IBM® Security Access Manager for Enterprise Single Sign-On
Version 8.2

Serial ID SPI Guide

SC14-7626-00

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Note
Before using this information and the product it supports, read the information in "Notices" on page 17.

Edition notice

Note: This edition applies to version 8.2 of IBM Security Access Manager for Enterprise Single Sign-On, (product number 5724–V67) and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

About this publication

The IBM® Security Access Manager for Enterprise Single Sign-On provides sign-on and sign-off automation, authentication management, and user tracking. IBM Security Access Manager for Enterprise Single Sign-On has a Service Provider Interface (SPI) for devices that contain serial numbers, such as RFID. See this guide to know how to integrate any device with serial numbers and use it as a second authentication factor with AccessAgent.

Intended audience

This publication is for Administrators who need to integrate IBM Security Access Manager for Enterprise Single Sign-On with devices that have serial numbers.

What this publication contains

This publication contains the following sections:

- Chapter 1, "About Security Access Manager for Enterprise Single Sign-On Serial ID SPI," on page 1

  Provides an overview of Serial ID SPI.
- Chapter 2, "Serial ID specification," on page 3

  Provides the Device Service Provider configuration details.
- Chapter 3, "API," on page 5

  Specifies a set of functions that the Device Service Provider implements.
- Chapter 4, "Implementing and testing Serial ID DSP," on page 11

  Provides the procedure for implementing and testing Serial ID SPI.
- "Device SPI Headers," on page 13

  Provides sample codes for the device SPI headers.

Publications

This section lists publications in the IBM Security Access Manager for Enterprise Single Sign-On library. The section also describes how to access Tivoli® publications online and how to order Tivoli publications.

IBM Security Access Manager for Enterprise Single Sign-On library

The following documents are available in the IBM Security Access Manager for Enterprise Single Sign-On library:

- *IBM Security Access Manager for Enterprise Single Sign-On Quick Start Guide*, CF38DML

  Read this guide for a quick start on the main installation and configuration tasks to deploy and use IBM Security Access Manager for Enterprise Single Sign-On.
- *IBM Security Access Manager for Enterprise Single Sign-On Planning and Deployment Guide*, SC23995203

  Read this guide before you do any installation or configuration tasks. This guide helps you to plan your deployment and prepare your environment. It provides an overview of the product features and components, the required installation

and configuration, and the different deployment scenarios. It also describes how to achieve high availability and disaster recovery.

- *IBM Security Access Manager for Enterprise Single Sign-On Installation Guide*, GI11930901

  Read this guide for the detailed procedures on installation, upgrade, or uninstallation of IBM Security Access Manager for Enterprise Single Sign-On.

  This guide helps you to install the different product components and their required middleware, and also do the initial configurations required to complete the product deployment. It covers procedures for using virtual appliance, WebSphere® Application Server Base editions, and Network Deployment.

- *IBM Security Access Manager for Enterprise Single Sign-On Configuration Guide*, GC23969201

  Read this guide if you want to configure the IMS Server settings, the AccessAgent user interface, and its behavior.

- *IBM Security Access Manager for Enterprise Single Sign-On Administrator Guide*, SC23995103

  This guide is intended for the Administrators. It covers the different Administrator tasks. This guide provides procedures for creating and assigning policy templates, editing policy values, generating logs and reports, and backing up the IMS Server and its database. Use this guide together with the IBM Security Access Manager for Enterprise Single Sign-On Policies Definition Guide.

- *IBM Security Access Manager for Enterprise Single Sign-On Help Desk Guide*, SC23995303

  This guide is intended for Help desk officers. The guide helps Help desk officers to manage queries and requests from users usually about their authentication factors. Use this guide together with the IBM Security Access Manager for Enterprise Single Sign-On Policies Definition Guide.

- *IBM Security Access Manager for Enterprise Single Sign-On Policies Definition Guide*, SC23969401

  Read this guide for the detailed descriptions of the different user, machine, and system policies that Administrators can configure in AccessAdmin. Use this guide along with the IBM Security Access Manager for Enterprise Single Sign-On Administrator Guide.

- *IBM Security Access Manager for Enterprise Single Sign-On Troubleshooting and Support Guide*, GC23969301

  Read this guide if you have any issues with regards to installation, upgrade, and product usage. This guide covers the known issues and limitations of the product. It helps you determine the symptoms and workaround for the problem. It also provides information about fixes, knowledge bases, and support.

- *IBM Security Access Manager for Enterprise Single Sign-On AccessStudio Guide*, SC23995603

  Read this guide if you want to create or edit profiles. This guide provides procedures for creating and editing standard and advanced AccessProfiles for different application types. It also covers information about managing authentication services and application objects, and information about other functions and features of AccessStudio.

- *IBM Security Access Manager for Enterprise Single Sign-On Provisioning Integration Guide*, SC23995703

  Read this guide for information about the different Java™ and SOAP API for provisioning. It also covers procedures for installing and configuring the Provisioning Agent.

- *IBM Security Access Manager for Enterprise Single Sign-On Web API for Credential Management Guide*, SC14764600

  Read this guide if you want to install and configure the Web API for credential management.
- *IBM Security Access Manager for Enterprise Single Sign-On Lightweight AccessAgent mode on Terminal Server SDK Guide*, SC14765700

  Read this guide for the details on how to develop a virtual channel connector that integrates AccessAgent with Terminal Services applications.
- *IBM Security Access Manager for Enterprise Single Sign-On Serial ID SPI Guide*, SC14762600

  IBM Security Access Manager for Enterprise Single Sign-On has a Service Provider Interface (SPI) for devices that contain serial numbers, such as RFID. See this guide to know how to integrate any device with serial numbers and use it as a second authentication factor with AccessAgent.
- *IBM Security Access Manager for Enterprise Single Sign-On Context Management Integration Guide*, SC23995403

  Read this guide if you want to install and configure the Context Management solution.
- *IBM Security Access Manager for Enterprise Single Sign-On User Guide*, SC23995003

  This guide is intended for the end users. This guide provides instructions for using AccessAgent and Web Workplace.
- *IBM Security Access Manager for Enterprise Single Sign-On Error Message Reference Guide*, GC14762400

  This guide describes all the informational, warning, and error messages associated with IBM Security Access Manager for Enterprise Single Sign-On.

