user to select a graphical image that will be included in the signature. If no image is available, a temporary graphical image will be displayed. However, if the user does not have a certificate, or has multiple certificates, not even a temporary image is displayed.
  To work in this mode, the value of this parameter is SAPI_ENUM_GR_IMG_SEL_MODE_SELECT.
- **User mode** – This mode enables the user to manage and edit graphical images. The dialog box opens, displaying all the available images. The user is then able to add, delete, or update graphical images. In this mode, the user cannot select an image.
  To work in this mode, the value of this parameter is SAPI_ENUM_GR_IMG_SEL_MODE_VIEW_USER.
- **Administrative mode (or Kiosk mode)** – This mode is similar to User mode regarding operations that can be performed on graphical images. The only difference is that in this mode a user is required to supply credentials before accessing graphical image objects. This mode is useful when a single machine serves multiple users, for example a machine with a signature pad attached that is located in the Human Resources department and is accessed by users in other departments to capture their graphical signature and load it to CoSign.
  To work in this mode, the value of this parameter is SAPI_ENUM_GR_IMG_SEL_MODE_VIEW_KIOSK.

- **Volatile mode** – In this mode, a graphical image is captured for the purpose of a digital or electronic signature operation. This image is not kept in the CoSign appliance or on user's disk.

GraphicImageHandle

[out] Pointer to a handle of a graphical image object.

This parameter is available only when the value of *Mode* is SAPI_ENUM_GR_IMG_SEL_MODE_SELECT. In all other modes, this parameter is ignored and is NULL.

This handle can later be used when calling other graphic image functions, such as SAPIGraphicSigImageInfoGet, SAPIGraphicSigImageInfoDelete, and SAPIGraphicSigImageSetDefault.
When *GraphicImageHandle* is no longer in use, it is released by calling SAPIHandleRelease.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageHandle* is NULL and must not be NULL when in *Selection mode*.
`SAPI_ERR_TOKEN_NOT_SUPPORTED`	Either the session handle is corrupt or the user is logged in to a token that does not support this functionality. Only CoSign supports this functionality.
`SAPI_ERR_OPERATION_CANCELLED_BY_USER`	No graphical image was selected. The user pressed the Cancel button before making a selection.
`SAPI_ERR_NO_ITEMS`	There are no objects to select.

Remarks

This function can be called only by applications that have the *InteractWithDesktop* property.

If the function was called in Selection mode and the return code is `SAPI_OK`, the selected image is also set as the default.

Starting from CoSign version 5.4, it is recommended to use the SAPISigningCeremonyGUI function.

See Also

SAPIHandleAcquire, SAPIGraphicSigImageEnumInit, SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageSetDefault, SAPIGraphicSigImageInfoGet, SAPIGraphicSigImageInfoDelete

SAPIGraphicSigImageSetDefaultEx

The **SAPIGraphicSigImageSetDefaultEx** function sets the graphical image associated with the graphic image handle as the default graphic signature image. The default graphic signature image is used for all signing operations in the current SAPI session handle. This function is used in cases where the user might have more than one available graphical image object.

```
SAPI int SAPIGraphicSigImageSetDefaultEx (
  SAPI_SES_HANDLE                 Handle,
  SAPI_GR_IMG_HANDLE              GraphicImageHandle,
  unsigned long                   Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[in] The default certificate handle created using one of the following functions:

SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageGUISelect, or SAPIGraphicSigImageInfoCreate.

If this parameter is NULL, the function automatically looks for a graphical image object and sets it as the default. See Selection mode in the SAPIGraphicSigImageGUISelect function for more details about the automatic search for a default image.

Flags

[in] The type of graphical image (Graphical, Initials, or Logo). For the exact value, see Flags when Enumerating or Using Graphical Signatures.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
SAPI_ERR_SESSION_IS_NULL	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
SAPI_ERR_TOO_MANY_ITEMS	More than one graphical image is available and CoSign Signature Local cannot choose between them. Use either SAPIGraphicSigImageGUISelect or enumerate the images with SAPIGraphicSigImageEnumInit and use SAPIGraphicSigImageEnumCont to select the image that is set as the default. **NOTE**: This error can occur only if *GraphicImageHandle* is NULL.
SAPI_ERR_NO_ITEMS	No image was found. This might be due to incorrect credentials, networking problems, or because the user has no graphical images stored. **NOTE**: This error can occur only if *GraphicImageHandle* is NULL.
SAPI_ERR_FAILED_TO_ALLOCATE_MEMORY	CoSign Signature Local failed to allocate the necessary memory for the default image. This might be due to a shortage in system resources.
SAPI_ERR_INVALID_HANDLE	*GraphicImageHandle* is corrupt or not initialized correctly.

Remarks

This function can be called more than once, each time with a different valid graphical image handle.

See Also

SAPIHandleAcquire, SAPIGraphicSigImageEnumInit, SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageGetDefault, SAPIGraphicSigImageGUISelect, SAPIGraphicSigImageSetDefaultEx

SAPIGraphicSigImageSetDefault

The **SAPIGraphicSigImageSetDefault** function is the older version of the SAPIGraphicSigImageSetDefaultEx function.

```
SAPI int SAPIGraphicSigImageSetDefault (
  SAPI_SES_HANDLE                 Handle,
  SAPI_GR_IMG_HANDLE              *GraphicImageHandle
);
```

SAPIGraphicSigImageGetDefaultEx

The **SAPIGraphicSigImageGetDefaultEx** employs a selection algorithm to choose a graphical signature image, and returns the handle of the chosen image. The algorithm selects a graphical signature image by interrogating an ordered set of criteria. When a criterion is met, the graphical image meeting the criterion is the chosen image, and the process stops. The ordered criteria are:

1. A graphical image was previously set as default in one of the following ways:
   - A graphical signature image was explicitly set as the default by SAPIGraphicSigImageSetDefault.
   - A graphical image was selected by the user when SAPIGraphicSigImageGUISelect was called.
   - A graphical image was set because of a previous call to SAPIGraphicSigImageGetDefault.
2. A graphical image with a name equal to a name that was set as a configuration value (SAPI_ENUM_CONF_ID_GR_SIG_PREF_NAME) is found.
3. There is only one available graphical image.

This function also sets the selected image as the default image for the current SAPI session.

```
SAPI int SAPIGraphicSigImageGetDefaultEx (
  SAPI_SES_HANDLE                 Handle,
  SAPI_GR_IMG_HANDLE              *GraphicImageHandle,
  Unsigned Long                   Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[out] Pointer to a handle of the selected graphical signature image. This handle can be used when calling other graphical image functions such as SAPIGraphicSigImageInfoUpdate and SAPIGraphicSigImageInfoDelete.

When *GraphicImageHandle* is not in use anymore, it is released by calling the SAPIHandleRelease function.

Flags

[in] The type of graphical image (Graphical, Initials, or Logo). For the exact value, see Flags when Enumerating or Using Graphical Signatures

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
SAPI_ERR_SESSION_IS_NULL	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*GraphicImageHandle* is NULL and must not be NULL.
SAPI_ERR_NO_ITEMS	No graphical image was found. This might be due to incorrect credentials, networking problems, or because the preferred image name could not be found.
SAPI_FAILED_TO_ALLOCATE_MEMORY	CoSign Signature Local failed to allocate the necessary memory for the graphical image object handle. This might be due to a shortage in system resources.

Remarks

If SAPI_ENUM_CONF_ID_GR_SIG_PREF_NAME is set but the respective graphical signature image cannot be found, an error is returned even in cases where there is only one available image that could have been selected if this value had not been set.

See Also

SAPIHandleAcquire, SAPIGraphicSigImageInfoUpdate, SAPIGraphicSigImageInfoDelete, SAPIGraphicSigImageGUISelect, SAPIHandleRelease, SAPIConfigurationValueSet

SAPIGraphicSigImageGetDefault

The **SAPIGraphicSigImageGetDefault** function is the older version of the SAPIGraphicSigImageGetDefaultEx function.

```
SAPI int SAPIGraphicSigImageGetDefault (
  SAPI_SES_HANDLE                 Handle,
  SAPI_GR_IMG_HANDLE              *GraphicImageHandle
);
```

SAPIGraphicSigImageInfoGet

The **SAPIGraphicSigImageInfoGet** function retrieves all the data of a graphical signature image associated with the provided graphical image handle.

```
SAPI int SAPIGraphicSigImageInfoGet (
  SAPI_SES_HANDLE                   Handle,
  SAPI_GR_IMG_HANDLE                GraphicImageHandle,
  SAPI_GR_IMG_INFO                  *GraphicImageInfo,
  SAPI_ENUM_GRAPHIC_IMAGE_FORMAT    Convert,
  unsigned long                     Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[in] A graphical image handle. The function returns the information of the graphical image associated with this handle. This handle is created using one of the following functions: SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageGUISelect, SAPIGraphicSigImageInfoCreate, or SAPIGraphicSigImageGetDefault.

GraphicImageInfo

[out] A pointer to a structure that contains the graphical image's information.
Before calling the function, the *StructLen* member of the structure must be set to the size of the structure.

Convert

[in] This parameter indicates whether the graphical image needs to be converted before retrieval. The conversion includes converting from certain BMP types to others, or converting from raster format to vector format. This conversion does not transform the BMP format to JPEG format, and vice versa. The *ImageConvertedFormat* member of *GraphicImageInfo* is set with the value of the *Convert* parameter.

Typically, this parameter is set to SAPI_ENUM_GRAPHIC_IMAGE_NONE, indicating that the image is to be returned in the same format in which it is stored.

Flags

[in] Flag values bit mask. The available values are:

AR_GR_SIG_GET_INTERNAL_ALLLOC: This flag indicates that it is the responsibility of the function to allocate memory for the *GraphicImage* member in *GraphicImageInfo*.

If this flag is not set and the *GraphicImage* member is NULL, the function returns the number of bytes allocated to hold the graphical signature image in the *GraphicImageLen* member of *GraphicImageInfo*.

If this flag is not set and the *GraphicImage* member of *GraphicImageInfo* is not NULL, the function fails if the size indicated by the *GraphicImageLen* member of *GraphicImageInfo* is smaller than the required length.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageHandle* or *GraphicImageInfo* is NULL and must not be NULL.
`SAPI_ERR_INVALID_HANDLE`	The *GraphicImageHandle* is corrupt or not initialized correctly.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the graphical image information structure. This might be due to a shortage in system resources. This error can occur only if AR_GR_SIG_GET_INTERNAL_ALLLOC is set in *Flags*.

Remarks

When *GraphicImageInfo* is no longer required, release any dynamically allocated memory. If the allocation was done by the **SAPIGraphicSigImageInfoGet** function, release it by calling SAPIStructRelease.

Note: *SAPIStructRelease must not be called if the allocation was not done by the* ***SAPIGraphicSigImageInfoGet*** *function.*

See Also

SAPIHandleAcquire, SAPIGraphicSigImageGUISelect, SAPIHandleRelease, SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageInfoCreate, SAPIGraphicSigImageGetDefault, SAPIStructRelease

SAPIGraphicSigImageInfoCreate

The **SAPIGraphicSigImageInfoCreate** function creates a new graphical signature image in CoSign. This new image becomes available for all applications that require a graphical signature image from CoSign.
The newly created image will be of type Graphical signature.

```
SAPI int SAPIGraphicSigImageInfoCreate (
  SAPI_SES_HANDLE                    Handle,
  SAPI_GR_IMG_HANDLE                 *GraphicImageHandle,
  SAPI_GR_IMG_INFO                   *GraphicImageInfo
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[out] A pointer to a graphical signature image handle of the image that was created.

GraphicImageInfo

[in/out] A pointer to a structure that contains the new graphical image information.
The mandatory structure members for this function are: *GraphicImage, GraphiImageLen, szGraphicImageName,* and *StructLen* (see SAPI_GR_IMG_INFO). All other members are ignored as input parameters.
Width, *Height*, and *Format* structure members might be changed by the function based on the image format.
The *DataType* field in the *GraphicalImageInfo* structure must be set to the value of AR_GR_FLAG_IMAGE_TYPE.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageHandle* or *GraphicImageInfo* is NULL and must not be NULL.

Remarks

The name of a graphical image cannot be NULL or based on white characters.

See Also

SAPIHandleAcquire, SAPIHandleRelease, SAPIGraphicSigImageGetDefault, SAPIGraphicSigLogoInfoCreate, SAPIGraphicSigInitialsInfoCreate

SAPIGraphicSigLogoInfoCreate

The **SAPIGraphicSigLogoInfoCreate** function is very similar to the **SAPIGraphicSigImageInfoCreate** function. In this case, the new graphical image is of type Logo.

```
SAPI int SAPIGraphicSigLogoInfoCreate (
  SAPI_SES_HANDLE                       Handle,
  SAPI_GR_IMG_HANDLE                    *GraphicImageHandle,
  SAPI_GR_IMG_INFO                      *GraphicImageInfo
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[out] A pointer to a graphical signature image handle of the image that was created.

GraphicImageInfo

[in/out] A pointer to a structure that contains the new graphical image information.
The mandatory structure members for this function are: *GraphicImage*, *GraphiImageLen*, *szGraphicImageName*, and *StructLen* (see SAPI_GR_IMG_INFO). All other members are ignored as input parameters.
Width, *Height*, and *Format* structure members might be changed by the function based on the image format.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageHandle* or *GraphicImageInfo* is NULL and must not be NULL.

Remarks

The name of a graphical image cannot be NULL or based on white characters.

See Also

SAPIHandleAcquire, SAPIHandleRelease, SAPIGraphicSigImageGetDefault, SAPIGraphicSigImageInfoCreate, SAPIGraphicSigInitialsInfoCreate

SAPIGraphicSigInitialsInfoCreate

The **SAPIGraphicSigInitialsInfoCreate** function is very similar to the SAPIGraphicSigImageInfoCreate function. In this case, the new graphical image is of type Initials.

```
SAPI int SAPIGraphicSigInitialsInfoCreate (
  SAPI_SES_HANDLE                       Handle,
  SAPI_GR_IMG_HANDLE                    *GraphicImageHandle,
  SAPI_GR_IMG_INFO                      *GraphicImageInfo
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[out] A pointer to a graphical signature image handle of the image that was created.

GraphicImageInfo

[in/out] A pointer to a structure that contains the new graphical image information.
The mandatory structure members for this function are: *GraphicImage*, *GraphiImageLen*, *szGraphicImageName*, and *StructLen* (see SAPI_GR_IMG_INFO). All other members are ignored as input parameters.
Width, *Height*, and *Format* structure members might be changed by the function based on the image format.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageHandle* or *GraphicImageInfo* is NULL and must not be NULL.

Remarks

The name of a graphical image cannot be NULL or based on white characters.

See Also

SAPIHandleAcquire, SAPIHandleRelease, SAPIGraphicSigImageGetDefault, SAPIGraphicSigImageInfoCreate, SAPIGraphicSigLogoInfoCreate

SAPIGraphicSigImageInfoDelete

The **SAPIGraphicSigImageInfoDelete** function deletes the graphical signature image that is associated with the provided graphical image handle from the CoSign.
After the call to this function, the graphical image that was deleted is no longer available for use, whether you are in the current SAPI session or any other application.

```
SAPI int SAPIGraphicSigImageInfoDelete (
  SAPI_SES_HANDLE                Handle,
  SAPI_GR_IMG_HANDLE             GraphicImageHandle
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[in] Graphical signature image handle that needs to be deleted. This handle was created using one of the following functions: SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageGUISelect, SAPICertificatesEnumCont, or SAPIGraphicSigImageGetDefault.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageHandle* is NULL and must not be NULL.
`SAPI_ERR_INVALID_HANDLE`	The *GraphicImageHandle* is corrupt or not initialized correctly.

Remarks

After calling this function, the graphical signature image might remain temporarily available for some applications because of the caching mechanism. It is not recommended to use a graphical image after its deletion because the results might be unpredictable.

The *GraphicImageHandle* is released using SAPIHandleRelease after the image is deleted.

See Also

SAPIHandleAcquire, SAPIGraphicSigImageGUISelect, SAPIHandleRelease, SAPIGraphicSigImageEnumCont, SAPICertificatesEnumCont, SAPIGraphicSigImageGetDefault

SAPIGraphicSigImageInfoUpdate

The **SAPIGraphicSigImageInfoUpdate** function changes the data of a graphical signature image, its name, or both the data and name. This function updates the image associated with the provided graphical image handle.
The updated image should be of type Graphical signature.

```
SAPI int SAPIGraphicSigImageInfoUpdate (
  SAPI_SES_HANDLE                    Handle,
  SAPI_GR_IMG_HANDLE                 GraphicImageHandle,
  SAPI_GR_IMG_INFO                   *GraphicImageInfo,
  unsigned long                      Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[in] A graphical image handle of the graphical signature image that needs to be updated. This handle was created using one of the following functions: SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageGUISelect, SAPICertificatesEnumCont, or SAPIGraphicSigImageGetDefault.

GraphicImageInfo

[in] A pointer to a structure that contains the new graphical image information.
The mandatory structure members for this function are: *GraphicImage*, *GraphiImageLen*, *szGraphicImageName*, and *StructLen* (see SAPI_GR_IMG_INFO). All other members are ignored.

Flags

[in] Reserved for future use and must be set to zero.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageHandle* or *GraphicImageInfo* is NULL and must not be NULL.
`SAPI_ERR_INVALID_HANDLE`	The *GraphicImageHandle* is corrupt or not initialized correctly,

Remarks

The name of a graphical signature image may not be NULL and cannot be composed of white characters only.
The only exceptions are graphical signature images created in a CoSign version prior to CoSign version 4.0. Such images were created with an empty name and therefore can be updated with the same value.

When updating a graphical signature image, verify that the image format is not damaged. Damage to the image format will prevent CoSign Signature Local from retrieving information such as width and height when SAPIGraphicSigImageInfoGet is subsequently called, and may cause unexpected results.

See Also

SAPIHandleAcquire, SAPIGraphicSigImageGUISelect, SAPIHandleRelease, SAPIGraphicSigImageEnumCont, SAPICertificatesEnumCont, SAPIGraphicSigImageGetDefaultEx, SAPIGraphicSigInitialsInfoUpdate, SAPIGraphicSigLogoInfoUpdate

SAPIGraphicSigLogoInfoUpdate

The **SAPIGraphicSigLogoInfoUpdate** function changes the data of a Logo graphical signature image, its name, or both the data and name. This function updates the image associated with the provided graphical image handle.

```
SAPI int SAPIGraphicSigLogoInfoUpdate (
  SAPI_SES_HANDLE                       Handle,
  SAPI_GR_IMG_HANDLE                    GraphicImageHandle,
  SAPI_GR_IMG_INFO                      *GraphicImageInfo,
  unsigned long                         Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[in] A graphical image handle of the graphical signature image that needs to be updated. This handle was created using one of the following functions: SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageGUISelect, SAPICertificatesEnumCont, or SAPIGraphicSigImageGetDefault.

GraphicImageInfo

[in] A pointer to a structure that contains the new graphical image information.
The mandatory structure members for this function are: *GraphicImage*, *GraphiImageLen*, *szGraphicImageName*, and *StructLen*. All other members are ignored.

Flags

[in] Reserved for future use and must be set to zero.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageHandle* or *GraphicImageInfo* is NULL and must not be NULL.
`SAPI_ERR_INVALID_HANDLE`	The *GraphicImageHandle* is corrupt or not initialized correctly,

Remarks

The name of a graphical signature image may not be NULL and cannot be composed of white characters only.
When updating a graphical signature image, verify that the image format is not damaged. Damage to the image format will prevent CoSign Signature Local from retrieving information such as width and height when SAPIGraphicSigImageInfoGet is subsequently called, and may cause unexpected results.

See Also

SAPIHandleAcquire, SAPIGraphicSigImageGUISelect, SAPIHandleRelease, SAPIGraphicSigImageEnumCont, SAPICertificatesEnumCont, SAPIGraphicSigImageGetDefaultEx, SAPIGraphicSigImageInfoUpdate, SAPIGraphicSigLogoInfoUpdate

SAPIGraphicSigInitialsInfoUpdate

The **SAPIGraphicSigInitialsInfoUpdate** function changes the data of an Initials graphical signature image, its name, or both the data and name. This function updates the image associated with the provided graphical image handle.

```
SAPI int SAPIGraphicSigInitialsInfoUpdate (
  SAPI_SES_HANDLE                       Handle,
  SAPI_GR_IMG_HANDLE                    GraphicImageHandle,
  SAPI_GR_IMG_INFO                      *GraphicImageInfo,
  unsigned long                         Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created using SAPIHandleAcquire.

GraphicImageHandle

[in] A graphical image handle of the graphical signature image that needs to be updated. This handle was created using one of the following functions: SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageGUISelect, SAPICertificatesEnumCont, or SAPIGraphicSigImageGetDefault.

GraphicImageInfo

[in] A pointer to a structure that contains the new graphical image information.
The mandatory structure members for this function are: *GraphicImage*, *GraphiImageLen*, *szGraphicImageName*, and *StructLen*. All other members are ignored.

Flags

[in] Reserved for future use and must be set to zero.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GraphicImageHandle* or *GraphicImageInfo* is NULL and must not be NULL.
`SAPI_ERR_INVALID_HANDLE`	The *GraphicImageHandle* is corrupt or not initialized correctly,

Remarks

The name of a graphical signature image may not be NULL and cannot be composed of white characters only.
When updating a graphical signature image, verify that the image format is not damaged. Damage to the image format will prevent CoSign Signature Local from retrieving information such as width and height when SAPIGraphicSigImageInfoGet is subsequently called, and may cause unexpected results.

See Also

SAPIHandleAcquire, SAPIGraphicSigImageGUISelect, SAPIHandleRelease, SAPIGraphicSigImageEnumCont, SAPICertificatesEnumCont, SAPIGraphicSigImageGetDefaultEx, SAPIGraphicSigImageInfoUpdate, SAPIGraphicSigLogoInfoUpdate

CoSign Signature Local Buffer Signing

CoSign Signature Local can be used to:

- Sign files of supported types such as Word and PDF.
  To sign a file of the supported type, see CoSign Signature Local Signature Field.
- Sign byte streams (raw data) such as records, transactions, or even data that is being read from files of unsupported types.
  The functions used for signing byte streams all begin with SAPIBufferSign.
- Sign a given hash value. This is intended for cases where the application calculates the hash value of a given data and requests to sign the given hash.
- Sign a single string of data (short record, transaction data, etc.). To do so, use SAPIBufferSign.
- Starting from CoSign version 5.4, it is possible to generate a PKCS#1 signature in addition to generating a PKCS#7 signature.

If the data is long or fragmented, use the continuous signing functions (SAPIBufferSignInit, SAPIBufferSignCont, and SAPIBufferSignEnd), as follows: call SAPIBufferSignInit once to initialize the operation, then call SAPIBufferSignCont as many times as needed, pointing each time to one portion of the data to be signed. Finally, call the SAPIBufferSignEnd function to end a signing buffer operation and return the signature data as a PKCS#7 blob or a PKCS#1 signature. Store the signature data in such a way that it can be linked to the original data for verification purposes at a later date.

Note*: If the signature data is dynamically allocated, call SAPISigningContextPKCS7BlobLenGet after calling SAPIBufferSignInit, to retrieve the length to be allocated.*

SAPIBufferSignEx

The **SAPIBufferSignEx** function signs data and retrieves the signature data. Use the **SAPIBufferSignEx** function to sign data that can be passed in one call, such as transaction data. If the data is too long for one buffer, or it is fragmented and you wish to sign only certain parts of it, use the trio of functions SAPIBufferSignInit, SAPIBufferSignCont, and SAPIBufferSignEnd.

Use this function also when the *prompt for sign* feature is enabled.

The **SAPIBufferSignEx** function is called once and signs only the data being passed in this call.

```
SAPI int SAPIBufferSignEx (
  SAPI_SES_HANDLE            Handle,
  unsigned char              *Buffer,
  unsigned long              BufferLen,
  unsigned char              *SignedData,
  unsigned long              *SignedDataLen,
  unsigned long              Flags,
  unsigned char              *Credential,
  unsigned long              CredentialLen
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

Buffer

[in] Pointer to the buffer holding the data to be signed.

BufferLen

[in] The size in bytes of the data pointed to by *Buffer*.

SignedData

[out] Pointer to the buffer holding the signature of the data, represented as a PKCS#7 blob. If the signature data is not required, this parameter can be set to NULL.

SignedDataLen

[in/out] Pointer to a value specifying the size, in bytes, of the buffer pointed to by the *SignedData* parameter. When the function returns, the value contains the number of bytes actually stored or to be stored in the buffer.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Time-Stamping/OCSP and Miscellaneous Signature-Related Flags.

Credential

[in] Pointer to a wide char buffer that holds the user credentials required for the signing operation. Contact ARX support for more information. If no special credential is needed, a NULL value can be supplied. However, if the *prompt for sign* feature is enabled, you must supply credentials.

CredentiaLen

[in] The length in bytes of the content of *Credential*, including NULL separators/terminators.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*Buffer* and *SignedDataLen* are NULL but should not be NULL.
`SAPI_ERR_NO_CERT_TO_SELECT_FROM`	No certificate was found. This might be due to incorrect credentials, networking problems, or because the preferred certificate could not be found.
`SAPI_ERR_TOO_MANY_CERTS_TO_SELECT_FROM`	More than one certificate is available, and CoSign Signature Local cannot choose between them. Use either SAPICertificateSetDefault or SAPIConfigurationValueSet to set the certificate with which CoSign Signature Local works.
`SAPI_ERR_FAILED_TO_SIGN_BUF`	A general error occurred while signing the data. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

The certificate that the **SAPIBufferSignEx** function uses for signing is either the one set as the default certificate (for example, by calling the SAPICertificateSetDefault function), or a certificate that the function automatically chooses. See the SAPICertificateGetDefault function for more information about the automatic algorithm for choosing a certificate.
To improve performance, if no default certificate is set prior to the signing operation, CoSign Signature Local stores the certificate it used for this operation as the default certificate for the purpose of certifying the next signing operation in the current SAPI session. If this behavior is not required, set the configuration value of SAPI_ENUM_CONF_ID_CERT_SET_DEFAULT to 0 before the initial call to **SAPIBufferSignEx** in the current session.

In order to generate a PKCS#1 signature, insert the AR_SAPI_SIG_PKCS1 constant into the *Flags* parameter.

In order to specify that the generated signature should be based on a hash mechanism different from SHA-1, insert one of the following flags into the *Flags* parameter: AR_SAPI_SHA256_FLAG, AR_SAPI_SHA384_FLAG, AR_SAPI_SHA512_FLAG or AR_SAPI_ENFORCE_SHA1_FLAG. If the given data is a hash value, insert the AR_SAPI_SIG_HASH_ONLY constant into the *Flags* parameter.

For signing long data or when the data is fragmented, call the trio of functions SAPIBufferSignInit, SAPIBufferSignCont, and SAPIBufferSignEndEx.

See Also

SAPIHandleAcquire, SAPICertificateSetDefault, SAPICertificateGetDefault, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd, SAPIBufferSign, SAPIConfigurationValueSet

SAPIBufferSign

The **SAPIBufferSign** function is the older version of the SAPIBufferSignEx function.

```
SAPI int SAPIBufferSign (
  SAPI_SES_HANDLE            Handle,
  unsigned char              *Buffer,
  unsigned long              BufferLen,
  unsigned char              *SignedData,
  unsigned long              *SignedDataLen,
  unsigned long              Flags
);
```

SAPIBufferSignInit

The trio of functions **SAPIBufferSignInit**, SAPIBufferSignCont, and SAPIBufferSignEnd is used for signing data that is too long for one buffer, or is fragmented and you wish to sign only certain parts of it. The functions are used as follows:

- Call the **SAPIBufferSignInit** function to initialize the operation.
- Call the SAPIBufferSignCont function as many times as needed, pointing each time to one portion of the data to be signed.
- Call the SAPIBufferSignEnd function to end a signing buffer operation and return the signature data as a PKCS#7 blob.

```
SAPI int SAPIBufferSignInit (
  SAPI_SES_HANDLE            Handle,
  SAPI_CONTEXT               *SignContext,
  unsigned long              Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignContext

[out] Pointer to the Sign Buffer operation context. This context contains internal information about the operation. The information in this context is passed in all subsequent calls to SAPIBufferSignCont and SAPIBufferSignEnd. Changing the value of *SignContext* by the application is not allowed and can lead to unexpected behavior.
SignContext must be released by the SAPIContextRelease function when the Sign Buffer operation is complete.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Time-Stamping/OCSP and Miscellaneous Signature-Related Flags.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignContext* is NULL and must not be NULL.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	CoSign Signature Local failed to allocate the necessary memory for the new operation context. This might be due to a shortage in system resources.

Value	Meaning
SAPI_ERR_NO_CERT_TO_SELECT_FROM	No certificate was found. This might be due to incorrect credentials, networking problems, or because the preferred certificate could not be found.
SAPI_ERR_TOO_MANY_CERTS_TO_SELECT_FROM	More than one certificate is available, and CoSign Signature Local cannot choose between them. Use either SAPICertificateSetDefault or SAPIConfigurationValueSet to set the certificate with which CoSign Signature Local works.
SAPI_ERR_FAILED_TO_INIT_SIGN_BUF	A general error occurred while initializing the signing data operation. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

The certificate that is used by the signing operation is determined by this function. Once this function is called, any change in the default certificate and any additions of available certificates does not affect this signing operation. Nevertheless, if the selected certificate becomes unavailable before calling the SAPIBufferSignEnd function, an error is returned by the latter.

The certificate that the **SAPIBufferSignInit** function uses for signing is either the one set as the default certificate (for example by calling the SAPICertificateSetDefault function), or a certificate that the function automatically chooses. See the SAPICertificateGetDefault function for more information about the automatic algorithm for choosing a certificate.
To improve performance, when no default certificate is set prior to the signing operation, CoSign Signature Local stores the certificate it used for this operation as the default for the purpose of certifying the next signing operation in the current SAPI session. If this behavior is not required, set the configuration value of SAPI_ENUM_CONF_ID_CERT_SET_DEFAULT to 0 before the initial call to SAPISignatureFieldSign in the current session.

See Also

SAPIHandleAcquire, SAPIBufferSignCont, SAPIBufferSignEnd, SAPICertificateSetDefault, SAPICertificateGetDefault, SAPIBufferSign, SAPIContextRelease, SAPIConfigurationValueSet

SAPIBufferSignCont

The **SAPIBufferSignCont** function feeds an additional buffer to the sign buffer operation initiated by SAPIBufferSignInit.

```
SAPI int SAPIBufferSignCont (
  SAPI_SES_HANDLE            Handle,
  SAPI_CONTEXT               *SignContext,
  unsigned char              *Buffer,
  unsigned long              BufferLen
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignContext

[in] Pointer to the Sign Buffer operation context created using SAPIBufferSignInit. *SignContext* must be released by the SAPIContextRelease function after the signature data is retrieved by SAPIBufferSignEnd, or if the operation is stopped for any reason.

Buffer

[in] Pointer to the buffer holding one portion of the data to be signed.

BufferLen

[in] Number of bytes of data in the buffer.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_CONTEXT_NOT_INITALIZED`	The sign buffer operation context was not initialized properly or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*Buffer* is NULL and must not be NULL.
`SAPI_ERR_FAILED_TO_CONT_SIGN_BUF`	A general error occurred during the course of the signing data operation. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

The sizes of the buffers sent to the **SAPIBufferSignCont** function may differ, but the **order** of the data that is sent to the **SAPIBufferSignCont** function is very important and must be kept when calling the verification functions.

The sizes of the buffers sent when calling verification functions do not need to match the sizes of the buffers sent to the **SAPIBufferSignCont** function, but the order of the bytes must be kept, as well as the total length of the data.

See Also

SAPIHandleAcquire, SAPIBufferSignInit, SAPIBufferSignEnd, SAPIContextRelease

SAPIBufferSignEndEx

The **SAPIBufferSignEndEx** function ends a signing buffer operation and returns the signature data as a PKCS#7 blob.

Use this function also when the *prompt for sign* feature is enabled.

```
SAPI int SAPIBufferSignEndEx (
  SAPI_SES_HANDLE            Handle,
  SAPI_CONTEXT               *SignContext,
  unsigned char              *SignedData,
  unsigned long              *SignedDataLen,
  unsigned char              *Credential,
  unsigned long              CredentialLen
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignContext

[in] Pointer to the Sign Buffer operation context created using SAPIBufferSignInit. *SignContext* must be released by the SAPIContextRelease function after the SAPIBufferSignEnd returns.

SignedData

[out] Pointer to the buffer holding the signature of the data, represented as a PKCS#7 blob. If the signature data is not required, this parameter can be set to NULL.

SignedDataLen

[in/out] Pointer to a value specifying the size, in bytes, of the buffer pointed to by the *SignedData* parameter. When the function returns, the value contains the number of bytes actually stored in the buffer.

Credential

[in] Pointer to a wide char buffer that holds the user credentials required for the signing operation. Contact ARX support for more information. If no special credential is needed, a NULL value can be supplied. However, if the *prompt for sign* feature is enabled, you must supply credentials.

CredentiaLen

[in] The length in bytes of the content of *Credentials* including NULL separators terminators.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.

Value	Meaning
SAPI_ERR_CONTEXT_NOT_INITALIZED	The sign buffer operation context was not initialized properly or is corrupt.
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*SignedDataLen* is NULL and must not be NULL.
SAPI_ERR_FAILED_TO_END_SIGN_BUF	A general error occurred while retrieving the signature data. Call SAPIExtendedLastErrorGet for more information about the exact problem.

See Also

SAPIHandleAcquire, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd, SAPISigningContextPKCS7BlobLenGet

SAPIBufferSignEnd

The **SAPIBufferSignEnd** function is the older version of the SAPIBufferSignEndEx function.

```
SAPI int SAPIBufferSignEnd (
  SAPI_SES_HANDLE            Handle,
  SAPI_CONTEXT               *SignContext,
  unsigned char              *SignedData,
  unsigned long              *SignedDataLen
);
```

SAPISigningContextPKCS7BlobLenGet

The **SAPISigningContextPKCS7BlobLenGet** function calculates the maximum number of bytes needed for the signature data, if the desired signature is based on PKCS#7. The length that is returned is based on the configuration settings (certificate, signing attributes, etc.) that were used for the signing operation initialization and are referred to by *SignContext*. Note that the length returned by this function is always greater than or equal to the actual number of bytes needed.
This function is called by applications that need to know the size to be allocated for the signature data before performing the whole signing operation.

```
SAPI int SAPISigningContextPKCS7BlobLenGet (
  SAPI_SES_HANDLE            Handle,
  SAPI_CONTEXT               *SignContext,
  unsigned long              *SignatureLen
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

SignContext

[in] Pointer to the Signing operation context created by the SAPIBufferSignInit function.

SignatureLen

[out] Pointer to a value that holds the maximum number of bytes needed for the signature data.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SignatureLen* is NULL and must not be NULL.
`SAPI_ERR_CONTEXT_NOT_INITALIZED`	The buffer signing operation context is either not initialized or is corrupt.

Remarks

Only call this function after calling the SAPIBufferSignInit function.

See Also

SAPIHandleAcquire, SAPIBufferSignInit, SAPIBufferSignEnd

CoSign Signature Local - Buffer Verify

CoSign Signature Local can be used to:

- Verify files of supported types, such as Word and PDF.
  To verify a file of the supported type, see CoSign Signature Local Signature Field.
- Verify byte streams, such as records, transactions, or even data that is being read from files of unsupported types.
  The functions used for verifying byte streams all begin with SAPIBufferVerifySignature.
- Verify a signature based on a given hash value. This is intended for cases where the application calculates the hash value of a given data, and requests to verify a given signature that is based on the given hash.
- Verify a single stream of data (short record, transaction data, etc.). To do so, use SAPIBufferVerifySignature.
- Starting from CoSign version 5.4, it is possible to validate a PKCS#1 signature in addition to validating a PKCS#7 signature.

If the data is long or fragmented, use the continuous verify functions (SAPIBufferVerifySignatureInit, SAPIBufferVerifySignatureCont and SAPIBufferVerifySignatureEnd) as follows: call SAPIBufferVerifySignatureInit once to initialize the operation, then call SAPIBufferVerifySignatureCont as many times as needed, pointing each time to one portion of the data to be verified. Finally, call SAPIBufferVerifySignatureEnd to actually perform the signature verification and check the signing certificate status.

Note: *Signature verification operations do not require access to the CoSign appliance. Moreover, CoSign client installation for a machine used only for verification does not require all the client components (see the CoSign User Manual for the installation requirements for verify-only mode).*

SAPIBufferVerifySignature

The **SAPIBufferVerifySignature** function verifies a signature of a single buffer. The function optionally returns the certificate validity status. This function is used for verifying short data. For verifying long or fragmented data, use the trio of functions SAPIBufferVerifySignatureInit, SAPIBufferVerifySignatureCont, and SAPIBufferVerifySignatureEnd.

```
SAPI int SAPIBufferVerifySignature (
  SAPI_SES_HANDLE            Handle,
  unsigned char              *Buffer,
  unsigned long              BufferLen,
  unsigned char              *SignedData,
  unsigned long              SignedDataLen,
  SAPI_FILETIME              *SignatureTime,
  SAPI_CERT_STATUS_STRUCT    *CertificateStatus,
  unsigned long              Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

Buffer

[in] Pointer to the buffer that holds the data that was signed.

BufferLen

[in] Size in bytes of the data in *Buffer*.

SignedData

[in] Pointer to the buffer that holds the signature value.

SignedDataLen

[in] Size in bytes of the signature value.

SignatureTime

[in] The time when the signature was created. This parameter is optional; if this parameter is not required, a NULL value should be provided.

CertificateStatus

[out] The certificate validity status. This parameter must be supplied.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Flags when Verifying a Signature.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
SAPI_ERR_SESSION_IS_NULL	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*Buffer* and *SignedData* is NULL and must not be NULL.
SAPI_ERR_FAILED_TO_VERIFY_BUF	A general error occurred while verifying a signature. Call SAPIExtendedLastErrorGet for more information about the exact problem.
SAPI_ERR_SIGNATURE_IS_NOT_VALID	The signature is not valid. The data was probably changed after it was signed.

Remarks

It is recommended to carefully check the certificate status and make sure its value is as expected. For example, whereas in some environments the inability to check a CRL can be a real problem, in other environments it cannot be checked at all.

To control the attributes to be checked when verifying a certificate, set SAPI_ENUM_CONF_ID_CERT_CHAIN_FLAGS (see SAPI_ENUM_CONF_ID) to a desired value, using the SAPIConfigurationValueSet function. Contact ARX for information about which value to pass.

In order to validate a PKCS#1 signature, insert the AR_SAPI_SIG_PKCS1 constant into the *Flags* parameter.
In order to specify that the signature should be based on a hash mechanism different from SHA-1, insert one of the following flags into the *Flags* parameter: AR_SAPI_SHA256_FLAG, AR_SAPI_SHA384_FLAG, AR_SAPI_SHA512_FLAG or AR_SAPI_ENFORCE_SHA1_FLAG.
If the given data is a hash value, insert the AR_SAPI_SIG_HASH_ONLY constant into the *Flags* parameter.

See Also

SAPIHandleAcquire, SAPIBufferSign, SAPIConfigurationValueSet, SAPIBufferVerifySignatureInit, SAPIBufferVerifySignatureCont, SAPIBufferVerifySignatureEnd

SAPIBufferVerifySignatureInit

The trio of functions **SAPIBufferVerifySignatureInit**, SAPIBufferVerifySignatureCont, and SAPIBufferVerifySignatureEnd is used for verifying data that is too long for one buffer, or is fragmented and only certain parts of it were signed. The functions are used as follows:

- Call the **SAPIBufferVerifySignatureInit** function to initialize the operation.
- Call the SAPIBufferVerifySignatureCont function as many times as needed, pointing each time to one portion of the data to be verified.
- Call the SAPIBufferVerifySignatureEnd function to actually perform the verification.

```
SAPI int SAPIBufferVerifySignatureInit (
  SAPI_SES_HANDLE            Handle,
  SAPI_CONTEXT               *VerifyContext,
  unsigned char              *SignedData,
  unsigned long              SignedDataLen,
  unsigned long              Flags
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

VerifyContext

[out] Pointer to the Verify Buffer Signature operation context. This context contains internal information about the operation. The information in this context is passed in all subsequent calls to SAPIBufferVerifySignatureCont and SAPIBufferVerifySignatureEnd. Changing the value of *VerifyContext* by the application is not allowed and can lead to unexpected behavior. *VerifyContext* must be released by the SAPIContextRelease function when the Verify Buffer operation is finished.

SignedData

[in] Pointer to the buffer that holds the signature value.

SignedDataLen

[in] Size in bytes of the signature value.

Flags

[in] Flag values bit mask. For more information, refer to the following section in Appendix D: Flags when Verifying a Signature.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.

SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	*VerifyContext* or *SignedData* is NULL and must not be NULL.
SAPI_FAILED_TO_ALLOCATE_MEMORY	CoSign Signature Local failed to allocate the necessary memory for the new operation context. This might be due to a shortage in system resources.
SAPI_ERR_FAILED_TO_VERIFY_BUF	A general error occurred while initializing the verify signature operation. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

To control the attributes to be checked when verifying a certificate, set SAPI_ENUM_CONF_ID_CERT_CHAIN_FLAGS (see SAPI_ENUM_CONF_ID) to a desired value, using the SAPIConfigurationValueSet function. Contact ARX for information about which value to pass.

See Also

SAPIHandleAcquire, SAPIBufferSign, SAPIConfigurationValueSet, SAPIBufferVerifySignatureCont, SAPIBufferVerifySignatureEnd

SAPIBufferVerifySignatureCont

The **SAPIBufferVerifySignatureCont** function feeds an additional buffer to the Verify Buffer operation.

```
SAPI int SAPIBufferVerifySignatureCont (
  SAPI_SES_HANDLE           Handle,
  SAPI_CONTEXT              *VerifyContext,
  unsigned char             *Buffer,
  unsigned long             BufferLen
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

VerifyContext

[in] Pointer to the Verify Buffer Signature operation context created using SAPIBufferVerifySignatureInit.
VerifyContext must be released by the SAPIContextRelease function after the signature data is verified by SAPIBufferVerifySignatureEnd, or if the operation is stopped for any reason.

Buffer

[in] Pointer to the buffer holding one portion of the data that was signed.

BufferLen

[in] Size in bytes of the data in *Buffer*.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*Buffer* or *VerifyContext* is NULL and must not be NULL.
`SAPI_ERR_FAILED_TO_VERIFY_BUF`	A general error occurred during the course of the verifying buffer operation. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

The sizes of the buffers sent to the **SAPIBufferVerifySignatureCont** function may differ, but the **order** of the data that is sent to the **SAPIBufferVerifySignatureCont** function is very important and must be the same as when calling the signing functions.

The sizes of the buffers sent when calling signing functions do not need to match the sizes of the buffers sent to the **SAPIBufferVerifySignatureCont** function, but the order of the bytes must be kept, as well as the total length of the data.

See Also

SAPIHandleAcquire, SAPIBufferSign, SAPIBufferSignCont, SAPIBufferVerifySignatureInit, SAPIBufferVerifySignatureEnd

SAPIBufferVerifySignatureEnd

The **SAPIBufferVerifySignatureEnd** function ends a verify buffer operation and actually performs the signature verification. The function also optionally returns the certificate validity status.

```
SAPI int SAPIBufferVerifySignatureEnd (
  SAPI_SES_HANDLE            Handle,
  SAPI_CONTEXT               *VerifyContext,
  SAPI_FILETIME              *SignatureTime,
  SAPI_CERT_STATUS_STRUCT    *CertificateStatus,
);
```

Parameters

Handle

[in] Handle of the SAPI session created by using SAPIHandleAcquire.

VerifyContext

[in] Pointer to the Verify Buffer Signature operation context created using SAPIBufferVerifySignatureInit.
VerifyContext must be released by SAPIContextRelease after **SAPIBufferVerifySignatureEnd** returns.

SignatureTime

[out] The time when the signature was created. Not supported in this version and its value is NULL.

CertificateStatus

[out] The certificate validity status. This parameter must be supplied.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPI session handle is NULL, was not created using SAPIHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*VerifyContext* is NULL and must not be NULL.
`SAPI_ERR_FAILED_TO_VERIFY_BUF`	A general error occurred while verifying a signature. Call SAPIExtendedLastErrorGet for more information about the exact problem.

Remarks

It is recommended to carefully check the certificate status and make sure its value is as expected. For example, whereas in some environments the inability to check a CRL can be a real problem, in other environments it cannot be checked at all.

See Also

SAPIHandleAcquire, SAPIBufferSign, SAPIBufferVerifySignatureInit, SAPIBufferVerifySignatureCont

CoSign Signature Local - Obsolete Functions

SAPIGraphicSigImageGet

This function is obsolete. See Graphical Image Objects for information about new graphical image functions.

SAPIGraphicSigImageSet

This function is obsolete. See Graphical Image Objects for information about new graphical image functions.

Signature Local User Management API

The following sections describe in detail the SAPICrypt User Management API.

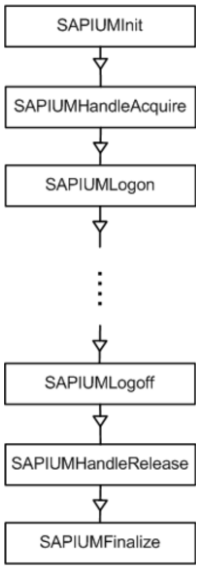
Using SAPIUM

SAPIUM refer to the CoSign Signature Local functions for managing CoSign users and CoSign groups. These functions can be called by applications that perform user management operations such as adding and deleting users, updating groups, and synchronizing the CoSign user database with the application's user database. For detailed information on CoSign Signature Local Error Codes, refer to Appendix E: CoSign Signature Local – Signing/Verifying Error Messages in the SAPICrypt Reference Manual.
Most of the SAPIUM functions work only in a Directory Independent environment. There are several functions (such as user information retrieval) that work also when CoSign is installed in other environments.

The `SAPIUM.dll` is part of the CoSign client installation and is located in the `<Program Files>\ARX\ARX Signature API` directory.

The `SAPIUM.lib` file is part of the CoSign SK CD and is located under the `SAPI\lib` directory.

General SAPIUM functions



Use the general SAPIUM functions as follows:

- The SAPIUMInit function must *always* be the first function to be called, and SAPIUMFinalize must always be called when all work with SAPIUM is completed. After calling **SAPIUMFinalize**, the only SAPIUM function that can be called is **SAPIUMInit**.
- SAPIUMHandleAcquire should be called before any other function that uses the SAPIUM session handle. **SAPIUMHandleAcquire** begins a session that is terminated only by calling SAPIUMHandleRelease with the session handle as a parameter. An application can have more than one SAPIUM session handle opened with SAPIUM, but since the SAPIUM API is used by administrative and usually interactive applications, the common application is single-threaded.
- The SAPIUMLogonEx function logs into CoSign under the provided credentials. This function should be called right after calling SAPIUMHandleAcquire. Since all the SAPIUM functions except SAPIUMSCPSet must be called by a privileged user, you must call SAPIUMLogonEx prior to calling these functions.
  The SAPIUMLogoff function ends the session with CoSign under a specific user's credentials. The **SAPIUMLogoff** function should be called only if the SAPIUMLogonEx function was previously called, and after ending all work with CoSign under the specific user credentials.
  A typical single-threaded SAPIUM application will begin by calling SAPIUMInit, followed by a call to SAPIUMHandleAcquire and then to SAPIUMLogonEx. It will end with calling SAPIUMLogoff, followed by calls to SAPIUMHandleRelease and SAPIUMFinalize.
- An application can call SAPIUMLibInfoGet to find out the SAPIUM version, and thus make use of specific functionality that is implemented only in new versions.

- All the non-void SAPIUM functions return `SAPI_OK` if they succeed and a SAPIUM error code in case of failure. Although the error code usually provides information about which operation failed and why, it is possible and recommended to call SAPIUMExtendedLastErrorGet for additional information about the reason for failure.
- In a high availability environment, client applications can use the SAPIUMGetTokenID and SAPIUMSetTokenID to get information about the currently used CoSign Appliance or set to which CoSign appliance to connect.
  The TokenIDs in these functions are compatible with the TokenIDs in the SAPIGetTokenID and SAPISetTokenID functions in SAPICrypt.

Functions for Managing a Single User

- The SAPIUMUserAddEx1 function adds a user to CoSign. Adding a user automatically triggers the generation of the user's key and certificate.
- The SAPIUMUserUpdate function updates user information in CoSign. The changes may trigger the generation of a new user key and certificate for the user.
- The SAPIUMCredentialSet function sets the credentials of a specific user.
- The SAPIUMUserSetLogonState function sets the login status (enabled or disabled) of the given CoSign user.
- The SAPIUMCounterReset function resets a signature counter of the user.
- The SAPIUMUserAssignGroup function sets the group of a given user.
- The SAPIUMUserDelete function deletes a user as well as all of the user's keys, certificates, and data objects (e.g., graphical image) from CoSign.
- The SAPIUMUserInfoGetEx function retrieves all the information stored in CoSign for a specific user.
- The SAPIUMUserGetByLoginName function retrieves the user's handle based on a given user login name.
- The SAPIUMUserTechIDGet function retrieves the internal technical identity of a given user.
- The SAPIUMGroupGetByUserGUID function retrieves the group's record of the group to which a user with a given GUID identity belongs.

Functions for Managing a Single Group

- The SAPIUMGroupAdd function adds a group to CoSign.
- The SAPIUMGroupSetStatusByTechID function sets the state of the group to either Enabled or Disabled. If the group is disabled, all users that are members of the group cannot sign. However, if a user is disabled, then even if his/her group is enabled, the user will nevertheless not be able to login.
- The SAPIUMGroupUpdate function updates the group record inside CoSign.
- The SAPIUMGroupDelete function deletes a group from CoSign.
- The SAPIUMGroupGetByTechID function retrieves all the group information stored in CoSign for a specific group, specified by its TechID.

- The SAPIUMGroupGetByName function retrieves all the group information stored in CoSign for a specific group, specified by its group name.
- The SAPIUMGroupExtDataUpdate function updates the extended information of a group. The SAPIUMGroupExtDataUpdate retrieve an extended information of a group.

Functions for Synchronizing CoSign's Users Database with the Application's Users Database

Applications working with their own users database that wish to synchronize their database with CoSign, generally call the SAPIUM add-user and delete-user functions, as needed. However, there are cases in which these actions are not enough to ensure synchronization. For example, in the case of networking problems, or if the application's users database is managed by various applications, some of which do not work with CoSign.

For all cases in which user information in CoSign differs from user information in the application, SAPIUM offers the ability to enforce synchronization between the two databases using a simple synchronization mechanism. The mechanism works as follows:

1. The application calls SAPIUMUsersSyncBegin and retrieves a Synchronization Context. The SAPIUMUsersSyncBegin function indicates to CoSign that a synchronization process has begun, and all subsequent calls to the synchronization functions must use the Synchronization Context returned.
2. For **every user** in the application's database, the application calls SAPIUMUserSync with all the user's information. If the user does not exist in CoSign, the user, as well as associated keys and certificate are created. If the user exists, CoSign compares the new information with its own, and updates its database and regenerates a new certificate, if necessary.
3. The application calls SAPIUMUsersSyncEnd to indicate that all users' information has been sent to CoSign. When this function is called, CoSign scans its entire users database, and deletes all users not referred to by SAPIUMUserSync, as well as their keys and certificates. It is imperative therefore to call SAPIUMUserSync for **every** user you wish to leave in CoSign, even if the user's information in CoSign is identical to the information in the application's database.

The application can call the SAPIUMUsersSyncStop function at any stage to stop the synchronization process. Any subsequent calls to SAPIUMUserSync and SAPIUMUsersSyncEnd return an error, and do not affect the CoSign user database.
Note that calling SAPIUMUsersSyncStop is equivalent to stopping the synchronization operation by discontinuing calls to SAPIUMUserSync for more users and refraining from calling SAPIUMUsersSyncEnd, which indicates the end of the synchronization process.