Accessing terminology online

The IBM Terminology Web site consolidates the terminology from IBM product libraries in one convenient location. You can access the Terminology Web site at the following Web address:

http://www.ibm.com/software/globalization/terminology

Accessing publications online

IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli Information Center Web site at http://www.ibm.com/tivoli/documentation.

Note: If you print PDF documents on other than letter-sized paper, set the option in the **File** > **Print** window that allows Adobe Reader to print letter-sized pages on your local paper.

Ordering publications

You can order many Tivoli publications online at http://www.elink.ibmlink.ibm.com/publications/servlet/pbi.wss.

You can also order by telephone by calling one of these numbers:

- In the United States: 800-879-2755
- In Canada: 800-426-4968

In other countries, contact your software account representative to order Tivoli publications. To locate the telephone number of your local representative, perform the following steps:

1. Go to http://www.elink.ibmlink.ibm.com/publications/servlet/pbi.wss.
2. Select your country from the list and click **Go**.
3. Click **About this site** in the main panel to see an information page that includes the telephone number of your local representative.

Accessibility

Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. With this product, you can use assistive technologies to hear and navigate the interface. You can also use the keyboard instead of the mouse to operate all features of the graphical user interface.

For additional information, see "Accessibility features" in the *IBM Security Access Manager for Enterprise Single Sign-On Planning and Deployment Guide*.

Tivoli technical training

For Tivoli technical training information, see the following IBM Tivoli Education Web site at http://www.ibm.com/software/tivoli/education.

Tivoli user groups

Tivoli user groups are independent, user-run membership organizations that provide Tivoli users with information to assist them in the implementation of Tivoli Software solutions. Through these groups, members can share information and learn from the knowledge and experience of other Tivoli users. Tivoli user groups include the following members and groups:

- 23,000+ members
- 144+ groups

Access the link for the Tivoli Users Group at www.tivoli-ug.org.

Support information

If you have a problem with your IBM software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:

Online
Go to the IBM Software Support site at http://www.ibm.com/software/support/probsub.html and follow the instructions.

IBM Support Assistant
The IBM Support Assistant is a free local software serviceability workbench that helps you resolve questions and problems with IBM software products. The IBM Support Assistant provides quick access to support-related information and serviceability tools for problem determination. To install the IBM Support Assistant software, go to http://www.ibm.com/software/support/isa.

Troubleshooting Guide
For more information about resolving problems, see the *IBM Security Access Manager for Enterprise Single Sign-On Troubleshooting and Support Guide*.

Conventions used in this publication

This publication uses several conventions for special terms and actions, operating system-dependent commands and paths, and margin graphics.

Typeface conventions

This publication uses the following typeface conventions:

Bold

- Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
- Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets) and labels (such as **Tip:** and **Operating system considerations**:)
- Keywords and parameters in text

Italic

- Citations (examples: titles of publications, diskettes, and CDs)
- Words defined in text (example: a nonswitched line is called a *point-to-point line*)
- Emphasis of words and letters (words as words example: "Use the word *that* to introduce a restrictive clause."; letters as letters example: "The LUN address must start with the letter *L*.")
- New terms in text (except in a definition list): a *view* is a frame in a workspace that contains data.
- Variables and values you must provide: ... where *myname* represents....

Monospace

- Examples and code examples
- File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
- Message text and prompts addressed to the user
- Text that the user must type
- Values for arguments or command options

Operating system-dependent variables and paths

This publication uses the UNIX convention for specifying environment variables and for directory notation.

When using the Windows command line, replace **$***variable* with **%** *variable***%** for environment variables and replace each forward slash (**/**) with a backslash (\) in directory paths. The names of environment variables are not always the same in the Windows and UNIX environments. For example, %TEMP% in Windows environments is equivalent to $TMPDIR in UNIX environments.

Note: You can use the UNIX conventions if you are using the bash shell on a Windows system.

Chapter 1. About Security Access Manager for Enterprise Single Sign-On Serial ID SPI

The Serial ID Service Provider Interface (SPI) provides a generic device management framework where AccessAgent can support any new device that contain serial numbers and use it as a second authentication factor.

Examples of these devices are:

- RFID cards
- Smart cards
- Thumb drives
- Transport cards

Serial ID Service Provider Interface (SPI) defines interfaces that:

- Detect the presence of readers
- Initialize the reader
- Set or reset reader configuration
- Read the card serial number from the card presented

To integrate a designated RFID card, reader, or any device that has a serial ID, and use it as a second factor, the vendor must:

- Develop a Windows Dynamic-link library (DLL) that implements those defined interfaces.
- Create registry values that follow the Security Access Manager for Enterprise Single Sign-On Serial ID SPI format.

AccessAgent uses these registry values as parameters passed to the interface. The registry values provide information about the SPI DLL name, the vendor-defined name of supported devices, reader configuration, and so on.

Vendors are provided with an RFID DSP tool to develop and test the Serial ID Device Service Provider for AccessAgent.

Chapter 2. Serial ID specification

The Device Service Provider configuration includes how to load the Device Service Provider, what type of devices it supports, and what interfaces these devices expose.