Functions for Enumerating All the Users Defined in CoSign

To retrieve all users defined in CoSign, use SAPIUMUsersEnumInitEx followed by repetitive calls to SAPIUMUsersEnumCont, to return all the user handles one by one. To retrieve detailed information about a specific user, use SAPIUMUserInfoGetEx.

Functions for Enumerating All the Groups Defined in CoSign

To retrieve all users defined in CoSign, use SAPIUMGroupsEnumInit followed by repetitive calls to SAPIUMGroupsEnumCont, to return all the groups records.

Functions for Setting Configuration

The SAPIUMSCPSet function sets the CoSign address in the current machine settings. The CoSign client on this machine will use this address whenever it needs to connect to CoSign.

SAPIUMInit

The **SAPIUMInit** function initializes the SAPIUM library and must be called before any other function in the library.

```
SAPIUM int SAPIUMInit ();
```

Parameters

This function has no parameters.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_FAILED_TO_INIT_REG_KEY`	Could not find the install path of the SAPIUM DLL in the registry. A possible reason is CoSign Signature Local is not installed.
`SAPI_ERR_FAILED_TO_INIT_LOAD_MODULE`	Failed to load the SAPIUM DLL. A possible reason is that the SAPIUM DLL was moved from the location specified during CoSign Signature Local installation.

Remarks

When no additional SAPIUM function needs to be called, you should call SAPIUMFinalize in order to close the library and free the library resources.

See Also

SAPIUMFinalize

SAPIUMHandleAcquire

The **SAPIUMHandleAcquire** function acquires a SAPIUM session handle. This returned handle should be used to make calls to all SAPIUM functions that require a session handle.

```
SAPIUM int SAPIUMHandleAcquire (
  SAPI_UM_SES_HANDLE         *Handle
);
```

Parameters

Handle

[out] Pointer to a handle of a SAPIUM session.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	NULL value for *Handle* is not allowed.
`SAPI_ERR_FAILED_TO_FIND_SERVER`	A general error occurred while trying to create a new session handle. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

When the handle is not required anymore, it should be released by calling the SAPIUMHandleRelease function. Releasing the session handle frees all the resources related to the handle, and the handle becomes invalid.

See Also

SAPIUMHandleRelease

SAPIUMLogonEx

The **SAPIUMLogonEx** function logs into CoSign under the provided credentials. This function should be called right after calling SAPIUMHandleAcquire.

```
SAPIUM int SAPIUMLogonEx (
  SAPI_UM_SES_HANDLE          Handle,
  SAPI_LPCWSTR                UserLoginName,
  SAPI_LPCWSTR                DomainName,
  unsigned char               *Password,
  long                        PasswordLen,
  unsigned long               Flags
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserLoginName

[in] The name under which this session is logged in.

DomainName

[in] This parameter is ignored and should be NULL.

Password

[in] The password of UserLoginName.

Note that the password value is represented as a wide char string.

PasswordLen

[in] The length in bytes of the password, including the NULL terminator.

Flags

[in] A bit mask value of the user's rights. See SAPI_UM_ENUM_LOGON_FLAG_TYPE for possible values.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_ILLEGAL_DIRECTORY_KIND`	CoSign is not installed in Directory Independent mode.

Value	Meaning
SAPI_ERR_HANDLE_ALREADY_LOGGED_ON	The session is already logged on. The reason might be that the SAPIUMLogon function was previously called, and no call to SAPIUMLogoff was made.
SAPI_ERR_FAILED_TO_LOGON	An error occurred while trying to logon to CoSign. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

Call SAPIUMLogoff when there are no other operations that need to be done under the provided user's credentials.

Call **SAPIUMLogonEx** before calling any function that needs to be run under special user privileges.

See Also

SAPIUMHandleAcquire, SAPIUMLogoff

SAPIUMLogon

The **SAPIUMLogon** function is the older version of the SAPIUMLogonEx function.

```
SAPI int SAPILogon (
  SAPI_SES_HANDLE            Handle,
  SAPI_LPCWSTR               UserLoginName,
  SAPI_LPCWSTR               DomainName,
  unsigned char              *Password,
  long                       PasswordLen,
);
```

SAPIUMGetTokenID

The **SAPIUMGetTokenID** function retrieves a Token ID that identifies the CoSign Appliance currently used by the SAPIUM Session. This enables more control over the flow of operations. The function is relevant for cases where several Primary CoSign appliances are used and the application would like to control and specify which appliance to use for the digital signature operations.

```
SAPI int SAPIGetTokenID (
  SAPI_UM_SES_HANDLE              Handle,
  char                            *TokenID);
```

Parameters

Handle

[in] Handle of the SAPIUM session created by using SAPIHandleAcquire.

TokenID

[out] The identification of the CoSign appliance used by this SAPIUM Session.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_ILLEGAL_DIRECTORY_KIND`	CoSign is not installed in Directory Independent mode.

See Also

SAPIUMHandleAcquire, SAPIUMSetTokenID

SAPIUMSetTokenID

The **SAPIUMSetTokenID** function sets the Token ID that defines which CoSign Appliance should be used by the SAPIUM Session. This enables more control over the flow of operations. This function is relevant for cases where several Primary CoSign appliances are used and the application would like to control and specify which appliance to use for the digital signature operations.

The command should be called before the SAPIUMLogon command.

```
SAPI int SAPIUMSetTokenID (
  SAPI_UM_SES_HANDLE                Handle,
  char                              *TokenID);
```

Parameters

Handle

[in] Handle of the SAPIUM session created by using SAPIHandleAcquire.

TokenID

[in] The identification of the CoSign appliance that should be used by this SAPIUM Session.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_ILLEGAL_DIRECTORY_KIND`	CoSign is not installed in Directory Independent mode.

See Also

SAPIUMHandleAcquire, SAPIUMGetTokenID

SAPIUMLogonBuiltIn

This function is obsolete.

SAPIUMLogoff

The **SAPIUMLogoff** function ends the session with CoSign under a specific user's credentials. The **SAPIUMLogoff** function should be called only if the SAPIUMLogonEx function was previously called, and after ending all work with CoSign under the specific user credentials.

```
SAPIUM int SAPIUMLogoff (
  SAPI_UM_SES_HANDLE         Handle
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire and is the same handle used for the SAPIUMLogonEx function call.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Remarks

It is recommended to call the SAPIUMHandleRelease function right after calling the **SAPIUMLogoff** function, although it is not mandatory.

Calling the **SAPIUMLogoff** function does not automatically release the handles that were allocated by SAPIUM functions. These resources must be released by SAPIUMHandleRelease.

See Also

SAPIUMHandleAcquire, SAPIUMHandleRelease, SAPIUMLogonEx

SAPIUMHandleRelease

The **SAPIUMHandleRelease** function releases all the resources related to any kind of SAPIUM handles. This function should be called whenever the application finishes using a handle, to avoid unnecessary allocation of resources.

```
SAPIUM void SAPIHandleRelease (
  Void                      *Handle
);
```

Parameters

Handle

[in] Any handle that was created by any of the SAPIUM handle creation functions, such as SAPIUMHandleAcquire, SAPIUMUsersEnumCont.

Return Values

This function has no return values.

Remarks

Using many handles without calling the **SAPIUMHandleRelease** function can lead to a shortage of system resources, and in some cases prevent SAPIUM from allocating new resources.

After calling the **SAPIUMHandleRelease** function, you may not use the handle anymore, and it is recommended to set its value to NULL.

See Also

SAPIUMHandleAcquire, SAPIUMUsersEnumCont

SAPIUMFinalize

The **SAPIUMFinalize** function ends the work with the SAPIUM library, and releases all the SAPIUM global resources. The **SAPIUMFinalize** function should be called when there are no more calls to SAPIUM functions. Once the **SAPIUMFinalize** function is called, a call to any of the SAPIUM functions can lead to unexpected results.

```
SAPIUM int SAPIUMFinalize ();
```

Parameters

This function has no parameters.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

See Also

SAPIUMInit

SAPIUMExtendedLastErrorGet

The **SAPIUMExtendedLastErrorGet** function retrieves the calling application's extended last-error code value. The Extended last-error is often, although not always, different from the error code that was returned in the last function call, and is useful for getting more information about what caused the last function to fail.

```
SAPIUM int SAPIUMExtendedLastErrorGet();
```

Parameters

This function has no parameters.

Return Values

The return value is the calling application's last-error code value. Internal SAPIUM functions set this value whenever an error occurs.

Remarks

For a complete list of error codes, see the `SAPIUMErrors.h` file in the `SAPI\include` folder in the CoSign installation CD.

Call the **SAPIUMExtendedLastErrorGet** function immediately when a function's return value indicates that such a call will return useful data. Immediacy is important because subsequent function calls can reset this value, wiping out the error code set by the most recently failed function.

SAPIUMLibInfoGet

The **SAPIUMLibInfoGet** function returns some general information about the library.

```
SAPIUM int SAPILibGetInfo(
  PSAPI_UM_INFO_STRUCT       SAPIUMInfoStruct
);
```

Parameters

SAPIUMInfoStruct

[out] A pointer to the SAPI_UM_INFO_STRUCT structure that holds the library version information.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

SAPIUMUserAddEx1

The **SAPIUMUserAddEx1** function adds a user to CoSign. Adding a user automatically triggers the generation of the user's keys and certificate.
This function is relevant only to a Directory Independent environment.

```
SAPIUM int SAPIUMUserAddEx1 (
  SAPI_UM_SES_HANDLE               Handle,
  SAPI_LPCWSTR                     UserLoginName,
  SAPI_LPCWSTR                     UserCN,
  SAPI_LPCWSTR                     emailAddress,
  unsigned char                    *Password,
  unsigned long                    PasswordLen,
  SAPI_CALC_CREDENTIALS_CALLBACK   CalcCredentialFunc,
  SAPI_TECH_ID                     GroupTechID,
  unsigned long                    Flags
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserLoginName

[in] The name that will be used for logging into CoSign. This field is mandatory.
The maximum length of the parameter is 64 characters.

UserCN

[in] The user's common name. This name will be the subject (issued to) of the certificate. This field is mandatory.
The maximum length of the parameter is 256 characters.

emailAddress

[in] The user's email address. This value will be part of the subject of the certificate.
The maximum length of the parameter is 128 characters.

Password

[in] The user's password. This field is mandatory.

Note that the password value is represented as a wide char string.

The maximum length of the parameter is 64 characters.

PasswordLen

[in] The length in bytes of the password, including the NULL terminator.

CalcCredentialFunc

[in] A pointer to a user-defined callback function that gets the user password and returns the user credentials. Currently this parameter is not supported, and its value should be NULL.

GroupTechID

[in] The technical identity of a group to which the user belongs. If the user does not belong to any group, the given GroupTechID should be 0.

Flags

[in] A bit mask value of the user's rights. See Appendix I: CoSign Signature Local – User Management Constants for possible values.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*UserLoginName*, *UserCN*, and *Password* should not be NULL.
`SAPI_ERR_FAILED_TO_WRITE_USER`	An error occurred while trying to add a new user. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

If a user with the same user login name already exists in CoSign, an error code is returned.

CoSign does not store the clear user password but rather a hash value of the password and a unique salt generated by the function, to prevent similar passwords from having similar credential hash values.

See Also

SAPIUMHandleAcquire, SAPIUMUserDelete, SAPIUMUserSync, SAPIUMCredentialSet

SAPIUMUserAdd

The **SAPIUMUserAdd** is the older version of the SAPIUMUserAddEx1 function, dating to before CoSign groups were introduced.

```
SAPIUM int SAPIUMUserAdd (
  SAPI_UM_SES_HANDLE               Handle,
  SAPI_LPCWSTR                     UserLoginName,
  SAPI_LPCWSTR                     UserCN,
  SAPI_LPCWSTR                     emailAddress,
  unsigned char                    *Password,
  unsigned long                    PasswordLen,
  SAPI_CALC_CREDENTIALS_CALLBACK   CalcCredentialFunc
  unsigned long                    Flags
);
```

SAPIUMUserUpdate

The **SAPIUMUserUpdate** function updates the user common name, email address and rights. This function is relevant only to a Directory Independent environment.

```
SAPIUM int SAPIUMUserUpdate (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_LPCWSTR               UserLoginName,
  SAPI_LPCWSTR               UserCN,
  SAPI_LPCWSTR               emailAddress,
  unsigned long              Flags
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserLoginName

[in] The name that will be used for logging into CoSign.

UserCN

[in] The user's common name. This name will be the subject (issued to) of the certificate.

emailAddress

[in] The user's email address. This value will be part of the subject of the certificate.

Flags

[in] A bit mask value of the user's rights. See Appendix I: CoSign Signature Local – User Management Constants for possible values.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

See Also

SAPIUMHandleAcquire, SAPIUMUserAdd, SAPIUMUserSync, SAPIUMCredentialSet

SAPIUMCredentialSet

The **SAPIUMCredentialSet** function sets the credentials of a specific user.
CoSign does not store the clear user password but rather a hash value of the password and a unique salt generated by the function, to prevent similar passwords from having similar credential hash values.

This function is relevant only to a Directory Independent environment.

```
SAPIUM int SAPIUMCredentialSet (
  SAPI_UM_SES_HANDLE               Handle,
  SAPI_LPCWSTR                     UserLoginName,
  unsigned char                    *Password,
  unsigned long                    PasswordLen,
  SAPI_CALC_CREDENTIALS_CALLBACK   CalcCredentialFunc
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserLoginName

[in] The login name of the user whose credentials are being set.

Password

[in] The user's new password.

Note that the password value is represented as a wide char string.

PasswordLen

[in] The length in bytes of the new password, including the NULL terminator.

CalcCredentialFunc

[in] A pointer to a user-defined callback function that gets the new password and returns the user credentials. Currently this parameter is not supported, and its value should be NULL.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_FAILED_TO_UPDATE_CREDENTIAL`	An error occurred while trying to set the user password. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMUserAdd

SAPIUMUserSetLogonState

The **SAPIUMUserSetLogonState** function sets the status of the user to either Disabled or Enabled. If a user is disabled, the user will not be able to sign even if the user belongs to an enabled group. This function is relevant only to a Directory Independent environment.

Note: You can retrieve a user's logon state by using the SAPIUMUserInfoGetEx function.

```
SAPIUM int SAPIUMUserSetLogonState (
  SAPI_UM_SES_HANDLE               Handle,
  SAPI_LPCWSTR                     UserLoginName,
  SAPI_UM__ENUM_USER_LOGIN_STATUS  UserLogonStatus
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserLoginName

[in] The login name of the user.

UserLogonStatus

[in] The new login status of the user. For information, refer to SAPI_UM_ENUM_USER_LOGIN_STATUS.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

See Also

SAPIUMHandleAcquire, SAPIUMUserAdd

SAPIUMUserDelete

The **SAPIUMUserDelete** deletes a user as well as his keys, certificates and data objects (e.g., graphical image) from CoSign.
This function is relevant only to a Directory Independent environment.

```
SAPIUM int SAPIUMUserDelete (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_LPCWSTR               UserLoginName
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserLoginName

[in] The login name of the deleted user.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*UserLoginName* should not be NULL.
`SAPI_ERR_FAILED_TO_DELETE_USER`	An error occurred while trying to delete the user. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMUserAdd

SAPIUMUsersSyncBegin

The **SAPIUMUsersSyncBegin** indicates to CoSign that the synchronization between CoSign users database and the application users database has begun. The function resets all the users' update time, so that when the SAPIUMUsersSyncEnd function is called, all users whose update time is still 0 will be removed.
This function is relevant only to a Directory Independent environment.

```
SAPIUM int SAPIUMUsersSyncBegin (
  SAPI_UM_SES_HANDLE          Handle,
  SAPI_UM_CONTEXT             SyncContext
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

SyncContext

[in] Pointer to the Users Sync operation context (refer to SAPI_UM_CONTEXT). This context contains internal information about the operation and should be passed to SAPIUMUsersSyncEnd and SAPIUMUsersSyncStop. Changing the value of *SyncContext* by the application is not allowed and can lead to unexpected behavior.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SyncContext* should not be NULL.
`SAPI_ERR_FAILED_TO_BEGIN_SYNC`	An error occurred while trying to begin the users database synchronization process. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMUsersSyncStop, SAPIUMUsersSyncEnd, SAPIUMUserSync

SAPIUMUserSync

The **SAPIUMUserSync** function synchronizes the CoSign users database and the application's users database for single user information. This function should be called for every user in the application database, after calling SAPIUMUsersSyncBegin and before calling SAPIUMUsersSyncEnd.
This function is relevant only to a Directory Independent environment.

The results of calling **SAPIUMUserSync** are as follows:

- If the user information is new for CoSign, the user and his keys and certificate will be created.
- If the user information is different from the information stored in CoSign, the information will be updated in CoSign, and, if necessary, a new certificate will be created.
- If the user information is identical to the information in CoSign, no action is taken.

  In all cases, the update time of the user record in CoSign is changed to the current time.

```
SAPIUM int SAPIUMUserSync (
  SAPI_UM_SES_HANDLE               Handle,
  SAPI_LPCWSTR                     UserLoginName,
  SAPI_LPCWSTR                     UserCN,
  SAPI_LPCWSTR                     emailAddress,
  unsigned char                    *Password,
  unsigned long                    PasswordLen,
  SAPI_CALC_CREDENTIALS_CALLBACK   CalcCredentialFunc
  unsigned long                    Flags
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserLoginName

[in] The name that will be used for logging into CoSign.

UserCN

[in] The user's common name. This name will be the subject (issued to) of the certificate.

emailAddress

[in] The user's email address. This value will be part of the subject of the certificate.

Password

[in] The user's password.

Note that the password value is represented as a wide char string.

PasswordLen

[in] The length in bytes of the password, including the NULL terminator.

CalcCredentialFunc

[in] A pointer to a user defined callback function that gets the new password and returns the user credentials. Currently this parameter is not supported, and its value should be NULL.

Flags

[in] A bit mask value of the user's rights. See Appendix I: CoSign Signature Local – User Management Constants for possible values.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*UserLoginName*, *UserCN*, and *Password*, should not be NULL.
`SAPI_ERR_FAILED_TO_WRITE_USER`	An error occurred while trying to add a new user. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

Changes caused by this function to the CoSign users database cannot be reversed by calling SAPIUMUsersSyncStop.

See Also

SAPIUMHandleAcquire, SAPIUMUsersSyncBegin, SAPIUMUsersSyncStop, SAPIUMUsersSyncEnd

SAPIUMUsersSyncEnd

The **SAPIUMUsersSyncEnd** function indicates to CoSign that the synchronization between CoSign users database and the application users database has ended. The function scans the entire users database and finds users whose update time is 0 (the value given by SAPIUMUsersSyncBegin). Any user with an update time of 0 is removed, as well as his keys, certificates and data objects (e.g., graphical signature image).
This function is relevant only to a Directory Independent environment.

```
SAPIUM int SAPIUMUsersSyncEnd (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_UM_CONTEXT            SyncContext
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

SyncContext

[in] Pointer to the Users Sync operation context. This context must have been created using SAPIUMUsersSyncBegin.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SyncContext* should not be NULL.
`SAPI_ERR_FAILED_TO_END_SYNC`	An error occurred while trying to end the users database synchronization process. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

Warning: Calling the **SAPIUMUsersSyncEnd** function without first calling SAPIUMUserSync for all the users in the application database, will cause the deletion of all unsynchronized users from the CoSign database. Therefore, if the synchronization process is stopped for any reason, do not call **SAPIUMUsersSyncEnd**, but rather restart the whole synchronization process.

See Also

SAPIUMHandleAcquire, SAPIUMUsersSyncBegin, SAPIUMUserSync, SAPIUMUsersSyncStop

SAPIUMUsersSyncStop

The **SAPIUMUsersSyncStop** function stops the CoSign users database synchronization process, in such a way that a subsequent call to SAPIUMUsersSyncEnd will have no effect on the CoSign users database.
This function is relevant only to a Directory Independent environment.

```
SAPIUM int SAPIUMUsersSyncStop (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_UM_CONTEXT            SyncContext
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

SyncContext

[in] Pointer to the Users Sync operation context. This context must have been created using SAPIUMUsersSyncBegin.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*SyncContext* should not be NULL.
`SAPI_ERR_FAILED_TO_CANCEL_SYNC`	An error occurred while trying to stop the users database synchronization process. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

Stopping the synchronization operation does not cancel the changes made in CoSign by the calls to SAPIUMUsersSyncEnd.

See Also

SAPIUMHandleAcquire, SAPIUMUsersSyncBegin, SAPIUMUsersSyncEnd, SAPIUMUserSync

SAPIUMUsersEnumInitEx

The **SAPIUMUsersEnumInitEx** function initializes the continuous operation of retrieving all the users defined in CoSign.

```
SAPIUM int SAPIUMUsersEnumInitEx (
  SAPI_UM_SES_HANDLE              Handle,
  SAPI_ENUM_USERS_CONTEXT         UsersEnumContext,
  SAPI_USERS_FILTER_STRUCT        *UsersFilterStruct,
  SAPI_UM_USERS_FILTER_EXT_TYPE   UsersFilterExtType,
  void                            *UsersFilterExtValue
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UsersEnumContext

[in] Pointer to the Users Enumeration operation context. This context contains internal information about the operation and should be passed to all subsequent calls to SAPIUMUsersEnumCont. The application may not change the value of *UsersEnumContext*; doing so may lead to unexpected behavior.
Note that this type was changed in CoSign version 6.

UsersFilterStruct

[in] Pointer to the users filter structure. You can use this structure to indicate which user types (users, computers or groups, as described in SAPI_UM_ENUM_USER_TYPE) to enumerate.

UsersFilterExtType

[in] The type of additional filter attribute. Refer to the SAPI_UM_USERS_FILTER_EXT_TYPE. For example, if the API_UM_USERS_FILTER_EXT_TYPE_GROUP_TECH_ID is specified, only users that belong to the specified group will be retrieved.

UsersFilterExtValue

[in] The value of the additional filter attribute.
For example, if in the UsersFilterExtType, the API_UM_USERS_FILTER_EXT_TYPE_GROUP_TECH_ID is specified, then the provided value should be a pointer to the relevant Group Technical ID.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*UsersEnumContext* should not be NULL.

Value	Meaning
SAPI_ERR_FAILED_TO_ENUM_USERS	An error occurred while trying to initialize the users enumeration operation. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have Users Admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMUsersEnumCont

SAPIUMUsersEnumInit

The **SAPIUMUsersEnumInit** function is the older version of the SAPIUMUsersEnumInitEx function.

```
SAPIUM int SAPIUMUsersEnumInit (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_ENUM_USERS_CONTEXT    UsersEnumContext,
  SAPI_USERS_FILTER_STRUCT   *UsersFilterStruct,
  );
```

SAPIUMUsersEnumCont

The **SAPIUMUsersEnumCont** function continues the Users Enumeration operation and returns a pointer to a single user handle. Every call returns a new user handle until the end of the list is reached.

```
SAPIUM int SAPIUMUsersEnumCont (
  SAPI_UM_SES_HANDLE          Handle,
  SAPI_ENUM_USERS_CONTEXT     UsersEnumContext,
  SAPI_UM_USR_HANDLE          *UserHandle
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UsersEnumContext

[in] Pointer to the Users Enumeration operation context. This context contains internal information about the operation and should be passed to all subsequent calls to **SAPIUMUsersEnumCont**. The application may not change the value of *UsersEnumContext*; doing so may lead to unexpected behavior.
Note that this type was changed in CoSign version 6.

UserHandle

[out] Pointer to a handle of a single user. This handle can be used for retrieving more information about the user using the SAPIUMUserInfoGetEx function.
UserHandle should be released by calling the SAPIUMHandleRelease function, when there is no further use for the handle.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*UsersEnumContext* and *UserHandle* should not be NULL.
`SAPI_NO_MORE_USERS`	The last user was retrieved, and there are no more users in CoSign.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	SAPIUM failed to allocate the necessary memory for the new user handle. This might be due to a shortage in system resources.

Value	Meaning
SAPI_ERR_FAILED_TO_ENUM_USERS	An error occurred while trying to get a single user handle. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have Users Admin privileges.

In order to retrieve the whole users list, **SAPIUMUsersEnumCont** should be called until SAPI_NO_MORE_USERS is returned.

See Also

SAPIUMHandleAcquire, SAPIUMUsersEnumInitEx, SAPIUMHandleRelease, SAPIUMUserInfoGetEx

SAPIUMUserInfoGetEx

The **SAPIUMUserInfoGetEx** function retrieves all the user information stored in CoSign for a specific user. The user is specified by a user handle.

```
 SAPIUM int SAPIUMUserInfoGet (
  SAPI_UM_SES_HANDLE                          Handle,
  SAPI_UM_USR_HANDLE                          UserHandle,
  SAPI_LPCWSTR                                UserLoginName,
  long                                        *UserLoginNameLen,
  SAPI_LPCWSTR                                UserCN,
  long                                        *UserCNLen,
  SAPI_LPCWSTR                                EmailAddress,
  long                                        *EmailAddressLen,
  SAPI_ENUM_USER_TYPE                         *Kind,
  long                                        *RightsMask,
  unsigned long                               *UpdateTime,
  SAPI_UM_GUID                                Guid,
  SAPI_UM_ENUM_USER_ENROLLMENT_STATUS         *EnrollmentStatus,
  SAPI_UM_ENUM_USER_ENROLLMENT_REASON         *EnrollmentReason,
  SAPI_UM_ENUM_USER_LOGIN_STATUS              *LoginStatus,
  long                                        *Counter1,
  long                                        *Counter2,
  long                                        *Counter3,
  SAPI_UM_ENUM_USER_CERT_STATUS_TYPE          *UserCertStatus,
  SAPI_UM_ENUM_PENDING_REQUEST_STATUS_TYPE    *CertRequestStatus
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserHandle

[in] Handle of the user whose information is retrieved. This handle was created by SAPIUMUsersEnumCont.

UserLoginName

[out] The name used for logging into CoSign. This parameter can be NULL if its value is not required.

UserLoginNameLen

[in/out] Pointer to a value that specifies the size allocated for the *UserLoginName* parameter. When the function returns, this value contains the size of the data copied to *UserLoginName*, or if *UserLoginName* is NULL, the size that should be allocated for it. This value can be NULL only if *UserLoginName* is NULL.

UserCN

[out] The user's common name. This name is the subject (issued to) of the certificate. This parameter can be NULL if its value is not required.

UserCNLen

[in/out] Pointer to a value that specifies the size allocated for the *UserCN* parameter. When the function returns, this value contains the size of the data copied to *UserCN*, or if *UserCN* is NULL, the size that should be allocated for it. This value can be NULL only if *UserCN* is NULL.

emailAddress

[out] The user's email address. This value is part of the subject of the certificate. This parameter can be NULL if its value is not required.

emailAddressLen

[in/out] Pointer to a value that specifies the size allocated for the *emailAddress* parameter. When the function returns, this value contains the size of the data copied to *emailAddress*, or if *emailAddress* is NULL, the size that should be allocated for it. This value can be NULL only if *emailAddress* is NULL.

Kind

[out] Pointer to the user type (user, computer, or group). This parameter can be NULL if its value is not required.

RightsMask

[out] Pointer to a bit mask value of the user rights. See Appendix I: CoSign Signature Local – User Management Constants for possible values. This parameter can be NULL if its value is not required.

UpdateTime

[out] Pointer to the last time this user was updated. This parameter can be NULL if its value is not required.

GUID

[out] The internal GUID stored for the user.

EnrollmentStatus

[out] The enrollment status of the certificate of the user. See SAPI_UM_ENUM_USER_ENROLLMENT_STATUS.

EnrollmentReason

[out] The reason for the last certificate enrollment for the user. See SAPI_UM_ENUM_USER_ENROLLMENT_REASON.

LoginStatus

[out] The logon status of the user. See SAPI_UM_ENUM_USER_LOGIN_STATUS.

Counter1

[out] The first signature counter of the user.

Counter2

[out] The second signature counter of the user.

Counter3

[out] The third signature counter of the user.

UserCertStatus

[out] The certificate status of the user. See SAPI_UM_ENUM_USER_CERT_STATUS_TYPE.

CertRequestStatus

[out] The certificate request status of the user. See SAPI_UM_ENUM_PENDING_REQUEST_STATUS_TYPE.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*UserHandle* and *GUID* should not be NULL.
`SAPI_ERR_FAILED_TO_GET_USER_INFO`	An error occurred while trying to get user information. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMUsersEnumCont, SAPIUMHandleRelease, SAPIUMUserInfoGetEx

SAPIUMUserInfoGet

The **SAPIUMUserInfoGet** function is the older version of the SAPIUMUserInfoGetEx function. Note that the extended function SAPIUMUserInfoGetEx retrieves more information from the user account than **SAPIUMUserInfoGet** does.

```
SAPIUM int SAPIUMUserInfoGet (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_UM_USR_HANDLE         UserHandle,
  SAPI_LPCWSTR               UserLoginName,
  long                       *UserLoginNameLen,
  SAPI_LPCWSTR               UserCN,
  long                       *UserCNLen,
  SAPI_LPCWSTR               EmailAddress,
  long                       *EmailAddressLen,
  SAPI_ENUM_USER_TYPE        *Kind,
  long                       *RightsMask,
  unsigned long              *UpdateTime,
  SAPI_UM_GUID               Guid
);
```

SAPIUMCounterReset

The **SAPIUMCounterReset** function resets the signature counters of the given user.

```
 SAPIUM int SAPIUMCounterReset (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_LPCWSTR               UserLoginName,
  SAPI_UM_ENUM_COUNTER_TYPE  CounterToReset
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserLoginName

[in] The name used for logging into CoSign.

CounterToReset

[in] The counter to reset. See SAPI_UM_ENUM_COUNTER_TYPE.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMHandleRelease, SAPIUMUserInfoGetEx

SAPIUMUserAssignGroup

The **SAPIUMUserAssignGroup** function assigns the given user to a group. A user can belong to at most one group.

```
 SAPIUM int SAPIUMUserAssignGroup (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_TECH_ID               UserTechID,
  SAPI_TECH_ID               GroupTechID,
  unsigned long              Flags
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserTechID

[in] The technical identity of the given user.

GroupTechID

[in] The technical identity of the given group. 0 indicates that the user does not belong to any group.

Flags

[in] Reserved for or future use.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

When a user is assigned to a group, the user's key and certificate are modified to conform with the group's defined KeySize and OrganizationName values.

See Also

SAPIUMHandleAcquire, SAPIUMHandleRelease, SAPIUMUserInfoGetEx

SAPIUMUserGetByLoginName

The **SAPIUMUserGetByLoginName** function enables you to directly get a user handle and access the user. Previously you could get a user handle only by enumerating all existing users.

```
 SAPIUM int SAPIUMUserGetByLoginName (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_LPCWSTR               UserLoginName,
  SAPI_UM_USR_HANDLE         *UserHandle
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserLoginName

[in] The name used for logging into CoSign.

UserHandlet

[out] A user handle of the given user name.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_FAILED_TO_GET_USER`	Failed to retrieve the given user.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMHandleRelease, SAPIUMUserInfoGetEx

SAPIUMUserTechIDGet

The **SAPIUMUserTechIDGet** gets the technical user identity of a given user. The technical user identity is used in functions such as SAPIUMUserAssignGroup.

```
SAPIUM int SAPIUMUserTechIDGet (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_UM_USR_HANDLE         UserHandle,
  SAPI_TECH_ID               *UserTechID
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserHandle

[in] A user handle of the given user.

UserTechID

[out] The technical identity of the user.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMHandleRelease, SAPIUMUserInfoGetEx

SAPIUMGroupGetByUserGUID

The **SAPIUMGroupGetByUserGUID** retrieves the group record of the group to which the user belongs. If the user does not belong to any group, the technical ID of the group in the GroupRecord output will have a value of 0.

```
SAPIUM int SAPIUMGroupGetByUserGUID (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_UM_GUID               UserGUID,
  SAPI_UM_GROUP_RECORD       *GroupRecord
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

UserGUID

[in] The GUID of a given user.

GroupRecord

[out] The record of the group to which the user belongs.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_FAILED_TO_GET_GROUP`	Failed to get group information.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMHandleRelease

SAPIUMGroupAdd

The **SAPIUMGroupAdd** function adds a group to CoSign. This function is relevant only to a Directory Independent environment.

```
SAPIUM int SAPIUMGroupAdd (
  SAPI_UM_SES_HANDLE              Handle,
  SAPI_UM_GROUP_RECORD            GroupRecord,
  SAPI_TECH_ID                    GroupTechID,
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupRecord

[in] The new group's data. For more information, refer to SAPI_UM_GROUP_RECORD.

GroupTechID

[out] The technical identity of the newly created group.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

If a group with the same name already exists in CoSign, an error code is returned.

See Also

SAPIUMHandleAcquire, SAPIUMGroupDelete, SAPIUMGroupUpdate

SAPIUMGroupUpdate

The **SAPIUMGroupUpdate** function updates the group information of a given group.
This function is relevant only to a Directory Independent environment. The GroupTechID field inside the given group record indicates which group to update.

```
SAPIUM int SAPIUMGroupUpdate (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_UM_GROUP_RECORD       GroupRecord
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupRecord

[in] The new record of the given group (for more information, refer to SAPI_UM_GROUP_RECORD). The GroupTechID field indicates which group to update.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

See Also

SAPIUMHandleAcquire, SAPIUMGroupAdd, SAPIUMGroupGetByTechID, SAPIUMGroupGetByName

SAPIUMGroupSetStatusByTechID

The **SAPIUMGroupSetStatusByTechID** function updates the status of the group to either Disabled or Enabled. If the group is Disabled, all users that belong to this group will not be able to login even if their user login state is Enabled. Conversely, if a user is disabled, then even if his/her group is enabled, the user will nevertheless not be able to login.
This function is relevant only to a Directory Independent environment.

```
SAPIUM int SAPIUMGroupSetStatusByTechID (
  SAPI_UM_SES_HANDLE              Handle,
  SAPI_TECH_ID                    GroupTechID,
  SAPI_UM__ENUM_GROUP_STATUS_TYPE  GroupStatus
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupTechID

[in] The technical identity of the group.

GroupStatus

[in] The new status of the group. For information, refer to SAPI_UM_ENUM_GROUP_STATUS_TYPE.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

See Also

SAPIUMHandleAcquire, SAPIUMGroupAdd

SAPIUMGroupDelete

The **SAPIUMGroupDelete** function deletes a group from CoSign.

```
SAPIUM int SAPIUMGroupDelete (
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_TECH_ID               GroupTechID,
  unsigned long              UserOP
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupTechID

[in] The technical identity of the group.

UserOP

[in] The parameter value should be 0. For more information, contact ARX.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMGroupAdd

SAPIUMGroupsEnumInit

The **SAPIUMGroupsEnumInit** function initializes the continuous operation of retrieving all the groups defined in CoSign.

```
SAPIUM int SAPIUMGroupsEnumInit (
  SAPI_UM_SES_HANDLE               Handle,
  SAPI_UM_CONTEXT                  GroupsEnumContext,
  SAPI_UM_ENUM_GROUPS_ORDER_TYPE   GroupsOrderType,
  SAPI_LPCSWSTR                    StartValue,
  int                              StartNumberValue,
  int                              OrderDescending
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupsEnumContext

[in] Pointer to the Groups Enumeration operation context. This context contains internal information about the operation and should be passed to all subsequent calls to SAPIUMUsersEnumCont. The application may not change the value of *GroupsEnumContext*; doing so may lead to unexpected behavior.

GroupsOrderType

[in] Not implemented.

StartValue

[in] Not implemented.

StartNumberValue

[in] Not implemented.

OrderDescending

[in] 0 indicates ascending order, 1 indicates descending order.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GroupsEnumContext* should not be NULL.
`SAPI_ERR_FAILED_TO_ENUM_USERS`	An error occurred while trying to initialize the groups enumeration operation. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have Users Admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMGroupsEnumCont

SAPIUMGroupsEnumCont

The **SAPIUMUsersEnumCont** function continues the Groups Enumeration operation and returns a pointer to several group records. Every call returns a bunch of group records until the end of the list is reached.

```
SAPIUM int SAPIUMUsersEnumCont (
  SAPI_UM_SES_HANDLE          Handle,
  SAPI_UM_CONTEXT             GroupsEnumContext,
  SAPI_UM_GROUP_RECORD        *GroupsList
  unsigned long               *NumOfGroups
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupsEnumContext

[in] Pointer to the Groups Enumeration operation context. This context contains internal information about the operation and should be passed to all subsequent calls to **SAPIUMGroupsEnumCont**. The application may not change the value of *GroupsEnumContext*; doing so may lead to unexpected behavior.

GroupsList

[out] Pointer to an empty list, which will be populated by this function.

NumOfGroups

[in/out] Pointer to a value specifying the desired number of group records to return at each call. When the function returns, the value contains the actual number of group records returned.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*GroupsEnumContext*, *GroupsList* and *NumOfGroups* should not be NULL.
`SAPI_NO_MORE_GROUPS`	The last group was retrieved, and there are no more groups in CoSign.
`SAPI_FAILED_TO_ALLOCATE_MEMORY`	SAPIUM failed to allocate the necessary memory for the groups context. This might be due to a shortage in system resources.

Value	Meaning
SAPI_ERR_FAILED_TO_ENUM_GROUPS	An error occurred while trying to get group records. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

The user under whose credentials this operation is performed must have Users Admin privileges.

In order to retrieve the records of all existing groups, **SAPIUMGroupsEnumCont** should be called until SAPI_NO_MORE_GROUPS is returned.

See Also

SAPIUMHandleAcquire, SAPIUMGroupsEnumInit

SAPIUMGroupGetByTechID

The **SAPIUMGroupGetByTechID** retrieves the group record based on a given group's technical ID.

```
SAPIUM int SAPIUMGroupGetByTechID(
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_TECH_ID               GroupTechID,
  SAPI_UM_GROUP_RECORD       *GroupRecord
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupTechID

[in] The technical identity of the group.

GroupRecord

[out] The group information.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_FAILED_TO_GET_GROUP`	Failed to get group information.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMGroupAdd, SAPIUMGroupUpdate

SAPIUMGroupGetByName

The **SAPIUMGroupGetByName** retrieves the group record based on a given group name.

```
SAPIUM int SAPIUMGroupGetByName(
  SAPI_UM_SES_HANDLE         Handle,
  SAPI_LPCSWSTR              GroupName,
  SAPI_UM_GROUP_RECORD       *GroupRecord
);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupName

[in] The name of the group.

GroupRecord

[out] The group information.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.
`SAPI_ERR_FAILED_TO_GET_GROUP`	Failed to get group information.

Remarks

The user under whose credentials this operation is performed must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMGroupAdd, SAPIUMGroupUpdate

SAPIUMGroupExtDataUpdate

The **SAPIUMGroupExtDataUpdate** updates the extended information of a given group, for example, the maximum allowed number of users in the group.

```
SAPIUM int SAPIUMExtDataUpdate(
  SAPI_UM_SES_HANDLE              Handle,
  SAPI_TECH_ID                    GroupTechID,
  SAPI_UM_ENUM_GROUP_VALUE_NAME   ValueType,
  long                            *IntVal,
  char                            *StrVal);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupTechID

[in] The technical identity of the group.

ValueType

[in] The type of information being updated. For more information refer to the SAPI_UM_ENUM_GROUP_VALUE_NAME enumerated type.

IntVal

[in] The updated new value if the updated value is an integer type.

StrVal

[in] The updated new value if the updated value is a string type.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.

Remarks

The user performing this operation must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMGroupAdd, SAPIUMGroupUpdate, SAPIUMGroupExtDataGet

SAPIUMGroupExtDataGet

The **SAPIUMGroupExtDataGet** gets the extended information of a given group.

```
SAPIUM int SAPIUMExtDataUpdate(
  SAPI_UM_SES_HANDLE              Handle,
  SAPI_TECH_ID                    GroupTechID,
  SAPI_UM_ENUM_GROUP_VALUE_NAME   ValueType,
  long                            *IntVal,
  char                            *StrVal);
```

Parameters

Handle

[in] Handle of the SAPIUM session. This handle must have been created using SAPIUMHandleAcquire.

GroupTechID

[in] The technical identity of the group.

ValueType

[in] The type of information being retrieved. For more information refer to the SAPI_UM_ENUM_GROUP_VALUE_NAME enumerated type.

IntVal

[out] The retrieved value if the value is an integer type.

StrVal

[out] The retrieved value if the value is a string type.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_SESSION_IS_NULL`	SAPIUM session handle is NULL, was not created using SAPIUMHandleAcquire, or is corrupt.

Remarks

The user performing this operation must have user admin privileges.

See Also

SAPIUMHandleAcquire, SAPIUMGroupAdd, SAPIUMGroupUpdate, SAPIUMGroupExtDataUpdate

SAPIUMSCPSet

The **SAPIUMSCPSet** function sets the CoSign address in the current machine settings. The CoSign client on this machine will use this address whenever it needs to connect to CoSign.

```
SAPIUM int SAPIUMSCPSet (
  char                      *Address
);
```

Parameters

Address

[in] The CoSign address.

Return Values

If the function succeeds, the return value is `SAPI_OK`.

Some possible error codes are listed in the following table.

Value	Meaning
`SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED`	*Address* should not be NULL.
`SAPI_ERR_FAILED_TO_SET_SCP`	An error occurred while trying to set the CoSign address. Call SAPIUMExtendedLastErrorGet for more information about the exact problem.

Remarks

Calling this function requires administrative rights on the local machine.

The CoSign IP address can also be set by MS group policy configuration. For more information, see the *Distributing the CoSign Client Configuration* section in chapter 8 of the *CoSign Administrators Guide*.

If the address of CoSign has changed, the settings should be changed either by using this function or by using the MS group policy configuration.

This function does not check whether the address is a valid CoSign address.

Signature Local COM Methods for Signing and Verifying

The following sections describe in detail the SAPI COM methods for Signing and Verifying.

SAPICryptCOM Functions

SAPICryptCOM refers to the CoSign Signature Local COM signing and verifying functions. This chapter lists the SAPICryptCOM interface API functions, and their corresponding SAPICrypt API functions. For a full description of each SAPICryptCOM interface API function, see the description of its corresponding SAPICrypt API function in the SAPICrypt Reference section.

Init

This function corresponds to the SAPICrypt SAPIInit function.

```
Integer Init ()
```

HandleAcquire

This function corresponds to the SAPICrypt SAPIHandleAcquire function.

```
Integer HandleAcquire (
  SESHandle                  ref Handle
)
```

ConfigurationValueGet

This function corresponds to the SAPICrypt SAPIConfigurationValueGet function.

```
Integer ConfigurationValueGet(
  SESHandle                  Handle,
  SAPI_ENUM_CONF_ID          ConfValueID,
  SAPI_ENUM_DATA_TYPE        ref ConfValueType,
  VARIANT                    ref Value,
  BOOL                       SessionValue
)
```

ConfigurationValueSet

This function corresponds to the SAPICrypt SAPIConfigurationValueSet function.

```
Integer ConfigurationValueSet(
  SESHandle                  Handle,
  SAPI_ENUM_CONF_ID          ConfValueID,
  SAPI_ENUM_DATA_TYPE        ConfValueType,
  VARIANT                    Value,
  BOOL                       SessionValue
)
```

ContextRelease

This function corresponds to the SAPICrypt SAPIContextRelease function.

```
Integer ContextRelease (
  SAPIContext                Context
)
```

HandleRelease

This function corresponds to the SAPICrypt SAPIHandleRelease function.

```
Integer HandleRelease (
  SESHandle                 Handle
)
```

Finalize

This function corresponds to the SAPICrypt SAPIFinalize function.

```
Integer Finalize ()
```

ExtendedLastErrorGet

This function corresponds to the SAPICrypt SAPIExtendedLastErrorGet function.

```
Integer ExtendedLastErrorGet ()
```

LibInfoGet

This function corresponds to the SAPICrypt SAPILibInfoGet function.

```
Integer LibInfoGet (
  InfoStruct                ref InfoStruct
)
```

LogonEx2

This function corresponds to the SAPICrypt SAPILogonEx function.

```
Integer Logon (
  SESHandle                 Handle,
  BSTR                      UserLoginName,
  BSTR                      DomainName,
  SAPIByteArray             Password,
  Integer                   Flags,
)
```

LogonEx

This function corresponds to the SAPICrypt SAPILogon function. The only difference between **LogonEx** and **Logon** is that in **LogonEx** the password field is a byte array.

```
Integer Logon (
  SESHandle                 Handle,
  BSTR                      UserLoginName,
  BSTR                      DomainName,
  SAPIByteArray             Password
)
```

Logon

This function corresponds to the SAPICrypt SAPILogonEx function.

```
Integer Logon (
  SESHandle                   Handle,
  BSTR                        UserLoginName,
  BSTR                        DomainName,
  BSTR                        Password
)
```

Logoff

This function corresponds to the SAPICrypt SAPILogoff function.

```
Integer Logoff (
  SESHandle                   Handle
)
```

CredentialChange

This function corresponds to the SAPICrypt SAPICredentialChange function.

```
Integer CredentialChange (
  SESHandle                   Handle,
  BSTR                        UserLoginName,
  BSTR                        OldPassword,
  BSTR                        NewPassword
)
```

UserActivate

This function corresponds to the SAPICrypt SAPIUserActivate function.

```
Integer UserAcrivate (
  SESHandle                   Handle,
  BSTR                        UserLoginName,
  BSTR                        Password,
  BSTR                        NewPassword,
  BSTR                        ExtCreds,
  long                        Flags
)
```

CAInfoGetInit

This function corresponds to the SAPICrypt SAPICAInfoGetInit function.

```
Integer CAInfoGetInit (
  SESHandle                   Handle,
  SAPIContext                 ref CAInfoContext,
  BSTR                        ref CAPublishLocation,
  SAPI_ENUM_CA_INFO_TYPE      CAInfoType
)
```

CAInfoGetCont

This function corresponds to the SAPICrypt SAPICAInfoGetCont function.

```
Integer CAInfoGetCont (
  SESHandle                   Handle,
  SAPIContext                 CAInfoContext,
  SAPIByteArray               ref CAInfoBlock,
  BOOL                        ref LastBlock
)
```

CACertInstall

This function corresponds to the SAPICrypt SAPICACertInstall function.

```
Integer CACertInstall (
  SESHandle                   Handle,
  SAPIByteArray               RootCert,
  SAPI_ENUM_STORE_TYPE        SystemStoreType
)
```

GetTokenID

This function corresponds to the SAPIGetTokenID function.

```
Integer GetTokenID (
  SESHandle                   Handle,
  BSTR                        TokenID
)
```

SetTokenID

This function corresponds to the SAPISetTokenID function.

```
Integer Logon (
  SESHandle                   Handle,
  BSTR                        TokenID
)
```

TimeGet

This function corresponds to the SAPICrypt SAPITimeGet function.

```
Integer TimeGet (
  SESHandle                   Handle,
  SAPIFileTime                ref SystemTime
)
```

CreateFileHandleByMem

This function corresponds to the SAPICrypt SAPICreateFileHandleByMem function.

```
Integer CreateFileHandleByMem (
  FileHandle                  out FileHandle,
  SAPI_ENUM_FILE_TYPE         FileType,
  Integer                     Flags,
  SAPI_Byte_Array             FileBuffer
)
```

CreateFileHandleByName

This function corresponds to the SAPICrypt SAPICreateFileHandleByName function.

```
Integer CreateFileHandleByName (
  FileHandle                  out FileHandle,
  SAPI_ENUM_FILE_TYPE         FileType,
  Integer                     Flags,
  BSTR                        FileUNC
)
```

GetFileMemData

This function corresponds to the SAPICrypt SAPIGetFileMemData function.

```
Integer GetFileMemData (
  FileHandle                  FileHandle,
  Integer                     Flags,
  SAPI_Byte_Array             FileBuffer
)
```

GetFileHandleType

This function corresponds to the SAPICrypt SAPIGetFileHandleTypefunction.

```
Integer GetFileHandleType (
  FileHandle                        FileHandle,
  SAPI_ENUM_FILE_HANDLE_TYPE out FileHandleType
)
```

SignatureFieldEnumInitEx

This function corresponds to the SAPICrypt SAPISignatureFieldEnumInitEx function.

```
Integer SignatureFieldEnumInitEx (
  SESHandle                   Handle,
  SAPIContext                 ref SigFieldContext,
  SAPI_ENUM_FILE_TYPE         FileType,
  BSTR                        FileUNC,
  FileHandle                  FileHandle,
  Integer                     Flags,
  Integer                     ref SignatureFieldsNum
)
```

SignatureFieldEnumInit

This function corresponds to the SAPICrypt **SAPISignatureFieldEnumInit** function, which is the older version of the SAPISignatureFieldEnumInitEx function.

```
Integer SignatureFieldEnumInit (
  SESHandle                   Handle,
  SAPIContext                 ref SigFieldContext,
  SAPI_ENUM_FILE_TYPE         FileType,
  BSTR                        FileUNC,
  Integer                     Flags,
  Integer                     ref SignatureFieldsNum
)
```

SignatureFieldEnumCont

This function corresponds to the SAPICrypt SAPISignatureFieldEnumCont function.

```
Integer SignatureFieldEnumCont (
  SESHandle                 Handle,
  SAPIContext               SigFieldContext,
  sigFieldHandle            ref SignatureFieldHandle
)
```

SignatureFieldLocatorEnumInit

This function corresponds to the SAPICrypt SAPISignatureFieldLocatorEnumInit function.

```
Integer SignatureFieldEnumInit (
  SESHandle                 Handle,
  SAPIContext               SigFieldLocatorContext,
  FileHandle                FileHandle,
  BSTR                      OpeningPatern,
  BSTR                      ClosingPatern,
  Integer                   Flags,
  Integer                   out SignatureFieldsLocatedNum
)
```

SignatureFieldLocatorEnumCont

This function corresponds to the SAPICrypt SAPISignatureFieldLocatorEnumCont function.

```
Integer SignatureFieldEnumCont (
  SESHandle                 Handle,
  SAPIContext               SigFieldLocatorContext,
  SigFieldSettings          SigFieldSettings,
  BSTR                      out EncodedMessage
)
```

SignatureFieldInfoGet

This function corresponds to the SAPICrypt SAPISignatureFieldInfoGet function.

```
Integer SignatureFieldInfoGet (
  SESHandle                 Handle,
  SigFieldHandle            SignatureFieldHandle,
  SigFieldSettings          ref SignatureFieldSettingStruct,
  SigFieldInfo              ref SignedFieldInfoStruct
)
```

SignatureFieldCreateEx

This function corresponds to the SAPICrypt SAPISignatureFieldCreateEx function.

```
Integer SignatureFieldCreateEx (
  SESHandle                 Handle,
  SAPI_ENUM_FILE_TYPE       FileType,
  BSTR                      FileUNC,
  FileHandle                FileHandle,
  SigFieldSettings          NewSignatureFieldStruct,
  Integer                   Flags,
  SigFieldHandle            ref SignatureFieldHandle
)
```

SignatureFieldCreate

This function corresponds to the SAPICrypt SAPISignatureFieldCreate function, which is the older version of the SAPISignatureFieldCreateEx function.

```
Integer SignatureFieldCreate (
  SESHandle                 Handle,
  SAPI_ENUM_FILE_TYPE       FileType,
  BSTR                      FileUNC,
  SigFieldSettings          NewSignatureFieldStruct,
  Integer                   Flags,
  SigFieldHandle            ref SignatureFieldHandle
)
```

SignatureFieldSignEx2

This function corresponds to the SAPICrypt SAPISignatureFieldSignEx function.
The difference between **SignaturefieldSignEx** and **SignaturefieldSignEx2** is that in **SignaturefieldSignEx2** the credentials are passed as a byte array.

```
Integer SignatureFieldSignEx (
  SESHandle                 Handle,
  SigFieldHandle            SignatureFieldHandle,
  Integer                   Flags,
  SAPIByteArray             Credential
)
```

SignatureFieldSignEx

This function corresponds to the SAPICrypt SAPISignatureFieldSignEx function.

```
Integer SignatureFieldSignEx (
  SESHandle                 Handle,
  SigFieldHandle            SignatureFieldHandle,
  Integer                   Flags,
  BSTR                      Credential
)
```

SignatureFieldSign

This function corresponds to the SAPICrypt SAPISignatureFieldSign function, which is the older version of the SAPISignatureFieldSignEx function.

```
Integer SignatureFieldSign (
  SESHandle                 Handle,
  SigFieldHandle            SignatureFieldHandle,
  Integer                   Flags
)
```

SignatureFieldCreateSignEx2

This function corresponds to the SAPICrypt SAPISignatureFieldCreateSignEx function.

```
Integer SignatureFieldCreateSignEx2 (
  SESHandle                  Handle,
  SAPI_ENUM_FILE_TYPE        FileType,
  BSTR                       FileUNC,
  FileHandle                 FileHandle,
  SigFieldSettings           NewSignatureFieldStruct,
  Integer                    Flags,
  SAPIByteArray              Credential
)
```

SignatureFieldCreateSignEx

This function corresponds to the SAPICrypt SAPISignatureFieldCreateSign function, which is the older version of the SAPISignatureFieldCreateSignEx function.
The difference between **SignatureFieldCreateSign** and **SignatureFieldCreateSignEx** is that in **SignatureFieldCreateSignEx** the credentials are passed as a byte array.

```
Integer SignatureFieldCreateSign (
  SESHandle                  Handle,
  SAPI_ENUM_FILE_TYPE        FileType,
  BSTR                       FileUNC,
  SigFieldSettings           NewSignatureFieldStruct,
  Integer                    Flags,
  SAPIByteArray              Credential
)
```

SignatureFieldCreateSign

This function corresponds to the SAPICrypt SAPISignatureFieldCreateSign function, which is the older version of the SAPISignatureFieldCreateSignEx function.

```
Integer SignatureFieldCreateSign (
  SESHandle                  Handle,
  SAPI_ENUM_FILE_TYPE        FileType,
  BSTR                       FileUNC,
  SigFieldSettings           NewSignatureFieldStruct,
  Integer                    Flags,
  BSTR                       Credential
)
```

SignatureFieldVerify

This function corresponds to the SAPICrypt SAPISignatureFieldVerify function.

```
Integer SignatureFieldVerify (
  SESHandle                  Handle,
  SigFieldHandle             SignatureFieldHandle,
  CertStatus                 ref CertificateStatus,
  Integer                    Flags
)
```

FileIsSignedEx

This function corresponds to the SAPICrypt SAPIFileIsSignedEx function.

```
Integer FileIsSignedEx (
  SESHandle                  Handle,
  SAPI_ENUM_FILE_TYPE        FileType,
  BSTR                       FileUNC,
  FileHandle                 FileHandle,
  Integer                    Flags,
  BOOL                       ref IsSigned,
)
```

FileIsSigned

This function corresponds to the SAPICrypt SAPIFileIsSigned function, which is the older version of the SAPIFileIsSignedEx function.

```
Integer FileIsSigned (
  SESHandle                  Handle,
  SAPI_ENUM_FILE_TYPE        FileType,
  BSTR                       FileUNC,
  Integer                    Flags,
  BOOL                       ref IsSigned,
)
```

SignatureFieldClear

This function corresponds to the SAPICrypt SAPISignatureFieldClear function.

```
Integer SignatureFieldClear (
  SESHandle                  Handle,
  SigFieldHandle             SignatureFieldHandle,
  Integer                    Flags
)
```

SignatureFieldRemove

This function corresponds to the SAPICrypt SAPISignatureFieldRemove function.

```
Integer SignatureFieldRemove (
  SESHandle                  Handle,
  SigFieldHandle             SignatureFieldHandle,
  Integer                    Flags
)
```

SignatureFieldDetailsGUIGet

This function corresponds to the SAPICrypt SAPISignatureFieldDetailsGUIGet function.

```
Integer SignatureFieldRemove (
  SESHandle                  Handle,
  SigFieldHandle             SignatureFieldHandle
)
```

CertificatesEnumInit

This function corresponds to the SAPICrypt SAPICertificatesEnumInit function.

```
Integer CertificatesEnumInit (
  SESHandle                   Handle,
  SAPIContext                 ref CertContext,
  Integer                     Flags
)
```

CertificatesEnumCont

This function corresponds to the SAPICrypt SAPICertificatesEnumCont function.

```
Integer CertificatesEnumCont (
  SESHandle                   Handle,
  SAPIContext                 CertContext,
  ICertHandle                 ref CertHandle
)
```

CertificateGetFieldByHandle

This function corresponds to the SAPICrypt SAPICertificateGetFieldByHandle function.

```
Integer CertificateGetFieldByHandle (
  SESHandle                   Handle,
  ICertHandle                 CertHandle,
  SAPI_ENUM_CERT_FIELD        FieldID,
  VARIANT                     ref Value,
  SAPI_ENUM_DATA_TYPE         ref FieldType
)
```

CertificateGetFieldByBlob

This function corresponds to the SAPICrypt SAPICertificateGetFieldByBlob function.

```
Integer CertificateGetFieldByBlob (
  SESHandle                       Handle,
  SAPIByteArray                   EncodedCertificate,
  SAPI_ENUM_CERT_FIELD            FieldID,
  VARIANT                         ref Value,
  SAPI_ENUM_DATA_TYPE__RPC_FAR    ref FieldType
)
```

PKCS7BlobGetValue

This function corresponds to the SAPICrypt SAPIPKCS7BlobGetValue function.

```
Integer PKCS7BlobGetValue (
  SESHandle                   Handle,
  SAPIByteArray               PKCS7Blob,
  SAPI_ENUM_PKCS7_FIELD       FieldID,
  VARIANT                     ref Value,
  SAPI_ENUM_DATA_TYPE         ref FieldType
)
```

CertificateGUISelect

This function corresponds to the SAPICrypt SAPICertificateGUISelect function.

```
Integer CertificateGUISelect (
  SESHandle                   Handle,
  Integer                     Flags,
  ICertHandle                 ref CertHandle
)
```

CertificateSetDefault

This function corresponds to the SAPICrypt SAPICertificateSetDefault function.

```
Integer CertificateSetDefault (
  SESHandle                   Handle,
  ICertHandle                 CertHandle
)
```

CertificateGetDefault

This function corresponds to the SAPICrypt SAPICertificateGetDefault function.

```
Integer CertificateGetDefault (
  SESHandle                   Handle,
  ICertHandle                 ref CertHandle
)
```

GraphicSigImageEnumInit

This function corresponds to the SAPICrypt SAPIGraphicSigImageEnumInit function.

```
Integer GraphicSigImageEnumInit (
  SESHandle                   Handle,
  SAPIContext                 ref GraphicImageContext,
  Integer                     FormatsPermitted,
  Integer                     Flags
)
```

GraphicSigImageEnumCont

This function corresponds to the SAPICrypt SAPIGraphicSigImageEnumCont function.

```
Integer GraphicSigImageEnumCont (
  SESHandle                   Handle,
  SAPIContext                 GrImageContext,
  GraphicImageHandle          ref GraphicImageHandle
)
```

GraphicSigImageGUISelect

This function corresponds to the SAPICrypt SAPIGraphicSigImageGUISelect function.

```
Integer GraphicSigImageGUISelect (
  SESHandle                       Handle,
  Integer                         FormatsPermitted,
  Integer                         Flags,
  SAPI_ENUM_GR_IMAGE_SELECT_MODE  selectMode,
  GraphicImageHandle              ref GraphicImageHandle
)
```

SigningCeremonyGUI

This function corresponds to the SAPICrypt SAPISigningCeremonyGUI function.

```
Integer SigningCeremonyGUI (
  SESHandle                                 Handle,
  Integer                                   Flags,
  Integer                                   DisplayComponentsMask,
  Integer                                   FormatsPermitted,
  BSTR                                      InstructToSigner,
  SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE    ImageSelection,
  SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE    CertSelection,
  SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE    ReasonSelection,
  SAPI_ENUM_CEREMONY_COMPONENT_SHOW_MODE    TitleSelection,
  SAPI_ENUM_GR_IMAGE_SELECT_MODE            selectMode
)
```

GraphicSigImageSetDefault

This function corresponds to the SAPICrypt SAPIGraphicSigImageSetDefault function, which is the older version of the SAPIGraphicSigImageSetDefaultEx function.

```
Integer GraphicSigImageSetDefault (
  SESHandle                 Handle,
  GraphicImageHandle        GraphicImageHandle
)
```

GraphicSigImageSetDefaultEx

This function corresponds to the SAPICrypt SAPIGraphicSigImageSetDefaultEx function.

```
Integer GraphicSigImageSetDefaultEx (
  SESHandle                 Handle,
  GraphicImageHandle        GraphicImageHandle,
  Integer                   Flags
)
```

GraphicSigImageGetDefault

This function corresponds to the SAPICrypt SAPIGraphicSigImageGetDefault function, which is the older version of the SAPIGraphicSigImageGetDefaultEx function.

```
Integer GraphicSigImageGetDefault (
  SESHandle                 Handle,
  GraphicImageHandle        ref GraphicImageHandle
)
```

GraphicSigImageGetDefaultEx

This function corresponds to the SAPICrypt SAPIGraphicSigImageGetDefaultEx function.

```
Integer GraphicSigImageGetDefaultEx (
  SESHandle                 Handle,
  GraphicImageHandle        ref GraphicImageHandle,
  Integer                   Flags
)
```

GraphicSigImageInfoGet

This function corresponds to the SAPICrypt SAPIGraphicSigImageInfoGet function.

```
Integer GraphicSigImageInfoGet (
  SESHandle                         Handle,
  GraphicImageHandle                GraphicImageHandle,
  GraphicImageInfo                  ref GraphicImageInfo,
  SAPI_ENUM_GRAPHIC_IMAGE_FORMAT    Convert,
  Integer                           Flags
)
```

GraphicSigImageInfoCreate

This function corresponds to the SAPICrypt SAPIGraphicSigImageInfoCreate function.

```
Integer GraphicSigImageInfoCreate (
  SESHandle                   Handle,
  GraphicImageHandle          ref GraphicImageHandle,
  GraphicImageInfo            ref GraphicImageInfo
)
```

GraphicSigInitialsInfoCreate

This function corresponds to the SAPICrypt SAPIGraphicSigInitialsInfoCreate function.

```
Integer GraphicSigImageInfoCreate (
  SESHandle                   Handle,
  GraphicImageHandle          ref GraphicImageHandle,
  GraphicImageInfo            ref GraphicImageInfo
)
```

GraphicSigLogoInfoCreate

This function corresponds to the SAPICrypt SAPIGraphicSigLogoInfoCreate function.

```
Integer GraphicSigLogoInfoCreate (
  SESHandle                   Handle,
  GraphicImageHandle          ref GraphicImageHandle,
  GraphicImageInfo            ref GraphicImageInfo
)
```

GraphicSigImageInfoDelete

This function corresponds to the SAPICrypt SAPIGraphicSigImageInfoDelete function.

```
Integer GraphicSigImageInfoDelete (
  SESHandle                   Handle,
  GraphicImageHandle          GraphicImageHandle
)
```

GraphicSigImageInfoUpdate

This function corresponds to the SAPICrypt SAPIGraphicSigImageInfoUpdate function.

```
Integer GraphicSigImageInfoUpdate (
  SESHandle                   Handle,
  GraphicImageHandle          GraphicImageHandle,
  GraphicImageInfo            GraphicImageInfo,
  Integer                     Flags
)
```

GraphicSigInitialsInfoUpdate

This function corresponds to the SAPICrypt SAPIGraphicSigInitialsInfoUpdate function.

```
Integer GraphicSigInitialsInfoUpdate (
  SESHandle                   Handle,
  GraphicImageHandle          GraphicImageHandle,
  GraphicImageInfo            GraphicImageInfo,
  Integer                     Flags
)
```

GraphicSigLogoInfoUpdate

This function corresponds to the SAPICrypt SAPIGraphicSigLogoInfoUpdate function.

```
Integer GraphicSigLogoInfoUpdate (
  SESHandle                   Handle,
  GraphicImageHandle          GraphicImageHandle,
  GraphicImageInfo            GraphicImageInfo,
  Integer                     Flags
)
```

BufferSignEx2

This function corresponds to the SAPICrypt **SAPIBufferSignEx** function.
The difference between **BufferSignEx** and **BufferSignEx2** is that in **BufferSignEx2** the credentials are passed as a byte array.

```
Integer BufferSignEx (
  SESHandle                   Handle,
  SAPIByteArray               Buffer,
  SAPIByteArray               SignedData,
  Integer                     Flags,
  SAPIByteArray               Credential
)
```

BufferSignEx

This function corresponds to the SAPICrypt SAPIBufferSignEx function.

```
Integer BufferSignEx (
  SESHandle                   Handle,
  SAPIByteArray               Buffer,
  SAPIByteArray               SignedData,
  Integer                     Flags,
  BSTR                        Credential
)
```

BufferSign

This function corresponds to the SAPICrypt SAPIBufferSign function, which is the older version of the SAPIBufferSignEx function.

```
Integer BufferSign (
  SESHandle                 Handle,
  SAPIByteArray             Buffer,
  SAPIByteArray             SignedData,
  Integer                   Flags
)
```

BufferSignInit

This function corresponds to the SAPICrypt SAPIBufferSignInit function.

```
Integer BufferSignInit (
  SESHandle                 Handle,
  SAPIContext               ref SignContext,
  Integer                   Flags
)
```

BufferSignCont

This function corresponds to the SAPICrypt SAPIBufferSignCont function.

```
Integer BufferSignCont (
  SESHandle                 Handle,
  SAPIContext               SignContext,
  SAPIByteArray             Buffer
)
```

BufferSignEndEx2

This function corresponds to the SAPICrypt SAPIBufferSignEndEx function.
The difference between **BufferSignEndEx** and **BufferSignEndEx2** is that in **BufferSignEndEx2** the credentials are passed as a byte array.

```
Integer BufferSignEndEx (
  SESHandle                 Handle,
  SAPIContext               SignContext,
  SAPIByteArray             SignedData,
  SAPIByteArray             Credential
)
```

BufferSignEndEx

This function corresponds to the SAPICrypt SAPIBufferSignEndEx function.

```
Integer BufferSignEndEx (
  SESHandle                 Handle,
  SAPIContext               SignContext,
  SAPIByteArray             SignedData,
  BSTR                      Credential
)
```

BufferSignEnd

This function corresponds to the SAPICrypt SAPIBufferSignEnd function, which is the older version of the SAPIBufferSignEndEx function.

```
Integer BufferSignEnd (
  SESHandle                   Handle,
  SAPIContext                 SignContext,
  SAPIByteArray               ref SignedData
)
```

SigningContextPKCS7BlobLenGet

This function corresponds to the SAPICrypt SAPISigningContextPKCS7BlobLenGet function.

```
Integer SigningContextPKCS7BlobLenGet (
  SESHandle                   Handle,
  SAPIContext                 SignContext,
  Integer                     ref SignatureLen
)
```

BufferVerifySignature

This function corresponds to the SAPICrypt SAPIBufferVerifySignature function.

```
Integer BufferVerifySignature (
  SESHandle                   Handle,
  SAPIByteArray               Buffer,
  SAPIByteArray               SignedData,
  SAPIFileTime                ref SignatureTime,
  CertStatus                  ref CertificateStatus,
  Integer                     Flags
)
```

BufferVerifySignatureInit

This function corresponds to the SAPICrypt SAPIBufferVerifySignatureInit function.

```
Integer BufferVerifySignatureInit (
  SESHandle                   Handle,
  SAPIContext                 ref VerifyContext,
  SAPIByteArray               SignedData,
  Integer                     Flags
)
```

BufferVerifySignatureCont

This function corresponds to the SAPICrypt SAPIBufferVerifySignatureCont function.

```
Integer BufferVerifySignatureCont (
  SESHandle                   Handle,
  SAPIContext                 VerifyContext,
  SAPIByteArray               Buffer
)
```

BufferVerifySignatureEnd

This function corresponds to the SAPICrypt SAPIBufferVerifySignatureEnd function.

```
Integer BufferVerifySignatureEnd (
  SESHandle                  Handle,
  SAPIContext                VerifyContext,
  SAPIFileTime               ref SignatureTime,
  CertStatus                 ref CertificateStatus
)
```

LoginTicketCheckInit, LoginTicketCheckCont, and LoginTicketCheckEnd

Contact ARX for more information.

SAPICOM Samples

The following samples illustrate the usage of the SAPICOM interface. These samples are located on the SAPI SDK CD in the `samples\SAPICOM` directory.

Sample 1 – Buffer Signing Code Using VB.NET

The following sample is code that illustrates signing a simple buffer in a VB .NET project.

```
Rem The following function is called as part of a signature operation.
Rem The digital signature in a base64 encoding will be directed to a special field.

Private Sub Sign_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Sign.Click

        Dim SAPI As New SAPICrypt
        Dim MyHandle As New SESHandle
        Dim MyInputData As New SAPIByteArray
        Dim MySignature As New SAPIByteArray
        Dim rc As Int32
        Dim Enc As New System.Text.ASCIIEncoding
        Rem Convert the string input data to binary information.
        MyInputData.FromArray(Enc.GetBytes(Data.Text))
        Rem Initialize SAPI.
        rc = SAPI.Init()
        If rc <> 0 Then
            MsgBox("Init failed: " + CStr(Hex(rc)))
            Exit Sub
        End If
        Rem Acquire the session handle.
        rc = SAPI.HandleAcquire(MyHandle)
        If rc <> 0 Then
            MsgBox("HandleAcquire failed: " + CStr(Hex(rc)))
            SAPI.Finalize()
            Exit Sub
        End If
        Rem If necessary, login (depending on whether the User ID has a value.
        If UserID.Text <> "" Then
            rc = SAPI.Logon(MyHandle, UserID.Text, Domain.Text, Password.Text)
            If rc <> 0 Then
                MsgBox("Login failed: " + CStr(Hex(rc)))
                SAPI.HandleRelease(MyHandle)
                SAPI.Finalize()
                Exit Sub
            End If
        End If
        Rem Sign the given buffer.
        rc = SAPI.BufferSign(MyHandle, MyInputData, MySignature, 0)
        If rc <> 0 Then
            MsgBox("BufferSign failed: " + CStr(Hex(rc)))
            SAPI.HandleRelease(MyHandle)
            SAPI.Finalize()
            Exit Sub
        End If
        Rem Convert the signature to a Base64 string.
        Signature.Text = Convert.ToBase64String(MySignature.ToArray())
        Signature.Refresh()
        Rem Logoff.
        If UserID.Text <> "" Then
            SAPI.Logoff(MyHandle)
        End If
        Rem Release resources.
        SAPI.HandleRelease(MyHandle)
        SAPI.Finalize()
    End Sub
```

This function is called from a GUI application that enables an end user to sign a given data buffer.

This function uses either the default user, or a given user's credentials, depending on the value of the UserID field.

Sample 2 – Buffer Verification Code Using VB .NET

The following sample is code that illustrates verifying a simple buffer in a VB .NET project.

```
Rem This function will verify the existing digital signature.
Rem A success message box will be displayed upon successful verification.
 Private Sub Verify_Click(ByVal sender As System.Object, ByVal e As
   System.EventArgs) Handles Verify.Click
     Dim SAPI As New SAPICrypt
     Dim MyHandle As New SESHandle
     Dim MyInputData As New SAPIByteArray
     Dim MySignature As New SAPIByteArray
     Dim rc As Int32
     Dim Enc As New System.Text.ASCIIEncoding
     Dim SigTime As New SAPIFileTime
     Dim CertStatus As New CertStatus
     Rem Get the original data.
     MyInputData.FromArray(Enc.GetBytes(Data.Text))
     Rem Convert the signature from base64 format to binary format.
     MySignature.FromArray(Convert.FromBase64String(Signature.Text))
     Rem Initialize SAPI.
     rc = SAPI.Init()
     If rc <> 0 Then
         MsgBox("Init failed: " + CStr(Hex(rc)))
         Exit Sub
     End If
     Rem Acquire the session handle.
     rc = SAPI.HandleAcquire(MyHandle)
     If rc <> 0 Then
         MsgBox("HandleAcquire failed: " + CStr(Hex(rc)))
         SAPI.Finalize()
         Exit Sub
     End If
     Rem If necessary, login depending on the UserID field.
     If UserID.Text <> "" Then
         rc = SAPI.Logon(MyHandle, UserID.Text, Domain.Text, Password.Text)
         If rc <> 0 Then
             MsgBox("Login failed: " + CStr(Hex(rc)))
             SAPI.HandleRelease(MyHandle)
             SAPI.Finalize()
             Exit Sub
         End If
     End If
     Rem Verify the digital signature.
     rc = SAPI.BufferVerifySignature(MyHandle, MyInputData, MySignature,
               SigTime, CertStatus, 0)
     If rc <> 0 Then
         MsgBox("BufferVerifySignature failed: " + CStr(Hex(rc)))
         SAPI.HandleRelease(MyHandle)
         SAPI.Finalize()
         Exit Sub
     Else
         MsgBox("Success!")
     End If
     Rem Logoff.
     If UserID.Text <> "" Then
         SAPI.Logoff(MyHandle)
     End If
     Rem Release resources.
     SAPI.HandleRelease(MyHandle)
     SAPI.Finalize()
 End Sub
```

This function is called from a GUI application that enables an end user to verify a signature of a given data buffer.

Signature Local COM Methods for User Management

The following sections describe in detail the SAPI COM methods for User Management.

SAPIUMCOM Functions

SAPIUMCOM refers to the CoSign Signature Local COM user management functions. This chapter lists the SAPIUMCOM functions, and their corresponding SAPIUM API functions. For a detailed description of each SAPIUMCOM interface API function, see the description of its corresponding SAPIUM API function in the SAPIUM Reference section.

Init

This function corresponds to the SAPIUM SAPIUMInit function.

```
Integer Init ()
```

HandleAcquire

This function corresponds to the SAPIUM SAPIUMHandleAcquire function.

```
Integer HandleAcquire (
  UMSESHandle                ref Handle
)
```

HandleRelease

This function corresponds to the SAPIUM SAPIUMHandleRelease function.

```
Integer HandleRelease (
  UMSESHandle                Handle
)
```

Finalize

This function corresponds to the SAPIUM SAPIUMFinalize function.

```
Integer Finalize ()
```

ExtendedLastErrorGet

This function corresponds to the SAPIUM SAPIUMExtendedLastErrorGet function.

```
Integer ExtendedLastErrorGet ()
```

LibInfoGet

This function corresponds to the SAPIUM SAPIUMLibInfoGet function.

```
Integer LibInfoGet (
  InfoStruct                 ref InfoStruct
)
```

Logon

This function corresponds to the SAPIUM SAPIUMLogon function.

```
Integer Logon (
  UMSESHandle                Handle,
  BSTR                       UserLoginName,
  BSTR                       DomainName,
  BSTR                       Password
)
```

LogonEx

This function corresponds to the SAPIUM SAPIUMLogonEx function.

```
Integer LogonEx (
  UMSESHandle                Handle,
  BSTR                       UserLoginName,
  BSTR                       DomainName,
  SAPIUMByteArray            Password,
  Integer                    Flags
)
```

Logoff

This function corresponds to the SAPIUM SAPIUMLogoff function.

```
Integer Logoff (
  UMSESHandle                Handle
)
```

GetTokenID

This function corresponds to the SAPIUMGetTokenID function.

```
Integer GetTokenID (
  UMSESHandle                Handle,
  BSTR                       TokenID
)
```

SetTokenID

This function corresponds to the SAPIUMSetTokenID function.

```
Integer Logon (
  UMSESHandle                Handle,
  BSTR                       TokenID
)
```

UserAddEx1

This function corresponds to the SAPIUM SAPIUMUserAddEx1 function.

```
Integer UserAddEx1 (
  UMSESHandle                 Handle,
  BSTR                        UserLoginName,
  BSTR                        UserCN,
  BSTR                        EmailAddress,
  BSTR                        Password,
  long                        GroupTechID,
  Integer                     Flags
)
```

UserAdd

This function corresponds to the SAPIUM SAPIUMUserAdd function, which is the older version of the SAPIUMUserAddEx1 function, dating to before CoSign groups were introduced.

```
Integer UserAdd (
  UMSESHandle                 Handle,
  BSTR                        UserLoginName,
  BSTR                        UserCN,
  BSTR                        EmailAddress,
  BSTR                        Password,
  Integer                     Flags
)
```

UserUpdate

This function corresponds to the SAPIUM SAPIUMUserUpdate function.

```
Integer UserUpdate (
  UMSESHandle                 Handle,
  BSTR                        UserLoginName,
  BSTR                        UserCN,
  BSTR                        EmailAddress,
  Integer                     Flags
)
```

CredentialSet

This function corresponds to the SAPIUM SAPIUMCredentialSet function.

```
Integer CredentialSet (
  UMSESHandle                 Handle,
  BSTR                        UserLoginName,
  BSTR                        Password
)
```

UserSetLogonState

This function corresponds to the SAPIUM SAPIUMUserSetLogonState function.

```
Integer UserSetLogonState (
  UMSESHandle                           Handle,
  BSTR                                  UserLoginName,
  SAPI_UM_ENUM_USER_LOGIN_STATUS User    UserLogonStatus
);
```

CounterReset

This function corresponds to the SAPIUM SAPIUMCounterReset function.

```
Integer CounterReset (
  UMSESHandle                Handle,
  BSTR                       UserLoginName,
  SAPI_UM_ENUM_COUNTER_TYPE  CounterToReset
)
```

UserAssignGroup

This function corresponds to the SAPIUM SAPIUMUserAssignGroup function.

```
Integer UserAssignGroup (
  UMSESHandle                Handle,
  long                       UserTechID,
  long                       GroupTechID,
  Integer                    Flags
)
```

UserDelete

This function corresponds to the SAPIUM SAPIUMUserDelete function.

```
Integer UserDelete (
  UMSESHandle                Handle,
  BSTR                       UserLoginName
)
```

UsersSyncBegin

This function corresponds to the SAPIUM SAPIUMUsersSyncBegin function.

```
IntegerUsersSyncBegin (
  UMSESHandle                Handle,
  UMContext                  ref SyncContext
)
```

UserSync

This function corresponds to the SAPIUM SAPIUMUserSync function.

```
Integer UserSync (
  UMSESHandle                Handle,
  UMContext                  SyncContext
  BSTR                       UserLoginName,
  BSTR                       UserCN,
  BSTR                       EmailAddress,
  BSTR                       Password,
  Integer                    Flags
)
```

UsersSyncEnd

This function corresponds to the SAPIUM SAPIUMUsersSyncEnd function.

```
Integer UsersSyncEnd (
  UMSESHandle                Handle,
  UMContext                  SyncContext
)
```

UsersSyncStop

This function corresponds to the SAPIUM SAPIUMUsersSyncStop function.

```
Integer UsersSyncStop (
  UMSESHandle                Handle,
  UMContext                  SyncContext
)
```

UsersEnumInit

This function corresponds to the SAPIUM SAPIUMUsersEnumInit function.

```
Integer UsersEnumInit (
  UMSESHandle                Handle,
  UMContext                  UsersEnumContext,
  UsersFilter                UsersFilterStruct
)
```

UsersEnumCont

This function corresponds to the SAPIUM SAPIUMUsersEnumCont function.

```
Integer UsersEnumInit (
  UMSESHandle                Handle,
  UMContext                  UsersEnumContext,
  UserHandle                 ref UserHandle
)
```

UserInfoGet

This function corresponds to the SAPIUM SAPIUMUserInfoGet function, which is the older version of the SAPIUMUserInfoGetEx function. Note that the extended function **UserInfoGetEx** retrieves more information from the user account than **SAPIUMUserInfoGet** does.

```
Integer UserInfoGet (
  UMSESHandle                Handle,
  UserHandle                 UserHandle,
  BSTR                       ref UserLoginName,
  BSTR                       ref UserCN,
  BSTR                       ref EmailAddress,
  SAPI_UM_ENUM_USER_TYPE     ref Kind,
  Integer                    ref RightMask,
  Integer                    ref UpdateTime,
  BSTR                       ref Guid
)
```

UserInfoGetEx

This function corresponds to the SAPIUM SAPIUMUserInfoGetEx function.

```
Integer UserInfoGetEx (
  UMSESHandle                                  Handle,
  UserHandle                                   UserHandle,
  BSTR                                         ref UserLoginName,
  BSTR                                         ref UserCN,
  BSTR                                         ref EmailAddress,
  SAPI_UM_ENUM_USER_TYPE                       ref Kind,
  Integer                                      ref RightMask,
  Integer                                      ref UpdateTime,
  BSTR                                         ref Guid,
  SAPI_UM_ENUM_USER_ENROLLMENT_STATUS          ref EnrollmentStatus,
  SAPI_UM_ENUM_USER_ENROLLMENT_REASON          ref EnrollmentReason,
  SAPI_UM_ENUM_USER_LOGIN_STATUS               ref LoginStatus,
  Integer                                      ref Counter1,
  Integer                                      ref Counter2,
  Integer                                      ref Counter3,
  SAPI_UM_ENUM_USER_CERT_STATUS_TYPE           ref CertStatus,
  SAPI_UM_ENUM_PENDING_REQUEST_STATUS_TYPE     ref CertRequestStatus
)
```

UserGetByLoginName

This function corresponds to the SAPIUM SAPIUMUserGetByLoginName function.

```
Integer UserGetByLoginName (
  UMSESHandle                Handle,
  BSTR                       UserLoginName,
  UserHandle                 ref UserHandle
)
```

UserTechIDGet

This function corresponds to the SAPIUM SAPIUMUserTechIDGet function.

```
Integer UserTechIDGet (
  UMSESHandle                Handle,
  UserHandle                 UserHandle,
  long                       out UserTechID
)
```

GroupGetByUserGUID

This function corresponds to the SAPIUM SAPIUMGroupGetByUserGUID f unction.

```
Integer GroupGetByUserGUID (
  UMSESHandle                Handle,
  BSTR                       ref Guid,
  GroupRecord                out GroupRecord
)
```

GroupAdd

This function corresponds to the SAPIUM SAPIUMGroupAdd function.

```
Integer GroupAdd (
  UMSESHandle                Handle,
  GroupRecord                GroupRecord,
  long                       out GroupTechID
)
```

GroupUpdate

This function corresponds to the SAPIUM SAPIUMGroupUpdate function.

```
Integer GroupUpdate (
  UMSESHandle                Handle,
  GroupRecord                GroupRecord
)
```

GroupSetStatusByTechID

This function corresponds to the SAPIUM SAPIUMGroupSetStatusByTechID function

```
Integer GroupSetStatusByTechID (
  UMSESHandle                      Handle,
  long                             GroupTechID,
  SAPI_UM_ENUM_GROUP_STATUS_TYPE   GroupStatus
)
```

GroupDelete

This function corresponds to the SAPIUM SAPIUMGroupDelete function.

```
Integer GroupDelete (
  UMSESHandle                      Handle,
  long                             GroupTechID,
  Integer                          UserOp
)
```

GroupGetByTechID

This function corresponds to the SAPIUM SAPIUMGroupGetByTechID function.

```
Integer GroupGetByTechID (
  UMSESHandle                      Handle,
  long                             GroupTechID,
  GroupRecord                      out GroupRecord
)
```

GroupGetByName

This function corresponds to the SAPIUM SAPIUMGroupGetByName function.

```
Integer GroupGetByTechID (
  UMSESHandle                      Handle,
  BSTR                             GroupName,
  GroupRecord                      out GroupRecord
)
```

GroupsEnumInit

This function corresponds to the SAPIUM SAPIUMGroupsEnumInit function.

```
Integer GroupsEnumInit (
  UMSESHandle                       Handle,
  GroupContext                      GroupsEnumContext,
  SAPI_UM_ENUM_GROUPS_ORDER_TYPE    GroupsOrderType,
  BSTR                              StartValue,
  Integer                           StartNumberValue,
  Integer                           OrderDescending
)
```

GroupsEnumCont

This function corresponds to the SAPIUM SAPIUMGroupsEnumCont function.

Please note that this function returns a single group record. In this it differs from the SAPIUM **SAPIUMGroupsEnumCont** function, which returns a bunch of group records for every call.

```
Integer GroupsEnumCont (
  UMSESHandle                       Handle,
  GroupContext                      GroupsEnumContext,
  GroupRecord                       out GroupRecord
)
```

GroupExtDataUpdate

This function corresponds to the SAPIUM SAPIUMGroupUpdate function.

```
Integer GroupExtDataUpdate (
  UMSESHandle                       Handle,
  long                              GroupTechID,
  SAPI_UM_ENUM_GROUP_VALUE_NAME     ValueType,
  Integer                           ref IntVal,
  BSTR                              StrVal
)
```

GroupExtDataGet

This function corresponds to the SAPIUM SAPIUMGroupUpdate function.

```
Integer GroupExtDataGet (
  UMSESHandle                       Handle,
  long                              GroupTechID,
  SAPI_UM_ENUM_GROUP_VALUE_NAME     ValueType,
  Integer                           ref IntVal,
  BSTR                              ref StrVal
)
```

SCPSet

This function corresponds to the SAPIUM SAPIUMSCPSet function.

```
Integer SCPSet (
  BSTR                        Address
)
```

Appendices

The following sections provide additional supplementary information for the CoSign Signature Local signing, verifying, and user management API.

Appendix A: CoSign Signature Local – Signing/Verifying Structures

This appendix describes the structures that can be passed as parameters to the CoSign Signature Local functions.

SAPI_CONTEXT

SAPI_CONTEXT is a context value that is used by all the continuous operations. It must be passed to all the relevant functions without being changed by the application. Any change to SAPI_CONTEXT can lead to inconsistent and unexpected results.

```
typedef struct _SAPI_CONTEXT {
  SAPI_ENUM_CONTEXT_TYPE     ContextType;
  void                       *OpaqueData;
} SAPI_CONTEXT;
```

Members

ContextType

The type of the context. See SAPI_ENUM_CONTEXT_TYPE for possible values.

OpaqueData

Data that is being used internally by CoSign Signature Local. This data must not be changed by the application.

See Also

SAPIContextRelease, SAPICAInfoGetInit, SAPICAInfoGetCont, SAPISignatureFieldEnumInit, SAPISignatureFieldEnumCont, SAPICertificatesEnumInit, SAPICertificatesEnumCont, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEndEx, SAPIBufferSignEx, SAPISigningContextPKCS7BlobLenGet, SAPIBufferVerifySignatureInit, SAPIBufferVerifySignatureCont, SAPIBufferVerifySignatureEnd

SAPI_SF_TIME_FORMAT_STRUCT

SAPI_SF_TIME_FORMAT_STRUCT is a structure that contains the information about the time format in a signature field.

```
typedef struct {
  SAPI_ENUM_EXTENDED_TIME_FORMAT   ExtTimeFormat;
  SAPI_WCHAR                       DateFormat[DATE_FORMAT_MAX_LEN];
  SAPI_WCHAR                       TimeFormat[TIME_FORMAT_MAX_LEN];
} SAPI_SF_TIME_FORMAT_STRUCT;
```

Members

ExtTimeFormat

Extended time format. See SAPI_ENUM_EXTENDED_TIME_FORMAT for possible values.

DateFormat

The format string used to form the date string. The format string must be null terminated.

Use the following elements to construct a format string. If you use spaces to separate the elements in the format string, the spaces appear in the same location in the output string. The letters are case sensitive (for example, "MM" not "mm"). Characters in the format string that are enclosed in single quotation marks appear unchanged and in the same location in the output string.

Picture	Meaning
d	Day of the month as digits with no leading zero for single-digit days.
dd	Day of the month as digits with leading zero for single-digit days.
ddd	Day of the week as a three-letter abbreviation. The function uses the LOCALE_SABBREVDAYNAME value associated with the specified locale.
dddd	Day of the week as its full name. The function uses the LOCALE_SDAYNAME value associated with the specified locale.
M	Month as digits with no leading zero for single-digit months.
MM	Month as digits with leading zero for single-digit months.
MMM	Month as a three-letter abbreviation. The function uses the LOCALE_SABBREVMONTHNAME value associated with the specified locale.
MMMM	Month as its full name. The function uses the LOCALE_SMONTHNAME value associated with the specified locale.
y	Year as last two digits, but with no leading zero for single-digit years.
yy	Year as last two digits, but with a leading zero for single-digit years.
yyyy	Year represented by full four digits.
gg	Period/era string. The function uses the CAL_SERASTRING value associated with the specified locale. This element is ignored if the date to be formatted does not have an associated era or period string.

For example, to display the date string

```
"Wed, Aug 31 94"
```

use the following format string:

```
"ddd',' MMM dd yy"
```

TimeFormat

The format string to use to form the time string.

Use the following elements to construct a format string. If you use spaces to separate the elements in the format string, the spaces appear in the same location in the output string. The letters must be in uppercase or lowercase as shown (for example, "ss", not "SS"). Characters in the format string that are enclosed in single quotation marks appear unchanged and in the same location in the output string.

Picture	Meaning
h	Hours with no leading zero for single-digit hours; 12-hour clock.
hh	Hours with a leading zero for single-digit hours; 12-hour clock.
H	Hours with no leading zero for single-digit hours; 24-hour clock.
HH	Hours with a leading zero for single-digit hours; 24-hour clock.
m	Minutes with no leading zero for single-digit minutes.
mm	Minutes with a leading zero for single-digit minutes.
s	Seconds with no leading zero for single-digit seconds.
ss	Seconds with a leading zero for single-digit seconds.
t	One character time-marker string, such as A or P.
tt	Multicharacter time-marker string, such as AM or PM.

For example, to get the time string

```
"11:29:40 PM"
```

use the following format string:

```
"hh':'mm':'ss tt"
```

See Also

SAPI_SIG_FIELD_SETTINGS

SAPI_SIG_FIELD_SETTINGS

SAPI_SIG_FIELD_SETTINGS is a structure that contains all the information that can be set for a signature field. Most of the information in this structure relates to the appearance of the field (both before and after it is signed).

```
typedef struct {
  unsigned long              StructLen;
  SAPI_WCHAR                 Name[SIGNATURE_FIELD_NAME_MAX_LEN];
  SAPI_ENUM_DEPENDENCY_MODE  DependencyMode;
  SAPI_ENUM_SIGNATURE_TYPE   SignatureType;
  long                       Page;
  long                       X;
  long                       Y;
  long                       Height;
  long                       Width;
  unsigned long              AppearanceMask;
  unsigned long              LabelsMask;
  SAPI_SF_TIME_FORMAT_STRUCT TimeFormat;
  SAPI_WCHAR                 EmptyFieldLabel[EMPTY_FIELD_LABEL_MAX_LEN];
  SAPI_BOOL                  Invisible;
  unsigned long              Flags;
  void                       *ExtendedInfo;
} SAPI_SIG_FIELD_SETTINGS, *PSAPI_SIG_FIELD_SETTINGS;
```

Members

StructLen

The length of this structure. This length must be set by the application prior to calling any function with this structure.

Name

The name of the signature field. This value is ignored when creating a new field, except when creating a new field in a PDF document with the AR_PDF_FLAG_FIELD_NAME_SET flag.

DependencyMode

Indicates whether the signature field depends on other signature fields or not.

SignatureType

The signature type, see SAPI_ENUM_SIGNATURE_TYPE for possible values.

Page

The page in the document where the signature field is located.
In Word, you can use –1 to indicate the last page.
In PDF, you can use –1 to indicate the last page, –2 to indicate the penultimate page, etc.

X

The X coordinate of the signature field rectangle.

Y

The Y coordinate of the signature field rectangle.

Height

The height of the signature field rectangle.

Width

The width of the signature field rectangle.

AppearanceMask

A bit mask indicating which information is displayed when the signature field is signed (graphical image, signer, reason, date). See the mask values description in SAPI_ENUM_DRAWING_ELEMENT.

LabelsMask

A bit mask indicating which labels (for signed by, reason and date) are displayed when the signature field is signed. This bit mask uses the same constants as AppearanceMask.

TimeFormat

The date and time format of the signing time displayed for the signed field. See SAPI_SF_TIME_FORMAT_STRUCT for more information.

EmptyFieldLabel

This field is only relevant for Word documents. It represents the string displayed on an unsigned signature field rectangle.

Invisible

A flag indicating whether the signature is invisible (true) or visible (false).

Flags

Bit mask flags. For more information, refer to the following sections in Appendix D: Flags when Using a Signature Field in Word Documents and Flags when Creating a Signature Field in TIFF Files.
Note that some signature field flags are passed as part of the SAPISignatureFieldCreateEx or SAPISignatureFieldCreateSignEx functions, while others are passed as part of this SAPI_SIG_FIELD_SETTINGS structure.
The relevant sections in Appendix D note which flags are passed as part of a function and which are passed as part of the signature field structure.

ExtendedInfo

Pointer to an extended information value.
Use this extended information to maintain a list of custom fields.
For information on custom fields, refer to SAPI_CUSTOM_FIELD_ELEMENTS_STRUCT.

See Also

SAPISignatureFieldInfoGet, SAPISignatureFieldCreateEx

SAPI_GRAPHIC_IMAGE_STRUCT

SAPI_GRAPHIC_IMAGE_STRUCT is a structure that contains the graphical image data and format.

This structure is used both for getting the graphical image from a signed signature field and for getting the graphical image information that is stored in CoSign by calling SAPIGraphicSigImageGet. SAPIGraphicSigImageGet is an obsolete function. Use the SAPI_GR_IMG_INFO structure and SAPIGraphicSigImageInfoGet function to get graphical image information from CoSign. Only SAPISignatureFieldInfoGet uses SAPI_GRAPHIC_IMAGE_STRUCT.

Note that **GraphicImage** is allocated by the SAPIGraphicSigImageGet function and must be released by the SAPIStructRelease function.

Note that if SAPI_GRAPHIC_IMAGE_STRUCT is returned as part of the signed signature field information, it is automatically released when the SAPI_SIGNED_FIELD_INFO structure is released.

```
typedef struct {
  unsigned char                    *GraphicImage;
  long                             GraphicImageLen;
  SAPI_ENUM_GRAPHIC_IMAGE_FORMAT   GraphicImageFormat;
  long                             Width;
  long                             Height;
} SAPI_GRAPHIC_IMAGE_STRUCT, *PSAPI_GRAPHIC_IMAGE_STRUCT;
```

Members

GraphicImage

Pointer to the graphical image data. The format of the data must comply with the value of **GraphicImageFormat**.

GraphicImageLen

The length in bytes of **GraphicImage**.

GraphicImageFormat

The format of the graphical image in **GraphicImage**. See SAPI_ENUM_GRAPHIC_IMAGE_FORMAT for possible values.

Width

The width in pixels of the graphical image.

Height

The height in pixels of the graphical image.

See Also

SAPIGraphicSigImageGet, SAPIGraphicSigImageSet, SAPISignatureFieldInfoGet, SAPIStructRelease, SAPIGraphicSigImageInfoGet

SAPI_GR_IMG_INFO

SAPI_GR_IMG_INFO is a structure that contains data related to a graphical signature image. This structure is used when creating, updating, or retrieving information about a new graphical image.

```
typedef struct {
  unsigned long                    StructLen;
  SAPI_WCHAR                       szGraphicImageName[GR_SIG_NAME_MAX_LEN];
  unsigned long                    DataFormat;
  unsigned char                    *GraphicImage;
  unsigned long                    GraphicImageLen;
  SAPI_ENUM_GRAPHIC_IMAGE_FORMAT   ImageConvertedFormat;
  long                             Width;
  long                             Height;
  long                             DataType;
} SAPI_GR_IMG_INFO, *PSAPI_GR_IMG_INFO;
```

Members

StructLen

The size of the structure. This field must be set prior to calling to **any** function that gets this structure as a parameter.

szGraphicImageName

The name of the graphical image object in wide chars.

DataFormat

Bit flag value that indicates the format of the graphical image object. You may set one or more bits. For the possible settings for *DataFormat*, see Graphical Signature Image Related Flags.

GraphicImage

The actual data of the graphical image. This pointer can be either allocated by the calling application or by CoSign Signature Local, see SAPIGraphicSigImageInfoGet for more information.

GraphicImageLen

The size in bytes that is allocated for *GraphicImage*, or the actual size of the data that was returned in *GraphicImage*.

ImageConvertedFormat

Indicates the format of the graphical image as was requested when this structure was filled when SAPIGraphicSigImageInfoGet was called.

Width

For known image formats (BMP, JPG), this member contains the width of the image in pixels.

Height

For known image formats (BMP, JPG), this member contains the height of the image in pixels.

DataType

The type of graphical image. The supported types are Graphical Signature, Initials, and Logo. For the available types, refer to Graphical Signature Image Related Flags below.

SAPI_FILETIME

SAPI_FILETIME is a structure containing date/time information.

```
typedef struct {
    struct {
       unsigned long LowDateTime;
       unsigned long HighDateTime;
    } LocalTime;
    long    GMTOffset;
} SAPI_FILETIME;
```

Members

LowDateTime

The low-order part of the date-time.

HighDateTime

The high-order part of the date-time.

GMTOffset

The GMT offset in minutes.

SAPI_SIGNED_FIELD_INFO

SAPI_SIGNED_FIELD_INFO is a structure that contains all the information related to a signed signature field.

```
typedef struct {
  unsigned long              StructLen;
  SAPI_LPWSTR                SignerName;
  SAPI_BOOL                  IsSigned;
  unsigned char              *Certificate;
  long                       CertificateLen;
  SAPI_FILETIME              SignatureTime;
  SAPI_LPWSTR                Reason;
  PSAPI_GRAPHIC_IMAGE_STRUCT GraphicImageStruct;
  SAPI_LPWSTR                DependencyString;
  PSAPI_GRAPHIC_IMAGE_STRUCT GraphicLogoStruct;
} SAPI_SIGNED_FIELD_INFO, *PSAPI_SIGNED_FIELD_INFO;
```

Members

StructLen

The length of this structure. This length must be set by the application prior to calling any function with this structure.

SignerName

The signer's name.

IsSigned

Indicates whether the signature field is signed. This is the only field returned for unsigned signature fields.

Certificate

The ASN1 value of the certificate used for signing.

CertificateLen

The certificate data length.

SignatureTime

When the signing operation was performed.

Reason

The reason for signing (only if entered during the signature operation).

GraphicImageStruct

The graphical image attached to the signed field.

DependencyString

A wide char string containing all the names of the signature fields that were signed prior to the current field, and which the current field depends on. The names are separated by a null character and the string is terminated with double null characters.

GraphicLogoStruct

The Logo image attached to the signed field.

See Also

SAPISignatureFieldInfoGet, SAPIStructRelease

SAPI_INFO_STRUCT

SAPI_INFO_STRUCT is a structure that contains SAPI lib general information, such as version and installation mode (verify and sign mode or verify-only mode).

```
typedef struct {
  SAPI_BOOL                 VerifyModeOnly;
  unsigned long             MajorVersion;
  unsigned long             MinorVersion;
} SAPI_INFO_STRUCT, *PSAPI_INFO_STRUCT;
```

Members

VerifyModeOnly

Indicates whether the current CoSign Signature Local installation can be used for signature verification only (true), or for both signing and verifying (false).

MajorVersion

CoSign Signature Local major version number.

MinorVersion

CoSign Signature Local minor version number.

See Also

SAPILibInfoGet

SAPI_CERT_STATUS_STRUCT

SAPI_CERT_STATUS_STRUCT is a structure that contains the certificate status as returned from a signature verification function. The structure includes two fields: the Operating System status as is, and the CoSign Signature Local interpretation of the OS status.

```
typedef struct {
  SAPI_ENUM_CERT_STATUS      SAPICertStatus;
  unsigned long              OSCertStatus;
} SAPI_CERT_STATUS_STRUCT, *PSAPI_CERT_STATUS_STRUCT;
```

Members

SAPICertStatus

The CoSign Signature Local interpretation of the certificate status as returned by the OS. See SAPI_ENUM_CERT_STATUS for possible values.

OSCertStatus

The certificate status as returned by the operating system.

See Also

SAPISignatureFieldVerify, SAPIBufferVerifySignature, SAPIBufferVerifySignatureEnd

SAPI_CUSTOM_FIELD_ELEMENTS_STRUCT

SAPI_CUSTOM_FIELD_ELEMENTS_STRUCT is a structure that contains the list of elements that are included in the signature field. The struct of elements points to an internal structure of a single element called **SAPI_CUSTOM_FIELD_ELEMENT_STRUCT**.

```
typedef struct {
  int                              ID;
  SAPI_ENUM_DATA_TYPE              Type;
  unsigned char                    *Value;
  unsigned long                    ValueLen;
} SAPI_CUSTOM_FIELD_ELEMENT_STRUCT;

typedef struct {
  int                              StructLen;
  int                              Version;
  int                              NumOfElements;
  SAPI_CUSTOM_FIELD_ELEMENT_STRUCT CustomFieldsArray[MAX_NUM_OF_CUSTOM_FIELDS];
} SAPI_CUSTOM_FIELD_ELEMENTS_STRUCT, *PSAPI_CUSTOM_FIELD_ELEMENTS_STRUCT;
```

Members of SAPI_CUSTOM_FIELD_ELEMENT_STRUCT

ID

The ID of the custom field.

Type

The type of the custom field. See **SAPI_ENUM_DATA_TYPE** for possible values.

Value

The value of the custom field.

ValueLen

The length of the custom field.

Members of SAPI_CUSTOM_FIELD_ELEMENTS_STRUCT

StructLen

The length of this structure. This length must be set by the application prior to calling any function with this structure.

Version

Internal use.

NumOfElements

The number of actual elements.

CustomFieldsArray

An array of the custom fields.

See Also

SAPISignatureFieldVerify, SAPIBufferVerifySignature, SAPIBufferVerifySignatureEnd

Appendix B: CoSign Signature Local – Signing/Verifying TYPEDEFs

This appendix describes the CoSign Signature Local type definitions that are not structures.

SAPI_SES_HANDLE

The type definition of the SAPI session handle.

```
typedef void                    *SAPI_SES_HANDLE;
```

SAPI_GR_IMG_HANDLE

The type definition of a graphical image handle. In this version, a graphical image handle is not being used.

```
typedef void                    *SAPI_GR_IMG_HANDLE;
```

SAPI_SIG_FIELD_HANDLE

The type definition of a signature field handle.

```
typedef void                    *SAPI_SIG_FIELD_HANDLE;
```

SAPI_CERT_HANDLE

The type definition of a certificate handle.

```
typedef void                    *SAPI_CERT_HANDLE;
```

SAPI_FILE_HANDLE

The type definition of a file handle.

```
typedef void                    *SAPI_FILE_HANDLE;
```

SAPI_BOOL

The CoSign Signature Local definition for a Boolean variable.

```
typedef int                     SAPI_BOOL;
```

SAPI_PROGRESS_CALLBACK

The definition of the progress bar callback function, called by CoSign Signature Local when signing and verifying files.

```
typedef void (SAPI_WINAPI *SAPI_PROGRESS_CALLBACK) (
  SAPI_ENUM_PROGRESS_CALLBACK_OPERATION  Operation,
  void                                  *Arg
);
```

When the SAPISignatureFieldSign or SAPISignatureFieldVerify functions are called, the signing, verifying and hashing operations processed by CoSign Signature Local, send the BEGIN event when starting the operation. They then divide the file into several blocks of data, and send the blocks one by one for signing/hashing or verifying, depending on the function called. Each time a block is sent for processing, the CONT event is sent to the callback function. When data processing is complete, the END event is called.

Following is a table describing the arguments passed for each operation.

Operation	Arg value
SAPI_ENUM_PROGRESS_CALLBACK_SIGN_BEGIN	The size of the file being signed.
SAPI_ENUM_PROGRESS_CALLBACK_SIGN_CONT	The number of additional bytes sent for signing.
SAPI_ENUM_PROGRESS_CALLBACK_SIGN_END	The signature data size.
SAPI_ENUM_PROGRESS_CALLBACK_VERIFY_BEGIN	The size of the file being verified.
SAPI_ENUM_PROGRESS_CALLBACK_VERIFY_CONT	The number of additional bytes sent for verification.
SAPI_ENUM_PROGRESS_CALLBACK_VERIFY_END	
SAPI_ENUM_PROGRESS_CALLBACK_HASH_BEGIN	The number of bytes to be hashed.
SAPI_ENUM_PROGRESS_CALLBACK_HASH_CONT	The number of additional bytes sent for hashing.
SAPI_ENUM_PROGRESS_CALLBACK_HASH_END	The length of the hash result.

Appendix C: CoSign Signature Local – Signing/Verifying ENUMS

This appendix describes the type definitions for the enumerated values (`typedef enum {…}`).