The Device Service Provider configuration details are stored in the `HKLM\SOFTWARE\IBM\ISAM ESSO\SOCIAccess\DSPList` registry hive.

This registry hive also contains configuration parameters that AccessAgent reads and passes on to the Device Service Provider. The implementer of the Device Service Provider provides the configuration information.

See the following registry configuration structure:

```
HKLM\SOFTWARE\IBM\ISAM ESSO\SOCIAccess\DSPList
| - <dsp name>
   | - Filename:REG_SZ: [Name of the DSP DLL]
   | - Enabled:DWORD:[0|1]
   | - Devices
      | - <device name>
           | - <DeviceTypeId:REG_SZ:[Device Type Identifier]
           | - Interfaces
                | - <interfaces_id>:REG_SZ:[GUID]
           | - Parameters
                | - <param_name>:REG_SZ:<param_value>
           | - Trigger
                | - WinInterfaceClass:REG_SZ:[GUID]
```

The following are the different identifiers in the registry configuration structure. The identifiers enclosed in < and > are variable names. These variables can have multiple instances depending on the registry structure. Other identifiers are registry constants.

Name	Description
Dsp_name	Vendor-defined name of the Device Service Provider.
Filename	Name of the Device Service Provider DLL. The Device Service Provider DLL specified in the registry must be placed in the AccessAgent installation folder. The other DLL files that it depends on must be stored outside of the AccessAgent installation folder so that it does not affect the AccessAgent upgrade.
Enabled	Registry value that controls whether the Device Service Provider is used by AccessAgent. This switch can be used for troubleshooting.
Devices	Registry node that contains all the devices supported by the Device Service Provider.
device_name	Vendor-defined friendly name of a supported device.
DeviceTypeId	Vendor-defined identifier representing a class of devices.
Interfaces	Registry node that contains the list of interfaces supported by the device.
Interface_id	Identifier (GUID) of a supported interface as defined in the Device SPI.

Name	Description
Parameters	Registry node that contains the list of name-value pairs that can be used to configure the device.
param_name	Name of a configuration parameter.
param_value	String value of the parameters.
Trigger	Registry node that contains the device trigger.
WinInterfaceClass	Device Trigger (GUID) of supported device.

Chapter 3. API

The IBM Security Access Manager for Enterprise Single Sign-On Serial ID Service Provider Interface API specifies a set of functions that the Device Service Provider implements.

See the following topics for a list of Serial ID SPI APIs:

- "Constants"
- "Error Codes"
- "Generic SPI functions"

Constants

Name	Value Description	Header
DEVICE_SPI_VERSION_MAJOR	1	Defines the major version of the current DeviceSPI
DEVICE_SPI_VERSION_MINOR	1	Defines the minor version of the current DeviceSPI
RFID_READER_ASYNC_INTERFACE_ID	{216DE8B9-FD09-44F3-A39D-B8A6F7A078D8}	Identifier for the event-based Serial ID SPI

Error Codes

Name	Description
E_DEV_SUCCESS	The operation completed successfully.
E_DEV_FILE_NOT_FOUND	File cannot be found.
E_DEV_DEVICE_ERROR	There is an error with device.
E_DEV_DEVICE_REMOVED	The device is no longer reachable.
E_DEV_INSUFFICIENT_BUFFER	The memory passed to interface is too small.
E_DEV_INVALID_ARGUMENT	Arguments are not correct.
E_DEV_NOT_INITIALIZED	Device is not initialized.
E_DEV_FAIL	Generic error.

Generic SPI functions

Table 1. GetDeviceSpiVersion

Definition	`E_DEV_Error GetDeviceSpiVersion(OUT int* puMajorVersion, OUT int* puMinorVersion);`
Description	Returns the version of the Device SPI implemented by the provider.
Parameters	`puMajorVersion` - Pointer to the location that receives the major version of the Device Service Provider. `puMinorVersion` - Pointer to the location that receives the minor version of the Device Service Provider.

Table 1. GetDeviceSpiVersion (continued)

Return Values	• `E_DEV_SUCCESS` if successful. • `E_DEV_INVALID_ARGUMENT` if any of the arguments is `NULL`.

Table 2. Open

Definition	`E_DEV_Error Open();`
Description	Initializes the Serial ID Device Service Provider. All other function returns `E_DEV_NOT_INITIALIZED`, if this function has not been successfully invoked first. Invoking this function again on an already initialized device does not have any effect.
Parameters	None.
Return Values	• `E_DEV_SUCCESS` if successful. • `E_DEV_FILE_NOT_FOUND` if one of the dependencies of the Device Service Provider is not installed or available.

Table 3. Close

Definition	`E_DEV_Error Close();`
Description	Uninitializes the interface DLL and performs clean up.
Parameters	None.
Return Values	• `E_DEV_SUCCESS` if successful.

Table 4. RefreshDeviceStatus

Definition	`E_DEV_Error RefreshDeviceStatus(IN const char szDeviceTypeId[], OUT unsigned long* pulNumDevices);`
Description	Scans the status connected devices of the given type and return the number of devices found. The Device Framework obtains the device name from the configuration information associated with the Device Service Provider. When the Device Framework receives a generic device arrival or removal notification from the Operating System, it calls this function to let the Device Service Provider refresh the status of its devices. This function might be called while a device has been started with `StartDevice()`. Hence, it is important that `RefreshDeviceStatus()` does not affect the operation of an existing device.
Parameters	`szDeviceTypeId` - String identifier of one of the devices supported by the Device Service Provider. `pulNumDevices` - Number of devices currently attached to the system.
Return Values	• `E_DEV_SUCCESS` if successful. • `E_DEV_INVALID_ARGUMENT` if either the `szDeviceTypeId` or `pulNumDevices` is `NULL` or the `szDeviceTypeId` is not supported by the Device Service Provider.