SAPI_ENUM_DRAWING_ELEMENT

The elements to be displayed in a signed signature field. To draw more than one element, logically OR all the values of the desired elements.

```
typedef enum SAPI_ENUM_DRAWING_ELEMENT{
  SAPI_ENUM_DRAWING_ELEMENT_GRAPHICAL_IMAGE     = 0x00000001,
  SAPI_ENUM_DRAWING_ELEMENT_SIGNED_BY           = 0x00000002,
  SAPI_ENUM_DRAWING_ELEMENT_REASON              = 0x00000004,
  SAPI_ENUM_DRAWING_ELEMENT_TIME                = 0x00000008,
  SAPI_ENUM_DRAWING_ELEMENT_TITLE               = 0x00000020,
  SAPI_ENUM_DRAWING_ELEMENT_ADDITIONAL_TXT      = 0x00000020,
  SAPI_ENUM_DRAWING_ELEMENT_LOGO                = 0x00000040,
  SAPI_ENUM_DRAWING_ELEMENT_SUGGESTED_TITLE     = 0x00000080,
  SAPI_ENUM_DRAWING_ELEMENT_INITIALS            = 0x40000000
} SAPI_ENUM_DRAWING_ELEMENT;
```

ENUM values

SAPI_ENUM_DRAWING_ELEMENT_GRAPHICAL_IMAGE

For displaying the graphical image (if exists), in the signed field.

SAPI_ENUM_DRAWING_ELEMENT_SIGNED_BY

Display the name of the signer, in the signed field.

SAPI_ENUM_DRAWING_ELEMENT_REASON

Display the reason for signing, in the signed field.

SAPI_ENUM_DRAWING_ELEMENT_TIME

Display when the file was signed, in the signed field.

SAPI_ENUM_DRAWING_ELEMENT_TITLE

Display the user's title in the signed field.

SAPI_ENUM_DRAWING_ELEMENT_ADDITIONAL_TXT

Display additional text in the signed field. The value of this element is identical to the value of SAPI_ENUM_DRAWING_ELEMENT_TITLE.

SAPI_ENUM_DRAWING_ELEMENT_LOGO

Displays a Logo(if one exists), in the signed field.

SAPI_ENUM_DRAWING_ELEMENT_SUGGESTED_TITLE

Not Implemented.

SAPI_ENUM_DRAWING_ELEMENT_INITIALS

This enumerated value must be set only if SAPI_ENUM_DRAWING_ELEMENT_GRAPHICAL IMAGE is not set.

SAPI_ENUM_PROGRESS_CALLBACK_OPERATION

The operation events sent to the progress bar callback function, while the file signing and verifying functions are being processed. See SAPI_PROGRESS_CALLBACK for more details.

```
typedef enum SAPI_ENUM_PROGRESS_CALLBACK_OPERATION {
  SAPI_ENUM_PROGRESS_CALLBACK_OPERATION_NONE    = 0,
  SAPI_ENUM_PROGRESS_CALLBACK_SIGN_BEGIN        = 1,
  SAPI_ENUM_PROGRESS_CALLBACK_SIGN_CONT         = 2,
  SAPI_ENUM_PROGRESS_CALLBACK_SIGN_END          = 3,
  SAPI_ENUM_PROGRESS_CALLBACK_VERIFY_BEGIN      = 4,
  SAPI_ENUM_PROGRESS_CALLBACK_VERIFY_CONT       = 5,
  SAPI_ENUM_PROGRESS_CALLBACK_VERIFY_END        = 6,
  SAPI_ENUM_PROGRESS_CALLBACK_HASH_BEGIN        = 7,
  SAPI_ENUM_PROGRESS_CALLBACK_HASH_CONT         = 8,
  SAPI_ENUM_PROGRESS_CALLBACK_HASH_END          = 9
} SAPI_ENUM_PROGRESS_CALLBACK_OPERATION;
```

ENUM values

SAPI_ENUM_PROGRESS_CALLBACK_OPERATION_NONE

Not in use.

SAPI_ENUM_PROGRESS_CALLBACK_SIGN_BEGIN

The signing operation has begun.

SAPI_ENUM_PROGRESS_CALLBACK_SIGN_CONT

An additional buffer of data read from the file was sent for signing.

SAPI_ENUM_PROGRESS_CALLBACK_SIGN_END

The file signing operation is completed.

SAPI_ENUM_PROGRESS_CALLBACK_VERIFY_BEGIN

The verifying operation has begun.

SAPI_ENUM_PROGRESS_CALLBACK_VERIFY_CONT

An additional buffer of data read from the file was sent for verifying.

SAPI_ENUM_PROGRESS_CALLBACK_VERIFY_END

The file verifying operation is completed.

SAPI_ENUM_PROGRESS_CALLBACK_HASH_BEGIN

Not in use.

SAPI_ENUM_PROGRESS_CALLBACK_HASH_CONT

Not in use.

SAPI_ENUM_PROGRESS_CALLBACK_HASH_END

Not in use.

SAPI_ENUM_CONTEXT_TYPE

Context type values. All the continuous operations share the same definition for their context (SAPI_CONTEXT), but are distinguished by the value of ContextType. ContextType can be any of the following values:

```
typedef enum SAPI_ENUM_CONTEXT_TYPE {
  SAPI_ENUM_CONTEXT_TYPE_NONE             = 0,
  SAPI_ENUM_CONTEXT_TYPE_CA               = 1,
  SAPI_ENUM_CONTEXT_TYPE_ENUM_CERT        = 2,
  SAPI_ENUM_CONTEXT_BUFF_SIGN             = 3,
  SAPI_ENUM_CONTEXT_BUFF_VERIFY           = 4,
  SAPI_ENUM_CONTEXT_BUFF_HASH             = 5,
  SAPI_ENUM_CONTEXT_TYPE_ENUM_SF          = 6,
  SAPI_ENUM_CONTEXT_TYPE_ENUM_GR_IMG      = 7,
  SAPI_ENUM_CONTEXT_TICKET_CHECK          = 8,
  SAPI_ENUM_CONTEXT_SF_LOCATOR            = 9
} SAPI_ENUM_CONTEXT_TYPE;
```

ENUM values

SAPI_ENUM_CONTEXT_TYPE_NONE

Not in use.

SAPI_ENUM_CONTEXT_TYPE_CA

The context for retrieving the CA information.

SAPI_ENUM_CONTEXT_TYPE_ENUM_CERT

The context for enumerating certificates.

SAPI_ENUM_CONTEXT_BUFF_SIGN

The context for signing buffers.

SAPI_ENUM_CONTEXT_BUFF_VERIFY

The context for verifying a signature on buffers.

SAPI_ENUM_CONTEXT_BUFF_HASH

The context for hashing data.

SAPI_ENUM_CONTEXT_TYPE_ENUM_SF

The context for enumerating signature fields.

SAPI_ENUM_CONTEXT_TYPE_ENUM_GR_IMG

The context for enumerating graphical images.

SAPI_ENUM_CONTEXT_TICKET_CHECK

Contact ARX for more information.

SAPI_ENUM_CONTEXT_SF_LOCATOR

The context of enumerating PDF field locator strings for positioning a signature field.

SAPI_ENUM_EXTENDED_TIME_FORMAT

The time format in the signature field is determined by the date and time format strings (e.g., “dd/mm/yyyy” and “hh:mm:ss”), but there are some additional extended attributes that are determined by the following values:

```
typedef enum SAPI_ENUM_EXTENDED_TIME_FORMAT {
  SAPI_ENUM_EXTENDED_TIME_FORMAT_NONE    = 0,
  SAPI_ENUM_EXTENDED_TIME_FORMAT_GMT     = 1,
  SAPI_ENUM_EXTENDED_TIME_FORMAT_SYSTEM  = 2
} SAPI_ENUM_EXTENDED_TIME_FORMAT;
```

ENUM values

SAPI_ENUM_EXTENDED_TIME_FORMAT_NONE

Not in use.

SAPI_ENUM_EXTENDED_TIME_FORMAT_GMT

The difference of the local time zone from GMT time is added to the date and time string.

SAPI_ENUM_EXTENDED_TIME_FORMAT_SYSTEM

The settings for the date and time format are taken from the system settings, and the date and time format strings are ignored. This value is not supported in the current version.

SAPI_ENUM_DEPENDENCY_MODE

The dependency mode of a single signature field.

```
typedef enum SAPI_ENUM_DEPENDENCY_MODE {
  SAPI_ENUM_DEPENDENCY_MODE_NONE          = 0,
  SAPI_ENUM_DEPENDENCY_MODE_DEPENDENT     = 1,
  SAPI_ENUM_DEPENDENCY_MODE_INDEPENDENT   = 2,
} SAPI_ENUM_DEPENDENCY_MODE;
```

ENUM values

SAPI_ENUM_DEPENDENCY_MODE_NONE

Not in use.

SAPI_ENUM_DEPENDENCY_MODE_DEPENDENT

The signature in the current signature field depends on all the previously-signed fields. This means that if a signature in one of the previously signed fields is cleared or recreated, the signature of the current field becomes invalid.

SAPI_ENUM_DEPENDENCY_MODE_INDEPENDENT

The signature in the current signature field is independent. This means that clearing or resigning of other signature fields in the same document do not invalidate the current signature.

SAPI_ENUM_SIGNATURE_TYPE

The signature type of a specific signature field. The signature type influences both the appearance of the signature field and the signing algorithms being used.

```
typedef enum SAPI_ENUM_SIGNATURE_TYPE {
  SAPI_ENUM_SIGNATURE_NONE                              = 0,
  SAPI_ENUM_SIGNATURE_DIGITAL                           = 1,
  SAPI_ENUM_SIGNATURE_E_HASH                            = 2
} SAPI_ENUM_SIGNATURE_TYPE;
```

ENUM values

SAPI_ENUM_SIGNATURE_NONE

Not in use.

SAPI_ENUM_SIGNATURE_DIGITAL

Standard visible signature (PKCS#7, RSA and SHA1).

SAPI_ENUM_SIGNATURE_E_HASH

Electronic visible signature. Only hash algorithm is used. This type is not supported in the current version.

SAPI_ENUM_GRAPHIC_IMAGE_FORMAT

The different formats in which the graphical image of the user's signature can be loaded and retrieved.

```
typedef enum SAPI_ENUM_GRAPHIC_IMAGE_FORMAT {
  SAPI_ENUM_GRAPHIC_IMAGE_NONE           = 0,
  SAPI_ENUM_GRAPHIC_IMAGE_PDF_LINE       = 1,
  SAPI_ENUM_GRAPHIC_IMAGE_PDF_BMP        = 2,
  SAPI_ENUM_GRAPHIC_IMAGE_BMP            = 3,
  SAPI_ENUM_GRAPHIC_IMAGE_BMP_B64        = 4,
  SAPI_ENUM_GRAPHIC_IMAGE_USER_DEFINED   = 5,
  SAPI_ENUM_GRAPHIC_IMAGE_PDF_BMP2       = 6
} SAPI_ENUM_GRAPHIC_IMAGE_FORMAT;
```

ENUM values

SAPI_ENUM_GRAPHIC_IMAGE_NONE

Not in use.

SAPI_ENUM_GRAPHIC_IMAGE_PDF_LINE

PDF format vectorial representation.

SAPI_ENUM_GRAPHIC_IMAGE_PDF_BMP

PDF format BMP representation (monochrome).

SAPI_ENUM_GRAPHIC_IMAGE_BMP

BMP format.

SAPI_ENUM_GRAPHIC_IMAGE_BMP_B64

BMP format, encoded as base 64.

SAPI_ENUM_GRAPHIC_IMAGE_USER_DEFINED

The graphical image is stored and retrieved as is.

SAPI_ENUM_GRAPHIC_IMAGE_PDF_BMP2

PDF format BMP representation. Unlike SAPI_ENUM_GRAPHIC_IMAGE_PDF_BMP, this format can hold monochrome and colored BMP as well as JPG formats. This format also makes white pixels transparent.

SAPI_ENUM_CA_INFO_TYPE

The information that can be retrieved from the CoSign CA.

```
typedef enum SAPI_ENUM_CA_INFO_TYPE {
  SAPI_ENUM_CA_INFO_NONE           = 0,
  SAPI_ENUM_CA_INFO_AIA            = 1,
  SAPI_ENUM_CA_INFO_CRL            = 2
} SAPI_ENUM_CA_INFO_TYPE;
```

ENUM values

SAPI_ENUM_CA_INFO_NONE

Not in use.

SAPI_ENUM_CA_INFO_AIA

The CoSign CA certificate.

SAPI_ENUM_CA_INFO_CRL

The Certificate Revocation List.

SAPI_ENUM_FILE_TYPE

The file types that can be processed by the CoSign Signature Local file functions.

```
typedef enum SAPI_ENUM_FILE_TYPE {
  SAPI_ENUM_FILE_NONE               = 0,
  SAPI_ENUM_FILE_WORD               = 1,
  SAPI_ENUM_FILE_ADOBE              = 2,
  SAPI_ENUM_FILE_TIFF               = 3,
  SAPI_ENUM_FILE_DETACHED           = 4,
  SAPI_ENUM_FILE_P7M                = 5,
  SAPI_ENUM_FILE_XML                = 6,
  SAPI_ENUM_FILE_OFFICE_XML_PACKAGE = 7,
  SAPI_ENUM_FILE_INFOPATH_XML_FORM  = 8
} SAPI_ENUM_FILE_TYPE;
```

ENUM values

SAPI_ENUM_FILE_NONE

Not in use.

SAPI_ENUM_FILE_WORD

Word file.

SAPI_ENUM_FILE_ADOBE

PDF file (Adobe).

SAPI_ENUM_FILE_TIFF

TIFF file.

SAPI_ENUM_FILE_DETACHED

Not supported in the current version.

SAPI_ENUM_FILE_P7M

Not supported in the current version.

SAPI_ENUM_FILE_XML

XML File. Supported from version 5.

SAPI_ENUM_FILE_OFFICE_XML_PACKAGE

Office 2007 file type (.docx file or .xlsx file).

SAPI_ENUM_FILE_INFOPATH_XML_FORM

InfoPath 2007/2010/2013 form (.xml file).

SAPI_ENUM_CONF_ID

The configuration values that can be set and retrieved.

```
typedef enum SAPI_ENUM_CONF_ID {
  SAPI_ENUM_FILE_NONE                       = 0,
  SAPI_ENUM_CONF_ID_REASON                  = 1,
  SAPI_ENUM_CONF_ID_SEL_CERT_TITLE          = 2,
  SAPI_ENUM_CONF_ID_SEL_CERT_CMD            = 3,
  SAPI_ENUM_CONF_ID_CHK_CRL_ENUM            = 4,
  SAPI_ENUM_CONF_ID_CHK_CRL_VERIFY          = 5,
  SAPI_ENUM_CONF_ID_VERIFY_CERT_SIGN        = 6,
  SAPI_ENUM_CONF_ID_PROGRESS_CALLBACK       = 7,
  SAPI_ENUM_CONF_ID_WORD_SF_FUNC            = 8,
  SAPI_ENUM_CONF_ID_REASON_LABEL            = 9,
  SAPI_ENUM_CONF_ID_DATE_LABEL              = 10,
  SAPI_ENUM_CONF_ID_SIGNER_LABEL            = 11,
  SAPI_ENUM_CONF_ID_CERT_SERIAL_ID          = 12,
  SAPI_ENUM_CONF_ID_CERT_CHAIN_FLAGS        = 13,
  SAPI_ENUM_CONF_ID_PREFERRED_TOKEN         = 14,
  SAPI_ENUM_CONF_ID_CERT_SKI                = 15,
  SAPI_ENUM_CONF_ID_CERT_SET_DEFAULT        = 16,
  SAPI_ENUM_CONF_ID_GR_SIG_PREF_NAME        = 17,
  SAPI_ENUM_CONF_ID_PDF_OWNER_PWD           = 18,
  SAPI_ENUM_CONF_ID_PDF_USER_PWD            = 19,
  SAPI_ENUM_CONF_ID_PDF_SF_FUNC             = 20,
  SAPI_ENUM_CONF_ID_GMT_OFFSET              = 21,
  SAPI_ENUM_CONF_ID_RET_EXT_FIELD_INFO      = 22,
  SAPI_ENUM_CONF_ID_SECURED_TS_ENABLE       = 23,
  SAPI_ENUM_CONF_ID_SECURED_TS_URL          = 24,
  SAPI_ENUM_CONF_ID_SECURED_TS_USER         = 25,
  SAPI_ENUM_CONF_ID_SECURED_TS_PWD          = 26,
  SAPI_ENUM_CONF_ID_SECURED_TS_ADDITIONAL_BYTES = 27,
  SAPI_ENUM_CONF_ID_TS_CERT_STATUS          = 28,
  SAPI_ENUM_CONF_ID_TITLE                   = 29,
  SAPI_ENUM_CONF_ID_ADDITIONAL_TEXT         = 29,
  SAPI_ENUM_CONF_ID_PDF_ROAMING_ID_SRV      = 30,
  SAPI_ENUM_CONF_ID_KEY_CONTAINER_NAME      = 31,
  SAPI_ENUM_CONF_ID_SLOT_NUMBER             = 32,
  SAPI_ENUM_CONF_ID_LOGO_PREF_NAME          = 33,
  SAPI_ENUM_CONF_ID_LOCK_USER               = 34,
  SAPI_ENUM_CONF_ID_EMBED_OCSP              = 35,
  SAPI_ENUM_CONF_ID_OCSP_URL                = 36,
  SAPI_ENUM_CONF_ID_CERT_PUBLIC             = 37,
  SAPI_ENUM_CONF_ID_TIFF_BANNER_CREATE      = 38,
  SAPI_ENUM_CONF_ID_TIFF_IGNORE_EMBEDDED_CLEAR  = 39,
  SAPI_ENUM_CONF_ID_XADES_TEMPLATE          = 40,
  SAPI_ENUM_CONF_ID_EXTENDED_VALIDATION     = 41,
  SAPI_ENUM_CONF_ID_PDF_FONT_PATH           = 42,
  SAPI_ENUM_CONF_ID_PDF_FONT_SIZE           = 43,
  SAPI_ENUM_CONF_ID_PDF_ATTRIBUTION         = 44,
  SAPI_ENUM_CONF_ID_CERT_VERIFY             = 45,
  SAPI_ENUM_CONF_ID_GR_IMG_REDUCE           = 46,
  SAPI_ENUM_CONF_ID_MIN_ADES_VERIFY         = 47,
  SAPI_ENUM_CONF_ID_INFP_SP_USER_NAME       = 48,
  SAPI_ENUM_CONF_ID_INFP_SP_USER_PWD        = 49,
  SAPI_ENUM_CONF_ID_INFP_SP_DOMAIN          = 50,
  SAPI_ENUM_CONF_ID_INFP_TEMPLATE_NAME      = 51,
  SAPI_ENUM_CONF_ID_APPEARANCE_MASK         = 52,
  SAPI_ENUM_CONF_ID_OLD_STYLE_PDF_APP       = 53,
```

```
  SAPI_ENUM_CONF_ID_PDF_FORCE_DISPLAY_SIGNER    = 54,
  SAPI_ENUM_CONF_ID_GR_IMG_REDUCE_SCALE         = 55,
  SAPI_ENUM_CONF_ID_SIGNATURE_ADDITIONAL_BYTES  = 56,
  SAPI_ENUM_CONF_ID_XML_ALT_ID                  = 57,
  SAPI_ENUM_CONF_ID_PADES_ENABLE                = 58
} SAPI_ENUM_CONF_ID;
```

ENUM values

SAPI_ENUM_CONF_ID_NONE

Not in use.

SAPI_ENUM_CONF_ID_REASON

General: The reason for signing when signing files. This reason is stored in the file and displayed according to the signature field settings.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_SEL_CERT_TITLE

General: The title of the select certificate dialog box when SAPICertificateGUISelect is called.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPICertificateGUISelect.

SAPI_ENUM_CONF_ID_SEL_CERT_CMD

General: The command string in the select certificate dialog box when SAPICertificateGUISelect is called.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPICertificateGUISelect.

SAPI_ENUM_CONF_ID_CHK_CRL_ENUM

General: Whether to filter out certificates whose CRL was not verified correctly during certificates enumeration.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values: 0, 1.

Associated Functions: SAPICertificatesEnumCont.

SAPI_ENUM_CONF_ID_CHK_CRL_VERIFY

General: Whether to check the CRL while verifying a signature.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values: 0, 1.

Associated Functions: SAPISignatureFieldVerify, SAPIBufferVerifySignature, SAPIBufferVerifySignatureInit, SAPIBufferVerifySignatureCont, SAPIBufferVerifySignatureEnd.

SAPI_ENUM_CONF_ID_VERIFY_CERT_SIGN

Not Used.

SAPI_ENUM_CONF_ID_PROGRESS_CALLBACK

General: The pointer of the function receiving the progress events when signing and verifying signature fields in a file. For more information, contact ARX.

SAPI_ENUM_CONF_ID_WORD_SF_FUNC

This value is for internal use.

SAPI_ENUM_CONF_ID_REASON_LABEL

General: The label for the reason in a signature field. Applies to PDF files only.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldCreate, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_DATE_LABEL

General: The label for the date in a signature field. Applies to PDF files only.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldCreate, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_SIGNER_LABEL

General: The label for the signer's name in a signature field. Applies to PDF files only.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldCreate, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_CERT_SERIAL_ID

General: The serial ID of the certificate automatically chosen during signing.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_CERT_CHAIN_FLAGS

General: The flags used for verifying a certificate chain. For exact values, see Microsoft's documentation on CertGetCertificateChain. It is recommended to contact ARX for questions regarding usage of this configuration value.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Associated Functions: All signature generation and signature validation functions.

SAPI_ENUM_CONF_ID_PREFERRED_TOKEN

General: The token to which the graphical image is written by SAPIGraphicSigImageGet, or the token which is used by SAPIGraphicSigImageGet, in an environment of multiple tokens. Available ARX token names are:

- "AR CoSign Appliance for CoSign" – Represents the CoSign appliance.
- "Token1" – Represents a software token.
- "Algorithmic Research Minikey 0" – Represents a MiniKey 6 USB token.
- "AKS Ifdh 0" – Represents a MiniKey 7 USB token.
- **Type**: SAPI_ENUM_DATA_TYPE_STR.

- **Associated Functions**: SAPIGraphicSigImageInfoCreate, SAPISigningCeremonyGUI.

SAPI_ENUM_CONF_ID_CERT_SKI

General: The Subject Key Identifier (based on the public key value) of the certificate automatically chosen during signing.

SAPI_ENUM_CONF_ID_CERT_SET_DEFAULT

General: Whether to set the last certificate used as the default for subsequent signing operations, or not.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR, SAPI_ENUM_DATA_TYPE_UCHAR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_GR_SIG_PREF_NAME

General: The name of the graphical image automatically chosen during signing.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_PDF_OWNER_PWD

General: You can configure a PDF document to have an owner password.
An owner password may be needed to restrict certain operations in the PDF document.
This parameter can be relevant whether a user password is configured or not.
If both a user password and owner password are set in the PDF, it is sufficient to supply an owner password in order to be able to sign the PDF document.
If the PDF is protected only by a user password, it is sufficient to set this configuration parameter in order to be able to sign the PDF document.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_PDF_USER_PWD

General: A PDF document can be configured to have a user password.
This parameter contains the user password needed to open a protected PDF document.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_PDF_SF_FUNC

General: This value is for internal use.

SAPI_ENUM_CONF_ID_GMT_OFFSET

General: This value is for setting a GMT offset that is different from the current system settings. The value is in minutes.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_RET_EXT_FIELD_INFO

General: This value is used to notify the SAPISignatureFieldInfoGet function to retrieve information that is kept inside custom fields. Set the configuration value prior to calling SAPISignatureFieldInfoGet.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values: 0, 1.

Associated Functions: SAPISignatureFieldInfoGet.

SAPI_ENUM_CONF_ID_SECURED_TS_ENABLE

General: Whether to enable or disable the time-stamping service. For more information see Time-Stamping/OCSP and Miscellaneous Signature-Related Flags.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values: 0, 1.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign, SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_SECURED_TS_URL

General: The URL of the time-stamping service.

Type: SAPI_ENUM_DATA_TYPE_STR, SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign, SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_SECURED_TS_USER

General: The user-ID used to authenticate to the time-stamping service.

Type: SAPI_ENUM_DATA_TYPE_STR, SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign, SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_SECURED_TS_PWD

General: The password of the user-ID used to authenticate to the time-stamping service.

Type: SAPI_ENUM_DATA_TYPE_STR, SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign, SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_SECURED_TS_ADDITIONAL_BYTES

General: The amount of bytes to be added to the PKCS#7 blob to maintain the time-stamping object. This parameter is necessary when signing a PDF document using a time-stamping service. Its value must be more than the expected size of the time-stamping blob.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign, SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_SECURED_TS_CERT_STATUS

General: Provides the exact time-stamping certificate status. This configuration value should be retrieved by the application after the signature verification operation.

Associated Functions: SAPISignatureFieldVerify, SAPIBufferVerifySignature, SAPIBufferVerifySignatureInit, SAPIBufferVerifySignatureCont, SAPIBufferVerifySignatureEnd.

SAPI_ENUM_CONF_ID_TITLE

General: The current title to be used as part of the signature operation.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ADDITIONAL_TEXT

General: This configuration value is identical to the SAPI_ENUM_CONF_ID_TITLE enumerand.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_PDF_ROAMING_ID_SRV

General: Set a roaming ID server information. This information is relevant to the Adobe/PDF roaming ID profile.
This string value must not be an empty string.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldCreate, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_KEY_CONTAINER_NAME

General: This parameter contains a CAPI virtual reader name that symbolizes the PKCS#11 slot that is allocated during a SAPILogonAPI call. The application can retrieve this value after the SAPILogon call.

Type: SAPI_ENUM_DATA_TYPE_STR.

Associated Functions: SAPILogonEx.

SAPI_ENUM_CONF_ID_SLOT_NUMBER

General: This parameter contains a PKCS#11 slot number, when SAPILogon API is used. The application can retrieve this value after the SAPILogon call.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Associated Functions: SAPILogonEx.

SAPI_ENUM_CONF_ID_LOGO_PREF_NAME

General: The name of the logo automatically chosen during signing.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_LOCK_USER

General: Set this configuration value to 1 if a third-party application is used as part of a user session to sign data or a document, and the application uses the Microsoft certificate store to select the user certificate. The configuration value should be set prior to the SAPILogon API Call. After the SAPILogin, call any attempt to view the certificate store will show the user related certificates.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values: 0, 1.

Associated Functions: SAPILogonEx.

SAPI_ENUM_CONF_ID_EMBED_OCSP

General: Set this configuration value to 1 to include an OCSP response in the signature blob. This will enable a verifier to make sure that the signer certificate and all other certificates in the chain were valid at the time of the signature.
The embedding of the OCSP response is compatible with Adobe PDF definitions.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values: 0,1.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign, SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_OCSP_URL

General: If it is required to embed an OCSP response into the digital signature, use this value to define the URL of the OCSP server. This value is used in the case that no OCSP URL is defined in the relevant certificate (either the signer certificate or any other certificate in the certificate chain).

Type: ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign, SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_CERT_PUBLIC

General: The public key of the certificate automatically chosen during signing. The value should be passed in hexadecimal string format.

Type: ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign, SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_TIFF_BANNER_CREATE

General: A visible signature can be embedded into a TIFF document. This replaces the previous implementation that added a banner page at the beginning of the TIFF document.
If you set this configuration value to 1, the previous functionality is preserved.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values :0, 1.

Associated Functions: SAPISignatureFieldCreate.

SAPI_ENUM_CONF_ID_TIFF_IGNORE_EMBEDDED_CLEAR

General: This configuration value is used during the creation of a new signature field. It directs the TIFF provider of CoSign Signature Local to disallow a clear operation when using a visible signature field.

Type: SAPI_ENUM_DATA_TYPE_DWORD

Possible Values: 0, 1.

Associated Functions: SAPISignatureFieldCreate.

SAPI_ENUM_CONF_ID_XADES_TEMPLATE

General: This configuration value enables using XML data that can be incorporated into the signed object as part of an advanced XML signature operation. This option enables XAdES-PES support. For more information, contact ARX. When used in CoSign Signature SOAP, this value should be passed encoded in base64 format.

Type: ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_EXTENDED_VALIDATION

General: Specifies that an extended certificate validation path will be used before attempting to sign. This meets the DoD certificate path validation requirements.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values:0, 1.

Associated Functions: SAPICertificatesEnumInit, SAPICertificatesEnumCont, SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign, SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_PDF_FONT_PATH

Reserved for future implementations of CoSign Signature Local.

SAPI_ENUM_CONF_ID_PDF_FONT_PATH

Reserved for future implementations of CoSign Signature Local.

SAPI_ENUM_CONF_ID_PDF_FONT_SIZE

Reserved for future implementations of CoSign Signature Local.

SAPI_ENUM_CONF_ID_PDF_ATTRIBUTION

General: Specifies whether to embed CoSign attribution in PDF signatures.

Type: SAPI_ENUM_DATA_TYPE_DWORD

Possible Values: 0, 1.

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_CERT_VERIFY

General: In the case of PKCS#1 signature validation, use this configuration value to include the certificate value to be used for signature validation. The value of the certificate should be DER encoded as a byte array.

Type: SAPI_ENUM_DATA_TYPE_UCHAR.

Associated Functions: SAPIBufferSignEx, SAPIBufferSignInit, SAPIBufferSignCont, SAPIBufferSignEnd.

SAPI_ENUM_CONF_ID_IMAGE_REDUCE

General: Activate the image size reduction functionality when uploading new graphical signatures into CoSign.
To use the default image size reduction, pass the value of PERFORM_IMAGE_REDUCTION_DEFAULT. If you do not want any image size reduction, pass the value of NOT_PERFORM_IMAGE_REDUCTION.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values: `NOT_PERFORM_IMAGE_REDUCTION`, `PERFORM_IMAGE_REDUCTION_DEFAULT`.

Associated Functions: SAPIGraphicSigImageInfoCreate, SAPIGraphicSigImageInfoUpdate.

SAPI_ENUM_CONF_ID_MIN_ADES_VERIFY

General: Use this configuration value to enforce a minimal level of existing attributes, such as signature time or signer certificate, in the signature. The minimum level is defined according to the SAPI_ENUM_ADVANCED_SIG_LEVEL enumeration type.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values: refer to SAPI_ENUM_ADVANCED_SIG_LEVEL.

Associated Functions: SAPISignatureFieldVerify, SAPIBufferVerifySignature, SAPIBufferVerifySignatureInit, SAPIBufferVerifySignatureCont, SAPIBufferVerifySignatureEnd.

SAPI_ENUM_CONF_ID_INFP_SP_USER_NAME

General: Specify the required Microsoft SharePoint user name when accessing SharePoint's InfoPath files and templates.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx.

SAPI_ENUM_CONF_ID_INFP_SP_USER_PWD

General: Specify the required Microsoft SharePoint user's password when accessing SharePoint's InfoPath files and templates.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx.

SAPI_ENUM_CONF_ID_INFP_SP_DOMAIN

General: Specify the required Microsoft SharePoint user's domain name when accessing SharePoint's InfoPath files and templates.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx.

SAPI_ENUM_CONF_ID_INFP_TEMPLATE_NAME

General: Provide a URL or local file location for accessing the InfoPath template file. In the case of a local file, provide a file location such as the following: `file:///dir1/dir2/<file Name>`.

Type: SAPI_ENUM_DATA_TYPE_STR or SAPI_ENUM_DATA_TYPE_WSTR.

Associated Functions: SAPISignatureFieldSignEx.

SAPI_ENUM_CONF_ID_APPEARANCE_MASK

General: In cases where CoSign Signature Local does not have control over signature fields such as in InfoPath, you can pass an appearance mask as part of the digital signature operation. An appearance mask is a bit mask indicating what information is displayed when the signature field is signed, such as graphical image, signer, reason, date, etc. (for the mask values description, refer to SAPI_ENUM_DRAWING_ELEMENT). If you pass an appearance mask in cases where CoSign Signature Local does not have control over signature fields, the visible signature content is displayed according to the appearance mask, but the appearance mask attribute is not kept in the signature field.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Associated Functions: SAPISignatureFieldSignEx.

SAPI_ENUM_CONF_ID_OLD_STYLE_PDF_APP

General: Whether to use the new method (introduced in CoSign version 5.6.4) of representing the visible signature in a PDF file. In the old method, each component of the visible signature – each text element and each graphical element – was saved separately. In the new method, all the elements are combined into a single image that is incorporated into the PDF document. The new method is more suitable for PDF/A requirements, and provides a solution for dealing with Unicode languages such as Chinese and Japanese.
A value of 1 indicates the previous visible signature format is used.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Possible Values: 0 (new method – the default), 1 (old method).

Associated Functions: SAPISignatureFieldSignEx, SAPISignatureFieldCreateSign.

SAPI_ENUM_CONF_ID_PDF_FORCE_DISPLAY_SIGNER

General: Relevant only to PDF. When this parameter is set to 1, the signer's name will always appear.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Associated Functions: SAPISignatureFieldSignEx.

SAPI_ENUM_CONF_ID_GR_IMG_REDUCE_SCALE

General: Directs CoSign Signature Local to reduce the size of an uploaded graphical image if it exceeds the max size limit (30 K).

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Associated Functions: SAPIGraphicSigImageInfoCreate and SAPIGraphicSigImageInfoUpdate.

SAPI_ENUM_CONF_ID_SIGNATURE_ADDITIONAL_BYTES

General: The number of bytes to be added to the PKCS#7 blob to maintain additional information such as OCSP data.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Associated Functions: SAPISignatureFieldSignEx.

SAPI_ENUM_CONF_ID_XML_ALT_ID

General: An alternative name for the ID attribute that represents the data being signed in an signed XML structure.

Type: SAPI_ENUM_DATA_TYPE_STR.

Associated Functions: SAPISignatureFieldSignEx.

SAPI_ENUM_CONF_ID_PADES_ENABLE

General: Whether to generate a PAdES-compliant PDF signature. In a PAdES compliant signature, the identification of the digital signature is *ETSI.CAdES.detached*, whereas in a regular PDF signature it is *adbe.pkcs7.detached*. This is supported from Adobe 10 onwards.

Type: SAPI_ENUM_DATA_TYPE_DWORD.

Associated Functions: SAPISignatureFieldSignEx.

SAPI_ENUM_DATA_TYPE

Data types:

```
typedef enum SAPI_ENUM_DATA_TYPE {
  SAPI_ENUM_DATA_TYPE_NONE              = 0,
  SAPI_ENUM_DATA_TYPE_DWORD             = 1,
  SAPI_ENUM_DATA_TYPE_STR               = 2,
  SAPI_ENUM_DATA_TYPE_WSTR              = 3,
  SAPI_ENUM_DATA_TYPE_TIME              = 4,
  SAPI_ENUM_DATA_TYPE_UCHAR             = 5,
  SAPI_ENUM_DATA_TYPE_FUNC_PTR          = 6,
  SAPI_ENUM_DATA_TYPE_SAPI_FILE_TIME    = 7
} SAPI_ENUM_DATA_TYPE;
```

ENUM values

SAPI_ENUM_DATA_TYPE_NONE

Not in use.

SAPI_ENUM_DATA_TYPE_DWORD

Double word (unsigned long).

SAPI_ENUM_DATA_TYPE_STR

String (char *).

SAPI_ENUM_DATA_TYPE_WSTR

Wide char string (WCHAR *).

SAPI_ENUM_DATA_TYPE_TIME

Time (time_t – long).

SAPI_ENUM_DATA_TYPE_UCHAR

Pointer to unsigned char.

SAPI_ENUM_DATA_TYPE_FUNC_PTR

Function pointer.

SAPI_ENUM_DATA_TYPE_SAPI_FILE_TIME

CoSign Signature Local time definition.

SAPI_ENUM_IMAGE_SOURCE_TYPE

The source of the graphical image:

```
typedef enum SAPI_ENUM_IMAGE_SOURCE_TYPE {
  SAPI_ENUM_IMAGE_SOURCE_NONE      = 0,
  SAPI_ENUM_IMAGE_SOURCE_PAD       = 1,
  SAPI_ENUM_IMAGE_SOURCE_TOKEN     = 2
} SAPI_ENUM_IMAGE_SOURCE_TYPE;
```

ENUM values

SAPI_ENUM_IMAGE_SOURCE_NONE

Not in use.

SAPI_ENUM_IMAGE_SOURCE_PAD

The image is taken from a pad. Not supported in this version.

SAPI_ENUM_IMAGE_SOURCE_TOKEN

The image is taken from a token.

SAPI_ENUM_CERT_STATUS

Certificate status as interpreted by CoSign Signature Local.

```
typedef SAPI_ENUM_CERT_STATUS {
  SAPI_ENUM_CERT_STATUS_NOT_CHECKED      = 0,
  SAPI_ENUM_CERT_STATUS_OK               = 1,
  SAPI_ENUM_CERT_STATUS_REVOKED          = 2,
  SAPI_ENUM_CERT_STATUS_INVALID          = 3,
  SAPI_ENUM_CERT_STATUS_WARNING          = 4,
  SAPI_ENUM_TS_CERT_STATUS_REVOKED       = 5,
  SAPI_ENUM_TS_CERT_STATUS_INVALID       = 6
} SAPI_ENUM_CERT_STATUS;
```

ENUM values

SAPI_ENUM_CERT_STATUS_NOT_CHECKED

The certificate status was not checked.

SAPI_ENUM_CERT_STATUS_OK

The certificate is OK.

SAPI_ENUM_CERT_STATUS_REVOKED

The certificate is revoked.

SAPI_ENUM_CERT_STATUS_INVALID

The certificate is invalid. The signature might not be trusted.

SAPI_ENUM_CERT_STATUS_WARNING

Not in use.

SAPI_ENUM_TS_CERT_STATUS_REVOKED

Whether the certificate of the time-stamping server is revoked.

SAPI_ENUM_TS_CERT_STATUS_INVALID

Whether there is a warning to validate the time-stamping server certificate.

SAPI_ENUM_CERT_FIELD

The values that can be retrieved from a certificate.

```
typedef SAPI_ENUM_CERT_FIELD {
  SAPI_ENUM_CERT_FIELD_NONE                    = 0,
  SAPI_ENUM_CERT_FIELD_CERT                    = 1,
  SAPI_ENUM_CERT_FIELD_SUBJECT                 = 2,
  SAPI_ENUM_CERT_FIELD_ISSUER                  = 3,
  SAPI_ENUM_CERT_FIELD_EMAIL                   = 4,
  SAPI_ENUM_CERT_FIELD_NOT_BEFORE              = 5,
  SAPI_ENUM_CERT_FIELD_NOT_AFTER               = 6,
  SAPI_ENUM_CERT_FIELD_SERIAL_ID               = 7,
  SAPI_ENUM_CERT_FIELD_SKI                     = 8,
  SAPI_ENUM_CERT_FIELD_HASHED_ISSUER_NAME      = 9,
  SAPI_ENUM_CERT_FIELD_HASHED_ISSUER_KEY       = 10
  SAPI_ENUM_CERT_FIELD_OCSP_URL                = 11,
  SAPI_ENUM_CERT_FIELD_PUBLIC_KEY              = 12,
} SAPI_ENUM_CERT_FIELD;
```

ENUM values

SAPI_ENUM_CERT_FIELD_NONE

Not in use.

SAPI_ENUM_CERT_FIELD_CERT

The ASN1 encoded certificate value.

SAPI_ENUM_CERT_FIELD_SUBJECT

The certificate subject (the owner of the certificate).

SAPI_ENUM_CERT_FIELD_ISSUER

The issuer of the certificate.

SAPI_ENUM_CERT_FIELD_EMAIL

The email of the certificate's owner.

SAPI_ENUM_CERT_FIELD_NOT_BEFORE

The time from when the certificate is valid.

SAPI_ENUM_CERT_FIELD_NOT_AFTER

The expiration time of the certificate.

SAPI_ENUM_CERT_FIELD_SERIAL_ID

The serial ID of the certificate.

SAPI_ENUM_CERT_FIELD_SKI

The Subject Key Identifier (based on the public key value) of the certificate.

SAPI_ENUM_CERT_FIELD_SKI

The Subject Key Identifier (based on the public key value) of the certificate.

SAPI_ENUM_CERT_FIELD_HASHED_ISSUER_NAME

A hash value of the issuer field in the certificate.

SAPI_ENUM_CERT_FIELD_HASHED_ISSUER_KEY

A hash value of the issuer's public key information.

SAPI_ENUM_CERT_FIELD_ FIELD_OCSP_URL

The URL of an OCSP server that can retrieve the OCSP response.

SAPI_ENUM_CERT_FIELD_PUBLIC_KEY

The user's public key value.

SAPI_ENUM_PKCS7_FIELD

The values that can be retrieved from a PKCS#7 blob.

```
typedef SAPI_ENUM_PKCS7_FIELD {
  SAPI_ENUM_PKCS7_FIELD_NONE              = 0,
  SAPI_ENUM_PKCS7_FIELD_CERT              = 1,
  SAPI_ENUM_PKCS7_FIELD_SIGNATURE         = 2,
  SAPI_ENUM_PKCS7_FIELD_TIME              = 3,
  SAPI_ENUM_PKCS7_FIELD_HASH              = 4,
  SAPI_ENUM_PKCS7_FIELD_HASH_ALG          = 5,
  SAPI_ENUM_PKCS7_FIELD_SIGNED_CONTENT    = 6,
  SAPI_ENUM_PKCS7_FIELD_SIGNED_CERT       = 7
} SAPI_ENUM_PKCS7_FIELD;
```

ENUM values

SAPI_ENUM_PKCS7_FIELD_NONE

Not in use.

SAPI_ENUM_PKCS7_FIELD_CERT

The ASN1 encoded certificate value.

SAPI_ENUM_PKCS7_FIELD_SIGNATURE

The Signature value inside the PKCS#7 blob.

SAPI_ENUM_PKCS7_FIELD_TIME

The time value inside the PKCS#7 blob. If no time-stamping is defined, the regular time inside the PKCS#7 blob is returned.

SAPI_ENUM_PKCS7_FIELD_HASH

The hash of the date inside the PKCS#7 blob. This value is located in the signed attributes section. Older signatures do not have this attribute.

SAPI_ENUM_PKCS7_FIELD_HASH_ALG

The signature hash algorithm used to sign the hash value.

SAPI_ENUM_PKCS7_SIGNED_CONTENT

The signed attributes section inside the PKCS#7 signature.

SAPI_ENUM_PKCS7_SIGNED_CERT

The hash of the signature certificate. This value is embedded in the signed attributes. This is one of the basic criteria of an advanced signature.

SAPI_ENUM_STORE_TYPE

The types of system store in which a certificate can be installed.

```
typedef SAPI_ENUM_STORE_TYPE {
  SAPI_ENUM_STORE_NONE              = 0,
  SAPI_ENUM_STORE_USER              = 1,
  SAPI_ENUM_STORE_LOCAL_MACHINE     = 2
} SAPI_ENUM_STORE_TYPE;
```

ENUM values

SAPI_ENUM_STORE_NONE

Not in use.

SAPI_ENUM_STORE_USER

The user store.

SAPI_ENUM_STORE_LOCAL_MACHINE

The local machine store.

SAPI_ENUM_STRUCT_TYPE

The structure types whose memory is allocated by CoSign Signature Local and is freed by the SAPIStructRelease function.

```
typedef SAPI_ENUM_STRUCT_TYPE {
  SAPI_ENUM_STRUCT_TYPE_NONE              = 0,
  SAPI_ENUM_STRUCT_TYPE_SIGNED_FIELD      = 1,
  SAPI_ENUM_STRUCT_TYPE_GR_IMAGE          = 2,
  SAPI_ENUM_STRUCT_TYPE_GR_SIG_INFO       = 3,
  SAPI_ENUM_STRUCT_TYPE_FIELD_INFO        = 4
} SAPI_ENUM_STRUCT_TYPE;
```

ENUM values

SAPI_ENUM_STRUCT_TYPE_NONE

Not in use.

SAPI_ENUM_STRUCT_TYPE_SIGNED_FIELD

The signed field information structure (SAPI_SIGNED_FIELD_INFO).

SAPI_ENUM_STRUCT_TYPE_GR_IMAGE

The graphical image structure (SAPI_GRAPHIC_IMAGE_STRUCT).

SAPI_ENUM_STRUCT_TYPE_GR_SIG_INFO

The graphical image information structure (SAPI_GR_IMG_INFO).

SAPI_ENUM_STRUCT_TYPE_FIELD_INFO

This structure contains the array of custom fields.

SAPI_ENUM_GR_IMG_SELECT_MODE

The different modes in which the graphical image selection GUI dialog can operate.

```
typedef SAPI_ENUM_GR_IMG_SELECT_MODE {
  SAPI_ENUM_GR_IMG_SEL_MODE_SELECT       = 0,
  SAPI_ENUM_GR_IMG_SEL_MODE_VIEW_USER    = 1,
  SAPI_ENUM_GR_IMG_SEL_MODE_VIEW_KIOSK   = 2,
  SAPI_ENUM_GR_IMG_SEL_MODE_VOLATILE     = 3
} SAPI_ENUM_GR_IMG_SELECT_MODE;
```

ENUM values

SAPI_ENUM_GR_IMG_SEL_MODE_SELECT

The graphical image selection dialog box is called for selecting a graphical image. If only one image exists, the dialog box does not appear. It is possible to edit the images in CoSign when the dialog box is called in this mode.

SAPI_ENUM_GR_IMG_SEL_MODE_VIEW_USER

The graphical image selection dialog box is called for editing the images in CoSign and it runs under the logged-in user. Only this mode enables updating the graphical image in Adobe Acrobat/Reader.

SAPI_ENUM_GR_IMG_SEL_MODE_VIEW_KIOSK

The graphical image selection dialog box is called for editing the images in CoSign and it requires an explicit login by a user. In this mode, it is not possible to update the graphical image in Adobe Acrobat/Reader.

SAPI_ENUM_GR_IMG_SEL_MODE_VOLATILE

This mode can be used for capturing a graphical image intended for the current transaction only; that is, a temporary graphical signature.

SAPI_ENUM_SIG_FIELD_SETTINGS_ID

The types of information that can be kept inside a signature field.

```
typedef SAPI_ENUM_SIG_FIELD_SETTINGS_ID {
  SAPI_ENUM_SIG_FIELD_SETTING_NONE                  = 0,
  SAPI_ENUM_SIG_FIELD_SETTING_CLEAR_PERMIT          = 1,
  SAPI_ENUM_SIG_FIELD_SETTING_TITLE                 = 2,
  SAPI_ENUM_SIG_FIELD_SETTING_TITLE_TAG             = 3,
  SAPI_ENUM_SIG_FIELD_SETTING_SUGGESTED_SIGNER      = 4,
  SAPI_ENUM_SIG_FIELD_SETTING_INSTRUCT_TO_SIGNER    = 5,
  SAPI_ENUM_SIG_FIELD_SETTING_ALLOW_REASON          = 6,
  SAPI_ENUM_SIG_FIELD_SETTING_EMAIL                 = 7,
  SAPI_ENUM_SIG_FIELD_SETTING_SIGNED_SECTION        = 8,
  SAPI_ENUM_SIG_FIELD_SETTING_FIELD_CONTAINER       = 9,
  SAPI_ENUM_SIG_FIELD_SETTING_FIELD_MODE            = 10,
  SAPI_ENUM_SIG_FIELD_SETTING_CUSTOM1               = 30,
  SAPI_ENUM_SIG_FIELD_SETTING_CUSTOM2               = 31,
  SAPI_ENUM_SIG_FIELD_SETTING_CUSTOM3               = 32
} SAPI_ENUM_SIG_FIELD_SETTINGS_ID;
```

ENUM values

SAPI_ENUM_SIG_FIELD_SETTING_NONE

Not in use.

SAPI_ENUM_SIG_FIELD_SETTING_CLEAR_PERMIT

The conditions for clearing the signature field. Currently applicable only to legacy Word and PDF files.

SAPI_ENUM_SIG_FIELD_SETTING_TITLE

The title of the person signing the field.

SAPI_ENUM_SIG_FIELD_SETTING_TITLE_TAG

The label of the title field.

SAPI_ENUM_SIG_FIELD_SETTING_SUGGESTED_SIGNER

The suggested signer of the signature field.

SAPI_ENUM_SIG_FIELD_SETTING_INSTRUCT_TO_SIGNER

Instructions to the signer.

SAPI_ENUM_SIG_FIELD_SETTING_ALLOW_REASON

Whether to enforce entry of a reason.

SAPI_ENUM_SIG_FIELD_SETTING_EMAIL

An email address of the signer.

SAPI_ENUM_SIG_FIELD_SETTING_SIGNED_SECTION

This parameter is relevant to InfoPath 2007/2010/2013 forms.
This enumerand identifies the signed section.

SAPI_ENUM_SIG_FIELD_SETTING_FIELD_CONTAINER

This parameter is relevant to InfoPath 2007/2010/2013 forms.
This enumerand identifies the signature field

SAPI_ENUM_SIG_FIELD_SETTING_FIELD_MODE

This parameter is relevant to InfoPath 2007/2010/2013 forms.
This enumerand identifies the signature mode in InfoPath.

SAPI_ENUM_SIG_FIELD_SETTING_CUSTOM1

Custom field 1.

SAPI_ENUM_SIG_FIELD_SETTING_CUSTOM2

Custom field 2.

SAPI_ENUM_SIG_FIELD_SETTING_CUSTOM3

Custom field 3.

SAPI_ENUM_FIELD_MODE

This enum type is relevant to InfoPath 2007/2010/2013 forms and represents the types of available signatures in an InfoPath form.

```
typedef SAPI_ENUM_FIELD_MODE {
  SAPI_ENUM_FIELD_MODE NONE              = 0,
  SAPI_ENUM_FIELD_MODE_SINGLE            = 1,
  SAPI_ENUM_FIELD_MODE_COUNTER_SIGN      = 2
  SAPI_ENUM_FIELD_MODE_CO_SIGN           = 3
} SAPI_ENUM_FIELD_MODE;
```

ENUM values

SAPI_ENUM_FIELD_MODE_NONE

Not in use.

SAPI_ENUM_FIELD_MODE_SINGLE

A single signature in the form.

SAPI_ENUM_FIELD_MODE_COUNTER_SIGN

The multiple signatures in the form are dependent.

SAPI_ENUM_FIELD_MODE_CO_SIGN

The multiple signatures in the form are independent.

SAPI_ENUM_SIG_EXT_INFO_FORMAT

The possible values of the extended information structure when using SAPI_ENUM_CONF_ID_RET_EXT_FIELD_INFO as part of the configuration values. Please consult ARX before using this field.

```
typedef SAPI_ENUM_FIELD_EXT_INFO_FORMAT {
  SAPI_ENUM_FIELD_EXT_INFO_FORMAT_NONE                = 0,
  SAPI_ENUM_FIELD_EXT_INFO_FORMAT_OLD                 = 1,
  SAPI_ENUM_FIELD_EXT_INFO_FORMAT_V1                  = 2
} SAPI_ENUM_FIELD_EXT_INFO_FORMAT;
```

ENUM values

SAPI_ENUM_FIELD_EXT_INFO_FORMAT_NONE

Not in use.

SAPI_ENUM_FIELD_EXT_INFO_FORMAT_OLD

The record format is in a format corresponding to a CoSign pre 4.4 version.

SAPI_ENUM_FIELD_EXT_INFO_FORMAT_V1

The record format is a CoSign V4.4+ format. In this version, the information contains the custom fields.

SAPI_ENUM_TICKET_CHECK_STATUS

Contact ARX support for more information.

SAPI_ENUM_ADVANCED_SIG_LEVEL

The possible advanced signature conformance levels.
The levels are defined according to the XAdES or CAdES definitions.

To read more about XAdES, refer to http://www.w3.org/TR/XAdES/.
To read more about CAdES, refer to RFC 5126 documentation.

```
typedef SAPI_ENUM_ADVANCED_SIG_LEVEL {
  SAPI SAPI_ENUM_ADVANCED_SIG_LEVEL_NONE        = 0,
  SAPI_ENUM_ADVANCED_SIG_LEVEL_BES              = 1,
  SAPI_ENUM_ADVANCED_SIG_LEVEL_PES              = 2,
  SAPI_ENUM_ADVANCED_SIG_LEVEL_TS
} SAPI_ENUM_ADVANCED_SIG_LEVEL;
```

SAPI_ENUM_ADVANCED_SIG_LEVEL_NONE

No limitation on levels.

SAPI_ENUM_ADVANCED_SIG_LEVEL_BES

The basic advanced level of advanced signatures.

SAPI_ENUM_ADVANCED_SIG_LEVEL_PES

The basic policy-based advanced level of advanced signatures. This is not implemented yet in CoSign Signature Local.

SAPI_ENUM_ADVANCED_SIG_LEVEL_TS

The time-stamp-based advanced level of advanced signatures.

SAPI_ENUM_FILE_HANDLE_TYPE

The possible types of file handles that can be used by SAPI.

```
typedef SAPI_FILE_HANDLE_TYPE {
  SAPI ENUM_FILE_HANDLE_NONE       = 0,
  SAPI_ENUM_FILE_HANDLE_MEMORY     = 1,
  SAPI_ENUM_FILE_HANDLE_FILE       = 2
} SAPI_ENUM_FILE_HANDLE_TYPE;
```

SAPI_ENUM_FILE_HANDLE_NONE

Not in use.

SAPI_ENUM_FILE_HANDLE_MEMORY

Content of file is in memory.

SAPI_ENUM_FILE_HANDLE_FILE

Content of file is on the disk.

SAPI_ENUM_SIG_CLEAR_POLICY

The policy to follow when trying to clear a signature field.

```
typedef enum SAPI_ENUM_SIG_CLEAR_POLICY_TYPE {
  SAPI_ENUM_SIG_CLEAR_POLICY_ALWAYS      = 0,
  SAPI_ENUM_SIG_CLEAR_POLICY_NEVER       = 1,
  SAPI_ENUM_SIG_CLEAR_POLICY_SIGNER_BY_CN= 2
} SAPI_ENUM_SIG_CLEAR_SIG_POLICY;
```

SAPI_ENUM_SIG_CLEAR_POLICY_ALWAYS

There are no restrictions when clearing a signature field.

SAPI_ENUM_SIG_CLEAR_POLICY_NONE

It is not possible to clear a signature field.

SAPI_ENUM_SIG_CLEAR_POLICY_SIGNER_BY_CN

Only the signer can clear the signature field.

Appendix D: CoSign Signature Local – Signing/Verifying Constants and Flags

This appendix describes all the constants and flags defined in CoSign Signature Local.

General Constants

Constant	Description	Value
EMPTY_FIELD_LABEL_MAX_LEN	The max length of the empty signature field label string.	128
SIGNATURE_FIELD_NAME_MAX_LEN	The max length of the signature field name.	128
DATE_FORMAT_MAX_LEN	The max length of the date format string.	32
TIME_FORMAT_MAX_LEN	The max length of the time format string.	32
GR_SIG_NAME_MAX_LEN	The max length of a graphical image name	124
NUMBER_OF_POSSIBLE_DRAWING_ELEMENTS	The maximum number of elements (for example, reason, or signer name) that can be displayed in a signature field.	7
GR_IMG_FLG_ALWAYS_ON_TOP	The graphical image selection dialog box will appear on top of other windows. Consult with ARX before setting this flag.	0x00000004
GR_IMG_FLG_EDIT_AUTO_OK	Automatic OK after capturing graphical image. Consult with ARX before setting this flag.	0x00000008
GR_IMG_FLG_HIDE_COLOR	Hide color selection button. Consult with ARX before setting this flag.	0x00000010
GR_IMG_FLG_FORCE_EDIT_DLG	Show the whole graphical image selection dialog box and not only the Capture Signature section. Consult with ARX before setting this flag.	0x00001000
COSIGN_BASIC_SLOT_STRING	The CoSign CSP provider.	"AR CoSign Appliance"
SAPI_MAX_SIG_INSTRUCT_LEN	The maximum number of alphanumerical characters in the instructions text.	256
PERFORM_IMAGE_REDUCTION_DEFAULT	Use the default image reduction behavior when uploading a graphical image to CoSign.	0xFFFFFFFF
TOKEN_ID_MAX_LENGTH	The length of the token used to identify the appliance used in this SAPI session.	50

Constant	Description	Value
NOT_PERFORM_IMAGE_REDUCTION	Do not perform image reduction when uploading a graphical image to CoSign.	0
AR_SF_LOCATOR_MAX_STRING_LENGTH	This flag is relevant when specifying signature field location in PDF files. The maximum length of the field locator string.	256
AR_LOCATOR_TEXT_DIRECTION_AS_PAGE_ROTATION	The orientation of each field locator string is the same as the orientation of the page on which it is located. This parameter should be used only if at least one of the pages is rotated.	0x00000001

Flags when Enumerating Signature Fields

The following values are used as flags when enumerating signature fields.

Flag	Description	Value
AR_INCLUDE_LEGACY_DOC_FIELDS_FLAG	Include also AR legacy fields in the signature field enumeration.	0x00000001
AR_SAPI_PDF_USE_SIGNER_GMT_OFFSET	Retrieve signature time according to the signer's GMT offset.	0x00000002

Flags used by the SAPILogonEx Function

The following values are used as flags by the SAPILogonEx Function.

Flag	Description	Value
SAPI_LOGON_FLAG_TYPE_WRITE_OP	Enable the open session to update user account information, such as the user's graphical image information. This means that the open session will be based on communication with the primary CoSign appliance.	0x00000001

Flags when Enumerating Certificates

The following values are used as flags when enumerating certificates.

Flag	Description	Value
PERFORM_EXTENDED_VALIDATION	To be used as part of the certificate enumeration function for enabling certificate path validation. Certificates that do not pass the validation process are not included in the certificate enumeration. This flag cannot be used when displaying a certificate list. In this case, you should use the SAPI_ENUM_CONF_ID_EXTENDED_VALIDATION configuration value.	0x00000001

Flags when Displaying Certificate List

The following values are used as flags when displaying a certificate list.

Flag	Description	Value
DISPLAY_ALL_CERTS_IN_DIALOG	Display all available certificates (even if there is only one certificate).	0
DONT_DISPLAY_DIALOG_FOR_SINGLE_CERT	If there is only one available certificate, the function does not display the dialog, and returns the certificate's handle.	1

Flags when Enumerating or Using Graphical Signatures

The following values are used as flags when enumerating graphical signatures.

Flag	Description	Value
AR_GR_FLAG_ALL_TYPE	Use this flag to retrieve all types of graphical images.	0x00FF0000
AR_GR_FLAG_IMAGE_TYPE	Use this flag to retrieve graphical signatures. This flag can also be used when creating a new graphical image.	0x00010000
AR_GR_FLAG_INITIALS_TYPE	Use this flag to retrieve initials images. This flag can also be used when creating a new graphical image.	0x00020000
AR_GR_FLAG_LOGO_TYPE	Use this flag to retrieve logo images. This flag can also be used when creating a new graphical image.	0x00040000
AR_GR_FLAG_VOLATILE_TYPE	This type identifies a volatile graphical signature (which is not actually kept in the user account in the CoSign appliance).	0x00100000

Flags when Using the Signing Ceremony API

The following values are used as flags when using the signing ceremony API.

Value	Meaning	Value
RESERVED_SC_ENABLE_THREAD	Use this flag to execute the signing ceremony in a thread. Consult ARX before using this option.	0x00000001
RESERVED_SC_STORAGE_BASIC_CONFIG	Use this flag to specify that the user is restricted to using the system-wide configuration. For example, the reasons list cannot be changed by the user.	0x00000002
AR_DISPLAY_ALLOW_TIMESTAMP	Used by the application to notify the signing ceremony that it allows the display of a time stamp checkbox	0x02000000

Flags when Creating a Signature Field in PDF Files

The following values are used as flags when creating a new signature field in PDF documents.

These flags can be passed as part of the *Flags* input parameter of the SAPISignatureFieldCreateEx and SAPISignatureFieldCreateSignEx functions.

Flag	Description	Value
AR_PDF_FLAG_FIELD_NAME_SET	Enables manually setting the name of the signature field.	0x00000080

Flags when Signing PDF Files

The following values are used as flags when signing Adobe documents.

These flags can be passed as part of the *Flags* input parameter of the SAPISignatureFieldCreateSignEx and the SAPISignatureFieldSignEx functions.

Flag	Description	Value
AR_PDF_FLAG_FILESIGN_LINE	Use the vectorial representation rather than the BMP representation when writing the graphical signature image to the file.	0x00000010
AR_PDF_FLAG_FILESIGN_VERTICAL	Split the graphical signature image and the other text elements vertically.	0x00000020
AR_PDF_FLAG_CERTIFY	The signature operation will use the PDF's certify operation instead of a regular digital signature operation. The certify restriction level will be level 2.	0x00000040
AR_PDF_FLAG_CERTIFY_2	The signature operation will use the PDF's certify operation instead of a regular digital signature operation. In the PDF certify operation there are three levels of restrictions that are implemented once the document is signed. This flag should be used in combination with the following to achieve all three levels of restrictions: □ Restriction Level 1 – AR_PDF_FLAG_CERTIFY_1 □ Restriction Level 2 - AR_PDF_FLAG_CERTIFY_2 □ Restriction Level 3 - AR_PDF_FLAG_CERTIFY_1 | AR_PDF_FLAG_CERTIFY_2	0x00000040
AR_PDF_FLAG_CERTIFY_1	See the description of AR_FLAG_CERTIFY_2	0x40000000
AR_PDF_FLAG_FILESIGN_FORCE_GRIMG_ERR	If a graphical image is required and the relevant user does not have any graphical image, determines whether to stop the signature operation with an error.	0x80000000

Flags when Creating a Signature Field in TIFF Files

The following values are used as flags when creating a new signature field in TIFF documents.

These flags can be set as part of the signature field's *Flags* attribute in the SAPI_SIG_FIELD_SETTINGS structure.

Flag	Description	Value
AR_TIFF_FLAG_FIELD_DRAW_BANNER_METHOD	Indicates the field drawing method is set to banner style.	0x00000100
AR_TIFF_FLAG_FIELD_DONOT_CLEAR_EMBEDDED_METHOD	Indicates that the visible field cannot be cleared. This directs CoSign Signature Local to not keep the image that is covered by the newly generated visible signature.	0x00000200

Flags when Signing TIFF Files

The following values are used as flags when signing a TIFF document.

These flags can be passed as part of the *Flags* input parameter of the SAPISignatureFieldSignEx function.

Flag	Description	Value
AR_TIFF_FLAG_SIGNING_FLAGS_MASK	Reserved – not in use.	0x0000003F
AR_TIFF_FLAG_PACKBITS_COMPRESSION	Use pack bit compression for the first display page (banner). The actual compression mode is PACKBITS_COMPRESSION.	0x00000002
AR_TIFF_FLAG_GROUP4FAX_COMPRESSION	Use pack bit compression for the first display page (banner). The actual compression mode is GROUP4FAX.	0x00000004

Flags when Using a Signature Field in Word Documents

The following values are used as flags when using signature field in Word documents.

These flags can be set as part of the signature field's *Flags* attribute in the SAPI_SIG_FIELD_SETTINGS structure.

Flag	Description	Value
AR_WORD_DUMMY_FIELD_CREATION	Reserved – Not in use.	0x00000001
AR_WORD_XP_COMPATIBLE_FLAG	Add a word XP compatible signature when signing this field. This means that the signature can be verified by Word XP without the AR word plug-in.	0x00000001
AR_WORD_OUTLOOK_INCOMPATIBLE	Include the file's summary information in the data to be signed. Note that if this flag is set and the file is sent via Outlook, Outlook changes the file's summary information and thus invalidates the signature.	0x00000002
AR_WORD_SHAREPOINT_2007_COMPATIBLE	Include the SharePoint related information in the data to be signed. Note that if this flag is set and the file is used by SharePoint, SharePoint changes some of the file's summary information and thus invalidates the signature.	0x00000004

Flags when Creating a Signature Field in Office 2007/2010/2013 Documents

The following values are used as flags when creating a new signature field in Office 2007/2010/2013 documents.

These flags can be passed as part of the *Flags* input parameter of the SAPISignatureFieldCreateEx and SAPISignatureFieldCreateSignEx functions.

Flag	Description	Value
AR_MS_SIGNATURE_LINE_ONLY	If this flag is set, the created empty signature field is a Microsoft field and not an ARX Signature Line Provider field.	0x00000001

Flags when Signing Word Documents

The following values are used as flags when signing Word documents.

These flags can be passed as part of the *Flags* input parameter of the SAPISignatureFieldSignEx function.

Flag	Description	Value
AR_WORD_REDRAW_SIG_METAFILE_FLAG	In case of a single signature in a file, the signature appearance is written to the file, so that the signature can be seen even in a version of Word without the AR plug-in. It cannot, however, be verified. Note that by default this feature is disabled. Contact ARX support for instructions on enabling this feature.	0x00000001
AR_WORD_OPERTAION_FROM_ADDIN_FLAG	Reserved – not in use.	0x00000002
AR_WORD_CLEAR_DEPENDENT_ SIGNATURES_FLAG	Clear all the signatures in the signature fields that depend on this field prior to signing. Note that this flag can also be used for SAPISignatureFieldClear, SAPISignatureFieldRemove, and SAPISignatureFieldCreate.	0x00000004
AR_WORD_CLEAR_ALL_SIGNATURES_FLAG	Clear the signatures in all the signature fields in the document prior to signing. Note that this flag can also be used for SAPISignatureFieldClear, SAPISignatureFieldRemove, and SAPISignatureFieldCreate.	0x00000008

Flags when Signing XML Documents

The following values are used as flags when signing XML documents.

These flags can be passed as part of the *Flags* input parameter of the SAPISignatureFieldCreateSignEx function.

Flag	Description	Value
AR_XML_XML_SIG_TYPE_ENVELOPED	Use Enveloped XML signature format. **Note**: You can specify either Enveloped XML signature format, or Enveloping XML signature format, not both. The Enveloped XML signature format is the default signature format when no flag is specified.	0x00000001
AR_XML_XML_SIG_TYPE_ENVELOPING	Use Enveloping XML signature format. **Note**: You can specify either Enveloped XML signature format, or Enveloping XML signature format, not both.	0x00000002
AR_XML_SIG_TYPE_XMLDIGSIG	Use a regular XML digital signature. **Note**: You can specify either a regular XML digital signature, or an advanced-BES XML signature, not both.	0x00000008
AR_XML_SIG_TYPE_XADES_BES	Use an advanced-BES XML digital signature. **Note**: You can specify either a regular XML digital signature, or an advanced-BES XML signature, not both. The advanced-BES XML signature is the default XML signature when no flag is specified.	0x00000010

Time-Stamping/OCSP and Miscellaneous Signature-Related Flags

The following values are used when involving a time stamping service or OCSP as part of the digital signature operation. The table also includes various miscellaneous constants.

Flag	Description	Value
AR_GR_SIG_ENABLE_STS, AR_SAPI_SIG_ENABLE_STS	Enable the time stamping service.	0x00000100
AR_GR_SIG_DISABLE_STS, AR_SAPI_SIG_DISABLE_STS	Disable the time stamping service.	0x00000200
AR_SAPI_SIG_HASH_ONLY	The value for buffer signing is the hash itself and not the data.	0x00000400
AR_SAPI_SIG_PDF_REVOCATION	A flag for the signing operation, indicating to embed revocation information when signing PDF-style. Currently supported only in PDF files.	0x00001000
AR_SAPI_SIG_CAdES_REVOCATION	A flag for the signing operation, indicating to embed revocation information when signing. Currently NOT supported.	0x00002000
AR_SAPI_SHA256_FLAG	A flag for the signing operation, indicating to use SHA256 for signing. Note that verification can fail if the verifying party does not have the SHA256 capability.	0x00004000
AR_SAPI_SHA384_FLAG	A flag for the signing operation, indicating to use SHA384 for signing. Note that verification can fail if the verifying party does not have the SHA384 capability.	0x00008000
AR_SAPI_SHA512_FLAG	A flag for the signing operation, indicating to use SHA512 for signing. Note that verification can fail if the verifying party does not have the SHA512 capability.	0x00010000
AR_SAPI_SIG_ENFORCE_NO_LOGOUT	When this flag is used as part of a digital signature operation, the signing user will remain logged-in after completing the signing operation. This flag is not relevant for cases where the session is dynamic (based on using SAPILogon and SAPILogoff calls).	0x00020000
AR_SAPI_SIG_ENFORCE_LOGOUT	When this flag is used as part of a digital signature operation, the signing user will be automatically logged off. This flag is not relevant for cases where the session is dynamic (based on using SAPILogon and SAPILogoff calls).	0x00040000

Flag	Description	Value
AR_SAPI_SIG_PKCS1	When this flag is used as part of a digital signature operation, the generated signature is based on PKCS#1 format. This option is relevant only to buffer signing.	0x00080000
AR_SAPI_ENFORCE_SHA1_FLAG	Use this flag to enforce a generation of a SHA1 signature.	0x00100000
PERFORM_EXTENDED_VALIDATION	When this flag is used, certificates that do not pass the validation test cannot be used for signature operation. This flag can be used as part of the certificate enumeration function for enabling certificate path validation.	0x00000001

Flags when Verifying a Signature

The following values are used as flags when verifying a signature of a signature field of any file type (SAPISignatureFieldVerify), or a signature of raw data (SAPIBufferVerifySignature, SAPIBufferVerifySignatureInit).

Flag	Description	Value
DONT_USE_FIELD_TIME_FOR_CERT_VERIFY	If the signature time does not exist in the PKCS#7 signature blob, use the current time for validating the certificate, rather than the signature field signing time or the time that is passed as an input parameter.	0x00000001
AR_SAPI_SIG_HASH_ONLY	The value for buffer signature validation is the hash itself and not the data.	0x00000400
AR_SAPI_SHA256_FLAG	A flag for the signing operation, indicating to use SHA256 for signing. Relevant only if the hash is given.	0x00004000
AR_SAPI_SHA384_FLAG	A flag for the signing operation, indicating to use SHA384 for validation. Relevant only if the hash is given.	0x00008000
AR_SAPI_SHA512_FLAG	A flag for the signing operation, indicating to use SHA512 for validation. Relevant only if the hash is given.	0x00010000
AR_SAPI_ENFORCE_SHA1_FLAG	A flag for the signing operation, indicating to use SHA1 for validation. Relevant only if the hash is given.	0x00100000
AR_SAPI_SIG_PKCS1	When this flag is used as part of a digital signature verification operation, the given signature is based on PKCS#1 format. This option is relevant only to buffer signature verification.	0x00080000

Flags when Clearing or Removing Signature Fields

The following values are used as flags when clearing or removing signature fields.

Flag	Description	Value
AR_WORD_CLEAR_DEPENDENT_ SIGNATURES_FLAG	Clear all the signatures in the signature fields that depend on this field, prior to clearing or removing this field.	0x00000004
AR_WORD_CLEAR_ALL_SIGNATURES_FLAG	Clear the signatures in all the signature fields in the document prior to clearing or removing this field.	0x00000008

Graphical Signature Image Related Flags

The following flags are used when initializing the graphical image enumeration operation, or to filter the images that are shown in the GUI dialog box when calling the SAPIGraphicSigImageGUISelect or SAPISigningCeremonyGUI functions.

Flag	Description	Value
AR_GR_SIG_DATA_FORMAT_MONO_BMP	Monochrome BMP image.	0x00000001
AR_GR_SIG_DATA_FORMAT_COLOR_BMP	Colored BMP image.	0x00000002
AR_GR_SIG_DATA_FORMAT_COLOR_1_BMP	Colored BMP image, but only 2 colors are in use.	0x00000004
AR_GR_SIG_DATA_FORMAT_JPG	JPEG image.	0x00000008
AR_GR_SIG_DATA_FORMAT_TIFF	TIFF image.	0x00000010
AR_GR_SIG_DATA_FORMAT_GIF	GIF format.	0x00000020
AR_GR_SIG_DATA_FORMAT_UNKNOWN	Unknown format.	0x00000000
AR_GR_SIG_DATA_FORMAT_ALL	Get all formats.	0xFFFFFFFF
CAP_DEV_DLG_ID_AUTOMATIC	Capturing device – automatic selection.	0
CAP_DEV_DLG_ID_GUI_OR_AUTOMATIC	Capturing device – manual selection.	1
CAP_DEV_DLG_ID_VIRTUAL	Capturing device – external DLL.	2
CAP_DEV_DLG_ID_TOPAZ	Capturing device – Topaz pad.	3
CAP_DEV_DLG_ID_EPAD	Capturing device – Interlink pad.	4
CAP_DEV_DLG_ID_TABLET_PC	Capturing device – Tablet PC or Mouse.	5
CAP_DEV_DLG_ID_TEXT	Capturing device – Script font Mouse.	6

Note: *CoSign Signature Local supports only BMP and JPG formats in its signature field signing function.*

The following is the value of the flags parameter in SAPIGraphicSigImageInfoGet.

Flag	Description	Value
AR_GR_SIG_GET_INTERNAL_ALLLOC	Let CoSign Signature Local allocate the memory for the graphical signature image.	0x00000001

Custom Fields-Related Constants

Constant	Description	Value
MAX_NUM_OF_CUSTOM_FIELDS	The maximum number of customer fields in a signature field.	15
CURRENT_CUSTOM_FIELDS_STRUCT_VERSION	The current structure version of the custom field.	1

Appendix E: CoSign Signature Local – Signing/Verifying Error Messages

This appendix describes the error codes returned by CoSign Signature Local.

Error Code	Description	Numeric Value
SAPI_OK	Function returned with no error.	0
SAPI_GENERAL_ERROR	A general failure message returned from CoSign Signature Local.	0x90010001
SAPI_ERR_FAILED_TO_INIT	Failed to initialize the SAPI library. Can be caused by installing an old CoSign Signature Local version on a machine with a newer CoSign client.	0x90020100
SAPI_ERR_FAILED_TO_INIT_REG_VALUE	Cannot read the CoSign Signature Local installation path. The Install_path value cannot be read from the registry.	0x90020101
SAPI_ERR_FAILED_TO_INIT_REG_KEY	Cannot read the CoSign Signature Local installation path. The Install_path key cannot be found.	0x90020102
SAPI_ERR_FAILED_TO_INIT_LOAD_MODULE	Failed to initialize the SAPI library. Failed to load the SAPI DLL.	0x90020103
SAPI_ERR_FAILED_TO_FIND_SERVER	Cannot find a CoSign server.	0x90020110
SAPI_ERR_FAILED_TO_CONNECT_TO_SERVER	Failed to connect to the CoSign server.	0x90020111
SAPI_ERR_SERVER_COMM_ERROR	Request from CoSign failed due to a communication error.	0x90020112
SAPI_ERR_SERVER_BLOCKED	Request from CoSign failed due to due client timeout.	0x90020113
SAPI_ERR_USER_IS_NOT_LOGON	User is trying to perform an operation that requires authentication before calling the logon function.	0x90020120

Error Code	Description	Numeric Value
SAPI_ERR_FAILED_TO_LOGON	Failed to logon to CoSign. Verify that the user name and password are correct.	0x90020130
SAPI_ERR_HANDLE_ALREADY_LOGGED_ON	SAPI session is active for another user. This error may also be returned when a second call to logon is attempted without a logoff. The error may also occur when a call to logon is made after the SAPI session was used to select objects under the credentials of the default user.	0x90020131
SAPI_ERR_LL_FAILURE_IN_LOGON	Failed to allocated resources for a new SAPI-LOGIN session (dynamic slot).	0x90020133
SAPI_ERR_ALREADY_LOCKED	The user session is already locked for third-party applications.	0x90020137
SAPI_ERR_LOCK_NOT_REQUIRED	No need for lock for third-party applications.	0x90020138
SAPI_ERR_FAILED_TO_UPDATE_CREDENTIAL	An attempt to change the user credentials failed.	0x90020150
SAPI_ERR_FAILED_TO_DELETE_USER	CoSign Signature Local failed to delete a user from CoSign. Call SAPIUMExtendedLastErrorGet to retrieve the specific error code returned from CoSign.	0x90020160
SAPI_ERR_FAILED_TO_BEGIN_SYNC	Failed to initialize a synchronization process. Call SAPIUMExtendedLastErrorGet to retrieve the specific error code returned from CoSign.	0x90020170
SAPI_ERR_FAILED_TO_END_SYNC	Failed to end a synchronization process. Ending a synchronization process directs CoSign to delete users that are not in sync. When this function returns an error, the synchronization process is cancelled. Call SAPIUMExtendedLastErrorGet to retrieve the specific error code returned from CoSign.	0x90020180
SAPI_ERR_FAILED_ACTIVATE_USER	Failure in user activation process.	0x900201A0
SAPI_ERR_CRED_AND_NEW_CRED_CANNOT_BE_EQUAL	A new password identical to the old password was entered when changing a password or activating a user account.	0x900201A1

Error Code	Description	Numeric Value
SAPI_ERR_USER_ALREADY_ACTIVATED	The user is already activated.	0x900201A2
SAPI_ERR_SESSION_GET_FAILED	A technical problem occurred.	0x900201A3
SAPI_ERR_FAILED_TO_GET_CA_INFO	Failed to get CA information. CoSign returns this error if the installed CA does not support the requested information type.	0x90020190
SAPI_ERR_FAILED_TO_LOGOFF	Failed to logoff from a SAPI session.	0x900201b0
SAPI_ERR_FAILED_TO_WRITE_USER	Failed to add or sync a user to CoSign. Call SAPIUMExtendedLastErrorGet to retrieve the specific error code returned from CoSign.	0x900201d0
SAPI_ERR_FAILED_TO_WRITE_USER_EXIST	Failed to add a user to CoSign. A user with the same ID already exists.	0x900201d2
SAPI_ERR_FAILED_TO_WRITE_USER_EXCEED_LICENSE	Failed to add a user to CoSign because the maximum number of users provided under the license has been reached. Either delete users that are not active, or contact ARX to get a license that allows for more users.	0x900201d4
SAPI_ERR_FAILED_TO_VERIFY_USRPWD	Failed to verify the user password. Passwords should be in wide character representation. Password length in bytes includes the null terminator (two bytes in wide char representation).	0x900201e0
SAPI_ERR_KEY_LOCKED	The user key is locked and cannot be used for signing.	0x900201e1
SAPI_ERR_USR_LOCKED	The user is locked and cannot logon.	0x900201e2
SAPI_ERR_USR_PASSWORD_EXPIRED	The user's password has expired.	0x900201e3
SAPI_ERR_USR_DISABLED	The user is in a disabled state.	0x900201e4
SAPI_ERR_USR_NOT_ACTIVATED	The user was not activated yet.	0x900201E5

Error Code	Description	Numeric Value
SAPI_ERR_USER_PWD_DO_NOT_FIT_POLICY	The user's password does not fit the configured password policy.	0x900201E6
SAPI_ERR_USER_PWD_IN_MIN_VALIDITY_PERIOD	The minimum time for a password change has not passed yet.	0x900201E7
SAPI_ERR_USR_DISABLED	The user is in a disabled state	0x900201e4
SAPI_ERR_FAILED_TO_UPDATE_USER	Failed to update the user record.	0x90020201
SAPI_ERR_FAILED_TO_RESET_COUNTER	Failed to reset the user's counter.	0x90020210
SAPI_ERR_FAILED_TO_GET_USER	Failed to retrieve user's information.	0x90020215
SAPI_ERR_SESSION_IS_NULL	The session parameter cannot be NULL.	0x90020220
SAPI_ERR_INVALID_SES_HANDLE	The session handle used is either not initialized or is corrupt.	0x90020222
SAPI_ERR_NO_SUCH_USER	No such user exists in CoSign.	0x90020300
SAPI_ERR_TOKEN_NOT_SUPPORTED	CoSign is the only supported token for this operation.	0x90030100
SAPI_ERROR_NO_MORE_ITEMS	There are no more graphical images or certificates to retrieve. This return code is usually used to indicate the end of an objects list and should not be interpreted as indicating an error.	0x90030103
SAPI_CANT_DELETE_ZOMBIE_USERS	Failed to delete zombie users. Zombie users are users that were not touched while synchronizing CoSign with the user directory. Zombie users should be deleted when the sync operation ends.	0x90030110
SAPI_ERR_FAILED_TO_ENUM_USERS	The users enumeration operation failed.	0x90030120
SAPI_FAILED_TO_ALLOCATE_MEMORY	A CoSign Signature Local operation required dynamic memory allocation and the allocation failed. Verify that there are no memory leaks or other resource problems.	0x90030130

Error Code	Description	Numeric Value
SAPI_COM_FAILED_TO_ALLOCATE_MEMORY	A SAPICOM operation required dynamic memory allocation and the allocation failed. Verify that there are no memory leaks or other resource problems.	0x90030131
SAPI_ERR_FAILED_TO_GET_USER_INFO	Failed to get a user information structure. Call SAPIUMExtendedLastErrorGet to retrieve the error code that was returned from CoSign.	0x90030140
SAPI_FUNCTION_NOT_SUPPORTED	This function is not supported, although defined by the CoSign Signature Local header.	0x90030150
SAPI_COM_FUNCTION_NOT_SUPPORTED	This function is not supported, although defined by the CoSign Signature Local header.	0x90030151
SAPI_NO_MORE_USERS	The user enumeration operation finished and there are no more users to retrieve. This return code is usually not an error but an indication that all the users were already retrieved.	0x90030160
SAPI_ERR_FAILED_TO_CANCEL_SYNC	The cancellation of the synchronization operation of the CoSign database with the external user directory failed. Do not call SAPIUMUsersSyncEnd before initializing a new synchronization operation.	0x90030170
SAPI_ILLEGAL_CA_INFO_TYPE	The CA information type that was required is not one of the supported values.	0x90030180
SAPI_ERR_FAILED_TO_FINALIZE	Failed to release the SAPI library.	0x90030190
SAPI_ERR_CONTEXT_NOT_INITALIZED	The context that is used is either not initialized by the relevant Init function or is corrupt.	0x900301a0
SAPI_ERR_TOKEN_HANDLE_NOT_INITALIZED	The handle that is used is either not initialized by the relevant function or is corrupt.	0x900301b0
SAPI_ERR_CONF_VALUE_NOT_FOUND	The configuration value requested by the function is not one of the supported values.	0x900301c0

Error Code	Description	Numeric Value
SAPI_ERR_FAILED_TO_GET_CONF_VALUE	Failed to get a configuration value. Make sure the length is correct.	0x900301c1
SAPI_ERR_FAILED_TO_SET_CONF_VALUE	Failed to set a configuration value. Make sure the type is correct.	0x900301c2
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	A NULL value is not allowed for one or more of the parameters.	0x900301d0
SAPI_ERR_FAILED_TO_SET_CERT	Failed to set a certificate as a default certificate for further signing operations.	0x900301e0
SAPI_ERR_FAILED_TO_GET_CERT	Failed to get the default certificate. Get the extended return code for more information about the source of the problem.	0x900301e1
SAPI_ERR_CERT_HANDLE_NOT_INITALIZED	The certificate handle used is either not initialized or is corrupt.	0x900301f0
SAPI_ERR_PARAMETER_LEN_IS_TOO_SHORT	The length allocated for the output parameter is too short. Usually the required length is returned in the corresponding length parameter.	0x90030210
SAPI_COM_ERR_PARAMETER_LEN_IS_TOO_SHORT	The length that was allocated for the output parameter is too short. Usually the required length is returned in the corresponding length parameter.	0x90030211
SAPI_ERR_UNSUPPORTED_CERT_FIELD	The value of the certificate field that is required is not one of the supported values.	0x90030220
SAPI_ERR_FAILED_TO_GET_CERT_FIELD	Failed to retrieve the certificate field.	0x90030230
SAPI_ERR_FAILED_TO_FIND_AUTHORITY_KEY_ID	Failed to retrieve the authority key ID.	0x90030231
SAPI_ERR_CERT_INVALID_OR_EMPTY_CHAIN	Failed to retrieve a certificate chain.	0x90030232
SAPI_ERR_FAILED_TO_FIND_OCSP_URL	Failed to get the URL of the OCSP server.	0x90030233
SAPI_ERR_CERT_REVOKED_BY_OCSP	The certificate is revoked using the OCSP service.	0x90030234

Error Code	Description	Numeric Value
SAPI_ERR_OCSP_CERT_GENERAL_ERROR	The OCSP check, performed as part of the signature operation, is reporting a general error.	0x90030235
SAPI_ERR_PARAMETER_LEN_IS_TOO_LONG	Parameter length is too long.	0x90030236
SAPI_ERR_FAILED_TO_GET_CERT_FIELD	Failed to retrieve the certificate field.	0x90030230
SAPI_ERR_FAILED_TO_INIT_CERT_ENUM	Failed to initialize the certificate enumeration operation.	0x90030240
SAPI_ERR_FAILED_TO_CONT_CERT_ENUM	Failed in enumerating certificates.	0x90030250
SAPI_ERR_FAILED_TO_SIGN_BUF	Failed to sign buffer. This usually occurs when there is no access to the private key. For example, when prompt for sign is set and an incorrect password is entered, or the process is unattended and the password cannot be entered.	0x90030270
SAPI_ERR_FAILED_TO_VERIFY_BUF	Failed to verify buffer.	0x90030271
SAPI_ERR_FAILED_TO_SIGN_XP_STYLE	Failed to sign a word file with an office compatible signature.	0x90030273
SAPI_ERR_FAILED_TO_INIT_SIGN_BUF	Failed to initialize the continuous sign buffer operation.	0x90030280
SAPI_ERR_FAILED_TO_INIT_VERIFY_BUF	Failed to initialize the continuous verify buffer operation.	0x90030281
SAPI_ERR_FAILED_TO_CONT_SIGN_BUF	Failed in maintaining the continuous sign buffer operation.	0x90030290
SAPI_ERR_FAILED_TO_CONT_VERIFY_BUF	Failed in maintaining the continuous verify buffer operation.	0x90030291
SAPI_ERR_FAILED_TO_END_SIGN_BUF	Failed to sign buffer. This usually occurs when there is no access to the private key. For example, when prompt for sign is set and an incorrect password is entered, or the process is unattended and the password cannot be entered.	0x900302a0
SAPI_ERR_FAILED_TO_END_VERIFY_BUF	Failed to verify buffer.	0x900302a1

Error Code	Description	Numeric Value
SAPI_ERR_TOO_MANY_CERTS_TO_SELECT_FROM	Failed to get the default certificate. The user has more than one certificate and CoSign Signature Local cannot determine which one should be used as the default.	0x900302b0
SAPI_ERR_CERT_FIELD_VALUE_NOT_FOUND	Failed to find the required field in the certificate.	0x900302c0
SAPI_ERR_NO_CERT_TO_SELECT_FROM	Failed to get the default certificate. The user has no valid certificate in the store.	0x900302d0
SAPI_ERR_FAILED_TO_BUILD_CERT_CHAIN	Failed to build a certificate chain.	0x900302e0
SAPI_ERR_GUI_SELECT_CERT_RETURNED_NO_CERT	The Select Certificate GUI dialog box found no certificate.	0x900302f0
SAPI_ERR_GUI_SELECT_SELCTED_CERT_NOT_FOUND	Unable to retrieve the certificate that was selected by the user via the Select Certificate dialog box.	0x900302f1
SAPI_ERR_GUI_SELECT_CERT_OPERATION_CANCELLED	The user pressed the **Cancel** button in the Select Certificate dialog box, and no certificate was selected.	0x900302f2
SAPI_ERR_UNSUPPORTED_GRAPHICAL_IMAGE_SOURCE	The value of the graphical image source is not one of the supported values.	0x90030300
SAPI_ERR_UNSUPPORTED_GRAPHICAL_IMAGE_DATA	The graphical image data format is not a supported graphical image format.	0x90030301
SAPI_ERR_FAILED_TO_INSTALL_CA_CERT	Failed to install the CA certificate in the store. This may be a permissions problem, because the user needs administrative privileges to install a certificate in the machine store. When installing a CA certificate in the user store, the user must approve the operation by pressing the **Yes** button in the dialog box that opens during the installation process.	0x90030310
SAPI_ERR_ILLEGAL_STORE_TYPE	The store type ID is not supported for certificate installation.	0x90030320
SAPI_ERR_BUFFER_CONTAINS_NO_CERT	The buffer for the certificate contains no certificate data, or contains an unsupported format.	0x90030330

Error Code	Description	Numeric Value
SAPI_ERR_FAILED_TO_PARSE_PKCS7_BLOB	Failed to parse the PKCS#7 blob. Verify that all blob bytes were sent to the function and that the length is correct.	0x90030340
SAPI_ERR_ILLEGAL_CONF_TYPE	A configuration value that was successfully set earlier in this SAPI session was set with an incorrect type.	0x90030350
SAPI_ERR_SIGNATURE_IS_NOT_VALID	The signature is not valid. The data was probably changed after it was signed.	0x90030360
SAPI_ERR_INVISIBLE_IS_UNSUPPORTED	An invisible signature is not supported for this file type (the Word file type).	0x90030370
SAPI_ERR_REQUEST_FOR_TS_TIMED_OUT	Timeout for Time Stamping request.	0x90030371
SAPI_ERR_TS_REPLY_TOO_LONG	Time Stamping reply is too long.	0x90030372
SAPI_ERR_TS_SUBMIT_HTTP_ERROR	Connection to Time Stamping service problem.	0x90030373
SAPI_ERR_TS_SUBMIT_WININET_ERROR	Connection to Time Stamping service problem.	0x90030374
SAPI_ERR_FAILED_TO_READ_TS_URL_VAL	Missing configuration value for Time Stamping service URL.	0x90030375
SAPI_ERR_FAILED_TO_ENCODE_PKCS7_WITH_TS	Failed to encode the time stamp into the digital signature.	0x90030376
SAPI_ERR_FAILED_TO_VERIFY_TS	Failed to verify the time stamp.	0x90030377
SAPI_ERR_TS_FAILED_TO_COMPARE_RANDOM_VAL	Failed to compare random information between Time Stamping request and response.	0x90030378
SAPI_ERR_TS_FAILED_TO_COMPARE_HASH_VAL	Failed to compare hash values between the Time Stamping request and response.	0x90030379
SAPI_ERR_TS_ILLEGAL_URL_FORMAT	Illegal URL format of the Time Stamping service.	0x9003037A
SAPI_ERR_INVALID_TIMESTAMP	Invalid time stamp.	0x90030380
SAPI_ERR_TIME_WASNT_FOUND	Time was not found in the time stamp.	0x90030381

Error Code	Description	Numeric Value
SAPI_ERR_UNSUPPORTED_DATA_TYPE	Unsupported type for the custom field.	0x90030382
SAPI_ERR_ILLEGAL_CUSTOM_FIELD_ID	Illegal custom field ID.	0x90030383
SAPI_ERR_SIGN_HASH_CALLED_TWICE_OR_BAD_HASH_LEN	Either the continuous signing operation was called twice or the hash mechanism is not SHA_1.	0x90030384
SAPI_ERR_SIGN_HASH_CANT_RETURN_PKCS7_LEN	Problem with hash signature.	0x90030385
SAPI_ERR_SIGN_HASH_ACQUIRE_CONTEXT	A Microsoft CSP problem.	0x90030386
SAPI_ERR_SIGN_HASH_CREATE_HASH	Problem creating hash value.	0x90030387
SAPI_ERR_SIGN_HASH_CRYPT_HASH_DATA	Problem creating hash value.	0x90030388
SAPI_ERR_SIGN_HASH_CRYPT_SIGN_HASH	Problem creating hash value.	0x90030389
SAPI_ERR_AR_CSP_CANNOT_BE_FOUND	Problem using ARCSP for verification purposes.	0x9003038a
SAPI_ERR_PKCS7_BLOB_HAS_A_BAD_ALGID	Problem verifying a signature. Probably an unsupported signature algorithm is used	0x9003038b
SAPI_ERR_CERT_VALIDATE_FAILURE	Problem validating certificate.	0x9003038c
SAPI_ERR_VERIFY_HASH_ACQUIRE_CONTEXT	Problem during hash calculations.	0x9003038d
SAPI_ERR_VERIFY_HASH_CREATE_HASH	Problem during hash calculations.	0x9003038e
SAPI_ERR_VERIFY_HASH_CRYPT_HASH_DATA	Problem during hash calculations.	0x9003038f
SAPI_ERR_VERIFY_HASH_CRYPT_VERIFY_HASH	Problem during hash calculations.	0x90030390
SAPI_ERR_VERIFY_HASH_CRYPT_IMPORT_KEY	Problem during PKCS#1 signature validation.	0x90030391
SAPI_ERR_VERIFY_MISSING_CERT	Problem during PKCS#1 signature validation. A certificate is required.	0x90030392

Error Code	Description	Numeric Value
SAPI_ERR_VERIFY_BAD_HASH_CERT	Problem during signature validation when an advanced signature is required.	0x90030393
SAPI_ERR_VERIFY_BAD_ADVANCED_SIG_LEVEL	Problem during signature validation when an advanced signature is required.	0x90030394
SAPI_ERR_OK_WITH_MISMATCH_IN_FILE_VERSIONS	Although the signature in an InfoPath form was successfully validated using CoSign Signature Local, there exists a file template mismatch – for example, the template was updated after the signature was generated and before the signature was validated. Note that an InfoPath template mismatch error is returned only by the SAPIUMExtendedLastErrorGet function. An InfoPath template mismatch is not considered an error by the SAPISignatureFieldVerify function; if the signature is valid, SAPISignatureFieldVerify returns a success message. The only way of discovering whether there is a template mismatch is to run the SAPIUMExtendedLastErrorGet function.	0x90030395
SAPI_ERR_FAILED_TO_READ_FILE_OR_BUFFER	Problem reading file or buffer.	0x90030396
SAPI_ERR_FAILED_TO_SET_APP_NAME	Failed to set the name of the application.	0x90030397
SAPI_ERR_VERIFY_OK_FILE_CHANGE_DETECTED	Relevant for PDF files. The signature is valid, but the PDF file was changed after the document was signed.	0x90034098
SAPI_ERR_FAILED_TO_CREATE_SIGNATURE_FIELD	Failed to create a signature field. This might be caused by a file permissions issue. For example, the file might have been opened by another application, or it is a read-only file.	0x900303b0
SAPI_ERR_LOCATOR_CALL_TO_INIT_MISSING	Internal error when trying to locate string markups.	0x900303a0
SAPI_ERR_LOCATOR_COULD_NOT_INIT_FILE	Failed to parse the file as a PDF file. This can occur due to a wrong file name, the file is missing, or in cases where the file is encrypted the failure can occur if the owner password and the user password are wrong.	0x900303a1

Error Code	Description	Numeric Value
SAPI_ERR_LOCATOR_SECOND_CALL_TO_INIT_WITHOUT_FREE	Internal error when trying to locate string markups.	0x900303a2
SAPI_ERR_LOCATOR_OBJECT_CREATION_FAILED	Internal error when trying to locate string markups.	0x900303a3
SAPI_ERR_LOCATOR_INVALID_CONTEXT	Invalid context handed to the SAPISignatureFieldLocatorEnumInit and SAPISignatureFieldLocatorEnumCont functions.	0x900303a4
SAPI_ERR_FAILED_TO_GET_SIGNATURE_FIELD_INFO	Failed to get the signature field information. The file might be corrupt, or it was created by an unsupported version.	0x900303c0
SAPI_ERR_FAILED_TO_INIT_ENUM_SF	Failed to initialize the signature field enumeration operation.	0x900303d0
SAPI_ERR_FAILED_TO_CONT_ENUM_SF	Failed to continue the signature field enumeration operation.	0x900303e0
SAPI_ERR_FAILED_TO_CLEAR_SIGNATURE_FIELD	Failed to clear a signature field. This might be due to privileges. For example, the file might have been opened by another application, or it is a read-only file.	0x900303f0
SAPI_ERR_FAILED_TO_CLEAR_SIGNATURE_FIELD_BY_POLICY	Failed to clear a signature field due to clearing policy.	0x900303f1
SAPI_ERR_FAILED_TO_GUI_GET_SIGNATURE_FIELD_DETAILS	Failed to get signature field signature information to be displayed in a GUI.	0x900303f2
SAPI_ERR_FAILED_TO_REMOVE_SIGNATURE_FIELD	Failed to remove a signature field. This might be due to privileges. For example, the file might have been opened by another application, or it is a read-only file.	0x90030400
SAPI_ERR_FAILED_TO_CONVERT_GRAPHIC_TO_B64	Failed to convert a graphical image object to base 64 format.	0x90030410
SAPI_ERR_FAILED_TO_CONVERT_ORIG_FORMAT_DOESNT_FIT	Problem converting image.	0x90030412
SAPI_ERR_FAILED_TO_GET_GRAPHIC_IMAGE	Failed to get a graphical image signature.	0x90030420
SAPI_ERR_FAILED_TO_SET_GRAPHIC_IMAGE	Failed to set a graphical image signature.	0x90030421

Error Code	Description	Numeric Value
SAPI_ERR_ELECTRONIC_SIG_WITH_NO_GRAPHICAL_SIG	A generated electronic signature cannot be created with an empty graphical image.	0x90030422
SAPI_ERR_LIB_IS_NOT_INITIALIZED	A call to one of the CoSign Signature Local functions was made before calling SAPIInit, or after calling SAPIFinalize.	0x90030430
SAPI_ERR_FAILED_TO_SIGN_FILE	Failed to sign a signature field in a file. This usually happens when there is no access to the private key. For example, when prompt for sign is set and an incorrect password is entered, or this is an unattended process and the password cannot be entered.	0x90030470
SAPI_ERR_FAILED_IN_IS_FILE_SIGNED	Failed to determine whether the file is signed.	0x90030480
SAPI_ERR_FILE_TYPE_NOT_SUPPORTED	The file type value that was used is not one of the supported values.	0x90030490
SAPI_ERR_FAILED_TO_VERIFY_FILE	Failed to verify a signature field in a file.	0x90030570
SAPI_ERR_INVALID_SIG_FIELD_HANDLE	The signature field handle that is used is either not initialized or is corrupt.	0x90030600
SAPI_ERR_INVALID_SIG_FIELD_ENUM_CONTEXT	The signature field enumeration operation context is either not initialized or is corrupt.	0x90030601
SAPI_ERR_VERSION_NOT_SUPPORTED	The signature field that is being processed was created by a version that is not supported.	0x90030602
SAPI_ERR_INTERNAL_ERROR	An unexpected error occurred within CoSign Signature Local.	0x90030603
SAPI_ERR_FILE_OPEN	Failed to open the file. Check the file path and the user permissions on this file.	0x90030604
SAPI_ERR_FILE_CANNOT_PARSE	Failed to parse the file. The file is either corrupt, or has features that are not supported by CoSign Signature Local.	0x90030605
SAPI_ERR_SIG_FIELD_NOT_SIGNED	The signature field that needs to be verified is not signed.	0x90030606

Error Code	Description	Numeric Value
SAPI_ERR_FILE_NO_SUCH_PAGE	The page that is specified for the new signature field does not exist in the document.	0x90030607
SAPI_ERR_TIME_CONVERT	Failed to convert the time from the file to a format that can be displayed in the signature field.	0x90030608
SAPI_ERR_FILE_IO	CoSign Signature Local failed in accessing the file after it was opened, or there is a value in the file that points to an address that does not exist.	0x90030609
SAPI_ERR_UNKNOWN_SIG_VALUE_KIND	The signature value is not in one of the supported formats. It is either a corrupt value, or the signature field that was created by a CoSign Signature Local version that is not supported by the current version.	0x9003060a
SAPI_ERR_UNSUPPORTED_SIG_DEPENDENCY_MODE	The dependency value is not in one of the supported formats. It is either a corrupt value, or the signature field was created by a CoSign Signature Local version that is not supported by the current version.	0x9003060b
SAPI_ERR_UNSUPPORTED_SIG_TYPE	The signature type is a value that is not supported by CoSign Signature Local. This error usually occurs when trying to work with a signature field of a Word file that was created by the Word plug-in, and its scope of signing is not the entire file. CoSign Signature Local can only work with Word's Signature fields that are of scope entire file.	0x9003060c
SAPI_ERR_FIELD_NOT_FOUND	Failed to find the signature field in the file. Verify the signature field was not removed after its handle was retrieved.	0x9003060d
SAPI_ERR_FIELD_NOT_SIGNED	Not in use.	0x9003060e
SAPI_ERR_INVALID_FIELD_SIZE	The signature field size is invalid. The width or height is either too small or too big.	0x9003060f
SAPI_ERR_CERTIFIED_CANT_CHANGE_FILE	The PDF file is certified and therefore cannot be changed.	0x90030610

Error Code	Description	Numeric Value
SAPI_ERR_CERTIFIED_CANT_CERTIFY_AGAIN	The PDF file is certified and therefore cannot be certified again.	0x90030611
SAPI_ERR_FAILED_TO_CREATE_FILE_HANDLE_BY_NAME	Problem creating a file handle by name.	0x90030612
SAPI_ERR_FAILED_TO_GET_FILE_MEM_DATA	Problem retrieving memory information of a file handle.	0x90030613
SAPI_ERR_FAILED_TO_GET_FILE_HANDLE	Problem getting a file handle.	0x90030614
SAPI_ERR_INVALID_HANDLE	The handle that was passed to the function is not valid.	0x90030700
SAPI_ERR_INVALID_ENUM_CONTEXT	The context that was passed to the function is incorrect.	0x90030701
SAPI_ERR_INVALID_PARAM	The value of one of the parameters is invalid. It was either not initialized or is corrupt.	0x90030702
SAPI_ERR_BUFFER_TOO_SMALL	The memory allocated for the returned buffer is too small.	0x90030703
SAPI_ERR_ALREADY_EXISTS	A graphical image with the same name already exists in the user account, or a signature field with the same name already exists in the document.	0x90030704
SAPI_ERR_NOT_FOUND	An object (usually a graphical image object) with the specified ID was not found in the token.	0x90030705
SAPI_ERR_TOO_MANY_ITEMS	Too many objects found. Unable to select a default object from them (usually graphical image objects).	0x90030706
SAPI_ERR_NO_ITEMS	No objects were found (usually a graphical image object).	0x90030707
SAPI_ERR_OPERATION_CANCELLED_BY_USER	The user pressed the **Cancel** button in the Select Graphical Signature dialog box and no graphical image is selected.	0x90030708
SAPI_ERR_LOGO_ALREADY_EXIST	A logo already exists for the user.	0x90030709
SAPI_ERR_FAILED_TO_INIT_GR_SIG_ENUM	Problem with graphical signature enumeration.	0x90030750
SAPI_ERR_FAILED_TO_CONT_GR_SIG_ENUM	Problem with graphical signature enumeration.	0x90030751

Error Code	Description	Numeric Value
SAPI_ERR_FAILED_TO_GET_GR_SIG_INFO	Problem getting a graphical image.	0x90030752
SAPI_ERR_FAILED_TO_UPDATE_GR_SIG_INFO	Problem updating a graphical image.	0x90030753
SAPI_ERR_FAILED_TO_CREATE_GR_SIG	Problem creating a graphical image.	0x90030754
SAPI_ERR_FAILED_TO_DELETE_GR_SIG	Problem deleting a graphical image.	0x90030755
SAPI_ERR_GUI_SELECT_GR_SIG_RETURNED_NO_SIG	No graphical signature exists.	0x90030756
SAPI_ERR_FAILED_TO_AUTO_SELECT_GR_SIG	Problem to automatically select graphical image.	0x90030757
SAPI_ERR_PAD_NOT_FOUND	Problem with signature pad.	0x90030758
SAPI_ERR_FAILED_IN_SIGN_CEREMONY	Problem in signature ceremony.	0x90030760
SAPI_ERR_FAILED_TO_SET_SCP	Failed to update CoSign information into SCP in the directory.	0x90030800
SAPI_ERR_ILLEGAL_DIRECTORY_KIND	The operation is invalid in this type of directory.	0x90030801
SAPI_TIFF_ALREADY_SIGNED_ERROR	The field to be signed is already signed, or a visible signature field is about to be signed while another visible signature already exists in the TIFF file.	0x90032000
SAPI_WORD_ERR_FAILED_INIT_WORD_APPLICATION	CoSign Signature Local failed to launch the Word application. The Word application is required for operations such as create and delete signature fields.	0x90033001
SAPI_WORD_ERR_FAILED_CLOSE_DOCUMENT	CoSign Signature Local failed to close the Word document.	0x90033002
SAPI_WORD_ERR_FAILED_SAVE_DOCUMENT	CoSign Signature Local failed to save the Word document. Verify that your user privileges on this file are correct and the file is not read only.	0x90033003
SAPI_WORD_ERR_FAILED_TO_GET_PROPERTY	CoSign Signature Local failed to get a document attribute from Word.	0x90033004

Error Code	Description	Numeric Value
SAPI_WORD_ERR_FAILED_TO_SET_PROPERTY	CoSign Signature Local failed to set a document attribute in Word.	0x90033005
SAPI_WORD_ERR_FAILED_ADD_OLE_CONTROL	Failed to add the ARX ActiveX to the Word document.	0x90033006
SAPI_WORD_ERR_FAILED_GET_OBJECT_INFO	Failed to read the signature field information. The field might be corrupted.	0x90033007
SAPI_WORD_ERR_OBJECT_NOT_FOUND	Not in use.	0x90033008
SAPI_WORD_ERR_FAILED_TO_DELETE	Failed to remove a signature field from a Word document.	0x90033009
SAPI_WORD_ERR_CORRUPTED_OBJECT	The signature field is corrupt and cannot be used or managed.	0x9003300a
SAPI_WORD_ERR_FAILED_TO_WRITE_XP_STREAM	Failed to write the office compatible signature data to the document. An Office compatible signature is one of the features one can define for a signature field when it is created.	0x9003300b
SAPI_OFFICE_ERR_UNKNOWN_APPLICATION	The class ID of the Word application is not one of the IDs that are known by CoSign Signature Local as Word application IDs.	0x9003300c
SAPI_WORD_ERR_SECTION_DOES_NOT_EXIST	CoSign Signature Local failed to find ARX signature information in the file.	0x9003300d
SAPI_WORD_ERR_MULTI_SECTIONS_IS_NOT_SUPPORTED	Not in use.	0x9003300e
SAPI_OFFICE_XP_SIG_UNSUPPORTED	Not in use.	0x9003300f
SAPI_PDF_ERR_NO_DOC_PERMISSION	The permissions of the file that is processed do not allow performing the requested operation.	0x90034001
SAPI_PDF_ERR_ENCRYPTED_DOC	The type of the file that is processed does not allow performing the requested operation.	0x90034002

Error Code	Description	Numeric Value
SAPI_ERR_ILLEGAL_DIRECTORY_KIND	SAPIUMLogonEx can be called only if CoSign is installed in DI mode. This error code is returned when CoSign is installed in an Active Directory environment or LDAP environment.	0x90030410
SAPI_ERR_FAILED_TO_SET_SCP	Failed to set the CoSign Service Connection Point. The client cannot connect to CoSign if the SCP is not configured correctly. Note that in DI mode the SCP can also be set by the CoSign Configuration Utility.	0x90030800
SAPI_ERR_FAILED_TO_INIT_GR_SIG_ENUM	Failed to initialize the graphical signature enumeration operation.	0x90030750
SAPI_ERR_FAILED_TO_CONT_GR_SIG_ENUM	Failed to continue the graphical signature enumeration operation.	0x90030751
SAPI_ERR_FAILED_TO_GET_GR_SIG_INFO	Failed to get the graphical signature information structure.	0x90030752
SAPI_ERR_FAILED_TO_UPDATE_GR_SIG_INFO	Failed to update the graphical signature.	0x90030753
SAPI_ERR_FAILED_TO_CREATE_GR_SIG	Failed to create the graphical signature object.	0x90030754
SAPI_ERR_FAILED_TO_DELETE_GR_SIG	Failed to delete the graphical signature object.	0x90030755
SAPI_ERR_GUI_SELECT_GR_SIG_RETURNED_NO_SIG	The GUI dialog for selecting a graphical image found no graphical signature object to show.	0x90030756
SAPI_ERR_FAILED_TO_AUTO_SELECT_GR_SIG	Failed in selecting a default graphical image. This error is returned when the CoSign Signature Local searches for the default image internally, such as when signing a signature field for which the default image was never set).	0x90030757
SAPI_ERR_PAD_NOT_FOUND	Signature PAD is not connected or is unusable.	0x90030758
SAPI_ALREADY_SIGNED_ERROR	The field is already signed.	0x90030801
SAPI_ERR_CERT_EMAIL_NOT_FIT_LICENSE	The certificate's email does not match the license.	0x90030a00

Error Code	Description	Numeric Value
SAPI_ERR_FAILED_RETRIEVE_EMAIL	There was an error retrieving email from the certificate.	0x90030a01
SAPI_TIFF_ALREADY_SIGNED_ERROR	TIFF file is already signed.	0x90032000

Appendix F: CoSign Signature Local – User Management Structures

This appendix describes the structures that can be passed as parameters to the SAPIUM functions.