Table 5. GetDeviceID

Definition	`E_DEV_Error GetDeviceID(IN const char szDeviceTypeId[],`
	`IN int iDeviceIndex,`
	`OUT char* szId,`
	`IN OUT unsigned long* pulIdeLen);`

Description	Returns the identifier of a device instance. The device instance is specified with a device type identifier and an index based on the number of devices return in the previous RefreshDeviceStatus call. As long as a device remains connected to the system, the Device Service Provider must return the same identifier every time this function is invoked. The device instance ID returned by a Device Service Provider must be unique across all the device type that it supports.
Parameters	`szDeviceTypeId` - `NULL` terminated string that identifies the device type. `iDeviceIndex` - Index of the device in the range 0..N-1, where N is the number of connected devices as returned in the previous `RefreshDeviceStatus()` call. `szId` - `NULL` terminated device instance identifier string. If this parameter is `NULL`, the Device Service Provider returns only the required size of the buffer in `pulIdLen` parameter. `pulIdLen` - Length of the `szId` buffer provided as the input. The Device Service Provider sets the number of characters (including the `NULL` character) of identifier as the output.
Return Values	• `E_DEV_SUCCESS` if successful. • `E_DEV_INVALID_ARGUMENT` if `pulIdLen` is `NULL` or if `iDeviceIndex` contains a value that is not valid. • `E_DEV_INSUFFICIENT_BUFFER` if either `szId` is `NOT NULL` and the size of the `szId` buffer as provided in `pulIdLen` is insufficient to hold the ID.

Table 6. SetDeviceParam

Definition	`E_DEV_Error SetDeviceParam(IN const char szDeviceId[],`
	`IN const char szKey[],`
	`IN const char szValue[]);`

Description	Sets a configurable parameter for the device. The Device Framework obtains this parameter from the configuration information associated with the Device Service Provider.
Parameters	`szDeviceId` - Identifier of the device obtained through a `GetDeviceID` function. `szKey` - Vendor-defined configuration key. `szValue` - Configuration value.
Return Values	• `E_DEV_SUCCESS` if successful. • `E_DEV_INVALID_ARGUMENT` if any of the input parameters are `NULL` or hold values that are not valid.

Table 7. StartDevice

Definition	`E_DEV_Error StartDevice(IN const char szDeviceId[]);`

Table 7. StartDevice (continued)

Description	Initializes the device. Calling `StartDevice()` on the device that has already been started has no effect.
Parameters	`szDeviceId` - Identifier of the device obtained through a `GetDeviceID` function.
Return Values	• `E_DEV_SUCCESS` if successful. • `E_DEV_INVALID_ARGUMENT` if any of the input parameters are `NULL` or hold values that are not valid. • `E_DEV_DEVICE_REMOVED` if the device identified by `szDeviceId` is not currently attached to host. • `E_DEV_DEVICE_ERROR` if a generic device error occurs.

Table 8. StopDevice

Definition	`E_DEV_Error StopDevice(IN const char szDeviceId[]);`
Description	Uninitializes the device. The Device Framework might call this function even after the device identified by `szDeviceId` is removed from the host.
Parameters	`szDeviceId` - Identifier of the device obtained through a `GetDeviceID` function.
Return Values	• `E_DEV_SUCCESS` if successful. • `E_DEV_INVALID_ARGUMENT` if any of the input parameters are `NULL` or hold values that are not valid.

Table 9. PF_ID_NOTIFY

Definition	`typedef E_DEV_Error (*PF_ID_NOTIFY)(IN void *pVoid,`
	`IN const char szDeviceId[],`
	`IN const unsigned char* pucId,`
	`IN unsigned long ulIdLen);`

Description	Callback function that allows a Device Service Provider to notify AccessAgent that a serial ID is read.
Parameters	`pVoid [in]` - Callback parameter registered with the DSP. `szDeviceId [in]` - Identifier of the reader that received the UID data. `pucId [in]` - Buffer containing the UID of the card. `ulIdLen [in]` - Length of the UID buffer in bytes.
Return Values	• `E_DEV_SUCCESSFUL` if successful.

Table 10. RegisterReaderCallback

Definition	`E_DEV_Error RegisterReaderCallback(IN PF_ID_NOTIFY pfNotify,` `IN void* pVoid);`
Description	Registers the reader callback function with the Device Service Provider. This function can be called with `NULL` argument to clear the previously registered callback.
Parameters	`pfNotify` - Reader callback function. `pVoid` - Callback parameter. This value is passed to the callback function when it is invoked by the Device Service Provider.
Return Values	• `E_DEV_SUCCESS` if successful.

Table 11. PF_Log

Definition	`typedef void (*PF_Log)(IN void *pCallbackParam,`
	`E_DEV_LogLevel level,`
	`IN const char sFunctionName[],`
	`IN const char szDesc[]);`

Description	Callback function that allows a Device Service Provider to write log statement. This function is implemented by the application (through the AccessAgent Device Framework) and invoked by the Device Service Provider. The following log levels are defined: • `DEV_LOG_SEVERE - 1` • `DEV_LOG_BASEINFO - 2` • `DEV_LOG_MOREINFO - 3` • `DEV_LOG_DEBUG - 4`
Parameters	`pCallbackParam` - Callback parameter registered with the Device Service Provider. `level` - Log Level. `szFunctionName` - Function from with the log is being written. `szDesc` - Descriptive text.
Return Values	

Table 12. RegisterLogCallback

Definition	`E_DEV_Error RegisterLogCallback(IN PF_Log pfLog,` `IN void* pVoid);`
Description	Registers a logging callback function with the Device Service Provider. Through this function, the Device Framework allows a Device Service Provider to write an error or debug information in AccessAgent log files. This function can be called with NULL argument to clear the previously registered callback.
Parameters	`pfLog` - Logging callback function. `pVoid` - Callback parameter. This value is passed to the callback function when it is invoked by the Device Service Provider.
Return Values	• `E_DEV_SUCCESS` if successful.