SAPI_UM_INFO_STRUCT

SAPI_UM_INFO_STRUCT is a structure that holds SAPIUM lib version information.

```
typedef struct {
  unsigned long              MajorVersion;
  unsigned long              MinorVersion;
} SAPI_UM_INFO_STRUCT, *PSAPI_UM_INFO_STRUCT;
```

Members

MajorVersion

SAPIUM major version number.

MinorVersion

SAPIUM minor version number.

See Also

SAPIUMLibInfoGet

SAPI_UM_USERS_FILTER_STRUCT

SAPI_UM_USERS_FILTER_STRUCT is a structure that holds filtering information for the user's enumeration operation.

```
typedef struct {
  SAPI_UM_ENUM_USER_TYPE     UserType;
  void                       *ExtendedFilter;
} SAPI_UM_USERS_FILTER_STRUCT;
```

Members

UserType

User type (User, Computer, Group).

ExtendedFilter

A pointer to extended filtering information. This value is currently not in use and should be set to NULL.
For more information regarding the usage of this API, please contact ARX.

See Also

SAPIUMUsersEnumInitEx

SAPI_UM_GROUP_RECORD

SAPI_UM_GROUP_RECORD is a structure that holds all group information.

```
typedef struct {
  SAPI_TECH_ID        TechID;
  SAPI_WCHAR          Name[SAPIUM_MAX_GROUP_NAME_LENGTH];
  SAPI_WCHAR          Address[SAPIUM_MAX_GROUP_ADDRESS_LENGTH];
  SAPI_WCHAR          PhoneNumber[SAPIUM_PHONE_NUMBER_LENGTH];
  SAPI_WCHAR          Country[SAPIUM_COUNTRY_LEN+1];
  SAPI_WCHAR          DomainName[SAPIUM_MAX_DOMAIN_NAME_LENGTH];
  SAPI_WCHAR          OrganizationName[SAPIUM_MAX_ORGANIZATION_NAME_LENGTH];
  SAPI_WCHAR          OrganizationUnitName[SAPIUM_MAX_ORGANIZATIONAL_UNIT_LENGTH];
  SAPI_UM_ENUM_GROUP_KEY_SIZE             KeySize;
  SAPI_UM_ENUM_GROUP_STATUS_TYPE          GroupStatus;
  unsigned long       PackagesMask;
  unsigned long       FlagsMask;
} SAPI_UM_GROUP_RECORD;
```

Members

TechID

The technical identity of the group.

Name

The name of the group.

Address

The contact address of the group.

PhoneNumber

The contact phone number of the group

Country

The country of the group using the two letter identification.

DomainName

The domain name of the group.

OrganizationName

The organization name of the group.

OrganizationUnitName

The organization unit name of the group.

KeySize

The generated RSA key size of the group in bytes. For the system default, use SAPI_UM_GROUP_DEFAULT_KEY. For the full list of values, refer to SAPI_UM_ENUM_GROUP_KEY_SIZE.

GroupStatus

The status of the group. Refer to values of SAPI_UM_ENUM_GROUP_STATUS_TYPE.

PackagesMask

Contact ARX for more information.

FlagsMask

Contact ARX for more information.

See Also

SAPIUMGroupsEnumInit, SAPIUMGroupGetByTechID

Appendix G: CoSign Signature Local – User Management TYPEDEFs

This appendix describes the SAPIUM type definitions that are not structures.

SAPI_UM_SES_HANDLE

The type definition of the SAPIUM session handle .

```
typedef void                    *SAPI_UM_SES_HANDLE;
```

SAPI_UM_USR_HANDLE

The type definition of the user handle.

```
typedef void                    *SAPI_UM_USR_HANDLE;
```

SAPI_UM_CONTEXT

The type definition of the context for the continuous operations (e.g., users enumeration).

```
typedef unsigned char SAPI_UM_CONTEXT[UM_OPAQUE_CONTEXT_LENGTH];
```

SAPI_UM_GUID

The type definition of the user GUID.

```
typedef char                    SAPI_UM_GUID[SAPIUM_GUID_LENGTH];
```

SAPI_TECH_ID

The type definition of the technical identity of users and groups in CoSign.

```
typedef __int64 SAPI_TECH_ID;
```

SAPI_ENUM_USERS_CONTEXT

A different context, specific for users enumeration.

```
typedef unsigned char SAPI_ENUM_USERS_CONTEXT[UM_ENUM_USERS_CONTEXT_LENGTH]
```

Appendix H: CoSign Signature Local – User Management ENUMS

This appendix describes the type definitions for the enumerated values (`typedef enum {…}`).

SAPI_UM_ENUM_USER_TYPE

The user types that can be created in CoSign. For each user a key pair is generated and a certificate is issued.

```
typedef enum SAPI_UM_ENUM_USER_TYPE {
  SAPI_UM_USER_TYPE_NONE           = 0,
  SAPI_UM_USER_TYPE_USER           = 1,
  SAPI_UM_USER_TYPE_GROUP          = 2,
  SAPI_UM_USER_TYPE_COMPUTER       = 3
} SAPI_ENUM_USER_TYPE;
```

ENUM values

SAPI_UM_USER_TYPE_NONE

Not in use.

SAPI_UM_USER_TYPE_USER

Regular user.

SAPI_UM_USER_TYPE_GROUP

A group – can be used to enable multiple users to share the same signing key.

SAPI_UM_USER_TYPE_COMPUTER

A computer – can be used by services that run under local system privileges.

SAPI_UM_ENUM_COUNTER_TYPE

The types of digital signatures counters for a given user account.

```
typedef enum SAPI_UM_ ENUM_COUNTER_TYPE {
  SAPI_UM_COUNTER_GENERAL          = 1,
  SAPI_UM_COUNTER_1                = 2,
  SAPI_UM_COUNTER_2                = 3
} SAPI_UM_ ENUM_COUNTER_TYPE;
```

ENUM values

SAPI_UM_COUNTER_GENERAL

The general counter of the user.

SAPI_UM_COUNTER_1

Additional user counter.

SAPI_UM_COUNTER_2

Additional user counter.

SAPI_UM_ENUM_USER_LOGIN_STATUS

The types of user login statuses. This can indicate why the end user cannot logon.

```
typedef enum SAPI_UM_ENUM_USER_LOGIN_STATUS {
  SAPI_UM_USER_LOGIN_STATUS_NONE          = 0,
  SAPI_UM_USER_LOGIN_STATUS_ENABLED       = 1,
  SAPI_UM_USER_LOGIN_STATUS_DISABLED      = 2
} SAPI_UM_ENUM_USER_LOGIN_STATUS;
```

ENUM values

SAPI_UM_USER_LOGIN_STATUS_NONE

Not in use.

SAPI_UM_USER_LOGIN_STATUS_ENABLED

User can login.

SAPI_UM_USER_LOGIN_STATUS_DISABLED

User is currently disabled.

SAPI_UM_ENUM_USER_ENROLLMENT_STATUS

The types of user enrollment statuses.

```
typedef enum SAPI_UM_ENUM_USER_LOGIN_STATUS {
  SAPI_UM_DONT_CARE_USER_ENROLLMENT_STATUS      = -1,
  SAPI_UM_NONE_USER_ENROLLMENT_STATUS           = 0,
  SAPI_UM_NEW_USER_ENROLLMENT_STATUS            = 1,
  SAPI_UM_RENEW_USER_ENROLLMENT_STATUS          = 2
} SAPI_UM_ENUM_USER_LOGIN_STATUS;
```

ENUM values

SAPI_UM_DONT_CARE_USER_ENROLLMENT_STATUS

This value can be used in a filter to ignore enrollment statuses.

SAPI_UM_NONE_USER_ENROLLMENT_STATUS

User certificate is OK.

SAPI_UM_NEW_USER_ENROLLMENT_STATUS

User needs a new certificate.

SAPI_UM_RENEW_USER_ENROLLMENT_STATUS

User needs to renew the certificate.

SAPI_UM_ENUM_USER_ENROLLMENT_REASON

The types of reason for a new certificate for the user.

```
typedef enum SAPI_UM_ENUM_USER_ENROLLMENT_REASON {
  SAPI_UM_NONE_USER_ENROLLMENT_REASON           = 0,
  SAPI_UM_CN_CHANGED_USER_ENROLLMENT_REASON     = 1,
  SAPI_UM_EMAIL_CHANGED_USER_ENROLLMENT_REASON  = 2,
  SAPI_UM_CERT_EXPIRE_USER_ENROLLMENT_REASON    = 4,
  SAPI_UM_EMAIL_SENT_USER_ENROLLMENT_REASON     = 8
} SAPI_UM_ENUM_USER_ENROLLMENT_REASON;
```

ENUM values

SAPI_UM_NONE_USER_ENROLLMENT_REASON

Not in use.

SAPI_UM_CN_CHANGED_USER_ENROLLMENT_REASON

The Common Name of the user was changed. The user therefore needs to re-enroll.

SAPI_UM_EMAIL_CHANGED_USER_ENROLLMENT_REASON

The email of the user was changed. The user therefore needs to re-enroll.

SAPI_UM_CERT_EXPIRE_USER_ENROLLMENT_REASON

The certificate of the user has expired. The user therefore needs to re-enroll.

SAPI_UM_EMAIL_SENT_USER_ENROLLMENT_REASON

Indicates an attempt was made to notify the user about the enrollment status.

SAPI_UM_ENUM_USER_CERT_STATUS_TYPE

The certificate status of the user.

```
typedef enum SAPI_UM_ENUM_USER_CERT_STATUS_TYPE {
  SAPI_UM_USER_CERT_STATUS_NONE          = 0,
  SAPI_UM_USER_CERT_STATUS_EXIST         = 1,
  SAPI_UM_USER_CERT_STATUS_NOT_EXIST     = 2
} SAPI_UM_ENUM_USER_CERT_STATUS_TYPE;
```

ENUM values

SAPI_UM_USER_CERT_STATUS_NONE

Not in use.

SAPI_UM_USER_CERT_STATUS_EXIST

There is a certificate for the user.

SAPI_UM_USER_CERT_STATUS_NOT_EXIST

There is no certificate for the user.

SAPI_UM_ENUM_PENDING_REQUEST_STATUS_TYPE

The certificate request status when using a WWV CA.

```
typedef enum SAPI_UM_ENUM_PENDING_REQUEST_STATUS_TYPE {
  SAPI_UM_PENDING_REQUEST_STATUS_NONE           = 0,
  SAPI_UM_PENDING_REQUEST_STATUS_SEND_CRQ       = 1,
  SAPI_UM_PENDING_REQUEST_STATUS_APPROVE        = 2,
  SAPI_UM_PENDING_REQUEST_STATUS_RETRIEVE_CERT  = 3,
  SAPI_UM_PENDING_REQUEST_STATUS_REVOKED        = 4,
  SAPI_UM_PENDING_REQUEST_STATUS_ALL            = 999
} SAPI_UM_ENUM_PENDING_REQUEST_STATUS_TYPE;
```

ENUM values

SAPI_UM_PENDING_REQUEST_STATUS_NONE

Not in use.

SAPI_UM_PENDING_REQUEST_STATUS_SEND_CRQ

A certificate request was sent.

SAPI_UM_PENDING_REQUEST_STATUS_APPROVE

The certificate request was approved.

SAPI_UM_PENDING_REQUEST_STATUS_RETRIEVE_CERT

The certificate is being retrieved.

SAPI_UM_PENDING_REQUEST_STATUS_REVOKED

The certificate is in the process of revocation.

SAPI_UM_PENDING_REQUEST_STATUS_ALL

Used to filter statuses.

SAPI_UM_ENUM_GROUP_STATUS_TYPE

The types of group statuses.

```
typedef enum SAPI_UM_ENUM_GROUP_STATUS_TYPE {
  SAPI_UM_GROUP_STATUS_NONE        = 0,
  SAPI_UM_GROUP_STATUS_ENABLED     = 1,
  SAPI_UM_GROUP_STATUS_DISABLED    = 2
} SAPI_UM_ENUM_GROUP_STATUS_TYPE;
```

ENUM values

SAPI_UM_GROUP_STATUS_NONE

Not in use.

SAPI_UM_GROUP_STATUS_ENABLED

Users of the group can login.

SAPI_UM_GROUP_STATUS_DISABLED

Users of the group cannot login.

SAPI_UM_ENUM_GROUP_KEY_SIZE

The key sizes of all users that belong to a group.

```
typedef enum SAPI_UM_ENUM_GROUP_KEY_SIZE{
  SAPI_UM_GROUP_DEFAULT_KEY  = 0,
  SAPI_UM_GROUP_NO_KEY       = 1,
  SAPI_UM_GROUP_KEY_1024     = 128,
  SAPI_UM_GROUP_KEY_2048     = 256,
  SAPI_UM_GROUP_KEY_4096     = 512
} SAPI_UM_ENUM_GROUP_KEY_SIZE;
```

ENUM values

SAPI_UM_GROUP_DEFAULT_KEY

User key size is the system default.

SAPI_UM_GROUP_NO_KEY

There will be no RSA key for the users in this group. These users will need to enroll their keys using an external CA.

SAPI_UM_GROUP_KEY_1024

User key size is RSA 1024 bit.

SAPI_UM_GROUP_KEY_2048

User key size is RSA 2048 bit.

SAPI_UM_GROUP_KEY_4096

User key size is RSA 4096 bit.

SAPI_UM_ENUM_GROUPS_ORDER_TYPE

Not in use.

SAPI_UM_ENUM_GROUP_PACKAGE

To use this enum structure, contact ARX.

```
typedef enum SAPI_UM_ENUM_GROUP_PACKAGE {
  SAPI_UM_GROUP_PACKAGE_NONE       = 0,
  SAPI_UM_GROUP_PACKAGE_1          = 1,
  SAPI_UM_GROUP_PACKAGE_2          = 2,
  SAPI_UM_GROUP_PACKAGE_3          = 4,
  SAPI_UM_GROUP_PACKAGE_4          = 8
} SAPI_UM_ENUM_GROUP_PACKAGE;
```

SAPI_UM_ENUM_GROUP_FLAGS

To use this enum structure, contact ARX.

```
typedef enum SAPI_UM_ENUM_GROUP_FLAGS {
  SAPI_UM_GROUP_FLAGS_NONE                      = 0,
  SAPI_UM_GROUP_FLAGS_ENFORCE_PROMPT_FOR_SIGN   = 1
} SAPI_UM_ENUM_GROUP_FLAGS;
```

SAPI_UM_ENUM_GROUP_DELETE_USER_OP

To use this enum structure, contact ARX.

```
typedef enum SAPI_UM_ENUM_GROUP_DELETE_USER_OP {
  SAPI_UM_GROUP_DELETE_USER_OP_NONE             = 0,
  SAPI_UM_GROUP_DELETE_USER_OP_DELETE           = 1,
  SAPI_UM_GROUP_DELETE_USER_OP_CLEAR_ACCOUNT    = 2,
  SAPI_UM_GROUP_DELETE_USER_OP_DISABLE          = 3
} SAPI_UM_ENUM_GROUP_DELETE_USER_OP;
```

SAPI_UM_ENUM_LOGON_FLAG_TYPE

This flag can be used in the SAPIUMLogonEx function to specify attributes related to the administrative login.

```
typedef enum SAPI_UM_ENUM_LOGON_FLAG_TYPE {
  SAPI_UM_LOGON_FLAG_TYPE_WRITE_OP              = 0,
  SAPI_UM_LOGON_FLAG_TYPE_READONLY_OP           = 1,
  SAPI_UM_LOGON_FLAG_TYPE_WRITE_NO_CACHE_OP     = 2,
  SAPI_UM_LOGON_FLAG_TYPE_NO_ADMIN              = 4
} SAPI_UM_ENUM_LOGON_FLAG_TYPE;
```

ENUM values

SAPI_UM_LOGON_FLAG_TYPE_WRITE_OP

A regular user admin with permissions to update information in the CoSign appliance.

SAPI_UM_LOGON_FLAG_TYPE_READONLY_OP

The operation is read-only and therefore can be performed by connecting to an alternate appliance.

SAPI_UM_LOGON_FLAG_TYPE_WRITE_NO_CACHE_OP

In the case of multiple Primary appliances, the operation will use load balancing mechanisms for every connection attempt.

SAPI_UM_LOGON_FLAG_TYPE_NO_ADMIN

Intended for nternal ARX usage.

SAPI_UM_ENUM_GROUP_VALUE_NAME

This enumerated type can be used for getting or updating additional attributes of a group. Most of these parameters are currently used by other CoSign components.

```
typedef enum SAPI_UM_ENUM_GROUP_VALUE_NAME{
  SAPI_UM_GROUP_VALUE_NONE                    = 0x00000000,
  SAPI_UM_GROUP_VALUE_LICENSE_NUM_OF_USERS    = 0x00000001,
  SAPI_UM_GROUP_VALUE_SAML_ID                 = 0x00000002,
  SAPI_UM_GROUP_VALUE_CPS_OID_ID              = 0x00000003,
  SAPI_UM_GROUP_VALUE_CPS_URI_ID              = 0x00000004
} SAPI_UM_ENUM_GROUP_VALUE_NAME;
```

ENUM values

SAPI_UM_GROUP_VALUE_NONE

No Value.

SAPI_UM_GROUP_VALUE_LICENSE_NUM_OF_USERS

The maximum number of users allowed in this group.

SAPI_UM_GROUP_VALUE_SAML_ID

The SAML-ID identifier of this group.

SAPI_UM_GROUP_VALUE_CPS_OID_ID

The CPS OID of all certificates generated for users of this group.

SAPI_UM_GROUP_VALUE_CPS_URL_ID

The CPS URL of all certificates generated for users of this group.

SAPI_UM_USERS_FILTER_EXT_TYPE

This enumerated type can be used for extended user filtering when running a users' query.

```
typedef enum SAPI_UM_ENUM_USERS_FILTER_EXT_TYPE {
  SAPI_UM_USERS_FILTER_EXT_TYPE_NONE            = 0,
  SAPI_UM_USERS_FILTER_EXT_TYPE_GROUP_TECH_ID   = 1
} SAPI_UM_ENUM_USERS_FILTER_EXT_TYPE;
```

ENUM values

SAPI_UM_ENUM_USERS_FILTER_EXT_TYPE_NONE

No additional filtering.

SAPI_UM_ENUM_USERS_FILTER_EXT_TYPE_GROUP_TECH_ID

Retrieve users that belong to this specified group.

Appendix I: CoSign Signature Local – User Management Constants

This appendix describes all the constants defined in SAPIUM.

Name	Meaning	Value
UM_OPAQUE_CONTEXT_LENGTH	The length of the opaque value in SAPI_UM_CONTEXT.	1024
SAPIUM_GUID_LENGTH	The length of the user GUID.	40
UM_ENUM_USERS_CONTEXT_LENGTH	The size of the context when enumerating users.	33000
SAPIUM_USER_RIGHT_NORMAL	Regular user privileges.	0x00000001
SAPIUM_USER_RIGHT_APPLIANCE_ADMIN	Appliance Administrative privileges. These privileges allow a user to enumerate all users in CoSign.	0x00000002
SAPIUM_USER_RIGHT_USER_ADMIN	User Administrative privileges. These privileges allow a user to manage the CoSign users (add, delete, sync, etc.).	0x00000004
SAPIUM_USER_RIGHT_USERS_ADMIN_FOR_ NONE_DI_INST	User Administrative privileges for non Directory Independent installations. These privileges allow querying user information.	0x00000008
SAPIUM_MAX_GROUP_NAME_LENGTH	Size of the group name in characters.	128
SAPIUM_MAX_GROUP_ADDRESS_LENGTH	Size of the contact address in characters.	128
SAPIUM_PHONE_NUMBER_LENGTH	Size of the contact phone number in characters.	64
SAPIUM_COUNTRY_LEN	Size of the country code in characters.	2
SAPIUM_MAX_DOMAIN_NAME_LENGTH	Size of the group’s domain name in characters.	128
SAPIUM_MAX_ORGANIZATION_LENGTH	Size of the group’s organization name in characters.	64
SAPIUM_MAX_ORGANIZATIONAL_UNIT_ LENGTH	Size of the group’s organization unit name in characters.	32
SAPIUM_MAX_NUMBER_OF_GROUPS_IN_CONT	Internal parameter.	30

Name	Meaning	Value
SAPIUM_MAX_SAML_ID_LEN	Maximum length of the SAML ID	64
SAPIUM_MAX_CPS_OBJECT_ID_LENGTH	Maximum length of the CPS OBJECT ID	64
SAPIUM_MAX_CPS_URI_LENGTH	Maximum length of the CPS URI	128
TOKEN_ID_MAX_LEN	The maximum length of the Token used for identifying the appliance used in this SAPIUM Session.	50
SAPIUM_MAX_NUMBER_OF_GROUPS_IN_CONT	Internal parameter.	30

Appendix J: CoSign Signature Local – User Management Error Messages

This appendix describes the error codes returned by SAPIUM.

Name	Meaning	Value
SAPI_OK	Function returned with no error.	0
SAPI_ERR_FAILED_TO_INIT	Failed to initialize the SAPI library. Can be caused by installing an old CoSign Signature Local version on a machine with a newer CoSign client.	0x90020100
SAPI_ERR_FAILED_TO_INIT_REG_VALUE	Cannot read the CoSign Signature Local installation path. The Install_path value cannot be read from the registry.	0x90020101
SAPI_ERR_FAILED_TO_INIT_REG_KEY	Cannot read the CoSign Signature Local installation path. The Install_path key cannot be found.	0x90020102
SAPI_ERR_FAILED_TO_INIT_LOAD_MODULE	Failed to initialize the SAPI library. Failed to load the SAPI DLL.	0x90020103
SAPI_ERR_FAILED_TO_FIND_SERVER	Cannot find a CoSign server	0x90020110
SAPI_ERR_USER_IS_NOT_LOGON	User is trying to perform an operation that requires authentication before calling the logon function.	0x90020120
SAPI_ERR_FAILED_TO_LOGON	Failed to logon to CoSign. Verify that the user name and password are correct.	0x90020130
SAPI_ERR_HANDLE_ALREADY_LOGGED_ON	SAPI session is active for another user. This error may also be returned when a second call to logon is attempted without a logoff. The error may also occur when a call to logon is made after the SAPI session was used to select objects under the credentials of the default user.	0x90020131
SAPI_ERR_FAILED_TO_UPDATE_CREDENTIAL	An attempt to change the user credentials failed.	0x90020150
SAPI_ERR_FAILED_TO_DELETE_USER	CoSign Signature Local failed to delete a user from CoSign. SAPIUMExtendedLastErrorGet to retrieve the specific error code returned from CoSign.	0x90020160
SAPI_ERR_FAILED_TO_BEGIN_SYNC	Failed to initialize a synchronization process. Call SAPIUMExtendedLastErrorGet to retrieve the specific error code returned from CoSign.	0x90020170

Name	Meaning	Value
SAPI_ERR_FAILED_TO_END_SYNC	Failed to end a synchronization process. Ending a synchronization process directs CoSign to delete users that are not in sync. When this function returns an error, the synchronization process is cancelled. Call SAPIUMExtendedLastErrorGet to retrieve the specific error code returned from CoSign.	0x90020180
SAPI_ERR_FAILED_TO_GET_CA_INFO	Failed to get CA information. CoSign returns this error if the installed CA does not support the requested information type.	0x90020190
SAPI_ERR_FAILED_TO_LOGOFF	Failed to logoff from a SAPI session.	0x900201B0
SAPI_ERR_FAILED_TO_WRITE_USER	Failed to add or sync a user to CoSign. Call SAPIUMExtendedLastErrorGet to retrieve the specific error code returned from CoSign.	0x900201D0
SAPI_ERR_FAILED_TO_WRITE_USER_EXIST	Failed to add a user to CoSign. A user with the same ID already exists.	0x900201D2
SAPI_ERR_FAILED_TO_WRITE_USER_EXCEED_LICENSE	Failed to add a user to CoSign because the maximum number of users provided under the license has been reached. Either delete users that are not active, or contact ARX to get a license that allows for more users.	0x900201D4
SAPI_ERR_FAILED_TO_UPDATE_USER	Failed to update the user record.	0x90020201
SAPI_ERR_FAILED_TO_RESET_COUNTER	Failed to reset the user's counter.	0x90020210
SAPI_ERR_FAILED_TO_GET_USER	Failed to retrieve user's information	0x90020215
SAPI_ERR_SESSION_IS_NULL	The session parameter cannot be NULL.	0x90020220
SAPI_ERR_INVALID_SES_HANDLE	The session handle used is either not initialized or is corrupt.	0x90020222
SAPI_ERR_INVALID_CONTEXT_HANDLE	The context handle used is either not initialized or is corrupt.	0x90020223
SAPI_ERR_NO_SUCH_USER	No such user exists in CoSign.	0x90020300
SAPI_ERR_TOKEN_NOT_SUPPORTED	CoSign is the only supported token for this operation.	0x90030100
SAPI_CANT_DELETE_ZOMBIE_USERS	Failed to delete zombie users. Zombie users are users that were not touched while synchronizing CoSign with the user directory. Zombie users should be deleted when the sync operation ends.	0x90030110
SAPI_ERR_FAILED_TO_ENUM_USERS	The users' enumeration operation failed.	0x90030120
SAPI_FAILED_TO_ALLOCATE_MEMORY	A CoSign Signature Local operation required dynamic memory allocation and the allocation failed. Verify that there are no memory leaks or other resource problems.	0x90030130

Name	Meaning	Value
SAPI_COM_FAILED_TO_ALLOCATE_MEMORY	A SAPICOM operation required dynamic memory allocation and the allocation failed. Verify that there are no memory leaks or other resource problems.	0x90030131
SAPI_ERR_FAILED_TO_GET_USER_INFO	Failed to get a user information structure. Call SAPIUMExtendedLastErrorGet to retrieve the error code that was returned from CoSign.	0x90030140
SAPI_FUNCTION_NOT_SUPPORTED	This function is not supported, although defined by the CoSign Signature Local header.	0x90030150
SAPI_NO_MORE_USERS	The user enumeration operation finished and there are no more users to retrieve. This return code is usually not an error but an indication that all the users were already retrieved.	0x90030160
SAPI_ERR_FAILED_TO_CANCEL_SYNC	The cancellation of the synchronization operation of the CoSign database with the external user directory failed. Do not call SAPIUMUsersSyncEnd before initializing a new synchronization operation.	0x90030170
SAPI_ERR_FAILED_TO_FINALIZE	Failed to release the SAPI library.	0x90030190
SAPI_ERR_NULL_VALUE_IS_NOT_ALLOWED	A NULL value is not allowed for one or more of the parameters.	0x900301d0
SAPI_COM_ERR_PARAMETER_LEN_IS_TOO_SHORT	The length allocated for the output parameter is too short. Usually the required length is returned in the corresponding length parameter.	0x90030211
SAPI_ERR_LIB_IS_NOT_INITIALIZED	A call to one of the CoSign Signature Local functions was made before calling SAPIInit, or after calling SAPIFinalize.	0x90030430
SAPI_ERR_FAILED_TO_SET_SCP	Failed to update CoSign information into SCP in the directory.	0x90030800
SAPI_ERR_ILLEGAL_DIRECTORY_KIND	The operation is invalid in this type of directory.	0x90030801
SAPI_NO_MORE_GROUPS	The group enumeration operation finished and there are no more groups to retrieve. This return code is usually not an error but an indication that all the groups were already retrieved.	0x90030802
SAPI_ERR_FAILED_TO_GET_USER_TECH_ID	Failed to get the technical identity of the user.	0x90030803
SAPI_ERR_NUM_OF_GROUPS_LARGER_THEN_MAX	The number of groups in the retrieve request is larger than the maximum allowed (see the value of SAPIUM_MAX_NUMBER_OF_GROUPS_IN_CONT) .	0x90030804
SAPI_ERR_GROUP_NAME_MANDATORY	When creating or updating a group, no group name was specified.	0x90030805

Name	Meaning	Value
SAPI_ERR_FAILED_TO_ADD_GROUP	Failed to create the group.	0x90030806
SAPI_ERR_FAILED_TO_UPDATE_GROUP	Failed to update the group record.	0x90030807
SAPI_ERR_FAILED_TO_GET_GROUP	Failed to retrieve group's information.	0x90030808
SAPI_ERR_FAILED_TO_SET_GROUP	Failed to set the group's status.	0x90030809
SAPI_ERR_FAILED_TO_DELETE_GROUP	Failed to delete the group.	0x9003080a
SAPI_ERR_FAILED_TO_ASSIGN_USER_TO_GROUP	Failed to assign the user to a group.	0x9003080b
SAPI_ERR_FAILED_TO_ENUM_GROUPS	The group' enumeration operation failed.	0x9003080c
SAPI_COM_ERR_PARAMETER_LEN_IS_TOO_LONG	Provided length is too long.	0x9003080d
SAPI_ERR_FAILED_TO_UPDATE_GROUP_EXT_DATA	Problem updating group extended info	0x90030811
SAPI_ERR_FAILED_TO_GET_GROUP_EXT_DATA	Problem getting group extended info	0x90030812
SAPI_ERR_GROUP_LICENCE_NUM_OF_USERS_PASS_LIMIT	Error internal to ARX	0x90030813
SAPI_ERR_GROUP_NEW_LICENSE_NUM_OF_USERS_NOT_VALID	Error internal to ARX.	0x90030814

CoSign Signature SOAP API

This section includes the following topics:

- Introduction
- Sign Operation
- Verify Operation
- User Management Operations
- Using Web Services
- Appendix A: CoSign Signature SOAP Structures
- Appendix B: CoSign Signature SOAP Enumerations

Introduction

This chapter describes the CoSign Signature SOAP network API provided by CoSign central appliances and the CoSign cloud.

CoSign Signature SOAP enables developers to enhance their applications with digital signatures without requiring previous experience using public-key cryptography. CoSign Signature SOAP is an XML/SOAP network API via HTTPS. It can be used from any client, with any operating system, using any language and any platform.

CoSign Signature SOAP includes functions for signing files, verifying signatures, and managing signers. Signer management is only supported by CoSign Central servers; these functions are not available for CoSign Cloud at this time.

As an alternative to the CoSign Signature SOAP API, starting from CoSign version 7.1, CoSign also supports the CoSign Signature API. This new API is easier to use than the CoSign Signature SOAP API but does not include user management capabilities.

The regular Web Services API cannot be used in CoSign Common Criteria EAL4+ deployments and FIPS 140-2 level 3 deployments.

The Web Services interface is composed of two functional families:

- Signature and validation related functions.
- User management related functions.

The Web Services approach can be integrated into any platform (such as MS Windows, Linux, Solaris), or any development environment (Java, .NET, PHP, PERL, etc.) that is able to produce a SOAP 1.2 interface to the Web Services executed inside the CoSign appliance.

There are several approaches to invoking a web service as part of the application:

- Native SOAP (Simple Object Access Protocol). The web application will generate an XML request and will receive an XML reply from the Web Service.
  This method requires more development resources than the following method.
- The Web Service publishes a WSDL (Web Services Definition Language) file. This file describes the interfaces of the Web Services as well as the parameters that need to be passed to the Web Service and must receive a reply from the Web Service.
  Many of the development environments have mechanisms for using the WSDL file to provide the developer with an easier method than the native SOAP.

The following sections provide detailed information about the web services offered by CoSign, and provide guidelines and samples in dedicated development environments to enable developers to easily use the CoSign Web Services solution.

Note: *CoSign also provides a new Web Service interface to Adobe applications such as Adobe Reader and Adobe Acrobat. This solution enables Adobe Reader to sign PDF documents without installing any client application. For more information, refer to the chapter on Signing Adobe Acrobat Documents in the* CoSign User Guide.

Technical Information

The CoSign appliance provides a secure Web Services communication that is based on TLS (Transport Layer Security) with X.509 Server Authentication Binding.

Accessing the signature and validation related function:

To access the signature and validation related function, use:

```
https://cosign:8080/SAPIWS/dss.asmx
```

or

```
https://<dns name of your CoSign appliance>:8080/SAPIWS/dss.asmx
```

Accessing the user management related function:

To access the user management related function, use:

```
https://cosign:8080/SAPIWS/spml.asmx
```

or

```
https://<dns name of your CoSign appliance>:8080/SAPIWS/spml.asmx
```

Remarks:

A special entry in the *hosts* file in the client side should be allocated to *cosign*, which will point to the IP address of CoSign in the network.
You also must install the ARX ROOT certificate, which is available in the CoSign CDROM in the *misc* directory. This enables the client to establish an SSL session with the CoSign appliance.

The SSL server key and certificate are temporary and should be replaced by the customer when moving to production. For instructions on how to install a new key and certificate for the SSL server, refer to the chapter on managing the CoSign appliance in the *CoSign Administrator Guide*.

Signature and Validation API

The Signature and Validation interface is based on a standard developed by the OASIS Digital Signature Service Technical Committee. The standard is called “Digital Signature Service Core Protocols, Elements, and Bindings” (DSS Core) and can be accessed at: http://docs.oasis-open.org/dss/v1.0/oasis-dss-core-spec-v1.0-os.pdf.

The Signature and Validation API is designed to be as compatible as possible with the Oasis DSS standard. Compatibility with the standard is required for the following reasons:

- It increases the adoption of digital signatures into many applications.
- It eases the integration of applications with the CoSign appliance.

However, Oasis DSS compatibility has some limitations:

- The Oasis DSS standard covers functionality that does not yet exist in CoSign. Pay attention to the remarks in every function description to ensure proper usage of the CoSign Web Services functionality.

- There are many functionalities in CoSign that are not yet covered by the Oasis DSS standard. The standard was artificially extended in the appropriate fashion so that these functionalities can be used.
  For example, the signature operation of the standard was extended to support also the field creation mechanism. Therefore, the description of how to create a signature field inside a document is described as part of the signature operation, although this may be confusing for the reader.

The CoSign Web Services is very similar to the SAPICrypt functionality. Most of the CoSign Web Services types, constant values, and enumerated types are similar to the ones used in SAPICrypt. Therefore, all values that are listed in the appendices of the SAPICrypt Reference Manual are relevant to CoSign Web Services as well.

The following information can be signed and verified:

- Data Buffers
- Hash values of data
- XML data
- PDF files
- Office 2007/2010/2013 files that already contain signature fields
- Word XP/2003 files that already contain file-based signature fields
- TIFF files
- InfoPath 2007/2010/2013 forms that already contain signature fields

For more information, see the following to view XML based information about this web service:

http://cosign:8080/SAPIWS/dss.asmx

or

```
http://<dns name of your CoSign appliance>:8080/SAPIWS/dss.asmx
```

Name Spaces Conventions

The following name spaces are used in this chapter. Some of the name spaces are defined by the Oasis DSS standard. Others are defined by ARX and promoted to be a standard either as part of the Oasis DSS standard or by other standards.

ID	URI	Description
xmlns:s4	**http://www.w3.org/2000/09/xmldsig#**	XML Digital Signature definitions of W3 group
xmlns:s	**http://www.w3.org/2001/XMLSchema**	XML definitions of W3 group
xmlns:wsdl	**http://schemas.xmlsoap.org/wsdl/**	WSDL types
xmlns:soap12	**http://schemas.xmlsoap.org/wsdl/soap12/**	XML SOAP definitions
xmlns:http	**http://schemas.xmlsoap.org/wsdl/http/**	XML SOAP definitions

ID	URI	Description
xmlns:soapenc	**http://schemas.xmlsoap.org/soap/encoding/**	XML SOAP definitions
xmlns:mime	**http://schemas.xmlsoap.org/wsdl/mime/**	XML SOAP definitions
xmlns:s1	**urnoasis:names:tc:dss:1.0:core:schema**	OASIS group definitions for signature and verification
xmlns:s2	**urn:oasis:names:tc:SAML:1.0:assertion**	OASIS group definitions for authentication
xmlns:s3	**http://arx.com/SAPIWS/DSS/1.0**	ARX DSS definitions
xmlns:tns	**http://arx.com/SAPIWS/DSS/1.0**	ARX DSS definitions

Signature and Validation API Operations

The CoSign Signature SOAP interface is based on two operations that enable activating all API signature related functions:

- **Sign** – Performs signature related operations. All operations include a Sign Request and a Sign Response.
- **Verify** – Performs the verify signature operation. All operations include a Verify Request and a Verify Response.

Sign Operation

The Sign operation includes a large set of API functions, some of which do not directly perform a signature operation. For example, you can use this command to enumerate all graphical images of the given user.

The Sign operation of the Signature and Validation API is composed of a Sign Request sent by the user to the server, and a Sign Response received back from the server. The Sign Request indicates the type of API signature related operation that the server should perform.

The API Sign functions include:

- SAPISignatureFieldCreateEx – Create a single signature field in a specific file.
- SAPISignatureFieldSignEx – Sign a specific signature field in a specific file.
- SAPISignatureFieldCreateSignEx – Create and sign a signature field in a file.
- SAPISignatureFieldClear – Clear a signature field in a file. This means that all the cryptographic-related information is cleared as well as its visual objects, but the field and its attributes remain unchanged.
- SAPISignatureFieldRemove – Remove a signature field from a file. A signature field can be removed whether it is signed or not.
- SAPIBufferSignEx – Sign a data buffer and retrieve the digital signature.
- SAPICertificatesEnumInit and SAPICertificatesEnumCont – Retrieve the list of user's certificates.
- SAPISignatureFieldLocatorEnumInit and SAPISignatureFieldLocatorEnumCont – Return signature fields location and information for the purpose of creating signatures based on field locator strings inside a document. The functionality is relevant for PDF files.
- SAPIGraphicSigImageEnumInit and SAPIGraphicSigImageEnumCont – Retrieve the list of user's graphical images.
- SAPIGraphicSigImageInfoGet – Retrieve all the data of a graphical signature image.
- SAPIGraphicSigImageInfoCreate – Create a new graphical signature image in CoSign.
- SAPIGraphicSigImageInfoUpdate – Update a certain graphical signature image by changing the data of a graphical signature image or its name.
- SAPIGraphicSigImageInfoDelete – Delete a certain graphical signature image.
- SAPICredentialChange – Change the user's password. The function first verifies that the old password is correct, and then stores the credentials calculated from the new password in the CoSign users database
- SAPIConfigurationValueSet – Set a new API configuration value.
- SAPIConfigurationValueGet – Retrieve a API configuration value.

- SAPICAInfoGetInit and SAPICAInfoGetCont – Retrieve CA information.
- SAPITimeGet – Retrieve time information. The returned value is in XML DateTime format.

Some examples are provided in Using Web Services to demonstrate the usage of a Sign Request.

Following is a detailed explanation of each of the parameters and the data sent as part of the Sign Request, and of each of the parameters and data received back in the Sign Response.

Note: *The user activation function, which is relevant only for Common Criteria deployments, is not part of the CoSign Signature SOAP interface. It is available only through the CoSign Signature interface.*

Note: *The SAPIGetTokenID and SAPISetTokenID functions are not relevant for the CoSign Signature SOAP interface and therefore are not defined in this interface.*

Sign Request

A Sign Request is forwarded to the server and includes the following parameters:

- Optional Inputs – See Optional Inputs (Sign Request).
- Input Documents – See Input Documents (Sign Request).
- RequestID – A parameter of type string. The input parameter will be sent in the Sign Response's response. This parameter has meaning in asynchronous operation mode, which is not supported.
- Profile – A parameter of type *s:AnyURI*. If this value is provided, it must contain the value `http://arx.com/SAPIWS/DSS1.0/`

Optional Inputs (Sign Request)

For a detailed description of the Optional Inputs, refer to Detailed Descriptions of a Sign Request's Optional Inputs.

Parameter	Description
Signature Type	A mandatory parameter that determines the actual operation of the Sign Request. The given URI defines the requested operation. Normally, a certain signature type value is mapped to a certain API function.
Claimed Identity	A mandatory parameter for operations that require user identity (for example, digital signature operation). The claimed identity is used to authenticate the user that commits the signature request and also to associate the appropriate signature key to use. Other operations such as field creation or clearing a signature field do not require a claimed identity structure.
Key Selector	Enables the client to select the certificate that should be used as part of the signature operation. This input is required in cases where more than one signing certificate exists for the signing user.

Parameter	Description
SAPI Sig Fields Settings	Used when creating a new field inside a given document. All the parameters of the newly generated field are defined as the characteristics of the signature field. Some of the parameters have a visual impact, for example, the location of the field inside the document.
Flags	Enables a client to set various flags during the signature operation. Depending on the API related function you use, any Flags value that is passed is forwarded to the specific API function. For more information, refer to the SAPICrypt documentation.
Return PDF Tail Only	An optional Boolean input that modifies the server's behavior when processing PDF files. The PDF specification supports modifications to PDF files to be implemented as a concatenation of the modification data to the end of an existing file.
Signature Field Name	A string value that indicates which field should be signed. This input is required in the cases where there is more than one signature field in the document.
Configuration Values	A list of several configuration values which can be set through this interface and reticently kept inside the CoSign server. These configuration parameters are used during the signature operation. The values can be a string, an integer, or a binary value encoded in Base64 format. Configuration values can also be retrieved through this interface.
Graphic Image To Set	A mandatory parameter whenever the Signature Type parameter is *set-graphic-image*. This parameter is used to set or update the user's graphical signature.
InfoPath Form Template	In cases where the CoSign appliance is provided with an InfoPath form template, this parameter includes the whole template file encoded in Base64.
FieldLocatorOpeningPattern	The pattern that indicates the start of the embedded field locator string.
FieldLocatorClosingPattern	The pattern that indicates the end point of the embedded field locator string.
IncludeObject	Used only for XML files. If this parameter is specified when performing an XML signature, the created XML signature will be an enveloping one.
SignaturePlacement	Used only for XML files. If this parameter is specified when performing an XML signature, the created XML signature will be an enveloped one.
EstimateSignatureSize	Not used.

Input Documents (Sign Request)

For a detailed description of the Optional Inputs, refer to Detailed Descriptions of a Sign Request's Input Documents.

Parameter	Description
Document	The document content that is used for digital signature operation or another operation such as signature field creation. In the case of data signing, the document will contain the value of the given data.
DocumentHash	Used when the input to the signature operation is the hash of the data.

Detailed Descriptions of a Sign Request's Optional Inputs

The following sections provide detailed descriptions of a Sign Request's optional inputs.

Signature Type

This parameter is mandatory and determines the actual operation of the Sign Request function.

Format

Name	Type	Description
SignatureType	s:AnyURI	The given URI defines the requested operation. One of the following URIs should be provided. ▪ `urn:ietf:rfc:3369` – For a detached PKCS#7 signature. This parameter should be used when it is required to sign a buffer. This function is similar to the SAPIBufferSignEx function. ▪ `urn:ietf:rfc:2437:RSASSA-PKCS1-v1_5` – For a detached PKCS#1 signature. This parameter should be used when it is required to sign a buffer. This function is similar to the SAPIBufferSignEx f unction. ▪ `urn:ietf:rfc:3275` – For an XML signature. This parameter should be used when it is required to sign XML data. ▪ `http://arx.com/SAPIWS/DSS/1.0/signature-field-sign` – This parameter should be used if it is required to sign or re-sign a given signature field inside a file. This function is similar to the SAPISignatureFieldSignEx function. The field that will be signed is selected according to the given Signature Field Name parameter. ▪ `http://arx.com/SAPIWS/DSS/1.0/signature-field-create-sign` – This parameter should be used if it is required to create and sign a new signature field. This function is similar to the SAPISignatureFieldCreateSign function. The signature field is created with attributes according to the value of the SAPI Sig Fields Settings parameter. ▪ `http://arx.com/SAPIWS/DSS/1.0/signature-field-create` – This parameter should be used when it is required to create a new signature field. The function is similar to the SAPISignatureFieldCreateSign function. The signature field is created with attributes according to the value of the SAPI Sig Fields Settings parameter.

Name	Type	Description
		▪ `http://arx.com/SAPIWS/DSS/1.0/signature-field-clear` – This parameter should be used when it is required to clear an existing signature field. The function is similar to SAPISignatureFieldClear. ▪ `http://arx.com/SAPIWS/DSS/1.0/signature-field-remove` – This parameter should be used when it is required to remove an existing signature field. The function is similar to SAPISignatureFieldRemove. ▪ `http://arx.com/SAPIWS/DSS/1.0/enum-certificates` – This parameter should be used when it is required to enumerate certificates available for signing. The function is similar to SAPICertificatesEnumInit and SAPICertificatesEnumCont. ▪ `http://arx.com/SAPIWS/DSS/1.0/enum-graphic-images` – This parameter should be used when it is required to enumerate graphical images available for use during a signature operation. The function is similar to SAPIGraphicSigImageEnumInit, SAPIGraphicSigImageEnumCont, and SAPIGraphicSigImageInfoGet. ▪ `http://arx.com/SAPIWS/DSS/1.0/set-graphic-image` – This parameter should be used when it is required to add, remove, or update a graphical signature image. The function is similar to the following functions: SAPIGraphicSigImageInfoCreate, SAPIGraphicSigImageInfoUpdate and SAPIGraphicSigImageInfoDelete. ▪ `http://arx.com/SAPIWS/DSS/1.0/enum-field-locators` –Return signature fields location and additional information for enabling the application to create new signature fields inside the PDF document. The function is similar to SAPISignatureFieldLocatorEnumInit and SAPISignatureFieldLocatorEnumCont.

Claimed Identity

This input is mandatory for operations that require user identity, such as a digital signature operation. The claimed identity is used to authenticate the user who commits the signature request and associate the appropriate signature key to use.

Format

Name	Type	Description

Name	s2:NameIdentifierType	CoSign User Name and optionally the Domain Name of the user.
		The *Name* parameter contains a string value of the CoSign user name. The relevant domain name can be specified using the NameQualifier attribute.
		For example,
		`<Name NameQualifier="mydomain">`
		`user1`
		`</Name>`

Name	Type	Description
SupportingInfo	CoSignAuthDataType	Required credentials for enabling a logon or signature operation. The *CoSignAuthdata* element is based on the following fields: ▪ **LogonPassword (string)** – The password will be used to authenticate the user and enable tracing the appropriate signing key. ▪ **LogonPasswordBinary (binary)** – The password will be used to authenticate the user and enable tracing the appropriate signing key. In this case, the password is given as a byte array. If this value is defined, it overrides the **LogonPassword (string)** value. ▪ **NewLogonPassword (string) –** This new password will be used when trying to change the user's password. Make sure you are not sending this parameter as part of a regular login operation. ▪ **SignPassword (string)** – When a *prompt for sign* is set, a string should be passed in this field. Refer to SAPIBufferSignEx or SAPISignatureFieldSignEx for information on the *credential* field. ▪ **NewSignPasswordBinary (binary)** – When a *prompt for sign* is set, a string should be passed in this field. Refer to SAPIBufferSignEx or SAPISignatureFieldSignEx for information on the *credential* field. In this case, the password is give as a byte array, If this value is defined, it overrides the **SignPassword(string)** value.

Key Selector

This parameter enables the client to select the certificate that should be used as part of the signature operation. This input is required in cases where more than one signing certificate exists for the signing user.