Chapter 4. Implementing and testing Serial ID DSP

Know how you can implement and test if the Serial ID DSP is working properly.

See the following topics for more information:

- "Implementing a Serial ID DSP"
- "Testing Serial ID DSP"
- "Verifying with AccessAgent"

Implementing a Serial ID DSP

Follow this procedure to implement the serial ID DSP.

Procedure

1. Implement each of the SPI functions.
   See "Generic SPI functions" on page 5 for details.
2. Use the RFID DSP tool to test the DSP.
   See "Testing Serial ID DSP" for details.
3. Deploy the RFID DSP with AccessAgent.

Testing Serial ID DSP

Vendors can use the RFID DSP tool to verify or test the implementation of Serial ID SPI.

Procedure

1. Create the registry configuration for the Device Service Provider.
   See Chapter 2, "Serial ID specification," on page 3 for details.
2. Copy the Device Service Provider DLL to the same folder where the tool is located.
3. Run the tool and select a Device Service Provider from the list.
   The tool automatically loads the Device Service Provider and detects the attached devices recognized by the selected Device Service Provider. The attached device type IDs and device IDs are displayed.
4. Present the authentication factor to the reader, if applicable.
   The GUI displays the device serial number and log statements of the Device Service Provider and the GUI tool.

Verifying with AccessAgent

Verify with AccessAgent if the Serial ID SPI is working properly.

Procedure

1. Copy the Serial ID Device Service Provider DLL to `<AccessAgent installation folder>/Config`.
2. Edit **DeploymentOptions.reg** to include the IBM Security Access Manager for Enterprise Single Sign-On Serial ID Device Service Provider registry configuration. See *IBM Security Access Manager for Enterprise Single Sign-On Configuration Guide*.

3. Install AccessAgent. See *IBM Security Access Manager for Enterprise Single Sign-On Installation Guide*.
4. Configure AccessAgent to use RFID as an authentication factor. See *IBM Security Access Manager for Enterprise Single Sign-On Configuration Guide*.
5. Use the second authentication factors you have added and see if it works with the typical AccessAgent workflows.