Note: *More information about this section and its types can be found in the W3C's "XML Signature syntax and Processing" standard.*

Format

Specify either one of the following:

Name	Type	Description
KeyInfo	S4:KeyInfo	The *Key Info* element enables you to select the certificate to use in the signature operation. There are several ways to select a certificate and you must specify the <X509Data> element as the only sub element of *KeyInfo*. The certificate selection methods include: ▪ Set the *X509Certificate* item of the *X509Data* field with the value of the certificate to use. This certificate will be selected for the signature operation. The certificate value should be provided in Base64 encoding. ▪ Set the *SPKIData* field with the Subject Key Identifier value of the certificate to use. The Subject Key Identifier should be provided in Base64 encoding. ▪ Set the *X509IssuerSerial* item of the *X509Data* field with the Issuer Name and the Certificate Serial Number. In this way, CoSign will be able to select the specific certificate having these characteristics. The provided serial number should be represented as a normal string. Refer to KeyInfo in Appendix A: CoSign Signature SOAP Structures for more information.
Other	s1:AnyType	Not used.

SAPI Sig Fields Settings

This element is used when creating a new field inside a given document. All the provided parameters are defined as the characteristics of the signature field. Some of the parameters have a visual impact, for example, the location of the field inside the document.

Format

Name	Type	Description
SAPISigFieldSettings	SAPISigFieldSettings Type	Signature field values that are passed as part of the create field command. For more information, refer to SAPISigFieldSettingsType in Appendix A: CoSign Signature SOAP Structures.

Flags

This parameter enables a client to set various flags during the signature operation or other API related functions that use the *flags* attribute. Depending on the invoked function, this parameter is passed as the *Flags* parameter to the function. For example, if the relevant function is SAPISignatureFieldSignEx, this parameter is passed as the *Flags* parameter of the SAPISignatureFieldSignEx function.

Format

Name	Type	Description
Flags	Unsigned Int	This parameter enables the client to pass various flags that can be used as part of the operation.

Return PDF Tail Only

This optional input modifies the server's behavior when processing PDF files. The PDF specification supports modifications to PDF files to be implemented as a concatenation of the modification data to the end of an existing file.

When this field is set to true, the CoSign appliance returns only the data to be concatenated to the file, instead of returning the whole file. In this case, the data is returned in the Signature Object element instead of in the optional output DocumentWithSignature.

Format

Name	Type	Description
ReturnPDFTailOnly	Boolean	–

Signature Field Name

This string value indicates which field should be used for the desired function. This input is required in cases where there is more than one signature field in the document.

Format

Name	Type	Description
SignatureFieldName	string	An identification of a field in a document. This identity will be used depending on the desired function.

Configuration Values

Several configuration values can be set through this interface and reticently used by the CoSign server. These configuration parameters are used during the signature operation and other operations.

The values can be a string, an integer, or a binary value (Base64 encoded).

Format

A list of configuration values. For each value, its enumerated string and its value should be specified. The value can be a string, an integer, or a binary attribute.

Name	Type	Description
ConfValueID	s3:ConfIDEnum	The identifier of the configuration parameter. These parameters are identical to the ones that are used by SAPICrypt. For more information, refer to Appendix B: CoSign Signature SOAP Enumerations.
StringValue	string	The value of the configuration.
IntegerValue	integer	The value of the configuration.
BinaryValue	s:base64Binary	The value of the configuration.

Graphic Image To Set

This parameter is mandatory when Signature Type is **set-graphic-image**. This parameter is used to set or update the user's graphical signature.
Refer to GraphicImageType in Appendix A for more information about all the attributes of a graphical image.

If a graphical signature image with the same GraphicImageName attribute already exists, it will be updated. If a graphical signature image with the same GraphicImageName attribute already exists and the given <Graphic Image> element is empty, the graphical image will be deleted.

Note that the CoSign appliance only processes the <GraphicImage> subelement and the GraphicImageName attribute.

This field supports adding and updating a Logo, Initials, or a graphical signature, depending on the specified *ImageType* value. If no value is specified in the *ImageType* attribute, the type is defined as a graphical signature.

Format

Name	Type	Description
GraphicImageToSet	s:GraphicImageType	Refer to GraphicImageType in Appendix A: CoSign Signature SOAP Structures for a more detailed description of this type.

InfoPath Form Template

This Base64 value is the encoded InfoPath form template. Together with the provided InfoPath 2007/2010/2013 file, it enables the CoSign Web Services to perform various operations upon the form such as signing a digital signature.

Format

Name	Type	Description
InfoPathFormTemplate	Base64	The binary content of the InfoPath form template is encoded in Base64 format and sent as a parameter to the CoSign Web Services interface.

FieldLocatorOpeningPattern and FieldLocatorClosingPattern

These string values are the opening and closing patterns of the field locator strings that enable the CoSign Web Services to locate the signature fields inside the PDF document.

Format

Name	Type	Description
FieldLocatorOpeningPattern	string	The pattern that indicates the start of the embedded field locator string.
FieldLocatorClosingPattern	string	The pattern that indicates the end point of the embedded field locator string.

Detailed Descriptions of a Sign Request's Input Documents

This section handles either the document content or the data to be signed.

In most cases, the full document is sent to the CoSign appliance for signature operations. In the latest CoSign Signature SOAP version, there are cases where it is also possible to send a hash value of the document's data.

Format

One of the following should be sent as part of the request. Currently only Document is supported.

Name	Type	Description
Document	s1:DocumentType	The document content that is used for a digital signature operation or another operation. Send this element with the <Base64Data> sub-element set to the document content, and the MimeType attribute set to the file type which must be one of the following values: ▪ `application/pdf` for PDF files. ▪ `application/msword` for DOC files. ▪ `application/vnd.openxmlformats-officedocument.wordprocessingml.document` for DOCX files. ▪ `application/vnd.openxmlformats-officedocument.spreadsheetml.sheet` for XLSX files. ▪ `image/tiff` for TIFF files. ▪ `application/ms-infopath.xml` for InfoPath 2007/2010/2013 forms. ▪ `application/octet-string` for general buffer signing. Note that in this case, the Signature Type should be `urn:ietf:rfc:3369` or `urn:ietf:rfc:2437:RSASSA-PKCS1-v1_5` In the case of an XML signature: ▪ Send this element with the <Base64XML> sub-element. ▪ Do not send a MimeType. ▪ Make sure that the Signature Type is `urn:ietf:rfc:3275`

Name	Type	Description
DocumentHash		Use this parameter if you need to generate either a PKCS#1 signature or a PKCS#7 signature, based on a given hash value. Send this element with a *DigestMethod* element that includes the identity of the used hashed algorithms. Use one of the following values to indicate the algorithm: ▪ `http://www.w3.org/2000/09/xmldsig#sha1` for SHA-1. ▪ `http://www.w3.org/2001/04/xmlenc#sha256` for SHA-256. ▪ `http://www.w3.org/2001/04/xmlenc#sha384` for SHA-384. ▪ `http://www.w3.org/2001/04/xmlenc#sha384` for SHA-512. ▪ The Base64 value of the hash should be sent using the DigestValue parameter. This method cannot be used for generating XML signatures. **Note**: You can generate a signature based on a given SHA-1/SHA-256/SHA-384/SHA-512 based hash in a different manner. You can use `the urn:ietf:rfc:3369` or `urn:ietf:rfc:2437:RSASSA-PKCS1-v1_5` Signature Type, and provide the hash value as data. In the *flags* attribute, enter the following to direct CoSign to use the given hash value: ▪ `0x00100400` (for forcing SHA-1) ▪ `0x00004400` (for SHA-256) ▪ `0x00008400` (for SHA-384) ▪ `0x00010400` (for SHA-512)
TransformedData		Not used.
Other	Any	Not used.

Sign Response

A Sign Response is returned from the server and includes the following parameters:

- Result – See Result (Sign Response).
- Optional Outputs – See Optional Outputs (Sign Response).
- Signature Object – This element, of type s:base64Binary, is returned by the server when the optional input Signature Type is set to `urn:ietf:rfc:3369` or `urn:ietf:rfc:2437:RSASSA-PKCS1-v1_5` (Data Signing), or the optional input Return PDF Tail Only is set to true, or when producing an enveloping XML signature.
  This element always contains a Base64Signature element containing the output signature. It also contains a Type attribute with the value of the Signature Type optional input.

- RequestID – A parameter of type string. Its value is identical to the value of the RequestID sent in the request.
- Profile – A parameter of type *s:AnyURI*. A fixed value of `http://arx.com/SAPIWS/DSS1.0/` is sent in the reply.

Result (Sign Response)

A return value for the requested operation.

Format

Name	Type	Description
ResultMessage	s1:InternationalStringType	A string that represents an answer to the request.
ResultMajor	s:anyURI	Major error codes will be returned as part of the result of the operation.
ResultMinor	s:anyURI	Minor error codes will be returned as part of the result of the operation.

Optional Outputs (Sign Response)

For a detailed description of the Optional Outputs, refer to Detailed Descriptions of a Sign Response's Optional Outputs.

Format

Parameter	Description
DocumentWithSignature	This output parameter is returned by the server in cases involving signature fields inside documents, or in the case of an enveloped XML signature.
SAPISignedFieldInfo	This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/signature-field-sign`, which corresponds to the SAPISignatureFieldSign operation. This element corresponds to the SAPI_SIGNED_FIELD_INFO structure.
SAPISigFieldSettings	This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/signature-field-create`, which corresponds to the SAPISignatureFieldCreate operation. This value includes all available information of a field inside a document. This element corresponds to the SAPI_SIG_FIELD_SETTINGS structure.
AvailableCertificate	This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/enum-certificates`, which corresponds to the SAPICertificatesEnumInit and SAPICertificatesEnumCont operations. The CoSign appliance may return multiple certificates, depending on the number of certificates that are assigned to the given user.

Parameter	Description
AvailableGraphicalSignature	This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/enum-graphic-images`, which corresponds to the SAPIGraphicSigImageEnumInit, SAPIGraphicSigImageEnumCont, and SAPIGraphicSigImageInfoGet operations. The CoSign appliance may return multiple graphical signatures, depending on the number of graphical images that are assigned to the given user.
SAPISeveralSigFieldSettings	This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/enum-field-locators`, which corresponds to the SAPISignatureFieldLocatorEnumInit and SAPISignatureFieldLocatorEnumCont operations. The CoSign appliance returns the relevant field information, for each of the field locators existing in the given document.
EncodedMessages	This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/enum-field-locators`, which corresponds to the SAPISignatureFieldLocatorEnumInit and SAPISignatureFieldLocatorEnumCont operations. In this parameter, the exact field locator strings are replied. The CoSign appliance returns all the field locators existing in the given document.
EstimatedSignatureSize	Not used.

Detailed Descriptions of a Sign Response's Optional Outputs

This section describes the information returned from the Sign operation. As mentioned above, this operation is used also for other API functions such as field creation inside a document, and retrieval of all the user's certificates.

DocumentWithSignature

This output parameter is returned by the server in cases involving signature fields inside documents or when producing an enveloped XML signature.
In these cases, the signed document is fully retrieved.
If the request is to perform a signature upon given data (that is, Signature Type is set to `urn:ietf:rfc:3369` or `urn:ietf:rfc:2437:RSASSA-PKCS1-v1_5`),or if the parameter Return PDF Tail Only is set to true or to performing an XML enveloping signature, then the returned signature is put inside the Signature Object parameter.

Format

Name	Type	Description
Document	s1:DocumentType	The document content that is used for the digital signature function or another function. The supported types include: ▪ Base64Data, used for most document types. ▪ Base64XML, used for XML document types. For more information, refer to Detailed Descriptions of a Sign Request's Input Documents.

SAPISignedFieldInfo

This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/signature-field-sign`, which corresponds to the SAPISignatureFieldSignEx function. This returned information corresponds to the SAPI_SIGNED_FIELD_INFO structure.

Format

Name	Type	Description
SAPISignedFieldInfo	s3:SAPISignedFieldInfo	This type includes all the information of the newly signed field. See SAPISignedFieldInfoType in Appendix A.

SAPISigFieldSettings

This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/signature-field-create`, which corresponds to the SAPISignatureFieldCreate operation. This value includes all available information of a field inside a document.

Format

Name	Type	Description
SAPISigFieldSettings	s3:SAPISigFieldSettingsType	This type includes all the information of the newly created field. See SAPISigFieldSettingsType in Appendix A: CoSign Signature SOAP Structures.

AvailableCertificate

This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/enum-certificates`, which corresponds to the SAPICertificatesEnumInit and SAPICertificatesEnumCont operations. The CoSign appliance may return multiple certificates, depending on the number of certificates that are assigned to the given user.

Format

Multiple occurrences of:

Name	Type	Description
AvailableCertificate	Base64Binary	A Base64 encoding of an X509 certificate.

AvailableGraphicalSignature

This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/enum-graphic-images`, which corresponds to the SAPIGraphicSigImageEnumInit and SAPIGraphicSigImageEnumCont operations. The CoSign appliance may return multiple graphical signatures of this parameter, depending on the number of graphical images that are assigned to the given user.

Format

Multiple occurrences of:

Name	Type	Description
AvailableGraphic Signature	s:GraphicImageType	A graphical image record is returned for every graphical image that belongs to the user. For more information of this type, refer to GraphicImageType in Appendix A: CoSign Signature SOAP Structures.

SAPISeveralSigFieldSettings

This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/enum-field-locators`, which corresponds to the SAPISignatureFieldLocatorEnumInit and SAPISignatureFieldLocatorEnumCont operations. The CoSign appliance returns the relevant field information, for each of the field locators existing in the given document.

Format

Multiple occurrences of:

Name	Type	Description
SAPISigFieldSettings	s3:SAPISigField SettingsType	This type includes all the information about the signature field to create. See SAPISigFieldSettingsType in Appendix A: CoSign Signature SOAP Structures.

EncodedMessages

This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/enum-field-locators`, which corresponds to the SAPISignatureFieldLocatorEnumInit and SAPISignatureFieldLocatorEnumCont operations. In this parameter, the exact field locator strings are replied. The CoSign appliance returns all the field locator strings existing in the given document.

Detailed Descriptions of a Sign Response's Signature Object

The following sections provide detailed descriptions of a Sign Response's signature object

Signature Object

This element is returned by the server when the optional input Signature Type is set to one of the following:

- `urn:ietf:rfc:3369` (PKCS#7 signing, or the optional input Return PDF Tail Only is set to true)
- `urn:ietf:rfc:2437:RSASSA-PKCS1-v1_5` (PKCS#1 signing)
- `urn:ietf:rfc: 3275` (the required signature operation is to produce an enveloping XML signature)

This element always contains a Base64Signature element containing the output signature.

Format

Name	Type	Description
Base64Signature	s:base64Binary	A digital signature.

Verify Operation

The Verify operation of the Signature and Validation API is composed of a Verify Request sent by the user to the server, and a Verify Response received back from the server. The Verify Request indicates the type of API verification-related function that the server should perform.

The supported API operations are:

- SAPISignatureFieldVerify – Verifies the validity of a single signature field.
- SAPIFileIsSigned – Checks whether a file has at least one signed signature field.
- SAPIBufferVerifySignature – Verifies a signature of a single buffer.
- SAPICAInfoGetInit and SAPICAInfoGetCont – Retrieves the CoSign's internal CA publication information, such as ROOT Certificate and CRL.
- SAPISignatureFieldEnumInit and SAPISignatureFieldEnumCont and then SAPISignatureFieldInfoGet – Retrieve signature field information of a given document. As part of the verification operation, if no specific field name is provided, then all signature fields are retrieved including the non-signed ones.
- SAPITimeGet – Retrieve time information. The returned value is in XML DateTime format.

Verify Request

The Verify Request is forwarded to the server and includes the following parameters:

- Optional Inputs – See Optional Inputs (Verify Request).
- Input Documents – See Input Documents (Verify Request).
- RequestID – A parameter of type string. The input parameter will be sent in the Sign Response's response. This parameter has meaning in asynchronous operation mode, which is not supported.
- Profile – A parameter of type *s:AnyURI*. If a value is provided, it must contain the value `http://arx.com/SAPIWS/DSS/1.0/`
- Signature Object – This element can be sent by the client only in cases of data verification, that is, where Signature Type is set to `urn:ietf:rfc:3369` or to `urn:ietf:rfc:3275` (enveloping XML signature).
  This element should always contain a Base64Signature element containing the input signature to be verified.

Optional Inputs (Verify Request)

For more information on Optional Inputs, refer to Detailed Descriptions of a Verify Request's Optional Inputs.

Parameter	Description
Signature Type	A mandatory parameter that determines the actual operation of the Verify Request. The given URI defines the requested operation. For more information, refer to the Sign Request section
Claimed Identity	Not relevant to the Verification operation.
Key Selector	Relevant only for verifying a PKCS#1 signature. Use this structure to set the signing certificate for the purpose of signature validation.
SAPI Sig Fields Settings	Not relevant to the Verification operation.
Flags	Enables a client to set various flags during the verification operation. Depending on the API related function you use, any flag value that is set is forwarded to the specific API function. For more information, refer to the SAPICrypt documentation.
Return PDF Tail Only	Not relevant to the Verification operation.
Signature Field Name	Enables a client to select the signature field to be processed. When this input is omitted and more than one signature field exists in the document, all the fields in the document are processed.
Configuration Values	A list of several configuration values which can be set through this interface and are reticently kept inside the API. These configuration parameters are used during the Verification operation. The values can be a string, an integer, or a binary value encoded in Base64 format.

Input Documents (Verify Request)

The Input Documents are the same as those listed in Input Documents (Sign Request) of the Sign Request.

Detailed Descriptions of a Verify Request's Optional Inputs

The following sections provide detailed descriptions of a Verify Request's optional inputs.

Signature Type

This parameter is mandatory and enables the appliance to differentiate between file verification, data verification, and other functionality.

Format

Name	Type	Description
SignatureType	S:AnyURI	One of the following URIs should be provided. ▪ `urn:ietf:rfc:3369` – For a detached PKCS#7 signature. This parameter should be used if it is required to verify a buffer. This function is similar to SAPIBufferVerifySignature. ▪ `urn:ietf:rfc:2437:RSASSA-PKCS1-v1_5` – For a detached PKCS#1 signature. This parameter should be used if it is required to verify a buffer. This function is similar to the SAPIBufferVerifySignature function. ▪ `urn:ietf:rfc:3275` – For XML signatures. This parameter should be used when it is required to verify XML data. ▪ `http://arx.com/SAPIWS/DSS/1.0/signature-field-verify` – This parameter should be used if it is required to verify a given signature field inside a file. This function is similar to SAPISignatureFieldVerify. This value should be provided, even if it is only required to enumerate all fields in the document,. ▪ `http://arx.com/SAPIWS/DSS/1.0/ca-info-get` – This parameter should be used if it is required to get the CA information. This function is similar to SAPICAInfoGetInit and SAPICAInfoGetCont. ▪ `http://arx.com/SAPIWS/DSS/1.0/time-get` – This parameter returns the current CoSign time in XML DateTime format.

Signature Field Name

This parameter enables a client to select the signature field to be processed. When this input is omitted and more than one signature field exists in the document, all the fields in the document are processed.

Format

Name	Type	Description
SignatureFieldName	string	–

Key Selector

This parameter is relevant only for PKCS#1 signature verification. It enables the server to complete a signature verification procedure.

Format

Specify one of the following:

Name	Type	Description
KeyInfo	S4:KeyInfo	The *Key Info* element enables you to select the certificate to use in the PKCS#1 verification operation. Set the *X509Certificate* item of the *X509Data* field with the value of the certificate to use. This certificate will be selected for the signature operation. The certificate value should be provided in Base64 encoding. Refer to KeyInfo in Appendix A: CoSign Signature SOAP Structures for more information.

Configuration Values

For explanations, refer to the explanations in Configuration Values.

Verify Response

A Verify Response is returned from the server and includes the following parameters:

- Result – See Result (Verify Response).
- Optional Outputs – See Optional Outputs (Verify Response).
- Signature Object – Not relevant.
- RequestID – A parameter of type string. Its value is identical to the value of the RequestID sent in the request.
- Profile – A parameter of type *s:AnyURI*. A fixed value of `http://arx.com/SAPIWS/DSS1.0/` is sent in the reply.

Result (Verify Response)

Refer to Result (Sign Response) in the Sign Response section.
Basically, a successful response to the verification call means that the signature is valid.

Optional Outputs (Verify Response)

The following data is returned in the Verify Response. For a complete description of the Optional Outputs, refer to Detailed Descriptions of a Verify Response's Optional Outputs.

Format

Parameter	Description
SAPI Fields Info	The output returned in the following cases: ▪ The optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/signature-field-verify` (which corresponds to the signature field verification function SAPISignatureFieldVerify). ▪ Signature Type is `urn:ietf:rfc:3369` (which corresponds to the buffer verification function SAPIBufferVerifySignature. ▪ Signature Type is `urn:ietf:rfc:3275`, (which corresponds to the XML verification function SAPISignatureFieldVerify).
CA Info	Information about the CoSign CA, such as Certificate and CRL.
SAPITime	CoSign time, encoded in XML DateTime format.

Detailed Descriptions of a Verify Response's Optional Outputs

This section describes the information returned from the Verify operation.

SAPI Fields Info

This output is returned when the optional input Signature Type is `http://arx.com/SAPIWS/DSS/1.0/signature-field-verify`, which corresponds to the SAPISignatureFieldVerify operation.

Multiple occurrences of this element are returned, one for each signature field in the input document. The FieldStatus subelement is returned for signed (non-empty) signature fields.

Format

Multiple occurrences of:

Name	Type	Description
SigFieldSettings	s:SAPISigFieldSettingsType	Information regarding the signature field. Refer to SAPISigFieldSettingsType in Appendix A: CoSign Signature SOAP Structures.
SignedFieldInfo	s:SAPISignedFieldInfoType	Information regarding the digital signature information inside the signature field. If the field is not signed, this structure is returned with the value of IsSign=False. Refer to SAPISignedFieldInfoType in Appendix A: CoSign Signature SOAP Structures.
FieldStatus	s:VerificationStatusType	An enumerated type that corresponds to the signature status. Refer to VerificationStatusType in Appendix A: CoSign Signature SOAP Structures.

CA Info

This element is retuned by the server when Signature Type is `http://arx.com/SAPIWS/DSS/1.0/ca-info-get`, which corresponds to SAPICAInfoGetInit and SAPICAInfoGetCont.

Format

Multiple occurrences of:

Name	Type	Description
CACertificate	base64Binary	A Base64 encoding of the CoSign CA Certificate.
CRL	base64Binary	The CoSign current CRL will be returned in Base64 encoding.
AIA	string	The value of the AIA parameter in CoSign. The AIA should be part of every user certificate generated by CoSign.
CDP	string	The value of the CDP parameter in CoSign. The CDP should be part of every user certificate generated by CoSign.

User Management Operations

The User Management interface is based on a standard developed by the OASIS Provisioning Services Technical Committee. The standard is named *Service Provisioning Markup Language* (SPML) and can be accessed at:
http://www.oasis-open.org/committees/download.php/3032/cs-pstc-spml-core-1.0.pdf

The listed operations are relevant mostly to a Directory Independent environment. Some of the queries can be used also in other environments such as Microsoft Active Directory.

This chapter describes all User Management related functionality that is available as part of CoSign Web Services.
In contrast to the Sign/Verify operations, every User Management operation is related to a certain SAPIUM function.

For more information see, refer to the following to view some XML-based information about this web service:

```
http://cosign:8080/SAPIWS/spml.asmx
```

or

```
http://<dns name of your CoSign appliance>:8080/SAPIWS/spml.asmx
```

The API Sign functions include:

- SAPIUMUserAddEx1 and SAPIUMUserAdd – Add a new user.
- SAPIUMCredentialSet – Set a password for an existing user.
- SAPIUMUserUpdate – Update an existing user.
- SAPIUMUserSetLogonState – Set the login state of the given user.
- SAPIUMCounterReset – Reset the user's signature counters.
- SAPIUMUserAssignGroup – Set the group of a given user.
- SAPIUMUserDelete – Delete an existing user.
- SAPIUMUsersEnumInitEx and SAPIUMUsersEnumCont – Enumerate the users inside CoSign.
- SAPIUMUserInfoGetEx and SAPIUMUserInfoGet – Receive detailed user information.
- SAPIUMGroupAdd – Add a new group.
- SAPIUMGroupUpdate – Update an existing group.
- SAPIUMGroupSetStatusByTechID – Set the state of the group to either Enabled or Disabled. If the group is disabled, all users who are members of the group cannot sign.
  However, if a user is disabled, then even if his/her group is enabled, the user will nevertheless not be able to login.
- SAPIUMGroupDelete – Delete an existing group.

- SAPIUMGroupsEnumInit and SAPIUMGroupsEnumCont – Enumerate the groups inside CoSign.
- SAPIUMGroupGetByTechID – Receive detailed group information.

The **following SAPIUM** functions are not supported:

- SAPIUMUsersSyncBegin, SAPIUMUserSync, SAPIUMUsersSyncEnd, SAPIUMUsersSyncStop – Synchronize the CoSign Users Database with an external Users Management Database.
- SAPIUMSCPSet – Not relevant to Web Services operation.
- SAPIUMLibInfoGet – Retrieve SAPIUM library versioning information.

Note: CoSign exposes a single SPML target which represents the CoSign user database. This is a flat table of users or groups, which means that no containers or hierarchy is supported.

Name Spaces Conventions

The following name spaces are used in this chapter. Some of the name spaces are defined by the Oasis SPML standard.

ID	URI	Description
Xmlns:s	**http://www.w3.org/2001/XMLSchema**	XML definitions of W3 group
Xmlns:wsdl	**http://schemas.xmlsoap.org/wsdl/**	WSDL types
Xmlns:soap	**http://schemas.xmlsoap.org/wsdl/soap/**	XML SOAP definitions
Xmlns:soap12	**http://schemas.xmlsoap.org/wsdl/soap12/**	XML SOAP12 definitions
Xmlns:http	**http://schemas.xmlsoap.org/wsdl/http/**	XML SOAP definitions
Xmlns:soapenc	**http://schemas.xmlsoap.org/soap/encoding/**	XML SOAP definitions
xmlns:mime	**http://schemas.xmlsoap.org/wsdl/mime/**	XML SOAP definitions
xmlns:s1	**urn:oasis:names:tc:SPML:2:0**	OASIS SPML definitions
xmlns:s2	**urn:oasis:names:tc:SPML:2:0:search**	OASIS SPML definitions
xmlns:s4	**urn:oasis:names:tc:SPML:2:0:password**	Oasis SPML definitions
xmlns:s3	**http://arx.com/SAPIWS/SPML/1.0**	ARX SPML definitions
xmlns:tns	**http://arx.com/SAPIWS/SPML/1.0**	ARX SPML definitions

User Management API Operations

The Web Services user management interface is based on the following operations:

- **listTargets** – Retrieve general information about the CoSign Users database.

- **add** – Add a new user.
- **modify** – Update an existing user.
- **delete** – Delete an existing user.
- **setPassword** – Set the password of an existing user.
- **search** – Retrieve users based on a query.
- **iterate** – Iterate a search.
- **lookup** – Retrieve a given user's information.
- **closeIterator** – Close the iteration.
- **addGroup** – Add a new group.
- **modifyGroup –** Modify an existing group.
- **deleteGroup** – Delete an existing group.
- **searchGroup –** Retrieve all groups that match the search criteria.
- **lookupGroup** – Retrieve a given group's information.

Common User Management Parameters

The following parameters are used by the User Management API operations.

RequestType Parameter

The *RequestType* parameter must be added to each of the API operations requests. The parameter includes the following values:

Name	Type	Description
CoSignLogonData	S4:CoSignLogonData	The identification of the administrator who performs the operations. For more information, see SPML – CoSignLogonData in Appendix A: CoSign Signature SOAP Structures.
requestID	string	The request ID. This value is optional.
executionMode	string	Whether the mode of execution is *synchronous* or *asynchronous*. Only *synchronous* is supported. This value is optional.

ResponseType Parameter

The *ResponseType* parameter is received in each of the API operations responses. The parameter includes the following values:

Name	Type	Description
errorMessage	string	Error Message response. Several error messages can appear.

Name	Type	Description
status	s1:StatusCodeType	General status code. The possible options are *Success*, *Failure*, or *Pending*.
requestID	string	The request ID that was sent in the Request.
error	s1:StatusCodeType	Specific Error status code.

listTargets Operations

List all target databases inside the CoSign appliance. This operation always returns a single entity.

listTargets Response

The response returns the following parameters in addition to the ResponseType Parameter.

Name	Type	Description
target	s1:TargetType	The parameter includes values that represent the Target database. In the case of CoSign, the answer is always fixed and includes a single target. For more information, see SPML – TargetType in Appendix A: CoSign Signature SOAP Structures.

add Operation

Add a user to the CoSign Users database. This operation activates the SAPIUMUserAddEx1 function.

add Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
psoID	s1:PSOIdentifierType	The identification of the new user. For more information, see SPML – PSOIdentifierType in Appendix A: CoSign Signature SOAP Structures.
UserRecord	s4:UserRecord	Contains the elements of the user's record. The values of the user's records are listed in the **UserRecord** type.
TargetID	string	The ID of the CoSign target. Should be the fixed value *CoSignDB*.
returnData	s1:ReturnDataType	Directs the command what to return as the response. The value should be either *everything* or *data*.

add Response

The response returns the following parameters in addition to the ResponseType Parameter.

Name	Type	Description
Pso	s1:PSOType	The information about the new user. For more information, see SPML – PSOType in Appendix A: CoSign Signature SOAP Structures.

modify Operation

Modify a user in the CoSign Users database. This operation can activate the following API functions:

- **SAPIUMUserSetLogonState** – Change the login state of the user to Enabled or Disabled. In this case, you should only supply the *LoginStatus* parameter with either the *USER_LOGIN_STATUS_ENABLED* or *USER_LOGIN_STATUS_DISABLED* value.
- SAPIUMUserAssignGroup – Set a new group for the user. In this case, you should supply the *GroupName* parameter with the requested group name.
- **SAPIUMCounterReset** – Perform a reset counter operation. To reset counter 2, specify a value of 0 in the *Counter2* field. To reset counter 3, specify a value of 0 in the *Counter3* field.
- **SAPIUMUserUpdate** – Updates the user record. Only the following fields in the user record can be updated: *UserCN*, *EmailAddress*, and *RightsMask*.

modify Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
psoID	s1:PSOIdentifierType	The identification of the new user. For more information, see SPML – PSOIdentifierType in Appendix A: CoSign Signature SOAP Structures.
modification	s1:ModificationType	This parameter includes a single instance with an internal UserRecord sub structure that contains the updated fields. For a description of the user record fields, refer to SPML – UserRecord.
returnData	s1:ReturnDataType	This parameter instructs the command what to return as the response. The value should be either *everything* or *data*.

modify Response

The response returns the following parameters in addition to the ResponseType Parameter.

Name	Type	Description
Pso	s1:PSOType	The information about the updated user. For more information, see SPML – PSOType in Appendix A: CoSign Signature SOAP Structures.

delete Operation

Deletes a given user in the CoSign Users database. This operation activates the SAPIUMUserDelete function.

delete Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
psoID	s1:PSOIdentifierType	The identification of the deleted user. For more information, see SPML – PSOIdentifierType in Appendix A: CoSign Signature SOAP Structures.
recursive	boolean	Should be false.

delete Response

The response includes only parameters from the ResponseType Parameter.

lookup Operation

Retrieves a given user in the CoSign Users database. This operation activates the SAPIUMUserInfoGetEx function.

lookup Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
psoID	s1:PSOIdentifierType	The identification of the retrieved user. For more information, see SPML – PSOIdentifierType in Appendix A: CoSign Signature SOAP Structures.

lookup Response

The response includes the following parameters in addition to the ResponseType Parameter.

Name	Type	Description
pso	s1:PSOType	Information about the retrieved user. For more information, see SPML – PSOType in Appendix A: CoSign Signature SOAP Structures.

setPassword Operation

Set a new password for a given user in the CoSign Users database. This operation activates the SAPIUMCredentialSet function.

setPassword Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
psoID	s1:PSOIdentifierType	The identification of the updated user. For more information, see SPML – PSOIdentifierType in Appendix A: CoSign Signature SOAP Structures.
password	string	The requested new password.
currentPassword	string	This parameter is omitted.

setPassword Response

The response includes only parameters from the ResponseType Parameter.

search Operation

Search for users in the CoSign users database.

search Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
query	s2:SearchQueryType	This parameter is not relevant to CoSign. All users will be retrieved depending on the specified maxSelect value.

Name	Type	Description
returnData	s1:ReturnDataType	Direct the command what to return as the response. The value should be either *everything*, *data*, or *identifier*. ▪ *everything* and *data* are synonymous, and indicate all the data of the users. For more information, see SPML – PSOType. ▪ *Identifier* indicates the User ID of the users.
maxSelect	int	Specify the maximum amount of returned entities. This parameter is optional.

search Response

The response returns the following parameters in addition to the ResponseType Parameter.

Name	Type	Description
Pso	s1:PSOType	Users' information that meets the search criteria. This parameter can have multiple instances.
iterator	s2:ResultsIterator Type	If there are more users in the query, this return value enables you to retrieve more users using the *iterator* command. An empty iterate value means all the users were queried from the CoSign appliance.

iterate Operation

If the search command or a previous iterate command did not reply with all the users, the iterate command replies with additional users.

iterate Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
iterator	s2:ResultsIteratorType	The iterator value that was sent in the reply received from previous search commands or iterator commands. Refer to SPML – ResultsIteratorType in Appendix A: CoSign Signature SOAP Structures for more information.

iterate Response

iterateResponse is similar to search Response.

closeIterator Operation

This operation closes an iterator. This operation should be called at the end of an iterator or search command.

closeIterator Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
iterator	s2:ResultsIteratorType	The iterator value that was sent in the reply received from pervious search commands or iterator commands. Refer to SPML – ResultsIteratorType in Appendix A: CoSign Signature SOAP Structures for more information.

closeIterator Response

The response only includes parameters from the ResponseType Parameter.

addGroup Operation

Add a group to the CoSign Users database. This operation activates the SAPIUMGroupAdd function.

addGroup Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
psoID	s1:PSOIdentifierType	The identification of the new user. For more information, see SPML – PSOIdentifierType in Appendix A: CoSign Signature SOAP Structures.
GroupRecord	s4:UserRecord	Contains the elements of the group's record. For more information, see SPML – GroupRecord.
TargetID	string	The ID of the CoSign target. This should be the fixed value *CoSignDB*.
returnData	s1:ReturnDataType	Directs the command what to return as the response. The value should be either *everything* or *data*.

addGroup Response

The response returns the following parameters in addition to the ResponseType Parameter.

Name	Type	Description
Pso	s1:PSOType	The information about the new group. For more information, see SPML – PSOType in Appendix A: CoSign Signature SOAP Structures.

modifyGroup Operation

Modify a group in the CoSign Users database. This operation activates the SAPIUMGroupUpdate function.

modifyGroup Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
psoID	s1:PSOIdentifierType	The identification of the updated group. For more information, see SPML – PSOIdentifierType in Appendix A: CoSign Signature SOAP Structures.
modification	s1:ModificationType	Includes a single instance with an internal GroupRecord sub structure that contains the updated fields. For a description of the group record fields, refer to SPML – GroupRecord.
returnData	s1:ReturnDataType	Instructs the command what to return as the response. The value should be either *everything* or *data*.

modifyGroup Response

The response returns the following parameters in addition to the ResponseType Parameter.

Name	Type	Description
Pso	s1:PSOType	The information about the updated group. For more information, see SPML – PSOType in Appendix A: CoSign Signature SOAP Structures.

deleteGroup Operation

Deletes a given group in the CoSign database. This operation activates the SAPIUMGroupDelete SAPIUMGroupDelete function.

deleteGroup Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
psoID	s1:PSOIdentifierType	The identification of the deleted group. For more information, see SPML – PSOIdentifierType in Appendix A: CoSign Signature SOAP Structures.
recursive	boolean	Should be false.
Group_user_op	integer	The parameter value should be 0. For more information, contact ARX.

deleteGroup Response

The response includes only parameters from the ResponseType Parameter.

lookupGroup Operation

Retrieves a given group in the CoSign database. This operation activates the SAPIUMGroupGetByTechID function.

lookupGroup Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
psoID	s1:PSOIdentifierType	The identification of the group. For more information, see SPML – PSOIdentifierType in Appendix A: CoSign Signature SOAP Structures.

lookupGroup Response

The response includes the following parameters in addition to the ResponseType Parameter.

Name	Type	Description
pso	s1:PSOType	Information about the retrieved group. For more information, see SPML – PSOType in Appendix A: CoSign Signature SOAP Structures.

searchGroup Operation

Search for groups in the CoSign database.

searchGroup Request

The request includes the following parameters in addition to the RequestType Parameter.

Name	Type	Description
returnData	s1:ReturnDataType	Direct the command what to return as the response. The value should be either *everything*, *data*, or *identifier*. ▪ *everything* and *data* are synonymous, and indicate all the data of the groups. For more information, see SPML – GroupRecord. ▪ *Identifier* indicates the GroupName of the groups.
maxSelect	int	Specify the maximum amount of returned entities. This parameter is optional.

searchGroup Response

The response returns the following parameters in addition to the ResponseType Parameter.

Name	Type	Description
pso	s1:PSOType	Groups information that meets the search criteria. This parameter can have multiple instances.

Note: *There is no iteration function for groups. Therefore, if maxSelect is included in the request and its value is smaller than the total number of groups in the CoSign database, the remaining groups will not be retrieved. It is therefore advisable not to include the maxSelect parameter in the request.*

Using Web Services

This chapter provides information on how to activate the CoSign Web Services from a variety of client development environments. A code sample is provided for every discussed environment, showing how to use the CoSign appliance to sign a buffer.

For each development environment, there are tools that use the CoSign Web Services WSDL file to either generate code or define methods that enable the application to easily access the CoSign Web Services. This chapter also describes these tools.

Java

In the Java environment there is a utility called Axis which can be downloaded from http://axis.apache.org/axis/. Activating this tool generates classes in Java that can access the Web Services implementation in CoSign.

PHP

The following sample is based on PHP5 and demonstrates how to use PHP for PDF signing. Other types of documents can be signed in a very similar manner.

```
<?php

try
{
    $ch = curl_init();
    curl_setopt($ch, CURLOPT_SSL_VERIFYPEER, false);

    // initiating the SOAP client side based on the given WSDL file
    $wsdl_url = "https://cosign:8080/sapiws/dss.asmx?wsdl";
    $client = new SoapClient($wsdl_url);

    // this namespace should be defined in several places
    $ns = "http://www.w3.org/2001/XMLSchema";

    // Authentication. In the case of Active Directory, the domain name should
    // be defined in the NameQualifier attribute
    $req->OptionalInputs->ClaimedIdentity->Name = "JMiller";
    $req->OptionalInputs->ClaimedIdentity->SupportingInfo->LogonPassword =
      "12345678";

    // Signature Type
    $req->OptionalInputs->SignatureType =
      "http://arx.com/SAPIWS/DSS/1.0/signature-field-sign";

    // Data
    // setting the GMT offset of the signature operation
    $confs->ConfValue[0]->ConfValueID = "GMTOffset";
    $confs->ConfValue[0]->IntegerValue ="60" ;

    $req->OptionalInputs->ConfigurationValues=$confs;

    // reading the PDF file
    $req->InputDocuments = array(
        'Document' => array(
            'Base64Data' => array(
                '_' => file_get_contents('aaa.pdf'),
                'MimeType' => 'application/pdf'
            )
        )
    );

    // sending the request
    $DssReq->SignRequest = $req;
    $output = $client->DssSign($DssReq);
```

```
    echo "result is: ";
    echo $output->DssSignResult->Result->ResultMajor;
    echo "\n";
    echo $output->DssSignResult->Result->ResultMinor;
    echo "\n";

    if ( $output->DssSignResult->Result->ResultMajor !=
     "urn:oasis:names:tc:dss:1.0:resultmajor:Success")
    {
        echo $output->DssSignResult->Result->ResultMessage->_;
        echo "\n\n";
    }
    else
    {
        $value =
          $output->DssSignResult->OptionalOutputs->DocumentWithSignature->Document->Base64Data;

        // write the signed pdf file
        file_put_contents('bbb.pdf',$value->_);
    }
}
catch (Exception $e)
{
    echo "Error!<br />";
    echo $e -> getMessage ();
}
```

Appendix A: CoSign Signature SOAP Structures

The following structures are defined and used as part of the CoSign Signature SOAP interface.

KeyInfo

This structure is used to manage information of a key and a certificate. This information can either be extracted from the CoSign Appliance by requesting a list of all user's certificates, or directed into the CoSign appliance when defining with which key and certificate to sign.

Format

Member	Type	Description
`X509Data`	s4:X509DataType	X509 Certificate value. Refer to X509DataType for a more detailed description of how this structure is defined.
`PGPData`	s4:PGPDataType	Not used.
`RetrievalMethod`	s4:RetrievalMethodType	Not used.
`SPKIData`	s4:SPKIDataType	Not used.
`KeyName`	string	Not used.
`KeyValue`	KeyValueType	Not used.
`MgmtData`	string	Not used

X509DataType

This structure is used to manage X509 certificate information and other X509 data such as the CRL. This structure is used in a variety of cases, such as an enumeration of user certificates, and also when retrieving the CoSign Certificate or CoSign CRL.

Format

Member	Type	Description
`X509Certificate`	Base64Binary	Base64 encoding of an X509 certificate.
`X509IssuerSerial`	s4:X509IssuerSerialType	Information about the serial number and issuer name of the X509 certificate. The elements include: ▪ 509IssuerName (string) – The name of the issuer who approved the certificate. The Common-Name field should be supplied. ▪ X509SerialNumber – The serial number of the specific certificate.

Member	Type	Description
X509CRL	Base64Binary	A representation of a CRL. Not used.
X509SKI	Base64Binary	Base64 encoding of the Subject key identifier field inside the X509 Certificate.
X509SubjectName	string	Not used.

TimeDateFormatType

This format defines the displayed time and date formats.

Format

Member	Type	Description
ExtTimeFormat	s3:ExtendedTime FormatEnum	An enumerated value that specifies whether to display GMT related information in addition to the displayed date and time. Refer to Appendix B: CoSign Signature SOAP Enumerations.
DateFormat	string	The display format of the date (i.e., “dd mmm yyyy”).
TimeFormat	string	The display format of the time (i.e., “hh:mm”).

GraphicImageType

This structure defines the graphical signature image that can be sent to the CoSign appliance or retrieved from the CoSign appliance.

Format

Member	Type	Description
GraphicImage	base64Binary	The actual data of the graphical image.
GraphicImageName	string	The ID of the graphical image.
DataFormat	Unsigned int	The format of the graphical image. Refer to GraphicImageFormatEnum.
ImageConverted Format	GraphicImage FormatEnum	The output graphical image might be converted from the original format in which the graphical image is stored. This field contains the type of the converted graphical image. Refer to GraphicImageFormatEnum for more information.
Height	int	The height of the image.
Width	int	The width of the image.
ImageType	s3:GraphicImage TypeEnum	The type of image. Refer to GraphicImageTypeEnum.

SAPISignedFieldInfoType

This structure defines all information of a signed signature field.

Format

Member	Type	Description
`Certificate`	base64Binary	The relevant certificate that was used as part of the signature operation.
`GraphicImage`	s3:GraphicImage Type	The graphical image of the digital signature operation.
`GraphicLogo`	s3:GraphicImage Type	The logo image of the digital signature operation.
`SignerName`	string	The user who signed the document.
`IsSigned`	Boolean	Whether the field is signed.
`SignertureTime`	dateTime	The date and time of the signature operation.
`Reason`	string	The reason for the signature operation.
`DependencyString`	string	An indication of the dependency mode of the signed field. Refer to DependencyModeEnum for the list of available strings.

SAPISigFieldSettingsType

This structure is used when creating a new field inside a given document or retrieving signature field information from a file. All the parameters represent characteristics of the signature field. Some of the parameters have a visual impact, such as `X` and `Y`, which determine the location of the field inside the document.

Format

Member	Type	Description
`TimeFormat`	s3:TimeDate FormatType	The format of the time displayed in the signature.
`ExtendedInfo`	dss:AnyType	Additional information about the signature field. For details contact ARX.
`Name`	string	The ID of the field.
`DependencyMode`	s3:Dependency ModeEnum	An enumerated type that specifies the dependency mode of the field. Refer to DependencyModeEnum.
`Signature Type`	s3:SignatureType Enum	An enumerated type that specifies the type of signature. Refer to SignatureTypeEnum.

Member	Type	Description
`Page`	int	The number of the page in which the signature field is located.
`X`	int	The X position of the signature field.
`Y`	int	The Y position of the signature field.
`Height`	int	The height of the signature field.
`Width`	int	The width of the signature field.
`AppearanceMask`	Unsigned int	An appearance mask that specifies which information is displayed inside the digital signature. For more information, refer to the description of SAPI_SIG_FIELD_SETTINGS in Appendix A: CoSign Signature Local – Signing/Verifying Structures in the SAPICrypt section.
`LabelsMask`	Unsigned int	A mask that specifies which fields are displayed with their caption. For more information, refer to the description of SAPI_SIG_FIELD_SETTINGS in Appendix A: CoSign Signature Local – Signing/Verifying Structures in the SAPICrypt section.
`EmptyFieldLabel`	string	A string that is displayed inside the empty signature field.
`Invisible`	Boolean	Indicates whether the new field is a visible or invisible signature field. TRUE means that the field is invisible.
`Flags`	unsigned int	Flags included in the signature field. For more information, refer to the descriptions of the SAPISignatureFieldCreateEx function and the SAPISignatureFieldCreateSignEx function in the CoSign Signature Local documentation.

VerificationStatusType

This structure is returned for a verification request upon a signature field or a data buffer.

Format

Member	Type	Description
`SignatureStatus`	int	The signature status.
`CertificateStatus`	s3:CertStatusEnum	Refer to the UserCertStatusEnum enumerated type for available options.
`OSCertificate Status`	Unsigned int	The certificate status as was returned by the system.

SPML – TargetType

This structure returns information about the CoSign users database target. CoSign includes a single target.

Format

Member	Type	Description
`TargetID`	string	The value 'CoSignDB'.
`profile`	s:anyURI	This parameter should not be included. It is listed for compatibility with the standard.
`Schema`	s1:SchemaType	This parameter should not be included. It is listed for compatibility with the standard.
`capabilities`	s1:CapabilitiesListType	This parameter should not be included. It is listed for compatibility with the standard.

SPML – PSOIdentifierType

This structure returns information about the CoSign User Identity.

Format

Member	Type	Description
`ID`	string	The ID of the User or Group.
`ContainerID`	s1:PSOIdentifierType	This parameter should not be included. It is listed for compatibility with the standard.
`TargetID`	string	The parameter that was returned in the ListTargets operation.

SPML – CoSignLogonData

This structure returns information about the CoSign Logged On user.

Format

Member	Type	Description
`User`	string	The login name of the user.
`Password`	string	The password of the given user.
`Domain`	string	The parameter that was returned in the ListTargets operation.

SPML – UserRecord

This structure returns information about the CoSign User Identity.

Format

Member	Type	Description
`UserLoginName`	string	The Login Name of the User.
`Password`	string	The password of the given user.
`UserCN`	string	The parameter that was returned in the ListTargets operation. This field can be updated in a modify operation.
`EmailAddress`	string	The parameter that was returned in the ListTargets operation. This field can be updated in a modify operation.
`RightsMask`	Unsigned Int	The parameter that was returned in the ListTargets operation. This mask value is built according to the following attributes: User – 1 Appliance Management – 2 Users Management – 4 This field can be updated in a modify operation.
`UserKind`	s4:UserKindEnum	The type of user. The value can be one of the following: *None*, *User*, *Group*, or *Computer*. In most cases, the accepted value is *User*.
`UpdateTime`	dateTime	The last update time of the user.
`Guid`	string	The Guid of the user.
`EnrollmentStatus`	s3:Enrollment StatusEnum	The enrollment status of the user (refer to EnrollmentStatusEnum).
`EnrollmentReason`	Unsigned Int	An enrollment reason, as specified in the API user record.
`LoginStatus`	S3:UserLogin Enum	This status is defined according to the SAPI_UM_ENUM_USER_LOGIN_STATUS. Currently, it indicates whether the user is enabled or disabled.
`Counter1`	Unsigned Int	The general counter of the user. This counter cannot be reset in a reset counter operation.
`Counter2`	Unsigned Int	The first resettable counter of the user.
`Counter3`	Unsigned Int	The second resettable counter of the user.
`UserCertStatus`	s3:UserCertStatus Enum	The User Certificate Status (refer to UserCertStatusEnum).

Member	Type	Description
CertRequestStatus	s3:PendingRequest StatusEnum	The User Certificate Request Status (refer to PendingRequestStatusEnum).
GroupName	string	The group to which the user belongs.

SPML – GroupRecord

This structure returns information about the CoSign Group Identity.

Format

Member	Type	Description
GroupName	string	The Name of the Group.
Address	string	The contact address of the group.
PhoneNumber	string	The phone number of the group's contact.
Country	string	The country code of the group.
DomainName	string	The domain name of the group.
OrganizationName	string	The organization name of the group.
OrganizationUnit Name	string	The organizational unit name of the group.
KeySize	s3:GroupKeySizeEnum	The key size, for all users who are members of the group. To leave the key size of all members unchanged, specify a value of GROUP_DEFAULT_KEY. For the full list of values, refer to SAPI_UM_ENUM_GROUP_KEY_SIZE.
GroupStatus	s3:GroupStatusEnum	The login status of the group (enabled or disabled).
PackagesMask	unsignedInt	For information about this parameter, contact ARX.
FlagsMask	unsignedInt	For information about this parameter, contact ARX.

SPML – PSOType

This structure returns user information.

Format

Member	Type	Description
`psoID`	s1:PSOIdentifierType	The ID of the user. For more information, see SPML – PSOIdentifierType.
`UserRecord`	s4:UserRecord	The User Record. For more information, see SPML – UserRecord.
`GroupRecord`	s4:GroupRecord	The Group Record. For more information, see SPML – GroupRecord.

SPML – ResultsIteratorType

This structure is used as part of the Users iterator if there are more users to retrieve from the CoSign Users database.

Format

Member	Type	Description
`ID`	string	The ID of the Iterator. This value should be used as opaque data.

Appendix B: CoSign Signature SOAP Enumerations

This appendix provides descriptions of the enumeration types of the CoSign Signature SOAP interface. Many of the following enumerated values are similar to the enumerated values in the SAPICrypt documentation. For each of the enumerated types, the corresponding SAPICrypt enumerated type is listed.

DependencyModeEnum

This type is equivalent to SAPI_ENUM_DEPENDENCY_MODE. This enumerated type lists the modes of dependency available for a digital signature:

- **None** – The dependency mode is not relevant.
- **Dependent** – The signature field is dependent on other fields.
- **Independent** – The signature field is not dependent on other fields.

SignatureTypeEnum

This type is equivalent to SAPI_ENUM_SIGNATURE_TYPE. This enumerated type lists the modes of dependency available for a digital signature:

- **None** – Undefined.
- **Digital** – A digital signature.
- **EHash** – An electronic signature.

GraphicImageTypeEnum

This enumerated type lists the type of graphical image available for a digital signature:

- **None** – Undefined.
- **GraphicImage** – A graphical signature.
- **Initials** – Initials image.
- **Logo** – Logo image.

ConfIDEnum

This type is equivalent to SAPI_ENUM_CONF_ID. This enumerated type lists all the existing configuration parameters that can be sent to the API and controls the behavior of the CoSign Signature SOAPinterface.