Appendix. Device SPI Headers

```
/*
* ============================================================================
* (c) Copyright IBM Corp. 2008, 2012
* ============================================================================
*/

///**
//* @file      DeviceSPI.h
//* @brief     Defines Device SPI
//* @version   1.2
//*/

///**
//* Change History
//* [20081008]: From v1.0 to v1.1
//* 1. Removed GetRfidSpiVersion() and added GetDeviceSpiVersion(). Replaced the
corresponding version constants.
//* 2. Added the interface ID string for asynchronous RFID reader interface.
//* 3. Added const qualifier for parameters wherever applicable
//* 4. Added a void* parameter to the RFID reader callback function.
//* 5. Added utility functions for writing log statements.
//*
//* [20081024]: From v1.1 to v1.2
//* 1. Added pre-processor instructions to allow multiple includes of this file
//* 2. Changes to the E_DEV_LogLevel enum.
//* 3. Changes to GetDeviceID() function: Added szDeviceTypeId parameter.
//*/
#ifndef _DEVICESPI_H_
#define _DEVICESPI_H_

#ifndef IN
#define IN
#endif
#ifndef OUT
#define OUT
#endif

//Constants
#define DEVICE_SPI_VERSION_MAJOR 1
#define DEVICE_SPI_VERSION_MINOR 0

#ifndef DEVICE_SPI
#ifdef DEVICE_SPI_IMPORTS
#define DEVICE_SPI __declspec(dllimport)
#else
#define DEVICE_SPI __declspec(dllexport)
#endif
#endif

#ifdef __cplusplus
extern "C" {
#endif

//Error Codes
typedef enum
{
 //SPI Error Codes------
 //More Error codes to be defined in the future
 //...
 E_DEV_FILE_NOT_FOUND = -7,
 E_DEV_DEVICE_ERROR = -6,
 E_DEV_DEVICE_REMOVED = -5,
```

```
 E_DEV_INSUFFICIENT_BUFFER = -4,
 E_DEV_INVALID_ARGUMENT = -3,
 E_DEV_NOT_INITIALIZED = -2,
 E_DEV_FAIL = -1,
 //---------------------

 //SPI Success codes----
 E_DEV_SUCCESS = 0,
 //More success codes to be defined in the future
 //...
 //---------------------
}E_DEV_Error;

//Utility functions: START ------------------------------------------------------
typedef enum
{
 DEVSPI_LOG_SEVERE = 1,
 DEVSPI_LOG_BASEINFO,
 DEVSPI_LOG_MOREINFO,
 DEVSPI_LOG_DEBUG
}E_DEV_LogLevel;

/**
 * \brief Callback function that allows a DSP to write log statements.
    This function is actually implemented by the application and invoked
by the DSP.
 * \param pCallbackParam [in] Callback parameter registered with the DSP.
 * \param level [in] Log level
 * \param szFunctionName [in] NULL-terminated function name
 * \param szDesc [in] NULL-terminated descriptive text
 */
typedef void (*PF_Log)(IN void* pCallbackParam, E_DEV_LogLevel level,
IN const char szFunctionName[], IN const char szDesc[]);


/**
 * \brief Register a logging callback function with the DSP.
   Through this function, the Device Framework allows a DSP
   to write error or debug information in AccessAgent log files.
   This function can be called with NULL argument to clear
   the previously registered callback.
 * \param pfLogCallback [in] Pointer to logging function
 * \param pVoid [in] Callback parameter.
 * \return E_DEV_SUCCESS if successful
 */
DEVICE_SPI E_DEV_Error RegisterLogCallback(IN PF_Log pfLogCallback,
IN void* pVoid);
//Utility functions: END --------------------------------------------------------

//Device Services Provider (DSP) Interface: START-------------------------------

/**
 * \brief Returns the version of the Device SPI implemented by the DSP
 * \param puMajorVersion [out] The current major version is 1
 * \param puMinorVersion [out] The current minor version is 0
 * \return E_DEV_SUCCESSFUL if successful.
 *   E_DEV_INVALID_ARGUMENT if any of the arguments is NULL.
 */
DEVICE_SPI E_DEV_Error GetDeviceSpiVersion(OUT int* puMajorVersion, OUT
int* puMinorVersion);

/**
 * \brief Initializes the interface DLL. All other function may return
E_DEV_NOT_INITIALIZED, if this function
    hasn't been successfully invoked.
 * \return E_DEV_SUCCESS if successful
 */
```

```
DEVICE_SPI E_DEV_Error Open();

/**
 * \brief Uninitializes the interface DLL and performs cleans up.
 * \return E_DEV_SUCCESS if successful
 */
DEVICE_SPI E_DEV_Error Close();

/**
 * \brief Scans the status of connected devices of the given type and
returns the number of devices found.
 * \param szDeviceTypeId [in] NULL terminated string that identifies the
type of the device
        e.g. the reader name "B-Net 91 07"
 * \param ulNumDevices [out] Number of devices currently attached to the system
 * \return E_DEV_SUCCESS if successful
 * \remark A DSP may support devices of multiple types.
 */
DEVICE_SPI E_DEV_Error RefreshDeviceStatus(IN const char szDeviceTypeId[],
OUT unsigned long* pulNumDevices);

/**
 * \brief Returns the device instance identifier.
 * \param szDeviceTypeId [in] NULL terminated string that identifies the type
of the device.
 * \param iDeviceIndex [in] Index of the device in the range 0..N-1 where
N is the number of connected devices
       as returned in the previous GetNumberOfConnectedDevices() call.
 * \param szId [out] NULL terminated device identifier string. If this parameter
is NULL,
      the DSP only returns the required size of the buffer in pulIdLen parameter.
 * \param pulIdLen [inout] Length of the szId buffer provided as the input.
       The DSP sets the number of characters (including the NULL character)
of identifier as the output.
 * \return E_DEV_SUCCESS if successful
 * \remark As long as a device remains connected to the system, a DSP must
return the same identifier every time this function is invoked.
 */
DEVICE_SPI E_DEV_Error GetDeviceID(IN const char szDeviceTypeId[], IN int
iDeviceIndex, OUT char* szId, IN OUT unsigned long* pulIdLen);
//Device Services Provider Interface: END---------------------------------


//Generic Device Interface: START----------------------------------------
/**
 * \brief Sets a configurable parameter for the device
 * \param szDeviceId [in] Identifier of the device
 * \param szKey [in] Configuration key
 * \param szValue [in] Configuration value
 * \return E_DEV_SUCCESS if successful
 * \remark The device parameters should be set before calling StartDevice().
   The configured parameters will take effect when StartDevice() is called next.
 */
DEVICE_SPI E_DEV_Error SetDeviceParam(IN const char szDeviceId[], IN const
char szKey[], IN const char szValue[]);

/**
 * \brief Initializes a device
 * \param szDeviceId [in] Device Identifier
 * \return E_DEV_SUCCESS if successful
 */
DEVICE_SPI E_DEV_Error StartDevice(IN const char szDeviceId[]);

/**
 * \brief Uninitializes the device and performs clean up.
 * \param szDeviceId [in] Device Identifier
 * \return E_DEV_SUCCESS if successful
```

```
 * \remark A client may call this function even after the device identified
by szDeviceId is removed from the host.
 */
DEVICE_SPI E_DEV_Error StopDevice(IN const char szDeviceId[]);

//Generic Device Interface: END-------------------------------------------

//RFID Reader interface: START--------------------------------------------

//GUID representing the current asynchronous RFID reader interface
#define RFID_READER_ASYNC_INTERFACE_ID "{216DE8B9-FD09-44f3-A39D-B8A6F7A078D8}"

/**
 * \brief Notifies the client of the card UID read by the RFID Reader
 * \param pVoid [in] Callback parameter registered with the DSP.
 * \param szDeviceId [in] Identifier of the reader that received the UID data
 * \param pucId [in] Buffer containing the UID of the card
 * \param ulIdLen [in] Length of the UID buffer in bytes
 * \return E_DEV_SUCCESSFUL if succesful
 * \remark The application won't hold on to the ID buffer after callback
function
 *  returns. As such, a DSP may free the buffer pointed to by pucId after
the function returns.
 */
typedef E_DEV_Error (*PF_ID_NOTIFY)(IN void* pVoid, IN const char szDeviceId[],
IN const unsigned char* pucId, IN unsigned long ulIdLen);

/**
 * \brief Registers a identifier callback function with the DSP.
 * \param fNotify [in] Callback function
 * \param pVoid [in] Callback parameter. This value is passed to the callback
function when it is invoked by the DSP.
 * \return E_DEV_SUCCESS if successful
 */
DEVICE_SPI E_DEV_Error RegisterReaderCallback(IN PF_ID_NOTIFY fNotify,
IN void* pVoid);

//RFID Reader interface: END-----------------------------------------------


#ifdef __cplusplus
}
#endif

#endif //#ifndef _DEVICESPI_H_
```

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Glossary

AccessAdmin. A web-based management console that Administrators and Helpdesk officers use to administer the IMS Server and to manage users and policies.