The following table lists all the ConfIDEnum values and their CoSign Signature Local equivalents:

ConfIDEnum Value	CoSign Signature Local Equivalent	Parameter Type
None	SAPI_ENUM_CONF_ID_NONE	
Reason	SAPI_ENUM_CONF_ID_REASON	StringValue
ChkCrlEnum	SAPI_ENUM_CONF_ID_CHK_CRL_ENUM	IntegerValue
ChkCrlVerify	SAPI_ENUM_CONF_ID_CHK_CRL_VERIFY	IntegerValue
VerifyCertSign	SAPI_ENUM_CONF_ID_VERIFY_CERT_SIGN	IntegerValue
WordSFFunc	SAPI_ENUM_CONF_ID_WORD_SF_FUNC	IntegerValue
ReasonLabel	SAPI_ENUM_CONF_ID_REASON_LABEL	StringValue
DateLabel	SAPI_ENUM_CONF_ID_DATE_LABEL	StringValue
SignerLabel	SAPI_ENUM_CONF_ID_SIGNER_LABEL	StringValue
CertChainFlags	SAPI_ENUM_CONF_ID_CERT_CHAIN_FLAGS	IntegerValue
GRSigPrefName	SAPI_ENUM_CONF_ID_GR_SIG_PREF_NAME	StringValue
PDFOwnerPwd	SAPI_ENUM_CONF_ID_PDF_OWNER_PWD	StringValue
PDFUserPwd	SAPI_ENUM_CONF_ID_PDF_USER_PWD	StringValue
PDFSFFunc	SAPI_ENUM_CONF_ID_PDF_SF_FUNC	IntegerValue
GMTOffset	SAPI_ENUM_CONF_ID_GMT_OFFSET	IntegerValue
UseTimestamp	SAPI_ENUM_CONF_ID_SECURED_TS_ENABLE	IntegerValue
TimestampURL	SAPI_ENUM_CONF_ID_SECURED_TS_URL	StringValue
TimestampUser	SAPI_ENUM_CONF_ID_SECURED_TS_USER	StringValue
TimestampPWD	SAPI_ENUM_CONF_ID_SECURED_TS_PWD	StringValue
TitleValue	SAPI_ENUM_CONF_ID_TITLE	StringValue
PDFRoamingIDSrv	SAPI_ENUM_CONF_ID_PDF_ROAMING_ID_SRV	StringValue
LogoPrefName	SAPI_ENUM_CONF_ID_LOGO_PREF_NAME	StringValue
UseOCSP	SAPI_ENUM_CONF_ID_EMBED_OCSP	IntegerValue
OCSPURL	SAPI_ENUM_CONF_ID_OCSP_URL	StringValue
TiffBannerCreate	SAPI_ENUM_CONF_ID_TIFF_BANNER	IntegerValue
XAdESTemplate	SAPI_ENUM_CONF_ID_XADES_TEMPLATE	StringValue

ConfIDEnum Value	CoSign Signature Local Equivalent	Parameter Type
TimestampAdditionalBytes	SAPI_ENUM_CONF_ID_SECURED_TS_ADDITIONAL_BYTES	IntegerValue
ExtendedValidation	SAPI_ENUM_CONF_ID_EXTENDED_VALIDATION	IntegerValue
PDFAttribution	SAPI_ENUM_CONF_ID_PDF_ATTRIBUTION	IntegerValue
CertVerify	SAPI_ENUM_CONF_ID_CERT_VERIFY	BinaryValue
GRImageReduce	SAPI_ENUM_CONF_ID_GR_IMG_REDUCE	IntegerValue
MinAdesVerify	SAPI_ENUM_CONF_ID_MIN_ADES_VERIFY	IntegerValue
InfpSpUserName	SAPI_ENUM_CONF_ID_INFP_SP_USER_NAME	StringValue
InfpSpPassword	SAPI_ENUM_CONF_ID_INFP_SP_USER_PWD	StringValue
InfpSpDomain	SAPI_ENUM_CONF_ID_INFP_SP_DOMAIN	StringValue
InfpSpTemplateName	SAPI_ENUM_CONF_ID_INFP_TEMPLATE_NAME	StringValue
AppearanceMask	SAPI_ENUM_CONF_ID_APPEARANCE_MASK	IntegerValue
OldStylePDFApp	SAPI_ENUM_CONF_ID_OLD_STYLE_PDF_APP	IntegerValue

Note: *The default value of **OldStylePDFApp** in CoSign Signature Local is 0, while in the CoSign Signature SOAPAPI its default value is 1.*

ExtendedTimeFormatEnum

This type is equivalent to SAPI_ENUM_EXTENDED_TIME_FORMAT.
This enumerated type lists the available GMT related time display.

- **None** – Not used.
- **GMT** – GMT related information will be displayed with the time.
- **System** – GMT related information will not be displayed.

GraphicImageFormatEnum

This type is equivalent to SAPI_ENUM_GRAPHIC_IMAGE_FORMAT.
This enumerated type lists all the existing formats of the graphical image.

UserCertStatusEnum

This type is equivalent to SAPI_ENUM_CERT_STATUS.
This enumerated type lists the available certificate statuses. This status is returned upon a Signature verification request.

- **Not Checked** – Certificate was not checked.
- **OK** – Certificate status is OK.

- **Revoked** – Certificate is revoked.
- **Invalid** – Relevant certificate is invalid.
- **Warning** – There is a problem with the certificate. For example, the full certificate chain cannot be established.

EnrollmentStatusEnum

This type is equivalent to SAPI_UM_ENUM_USER_ENROLLMENT_STATUS.
This enumerated type lists the available enrollment status for a certificate. This status is returned upon a user's query request.

UserCertStatusEnum

This type is equivalent to SAPI_UM_ENUM_USER_CERT_STATUS_TYPE.
This enumerated type lists the available user certificate status. This status is returned upon a user's query request.

UserLoginEnum

This type is equivalent to SAPI_UM_ENUM_USER_LOGIN_STATUS.
This enumerated type lists the available user login status. This status is returned upon a user's query request. This status can be updated.

GroupStatusEnum

This type is equivalent to SAPI_UM_ENUM_GROUP_STATUS_TYPE.
This enumerated type lists the available group activity status. This status is returned upon a group's query request. This group status can be updated.

PendingRequestStatusEnum

This type is equivalent to SAPI_UM_ENUM_PENDING_REQUEST_STATUS_TYPE.
This enumerated type lists the available pending request status of a user when using a WWV CA. This status is returned upon a user's query request.

SPML returnDataType

This type is used in the User Management API operations to specify the content of the response:

- **Identifier** – Only the ID is returned.
- **Data** – Only data is returned.
- **Everything** – Everything is returned.

CoSign Signature API

This section includes the following topics:

- Introduction
- Signing and Verifying

Introduction

This chapter describes the CoSign Signature network API provided by CoSign appliances and the CoSign cloud.

This API is provided starting from CoSign version 7.1 and can be used in addition to the CoSign Signature SOAP interface. The CoSign Signature API is designed to be easier for the developer to use than the CoSign Signature SOAP API. Currently the CoSign Signature API only supports signature and validation functions, and will be expanded in the future.

The CoSign Signature API can be used with all CoSign configurations, including CoSign Common Criteria EAL4+, FIPS 140-2 level 3, and the CoSign cloud.

Just like the SOAP-based API, the CoSign Signature API can be used with any platform (such as MS Windows, Linux, Solaris), and any development environment (such as Java, .NET, PHP, PERL) that is able to use an HTTPS-based API.

Technical Information

The CoSign service (appliance or cloud) provides the API using HTTPS with TLS (Transport Layer Security) including X.509 Server Authentication Binding.

- The API uses the HTTPS protocol on port 8081.
  To access the API, use: `https://<dns name of your CoSign service>:8081/<API function>`
- The base URL for every request is `https://<dns name of your CoSign service>:8081/sapiws/`
  The specific command name is added after the base URL.
  For example, `https://<dns name of your CoSign appliance>:8081/sapiws/ChangePassword`
  performs a SAPICredentialChange command.
- The API functions use either HTTP-GET commands or HTTP-POST commands, as described below.
- Parameters sent to and received from the appliance are encoded using the JavaScript Object Notation (JSON) format.
  When JSON is used, parameters that are not mandatory can be omitted from the JSON structure.
- Binary information is represented in BASE64 encoding.

Integrating applications with a CoSign Appliance

- A special entry in the *hosts* file in the client side can be allocated to *cosign*, which will point to the IP address of a CoSign appliance in your network.

  You also must install the ARX ROOT certificate, which is available in the CoSign CDROM in the *misc* directory. This enables the client to establish an SSL session with the CoSign appliance.

- The SSL server key and certificate are temporary and should be replaced by the customer when moving to production. For instructions on how to install a new key and certificate for the SSL server, refer to the chapter on managing the CoSign appliance in the *CoSign Administrator Guide*.

Signature and Validation API

The CoSign Signature API is very similar to the SAPICrypt functionality, but currently includes only the most commonly-required functions. It focuses on the following:

- Create and sign a signature field in a file
- Sign an existing field in a file
- Verify an existing signature field in a file
- Sign a data buffer
- Verify a signature of a data buffer
- Retrieve user certificates
- Manage graphical signatures
- Validate a user's credentials
- Change a user's password
- Activate a user's account

The following information can be signed and verified:

- Data Buffers
- Hash values of data
- XML data
- PDF files
- Office 2007/2010/2013 files that already contain signature fields
- Word XP/2003 files that already contain file-based signature fields
- TIFF files
- InfoPath 2007/2010/2013 forms that already contain signature fields

General Data Structures

Every CoSign Signature command is mapped to a SAPICrypt API, which is described in detail in the above SAPICrypt sections.

Whenever a CoSign Signature web service is called, the CoSign appliance responds with an answer.

If the answer is successful, the response has the following JSON format:

```
{
    "Success": true ,
     "data":
    {
        OutParam1: data
        OutParam2: data
        …
        Outparam3:data
    }
}
```

Upon functional failure, the response has the following JSON format:

```
{
     "Success":false,
     "Errdata":
    {
        "Message": error message,
        "Module": the module that returned the error,
        "Code": error code,
        "InnerCode": SAPICrypt error code
    }
}
```

The InnerCode in an Error response presents a SAPICrypt error code (for a full description of the SAPICrypt error codes, refer to CoSign Signature Local – Signing/Verifying Error Messages).

The basic response returns either a success without replied data, or an error structure.

Signing and Verifying

This chapter provides a detailed description of the functions available in the CoSign Signature interface.

Sign

This function signs an existing signature field, or creates and signs a signature field.

URL Resource Name

Sign

SAPICrypt Base Functions

SAPISignatureFieldSignEx

Input Parameters

Name	Type	Mandatory	Comments	Default Value
`Username`	String	Yes		
`Domain`	String	No		
`Password`	String	Yes		
`FileData`	Buffer	Yes	The data to sign	
`FileType`	string	Yes	The file type can be any one of the following: ▪ “doc” ▪ “docx” ▪ “xls” ▪ “xlsx” ▪ “pdf” ▪ ”tif” ▪ “xml” ▪ “inp”	
`SignPassword`	String	No	If prompt for sign is enabled, use this password to sign.	
`GrSigName`	String	No	Graphical signature name.	If not given, selects the first image

Name	Type	Mandatory	Comments	Default Value
`UserCertID`	String	No	Certificate ID to sign with.	If not given, selects the first certificate
`Reason`	String	No		
`Title`	String	No		
`UserGMTOffset`	Int	No	The GMT offset used for the purpose of the digital signature operation. For example: "-6".	
`SigFieldName`	String	No	The name of the field to sign (if it exists). Otherwise, the name of the new signature field to create.	
`Width`	Int	No	Width of the signature field.	"100"
`Height`	Int	No	Height of the signature field.	"100"
`X`	Int	No	Top-Left X coordinate of the signature field.	"100"
`Y`	Int	No	Top-Left Y coordinate of the signature field.	"100"
`Page`	Int	No	The number of the page in which to create the field. For example: "1".	"-1" (last page)
`Appearance`	Int	No	The appearance mask.	"11". This means that the following information will be displayed when the signature field is signed: ▪ Graphical image ▪ Signed by ▪ Time with difference from GMT
`Type`	Int	No	According to the SAPI_ENUM_SIGNATURE_TYPE enumerated type.	"1" (that is, digital)
`Flags`	Int	No	Refer to the flags in the SAPISignatureFieldSignEx function.	"0"
`TimeFormat`	String	No		"h:mm tt"
`DateFormat`	String	No		"MMM d yyyy"

Name	Type	Mandatory	Comments	Default Value
`Labels`	Int	No	Label mask	0 (which means that labels are not displayed in the visible signature)
`HashAlg`	String	No	The hash algorithm to use for the signature. The possible values are: ▪ "Sha1" ▪ "Sha256" ▪ "Sha384" ▪ "Sha512" **Note** that when CoSign is deployed in Common Criteria mode or in FIPS mode, any attempt to sign using SHA1 is rejected by the CoSign Appliance.	"Sha256"
`TimeStampUrl`	String	No		
`TimeStampUser`	String	No		
`TimeStampPwd`	String	No		

Output Parameters

In case of success, the parameters in the following table are returned. In case of error, a regular Error response is returned.

Name	Type	Mandatory	Comments
`Signed file data`	Buffer	Yes	

Get Signature Fields

Gets a list of all signature fields in the file as well as their details.

URL Resource Name

GetSignatureFields

SAPICrypt Base Functions

SAPISignatureFieldEnumInitEx, SAPISignatureFieldEnumCont, SAPISignatureFieldInfoGet

Input Parameters

Name	Type	Mandatory	Comments	Default Value
FieldName	String	No	If given, returns the details of this field only. Otherwise, returns the details of all fields.	
FieldState	String	No	The possible values are: ▪ "Signed" ▪ "unsigned" If no value is provided, all signature fields are returned.	
FileData	Buffer	Yes	The file's data in Base64 format.	
FileType	String	Yes	File type can by any one of the following: ▪ "doc" ▪ "docx" ▪ "xls" ▪ "xlsx" ▪ "pdf" ▪ "tif" ▪ "xml" ▪ "inp"	

Output Parameters

In case of success, the parameters in the following table are returned. In case of error, a regular Error response is returned.

Name	Type	Mandatory	Comments
NumOfFields	Int	Yes	
Fields	Array of data structs	Yes	An array of fields that contains the following data for each signature field inside the file.
Name	String	Yes	Field name
Width	Int	Yes	
Height	Int	Yes	
X	Int	Yes	
Y	Int	Yes	
Page	Int	Yes	
Appearance	Int	Yes	The appearance mask of the field.
Type	Int	Yes	Signature type: Digital or electronic. Refer to SAPI_ENUM_SIGNATURE_TYPE for a description of the possible values.
Flags	Int	Yes	
TimeFormat	String	Yes	
DateFormat	String	Yes	
LabelsMask	Int	Yes	
IsSigned	Boolean	Yes	Whether the field is signed
SignedFieldProperties	Struct	No	A struct that contains the signed field data. It contains the following data.
IsValid	Boolean	No	For signed field
Reason	String	No	For signed field
CertificateStatus	Int	No	For signed field Refer to SAPI_ENUM_CERT_STATUS for a description of the possible values.
Subject	String	No	For signed field
Email	String	No	For signed field
SignatureTime	String	No	For signed field

Name	Type	Mandatory	Comments
IssuedBy	String	No	For signed field
CertExpirationDate	String	No	For signed field

Sign Buffer

This function signs a buffer and returns the signature.

URL Resource Name

SignBuffer

SAPICrypt Base Functions

SAPIBufferSignEx

Input Parameters

Name	Type	Mandatory	Comments	Default Value
Username	String	Yes		
Domain	String	No		
Password	String	Yes		
BufferToSign	Buffer	Yes		
BufferHash	Boolean	No	Whether the buffer to sign is a hash value or data.	"false" – the buffer is data
SignPassword	String	No	If prompt for sign is enabled, use this password to sign.	
UserCertID	String	No	Certificate ID with which to sign.	If not given, selects the first certificate
HashAlg	String	No	The hash algorithm to use for the signature. The options are: ▪ "Sha1" ▪ "Sha256" ▪ "Sha384" ▪ "Sha512" **Note** that when CoSign is deployed in Common Criteria mode or in FIPS mode, any attempt to sign using SHA1 is rejected by the CoSign Appliance.	"Sha256"
TimeStampUrl	String	No		
TimeStampUser	String	No		
TimeStampPwd	String	No		
Flags	Int	No	Refer to the flags in the SAPIBufferSignEx function.	"0"

Output Parameters

In case of success, the parameters in the following table are returned. In case of error, a regular Error response is returned.

Name	Type	Mandatory	Comments
Signature	Buffer	Yes	The signature data.

Verify Buffer

This function verifies the buffer and returns a list of all signatures.

URL Resource Name

VerifyBuffer

SAPICrypt Base Functions

SAPIBufferVerifySignature

Input Parameters

Name	Type	Mandatory	Comments	Default Value
BufferHash	Boolean	No	Whether the buffer that was signed is the hash value or the clear data.	"false" – the buffer is data
BufferToSign	Buffer	Yes	The buffer that was signed.	
Signature	Buffer	Yes	The signature value.	
Flags	Int	No	Refer to the flags in the SAPIBufferVerifySignature function	"0"
Certificate	Buffer	No	Relevant only in the case of PKCS#1 validation	

Output Parameters

In case of success, the parameters in the following table are returned. In case of error, a regular Error response is returned.

Name	Type	Mandatory	Comments
IsValid	Boolean	Yes	
CertificateStatus	Int	Yes	
Subject	String	Yes	
Email	String	Yes	
SignatureTime	String	Yes	
IssuedBy	String	Yes	
CertExpirationDate	String	Yes	

Get User Certificates

This function returns all user certificates.

URL Resource Name

UserCertificatesGet

SAPICrypt Base Functions

SAPICertificatesEnumInit, SAPICertificatesEnumCont

Input Parameters

Name	Type	Mandatory	Comments	Default Value
Username	String	Yes		
Domain	String	No		
Password	String	Yes		

Output Parameters

In case of success, the parameters in the following table are returned. In case of error, a regular Error response is returned.

Name	Type	Mandatory	Comments
NumOfCerts	Int	Yes	
Certificates	Array of structs	Yes	An array of Certificates that contains the data listed below
Subject	String	Yes	
Issuer	String	Yes	
Email	String	Yes	
NotBefore	String	Yes	The first day of the certificate's validity period
NotAfter	String	Yes	The last day of the certificate's validity period
SerialID	String	Yes	

Get Graphical Signatures

This function gets a list of all the user's graphical signature images.

URL Resource Name

GrSigImgGet

SAPICrypt Base Function

SAPIGraphicSigImageEnumInit, SAPIGraphicSigImageEnumCont, SAPIGraphicSigImageInfoGet

Input Parameters

Name	Type	Mandatory	Comments	Default Value
Username	String	Yes		
Domain	String	No		
Password	String	Yes		
GrSigName	String	No	If given, returns the details of this signature image only; otherwise, returns the details of all the user's signature images.	

Output Parameters

In case of success, the parameters in the following table are returned. In case of error, a regular Error response is returned.

Name	Type	Mandatory	Comments
NumOfSigs	Int	Yes	
GrSigImages	Array of data structs	Yes	An array of graphical signatures that contains the data listed below.
Name	String	Yes	
SigImageData	Buffer	Yes	
DataFormat	Int	Yes	The graphical image information, presented in the SAPI_GR_IMG_INFO structure.
Width	Int	Yes	
Height	Int	Yes	

Create Graphical Signature

This function creates a new graphical signature for a user.

URL Resource Name

GrSigImgCreate

SAPICrypt Base Functions

SAPIGraphicSigImageInfoCreate

Input Parameters

Name	Type	Mandatory	Comments	Default Value
Username	String	Yes		
Domain	String	No		
Password	String	Yes		
GrSigName	String	Yes		
ImageData	Buffer	Yes		
ReducePercentage	Int	No	The value in percentage by which the graphical signature image is decreased in order to fit the CoSign image size limitation.	"0"
ReduceIterations	Int	No	The maximum number of image size reductions allowed.	"0"

Output Parameters

In case of success, the parameters in the following table are returned. In case of error, a regular Error response is returned.

Name	Type	Mandatory	Comments
NewGrSigImg	Data Struct	Yes	A structure that contains the new graphical signature data as listed below.
Name	String	Yes	
ImageData	Buffer	Yes	
DataFormat	Int	Yes	
Width	Int	Yes	
Height	Int	Yes	

Delete Graphical Signature

This function deletes a specific graphical signature.

URL Resource Name

GrSigImgDelete

SAPICrypt Base Functions

SAPIGraphicSigImageInfoDelete

Input Parameters

Name	Type	Mandatory	Comments	Default Value
Username	String	Yes		
Domain	String	No		
Password	String	Yes		
GrSigName	String	Yes	The name of the graphical signature to delete.	

Output Parameters

The default Success response with no data, or an Error response.

Validate Credentials

This function verifies a given user's credentials.

URL Resource Name

ValidateCredentials

SAPICrypt Base Functions

SAPILogonEx

Input Parameters

Name	Type	Mandatory	Comments	Default Value
`Username`	String	Yes		
`Domain`	String	No		
`Password`	String	Yes		

Output Parameters

The default Success response with no data, or an Error response.

Change Password

This function changes the user password.

URL Resource Name

ChangePassword

SAPICrypt Base Functions

SAPICredentialChange

Input Parameters

Name	Type	Mandatory	Comments	Default Value
`Username`	String	Yes		
`Password`	String	Yes	The user's old password	
`NewPassword`	String	Yes	The user's new password.	

Output Parameters

The default Success response with no data, or an Error response.

User Activate

This function performs user activation.

URL Resource Name

UserActivation

SAPICrypt Base Functions

SAPIUserActivate

Input Parameters

Name	Type	Mandatory	Comments	Default Value
`Username`	String	Yes		
`Password`	String	Yes		
`NewPassword`	String	Yes	The new password to set after activation.	
`ExtCreds`	String	No	The extended password (OTP).	

Output Parameters

The default Success response with no data, or an Error response.

CoSign Web Agent API

This section includes the following topics:

- Introduction
- Interface between your Web Application and CoSign Web Agent
- XML and Redirection URL Samples

Introduction

The CoSign Web App is a UI web based ASPX.NET product that handles Digital Signing and Signature Verification operations. For a full description, refer to the *CoSign Web App User Guide*. The CoSign Web App provides the CoSign Web Agent API. The CoSign Web Agent API is the fastest and easiest way to add open, standard digital signatures to your application, using any language and any platform.

The API includes a full User Experience (UX) layer. The UX enables the user to preview the document to be signed, dynamically locate and size his signature, and then sign the document. You can also enable the UX to provide the user with management features: update the user's graphical signatures, signing reasons and more.

The CoSign Web Agent handles all user experience aspects of previewing and digitally signing documents. Your web app controls the Web Agent by sending requests and receiving responses via HTTPS. The requests and responses are sent in XML data format.

The CoSign Web Agent API enables web applications to easily integrate with CoSign in order to provide a web based signing solution as well as a signature verification service.

The CoSign Web App is designed to be used either directly by a person, or integrated with your web application. When it is integrated with your web application, we refer to the product as the CoSign Web Agent, because it is acting as an agent of your web app. Your web app controls the Cosign Web Agent through the CoSign Web Agent API.

The PKCS#7 or PKCS#1 signature is then validated using the signature validation function.

Important: *The CoSign Web Agent API is not enabled by default. To use the API, you must enable it from the Cosign Web App's web config file. For information, see Setting Basic Integration Settings in the CoSign Web App Configuration File.*

Typical CoSign Web App Implementations

The applications that can typically benefit from integrating with the CoSign Web App are document management applications, business process applications and workflow applications that are based on a web application. In these applications, the user usually has a web based session with the application, which requires a digital signature operation. One option for implementing the digital signature operation is for the application to use the various previously-mentioned CoSign Signature APIs (CoSign Signature Local, CoSign Signature SOAP, CoSign Signature). However, an easier method of integrating digital signature operations is to redirect the user as part of the web session to the CoSign Web App for a digital signature operation and when the user is done, send him/her back to the original web application to continue his/her work there with the signed document.

In this model, the CoSign Web App handles all of the UI aspects of the signing ceremony, including visual dragging and re-sizing of the signature location.

Required Components

In order to implement an integration based on the CoSign Web App, the following components are required:

- A web application that communicates with the CoSign Web App.
- A CoSign Web App installed on a Windows 2008R2 server or a higher version.
- A set of CoSign user accounts either on a CoSign appliance or on the CoSign Cloud system. The CoSign appliance is the engine that performs the actual digital signature operation.

Note: *The CoSign Web App can only work with a CoSign Appliance version 6.2 or above.*

Overview of the Signing Process

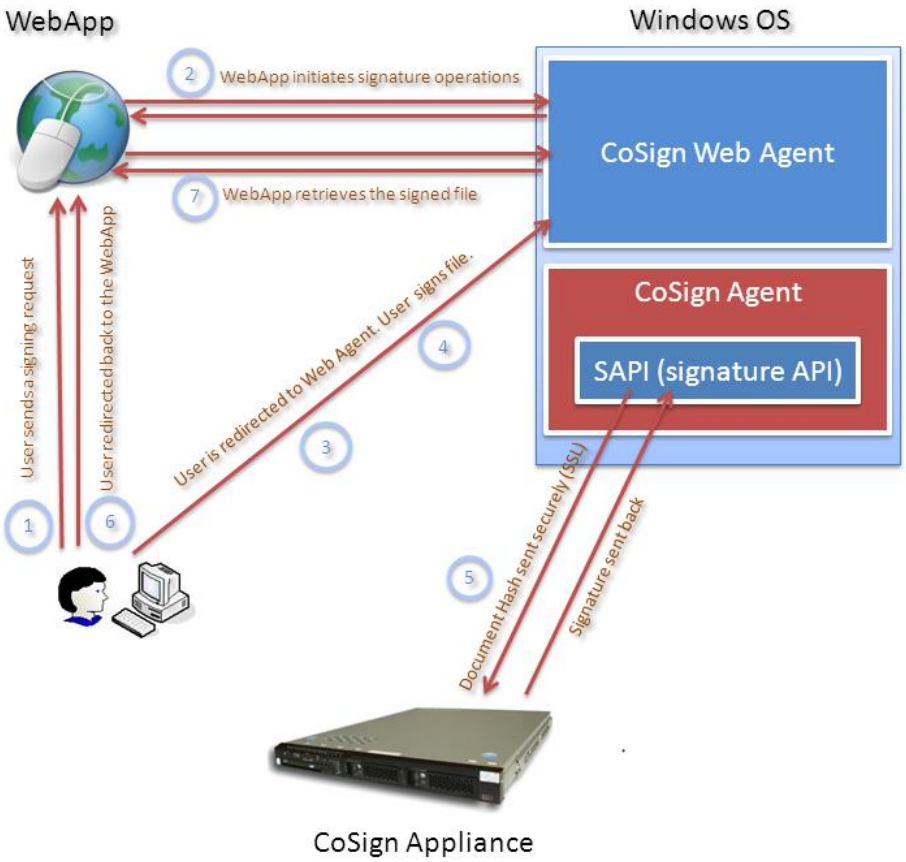
After integrating your web application with CoSign Web App, the signing process proceeds as follows:

1. A user initiates a signing request to your web application.
2. Your web application sends CoSign Web App a file embedded inside an XML in an HTTP-POST request. The XML request includes various parameters (described in the following sections) that influence the signature process.
   The CoSign Web App assigns a SessionID which is returned to your web application.
3. Your web application redirects the user's browser to the CoSign Web App.
4. The user logs on to the CoSign Web App and views the uploaded file. The user can browse the file, sign empty signature fields, and create new signatures. Note that user login to CoSign Web App can be done as part of the user session with the web application; in this case, the XML HTTP-POST command includes the user login information.

   The signing process takes place between the browser and the CoSign Web App according to the HTTP request parameters. Note:

   - The document types supported for signing are PDF, DOC, DOCX, XLS and XLSX.
     Any non-PDF file is first converted to PDF and then the PDF file is signed. The signed file returned to your web application is always a PDF file.
     Only DOCX and XLSX files that contain signatures or signature fields are not converted to PDF and are signed using the native Microsoft Office signature provider.
   - As part of the user's session with the CoSign Web App, a new graphical signature can be uploaded to CoSign and used.
5. The CoSign Web App communicates with the CoSign appliance for producing a digital signature. The CoSign appliance can optionally be located in the CoSign Cloud.

   The user selects the Done option or the Reject option. The Reject option is only relevant for a Signature Workflow scenario.
6. The user is redirected back to the web application.
7. Upon success, the web application retrieves the signed file from the CoSign Web App.



Signing Process Flow Using CoSign Web Agent API

Overview of the Verification Process

After integrating your web application with CoSign Web App, the verification process proceeds as follows:

1. The web application sends CoSign Web App a file embedded inside an XML in an HTTP-POST request, and requests signature validation. The XML request includes the file information (as described in the following sections).
   This operation is supported for signed PDF, DOCX and XLSX files.
2. CoSign Web App performs digital signature verification as follows:

   All digital signatures in the document are validated.
3. An XML structure is returned, containing an individual status per each signature field as well as a general validity status.

Setting Basic Integration Settings in the CoSign Web App Configuration File

The **APISettings** section of the CoSign Web App configuration file (web.config) defines the basic settings for integrating with web applications. These include:

Key	Description	Default	Mandatory
EnableAPIRequests	Whether to enable API request handling by the CoSign Web App application.	False	Yes
APIRequestTimeOut	The API request session time out. This is the amount of time in minutes the CoSign Web App keeps the signed file to be retrieved by the web application after the user finished signing the document.	30 minutes	No

- To enable integrating your web application with CoSign Web App, you must set **EnableAPIRequests** to **True**.

For more information about the web.config file, refer to the *CoSign Web App User Guide*.

Interface between your Web Application and CoSign Web Agent

This chapter describes in detail the CoSign Web Agent protocol used between your web application and CoSign Web Agent. The protocol defines the parameters and methods to use when performing the following actions:

- Upload File and Initiate the Signing Ceremony (Step 2 in Signing Process Flow). This is comprised of two actions:
  - A request sent by your web application to sign a specific file.
  - A response returned by CoSign Web Agent which includes the session ID of the newly created session.
- Redirect user to CoSign Web Agent (Step 3 in Signing Process Flow). Starting from this point, the user interacts with the CoSign Web Agent for the purpose of signing the uploaded file.
- Redirect user back to your web application when the user has completed the signing process (Step 6 in Signing Process Flow).
- Download Signed file (Step 7 in Signing Process Flow). This is comprised of two actions:
  - A request sent by your web application to receive the signed file.
  - A response returned by CoSign Web Agent which includes the signed file.
- Upload File and Verify Signatures. This is comprised of two actions:
  - A request sent by your web application to verify signatures in a specific file.
  - A response returned by CoSign Web Agent which includes validity information about the signatures in the file.

The Networking Infrastructure

All requests and responses use the HTTPS protocol. Depending on the operation, HTTP-GET, HTTP-POST or HTTP-Redirect commands are used. All Commands are HTTP protocol commands, secured with the SSL/TLS protocol.

The entire user experience is web based:
The user starts his/her session with your web application. When a digital signature is needed, the user is redirected to the CoSign Web Agent using the HTTP-Redirect command.
When signing is completed, the user is redirected back to your web application using an HTTP-Redirect command, and continues his/her user session.

Uploading a File and Initiating Signing

The following sections describe the format of the request and response when uploading a file and initiating signing.

Request Format

To initiate the file upload and signing process, an XML request must be sent from your web application to: `https://<host name>/Sign/UploadFileToSign`

The HTTP header of the request must specify the POST method, and it must include a Content-Type parameter with a value `application/x-www-form-urlencoded`. The actual data of the HTTP-POST command should include the parameter `inputXML`, and the content should be an XML structure. The XML structure must contain all relevant data regarding the desired behavior of the CoSign Web Agent, as well as the file to be signed, Base64 encoded. For a full description of the parameters in the XML structure, refer to Request Parameters).

For an example of such an XML structure, refer to Sample XML Request.

Authentication Options

To digitally sign a document with CoSign, a user must authenticate to the CoSign signing system by presenting signing credentials. Each installation of the CoSign Web Agent can be configured to use either a CoSign Central appliance or the CoSign Cloud. CoSign supports various modes of authentication (as described in the *CoSign Administrator Guide*). The role of the CoSign Web Agent in terms of authentication is to provide CoSign with the information necessary to authenticate a user. Currently, CoSign Web Agent supports username/password authentication mode. Within this mode, CoSign Web Agent provides the following options for receiving user credentials:

- The user enters his/her username and password in the CoSign Web Agent's Login page when redirected to the CoSign Web Agent.
- Your web application provides the username in the request XML. The login page will display the username as "read only" and the user will only need to enter his/her password (in this case, a user will not be able to enter a different username).
- Your web application provides both the username and password in the request XML. If the username and password are valid, the user is redirected to the Signing Ceremony page and the Login Page is skipped. If the credentials are not valid, the operation is aborted and an error is returned to the web application as part of response returned by the CoSign Web Agent.

Request Parameters

The request parameters are sorted by logical groups. Some of these groups can have multiple instances in a single request. For example, a request can specify a number of Sign Reasons for the user to choose from. For an example of a request, refer to Sample XML Request.

Group	Name	Type	Description	Default if not Specified	Notes
Auth	username	String	Username	Request user for input	
	password	String	Password of a user	Request user for input	
	keepUserLogin	Boolean	Specifies whether the user remains logged-in after signing the document and can sign the next document without presenting his/her credentials again. Possible values: **true**, **false**.	False	
Document This group is required	content	String	A Base64 encoded file to be signed		Mandatory
	contentType	String	The type of document to be signed. Supported types: **PDF**, **Doc**, **Docx**, **Xls**, **Xlsx**.		Mandatory
	fileID	String	A unique identifier for the file. This identifier will be returned after a file was signed in order for the calling application to identify it.		
	fileName	String	The document file name. This will be displayed to the user in the Signing Ceremony page. Note that the value of this parameter is used for display purposes only and does not determine the document type. The document type is specified using the **contentType** parameter.		

Group	Name	Type	Description	Default if not Specified	Notes
Layout	layoutMask	Int	Determines the sign ceremony menu displayed to the user. A mask of the following options can be passed: None = 0 Education center = 2 Settings and change password = 8 Graphical Signatures = 16	0	
UserGMTOffset	GMTOffset	Int	Determines the user GMT offset. Used in case the user's GMT offset is different from the server system settings. The value is in minutes.		
SigField	fieldNameToSign	String	Specifies a name of a signature field in the document or a signature profile in a request. If **enforceFieldToSign** is true, this is the name of the signature field that must be signed; otherwise, the user does not have to sign this field. This parameter is not allowed in a Point of Sale signing process.		
	enforceFieldToSign	Boolean	Specifies whether the user must sign the field specified in the **fieldNameToSign** parameter. If true, the user cannot select another existing field or create a new field to sign, nor can the user change the given signature's profile settings. Possible values: **true**, **false**. This parameter is not allowed in a Point of Sale signing process.	False	
SigProfile	x	Int	X coordinate of a signature field to be created. X should be a positive integer.	Value required if group exists	This entire group of parameters is not allowed when signing
	y	Int	Y coordinate of a signature field to be created. X should be a positive integer.	Value required if group exists	

Group	Name	Type	Description	Default if not Specified	Notes
	width	Int	Specifies the width of the signature field to be created. X should be a positive integer.	Value required if group exists	Office files.
	height	Int	Specifies the height of the signature field to be created. X should be a positive integer.	Value required if group exists	
	pageNumber	Int	Specifies the page number on the document	Value required if group exists	
	fieldName	String	The name of the field that will be created. **fieldName** is limited to 32 characters and supports only English, digits, +, -, and =.	Value required if group exists	
	isNewFieldDefault	Boolean	If true, the signature profile settings will be used as default settings for the ad-hoc (newly created) fields. This means the user will be able to move, resize and change the appearance settings of the field. Note that in order to enable the user to create and sign new fields the allowAdHoc parameter must be set to **true**.	False	
	dateFormat	String	The format string used to form the date string. Refer to DateFormat.	MMM d yyyy	
	timeformat	String	The format string to use to form the time string. Refer to TimeFormat.	h:mm tt	
	isDisplayGMT	Boolean	Specifies whether to display GMT-related information in addition to the displayed date and time. Possible values: **true**, **false**.	False	
	signer	Boolean	Specifies whether to display the Signed By value (Printed Name). Possible values: **true**, **false**.	True	
	date	Boolean	Specifies whether the date should be visible. Possible values: **true**, **false**.	True	

Group	Name	Type	Description	Default if not Specified	Notes
	graphicalImage	Boolean	Specifies whether to display a graphical image. Possible values: **true**, **false**.	True	
	showTitle	Boolean	Specifies whether to show the title in the signature field. Possible values: **true**, **false**.	False	
	title	String	A title that will appear in the signature field if **showTitle** is True. Title length is limited to 64 characters. Note that the user will be able to change this during the signing ceremony.	Request user for input	
Sign Reasons (One or more occurrences within the XML)	signReason	String	Determines the reasons in the Reasons combo box. Each **signReason** occurrence is a separate reason. The length of **signReason** is limited to 128 characters. Note that in order to enable the user to enter his/her own sign reason instead of selecting from the combo-box, the **allowUserReason** parameter must be set to **true**.	Request user for input	Multiple instances
Reject Reasons (One or more occurrences within the XML)	rejectReason	String	Determines the reasons in the Reject combo box. Each **rejectReason** occurrence is a separate reason. The length of **rejectReason** is limited to 128 characters. Note that in order to enable the user to enter his/her own rejection reason instead of selecting from the combo-box, the **allowUserReason** parameter must be set to **true**.	Request user for input	Multiple instances

Group	Name	Type	Description	Default if not Specified	Notes
Logic	isRejectButton	Boolean	This parameter affects the UI. When true, it adds a Reject button so that the user can either sign the document or click Reject. Possible values: **true**, **false**. This parameter is not allowed in a Point of Sale signing process.	False	
	allowAdHoc	Boolean	Allow users to dynamically create a signature field. If the signature profile settings are given and isNewFieldDefault is true, those settings will determine the new field's default settings. Possible values: **true**, **false**. This parameter is disregarded when signing Office files.	False	
	enforceReason	Boolean	Specifies whether a user must enter a reason. Possible values: **true**, **false**.	True	
	allowUserReason	Boolean	Specifies whether the user can enter his/her own reason text, rather than selecting a reason from the predefined reasons list. Possible values: **true**, **false**.	True	
	verify	Boolean	Specifies whether to verify all existing signatures in the document in addition to the signing process. If you specify true, a **Verify** XML node is added to the sign response XML. The structure of that node is identical to the structure received when sending a separate Verify Signatures request (refer to Response Format). Note that specifying **true** may impact performance.	False	

Group	Name	Type	Description	Default if not Specified	Notes
	posMode	Boolean	Specifies whether to enable a Point of Sale signing process. This parameter affects the UI behavior and user signing options. In Point of Sale mode, a customer can sign electronically using his handwritten signature. Point of Sale mode is relevant only for PDF files and is not allowed when signing Office files. Possible values: **true**, **false**.	False	
Url This group is required	finishURL	String	The URL to which the CoSign Web Agent redirects the browser after the user finishes signing.		Mandatory
	redirectIFrame	Boolean	Relevant when the CoSign Web Agent is running on an iframe. If **true**, *only* the iframe will redirect to the page specified in finishURL. Otherwise, the whole page will redirect to the finishURL.	False	

Response Format

The response will be based on the following format:

Content Type = application/xml; charset-utf-8

Response Parameters

The XML response will include the following fields:

Group	Name	Type	Description
Error	returnCode	Int	0 – specifies success. This means that the document and signature data were successfully received, and the user can now be redirected to CoSign Web Agent. For a list of all possible error codes, refer to CoSign Web Agent API Error Codes.
	errorMessage	String	The error message in case of an error.
Session	sessionId	String	A unique session identifier. Used to maintain a session between the CoSign Web Agent and your web application.
	docId	String	The ID of the document that was passed to the **Sign/UploadFileToSign** service. Refer to the fileID parameter in Request Parameters.

Redirecting a User to CoSign Web Agent

The user should be directed to the CoSign Web Agent using the following URL:

```
https://<host name>/Sign/SignCeremony?sessionId==1212122
```

where *sessionId* is a value returned from the CoSign Web Agent in the Initiate Signing Response (see Response Format described above).

The user will be able to view the uploaded document, browse different pages and then sign the relevant signature field(s) or create and sign a new signature. The Signing Ceremony will proceed according to the parameters sent in Request Parameters.

Redirecting a User Back to your Web Application

After signing operations are completed, the CoSign Web Agent redirects the web browser to the page specified in finishURL. The redirection includes the following HTTP-GET parameters:

- **sessionId** – request identifier
- **docId** – document identifier
- **returnCode** – sign operation outcome:
  - 0 – success
  - -1 – general error
  - -2 – cancelled
  - -3 – rejected
  - other number – signing error code (refer to CoSign Web Agent API Error Codes).
- **errorMessage** – error message or reject reason (refer to CoSign Web Agent API Error Codes). Note that an error message is only included if the **returnCode** is not 0.

For example:

```
https://webapp.org.com/finishURL.aspx?sessionId=12321_3213213&docId=12321&returnCode=0
```

Your web application can now continue and download the signed file from the CoSign Web Agent as described in Downloading a Signed File.

Downloading a Signed File

Upon successful document signing, your web Application can request the CoSign Web Agent to return an XML response that includes the signed document.

Request Format

If the file was signed successfully, your web application can pull the signed file as part of a returned signing response XML. The web application calls the **Sign/DownloadSignedFileG** service with the session ID parameter using an HTTP-GET method. For example:

```
https://cosign-web-app.org.com/Sign/DownloadSignedFileG?sessionId=12321_3213213
```

Response Format

The following table describes the various parameters used by the response protocol. The response is sent from the CoSign Web Agent to your web app.

For an example of such an XML structure, refer to Sample Response.

Group	Name	Type	Description
Result	operationStatus	Int	1 – signed.
Error	returnCode	Int	0 – specifies success. For a list of all possible error codes, refer to CoSign Web Agent API Error Codes.
Session	sessionId	String	The session identifier of the request. .
	docId	String	The ID of the document that was passed to the **Sign/UploadFileToSign** service.
SigDetails (Details of the latest signature)	fieldName	String	The name of the latest field that was signed. To retrieve information about all the fields that were signed, send a verify signatures request as described in Request Format. If a new signature was created ad hoc, the **fieldName** might not be returned.
	x	Int	X coordinate of the signature field.
	y	Int	Y coordinate of the signature field.
	width	Int	Signature field width.
	height	Int	Signature field height.
	pageNumber	Int	The page number on the document.
	dateFormat	String	The format string used to form the date string.
	timeformat	String	The format string used to form the time string.
	graphicalImage	Boolean	Whether the graphical image is displayed.
	signer	Boolean	Whether the signer name is displayed.
	date	Boolean	Whether the date is displayed.
	showTitle	Boolean	Whether the title is displayed.
	showReason	Boolean	Whether the Reason is displayed.
	title	String	The signer title.
	reason	String	The selected sign reason or reject reason.
Document	contentType	String	The document content-type (PDF).
	content	String	The content, in base64 format.

Verifying Signatures in a File

The Verify Signatures operation enables your web application to validate signatures in a document. The document types supported for document verification are PDF, DOCX and XLSX.

Request Format

To initiate the verification operation, an XML request is sent to:

```
https://<host name>/Sign/VerifyServiceXML.
```

The HTTP header of the request must specify the POST method, and it must include a Content-Type parameter with a value "**application/x-www-form-urlencoded**". The actual data of the HTTP-POST command should include the parameter "**inputXML**", and the contents should be an XML structure. The XML structure must contain the signed file to be verified, Base64 encoded. For a full description of the parameters in the XML structure, refer to Request Parameters.

Request Parameters

The request contains the file to verify and its type. For an example of such an XML structure, refer to Sample XML Request.

Group	Name	Type	Description
Document This group is required	content	String	A Base64 encoded file to verify.
	contentType	String	The type of document to verify. Supported types: **PDF**, **Docx**, **Xlsx**.

Response Format

The Response XML will be returned by the CoSign Web Agent to your web app. Either a success or an error response will be sent.

- In case of an error, the returnCode parameter will be -1. In addition, the errorMessage parameter will contain the detailed error message.
- If the operation was successfully completed, an XML file will be returned, containing the validation parameters for each field in the document as well as a general validation code.

For an example of the XML structure sent upon success, refer to Sample Response.

Group	Name	Type	Description	Notes
Status	validationStatus	Int	The validation status of the entire document. The possible values are: 0 – Valid. All signatures in the document are valid. There are no unsigned signature fields or invalid signatures, 1 – Invalid. There is at least one invalid signature in the document. 2 – Error. The signature validation process failed. Signature validity cannot be determined. 3 – Incomplete. At least one unsigned field exists in the document and all other signatures (if exist) are valid. If there is at least one invalid signature, Invalid status (1) will be returned. 4 – Unknown. The status of at least one signature is 'unknown' (see status below). 5 – Empty. The Document does not contain any signature fields.	
	returnCode	Int	Specifies an internal CoSign return code that was returned when trying to verify signatures in a document. Will return only in case of an error. For a description of the CoSign error codes, refer to CoSign Signature Local – Signing/Verifying Error Messages.	
	errorMessage	String	A textual error message. This message will be returned only in case of an error.	
Field One or more occurrences within the XML	fieldname	String	The name of the signature field that was verified.	Multiple instances
	status	String	Validity status of a specific signature field. The possible values are: 0 – valid 1 – invalid 2 – not signed 3 – unknown	
	signingTime	String	Time and Date of the signing event. The GMT offset will be taken from the machine that runs the CoSign Web App application. The format is: dd/MM/yyyy HH:mm:ssZ	
	signFileTime	FILETIME	Date and Time of the signing event in FILETIME format	
	signerName	String	The name of the signer (Common Name).	
	signReason	String	Signing Reason.	

Group	Name	Type	Description	Notes
	certErrorStatus	Int	The certificate's status. The possible values are: 0 – The certificate status was not checked. 1 – The certificate is OK. 2 – The certificate is revoked. 4 – The certificate chain is not complete because one of the certificates in the chain is not trusted. 8 – The revocation status of the certificate or one of the certificates in the certificate chain is unknown.	

XML and Redirection URL Samples

This section provides samples of XML files and Redirection URLs participating in the various actions (requests and responses) sent from your web app to the CoSign Web Agent and received back.

Uploading a File and Initiating Signing – Samples

The following section provide Upload File and Initiate Signing samples.

Sample Protocol Request

The POST request uses urlencoding for the payload body:

```
POST http://foo.bar.com>/Sign/UploadFileToSign HTTP/1.1
Content-Type: application/x-www-form-urlencoded
Host: foo.bar.com
Content-Length: 166173
Expect: 100-continue
Connection: Keep-Alive

inputXML=%3c%3fxml+version%3d%221.0%22+encoding%3d%22utf-8%22 …
```

Note that `%3c` is url encoded “<”, `%3f` is “?”, etc.

Sample XML Request

```
<?xml version="1.0" encoding="utf-8" ?>
<request>
    <SigField>
        <fieldNameToSign>SampleField</fieldNameToSign>
        <enforceFieldToSign>false</enforceFieldToSign>
    </SigField>
<SigProfiles>
        <SigProfile>
            <fieldName>SampleField</fieldName>
            <x>370</x>
            <y>120</y>
            <width>165</width>
            <height>55</height>
            <pageNumber>-1</pageNumber>
            <title>CEO</title>
            <showTitle>true</showTitle>
            <dateFormat>MM/dd/yyyy</dateFormat>
            <timeFormat>hh:mm tt</timeFormat>
            <signer>true</signer>
            <date>true</date>
            <graphicalImage>true</graphicalImage>
            <isNewFieldDefaults>false</isNewFieldDefaults>
        </SigProfile>
    </SigProfiles>
    <SignReasons>
        <signReason>I am the author of the document</signReason>
        <signReason>I Approve the document</signReason>
    </SignReasons>
    <RejectReasons>
        <rejectReason>Not approved due to budgetary constraints</rejectReason>
        <rejectReason>Legal opinion required</rejectReason>
        <rejectReason>Management approval required</rejectReason>
    </RejectReasons>
    <Document>
        <content> <Base64 file> </content>
        <contentType> pdf </contentType>
        <fileID> 123as1d4 </fileID>
        <filename>Getting Started.pdf</filename>
    </Document>
    <Logic>
        <isWorkflowMode>true</isWorkflowMode>
        <allowAdHoc>true</allowAdHoc>
        <enforceReason>false</enforceReason>
        <allowUserReason>true</allowUserReason>
        <verify>false</verify>
    </Logic>
    <Url>
        <finishURL>http://example.com/finish.html</finishURL>
        <redirectIFrame>true</redirectIFrame>
    </Url>
    <Auth>
        <username>usernameExample</username>
        <password>passwordExample</password>
        <keepUserLogin>false</keepUserLogin>
    </Auth>
    <Layout>
        <layoutMask>24</layoutMask>
    </Layout>
</request>
```

Sample XML Response

```
<?xml version="1.0" encoding="utf-8"?>
<response xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.
org/2001/XMLSchema-instance" type="error">
  <Error>
    <returnCode>0</returnCode>
    <errorMessage />
  </Error>
  <Session>
    <sessionId>307725171</sessionId>
    <docId>123as1d4 </docId>
  </Session>
</response>
```

Redirecting a User to CoSign Web Agent – Sample

```
http://cosign-web-app.org.com/Sign/SignCeremony?sessionId=307725171
```

Redirecting User Back to your Web Application – Sample

```
https://webapp.org.com/?sessionId=307725171&docId=123as1d4&returnCode=0
```

Downloading a Signed File – Samples

Sample Request

```
Sign/DownloadSignedFileG?sessionId =12321_3213213
```

Sample Response

```
<?xml version="1.0" encoding="utf-8"?>
<response type="signing">
  <Error>
    <returnCode>0</returnCode>
  </Error>
  <Session>
    <sessionId>swaSes_84093_78193977</sessionId>
    <docId>84093</docId>
  </Session>
  <Result>
    <operationStatus>1</operationStatus>
  </Result>
  <SigDetails>
    <fieldName>SampleField</fieldName>
    <x>367</x>
    <y>125</y>
    <width>159</width>
    <height>61</height>
    <pageNumber>1</pageNumber>
    <dateFormat>dd MMM yyyy</dateFormat>
    <timeformat>hh:mm tt</timeformat>
    <graphicalImage>True</graphicalImage>
    <signer>False</signer>
    <date>False</date>
    <showTitle>True</showTitle>
    <showReason>True</showReason>
    <title>CEO</title>
    <reason>I am the author of the document</reason>
  </SigDetails>
</response>
```

Uploading a File and Verifying Signatures – Samples

Sample Request

```
<?xml version="1.0" encoding="utf-8" ?>
<request>
    <Document>
        <content> <Base64 file> </content>
        <contentType> pdf </contentType>
    </Document>
</request>
```

Sample Response

```
<?xml version="1.0" encoding="utf-8"?>
<response type="verify">
  <Verify>
    <Status>
      <validationStatus>0</validationStatus>
    </Status>
    <Fields>
      <Field>
        <fieldName>SampleField</fieldName>
        <signingTime>10/08/2012 15:45:39</signingTime>
        <signerName>John Miller</signerName>
 <signReason>I approve this document</signReason>
        <signerEmail>johnm@arx.com</signerEmail>
        <status>0</status>
        <certErrorStatus>1</certErrorStatus>
      </Field>
    </Fields>
  </Verify>
</response>
```

Appendix A: CoSign Web Agent API Error Codes

This appendix describes the error codes returned by the CoSign Web Agent API.

Convert to PDF Error Codes

Error Code	Description
601	Failed to convert the document to PDF format.
604	File type is unsupported. Supported file types are: pdf, doc, docx, xsl, and xslx.
605	Document to convert exceeds the maximum number of pages (200 by default).

API Request Error Codes

Error Code	Description
706	Failed to handle a sign request.
707	The request has timed out.
708	Failed to build a response.
709	Signature Profile has an invalid page number.
710	The document does not contain any signatures fields and the user is not allowed to create new fields.
711	Signature Field to Sign does not match any fields in the document (including Signature Profile).
712	API request denied because the Server is not allowed to handle the API request. This is controlled by a configurable web.config parameter (refer to Setting Basic Integration Settings in the CoSign Web App Configuration File).
713	A Signature Profile with the same name already exists in the document.
714	The request does not contain a Signature Field to Sign name.
715	The user credentials given in the XML are incorrect.
716	The mandatory finishURL element is missing.
717	“Point of Sale” mode is not supported for Office files (docx, xlsx).
718	Signature profiles are not supported for Office files (docx, xlsx).
720	Signature profile has an invalid width.

Error Code	Description
721	Signature profile has an invalid height.
722	Signature profile has an invalid field name. Field name is limited to 50 characters and supports only alphanumeric characters, +, -, =, _
723	POS mode does not support suggesting a field name to sign.
724	POS mode does not support enforcing signing of a specific field.
725	POS mode does not support the display of a Reject button.