AccessAgent plug-in. A piece of script, written in VBscript or Javascript, that is embedded within an AccessProfile to perform custom checking of conditions or to execute custom actions. It is used for extending the capability of an AccessProfile beyond the built-in triggers and actions.

AccessAgent. The client software that manages the identity of the user, authenticates the user, and automates single sign-on and sign-off.

AccessAssistant. The web-based interface that helps users to reset their passwords and retrieve their application credentials.

AccessProfile widget / widget. An independent AccessProfile that consists of pinnable states, which can be used to build another AccessProfile.

AccessProfiles. AccessAgent uses these XML specifications to identify application screens that it can perform single sign-on and automation.

AccessStudio. An application used by Administrators for creating and maintaining AccessProfiles.

Account data bag. A data structure that holds user credentials in memory while single sign-on is performed on an application.

Account data item template. A template that defines the properties of an account data item.

Account data item. The user credentials required for logon.

Account data template. A template that defines the format of account data to be stored for credentials captured by using a specific AccessProfile.

Account data. The logon information required to verify an authentication service. It can be the user name, password, and the authentication service which the logon information is stored.

Action. In profiling, an act that can be performed in response to a trigger. For example, automatic filling of user name and password details as soon as a sign-on window displays.

Active Directory (AD). A hierarchical directory service that enables centralized, secure management of an entire network, which is a central component of the Microsoft Windows platform.

Active Directory credentials. The Active Directory user name and password.

Active Directory password synchronization. An IBM Security Access Manager for Enterprise Single Sign-On feature that synchronizes the ISAM ESSO password with the Active Directory password.

Active RFID (ARFID). ARFID is both a second authentication factor and a presence detector. It can detect the presence of a user and AccessAgent can be configured to perform specific actions. In previous releases, it is called Active Proximity Badge.

ActiveCode. Short-lived authentication codes that are generated and verified by IBM Security Access Manager for Enterprise Single Sign-On. There are two types of ActiveCodes: Mobile ActiveCodes and Predictive ActiveCodes.

Mobile ActiveCodes are generated by IBM Security Access Manager for Enterprise Single Sign-On and dispatched to the mobile phone or email account of the user. Predictive ActiveCodes, or One Time Passwords, are generated from OTP tokens when a user presses its button.

Combined with alternative channels or devices, ActiveCodes provide effective second-factor authentication.

Administrator. A person responsible for administrative tasks such as access authorization and content management. Administrators can also grant levels of authority to users.

Application policies. A collection of policies and attributes governing access to applications.

Application programming interface (API). An interface that allows an application program written in a high-level language to use specific data or functions of the operating system or another program.

Application. One or more computer programs or software components that provide a function in direct support of a specific business process or processes. In AccessStudio, it is the system that provides the user interface for reading or entering the authentication credentials.

Audit. A process that logs the user, Administrator, and Helpdesk activities.

Authentication factor. The different devices, biometrics, or secrets required as credentials for validating digital identities. Examples of authentication

factors are passwords, smart card, RFID, biometrics, and one-time password tokens.

Authentication service. In IBM Security Access Manager for Enterprise Single Sign-On, a service that verifies the validity of an account against their own user store or against a corporate directory. Identifies the authentication service associated with a screen. Account data saved under a particular authentication service is retrieved and auto-filled for the logon screen that is defined. Account data captured from the logon screen defined is saved under this authentication service.

Authorization code. An alphanumeric code generated for administrative functions, such as password resets or two-factor authentication bypass with AccessAgent, AccessAssistant, and Web Workplace.

Auto-capture. A process that allows a system to collect and reuse user credentials for different applications. These credentials are captured when the user enters information for the first time, and then stored and secured for future use.

Automatic sign-on. A feature where users can log on to the sign-on automation system and the system logs on the user to all other applications.

Base distinguished name. A name that indicates the starting point for searches in the directory server.

Bidirectional language. A language that uses a script, such as Arabic and Hebrew, whose general flow of text proceeds horizontally from right to left, but numbers, English, and other left-to-right language text are written from left to right.

Bind distinguished name. A name that specifies the credentials for the application server to use when connecting to a directory service. The distinguished name uniquely identifies an entry in a directory. See also *Distinguished name*.

Biometrics. The identification of a user based on a physical characteristic of the user, such as a fingerprint, iris, face, voice, or handwriting.

Card Serial Number (CSN). A unique data item that identifies a hybrid smart card. It has no relation to the certificates installed in the smart card

Cell. In WebSphere Application Server, a cell is a virtual unit that consists of a deployment manager and one or more nodes.

Certificate authority (CA). A trusted organization or company that issues the digital certificates. The certificate authority typically verifies the identity of the individuals who are granted the unique certificate.

IMS Server Certificate. Used in IBM Security Access Manager for Enterprise Single Sign-On. The IMS Server Certificate allows clients to identify and authenticate an IMS Server.

Client AccessAgent. AccessAgent installed and running on the client machine.

Client workstation, client machine, client computers. Computers where AccessAgent installed.

Clinical Context Object Workgroup (CCOW). A vendor independent standard, for the interchange of information between clinical applications in the healthcare industry.

Clustering. In WebSphere Application Server, clustering is the ability to group application servers.

Clusters. A group of application servers that collaborate for the purposes of workload balancing and failover.

Command line interface. A computer interface in which the input command is a string of text characters.

Credentials. Information acquired during authentication that describes a user, group associations, or other security-related identity attributes, and that is used to perform services such as authorization, auditing, or delegation. For example, a user ID and password are credentials that allow access to network and system resources.

Cryptographic application programming interface (CAPI). An application programming interface that provides services to enable developers to secure applications using cryptography. It is a set of dynamically-linked libraries that provides an abstraction layer which isolates programmers from the code used to encrypt the data.

Cryptographic Service Provider (CSP). A feature of the i5/OS® operating system that provides APIs. The CCA Cryptographic Service Provider enables a user to run functions on the 4758 Coprocessor.

Data source. The means by which an application accesses data from a database.

Database (DB) server. A software program that uses a database manager to provide database services to software programs or computers.

DB2®. A family of IBM licensed programs for relational database management.

Deployment manager profiles. A WebSphere Application Server runtime environment that manages operations for a logical group, or cell, of other servers.

Deployment manager. A server that manages and configures operations for a logical group or cell of other servers.

Deprovision. To remove a service or component. For example, to deprovision an account means to delete an account from a resource.

Desktop application. Application that runs in a desktop.

Desktop Manager. Manages concurrent user desktops on a single workstation

Direct auth-info. In profiling, direct auth-info is a direct reference to an existing authentication service.

Directory service. A directory of names, profile information, and computer addresses of every user and resource on the network. It manages user accounts and network permissions. When a user name is sent, it returns the attributes of that individual, which might include a telephone number, or an email address. Directory services use highly specialized databases that are typically hierarchical in design and provide fast lookups.

Directory. A file that contains the names and controlling information for objects or other directories.

Disaster recovery site. A secondary location for the production environment in case of a disaster.

Disaster recovery. The process of restoring a database, system, policies after a partial or complete site failure that was caused by a catastrophic event such as an earthquake or fire. Typically, disaster recovery requires a full backup at another location.

Distinguished name. The name that uniquely identifies an entry in a directory. A distinguished name is made up of attribute:value pairs, separated by commas. For example, CN=person name and C=country or region.

Distributed IMS Server. The IMS Servers are deployed in multiple geographical locations.

Domain name server (DNS). A server program that supplies name-to-address conversion by mapping domain names to IP addresses.

Dynamic link library (DLL). A file containing executable code and data bound to a program at load time or run time, rather than during linking. The code and data in a DLL can be shared by several applications simultaneously.

Enterprise directory. A directory of user accounts that define IBM Security Access Manager for Enterprise Single Sign-On users. It validates user credentials during sign-up and logon, if the password is synchronized with the enterprise directory password. An example of an enterprise directory is Active Directory.

Enterprise Single Sign-On (ESSO). A mechanism that allows users to log on to all applications deployed in the enterprise by entering a user ID and other credentials, such as a password.

Enterprise user name. The user name of a user account in the enterprise directory.

ESSO audit logs. A log file that contains a record of system events and responses. ESSO audit logs are stored in the IMS Database.

ESSO Credential Provider. Previously known as the Encentuate Credential Provider (EnCredentialProvider), this is the IBM Security Access Manager for Enterprise Single Sign-On GINA for Windows Vista and Windows 7.

ESSO credentials. The ISAM ESSO user name and password.

ESSO GINA. Previously known as the Encentuate GINA (EnGINA). IBM Security Access Manager for Enterprise Single Sign-On GINA provides a user interface that is integrated with authentication factors and provide password resets and second factor bypass options.

ESSO Network Provider. Previously known as the Encentuate Network Provider (EnNetworkProvider). An AccessAgent module that captures the Active Directory server credentials and uses these credentials to automatically log on the users to their Wallet.

ESSO password. The password that secures access to the user Wallet.

Event code. A code that represents a specific event that is tracked and logged into the audit log tables.

Failover. An automatic operation that switches to a redundant or standby system in the event of a software, hardware, or network interruption.

Fast user switching. A feature that allows users to switch between user accounts on a single workstation without quitting and logging out of applications.

Federal Information Processing Standard (FIPS). A standard produced by the National Institute of Standards and Technology when national and international standards are nonexistent or inadequate to satisfy the U.S. government requirements.

Fix pack. A cumulative collection of fixes that is made available between scheduled refresh packs, manufacturing refreshes, or releases. It is intended to allow customers to move to a specific maintenance level.

Fully qualified domain name (FQDN). In Internet communications, the name of a host system that

includes all of the subnames of the domain name. An example of a fully qualified domain name is rchland.vnet.ibm.com.

Graphical Identification and Authentication (GINA). A dynamic link library that provides a user interface that is tightly integrated with authentication factors and provides password resets and second factor bypass options.

Group Policy Object (GPO). A collection of group policy settings. Group policy objects are the documents created by the group policy snap-in. Group policy objects are stored at the domain level, and they affect users and computers contained in sites, domains, and organizational units.

High availability (HA). The ability of IT services to withstand all outages and continue providing processing capability according to some predefined service level. Covered outages include both planned events, such as maintenance and backups, and unplanned events, such as software failures, hardware failures, power failures, and disasters.

Host name. In Internet communication, the name given to a computer. The host name might be a fully qualified domain name such as `mycomputer.city.company.com`, or it might be a specific subname such as `mycomputer`.

Hot key. A key sequence used to shift operations between different applications or between different functions of an application.

Hybrid smart card. An ISO-7816 compliant smart card which contains a public key cryptography chip and an RFID chip. The cryptographic chip is accessible through contact interface. The RFID chip is accessible through contactless (RF) interface.

IBM HTTP server. A web server. IBM offers a web server, called the IBM HTTP Server, that accepts requests from clients and forward to the application server.

IMS Bridge. A module embedded in third-party applications and systems to call to IMS APIs for provisioning and other purposes.

IMS Configuration Utility. A utility of the IMS Server that allows Administrators to manage lower-level configuration settings for the IMS Server.

IMS Configuration wizard. Administrators use the wizard to configure the IMS Server during installation.

IMS Connector. A module that connects IMS to external systems to dispatch a mobile active code to a messaging gateway.

IMS data source. A WebSphere Application Server configuration object that defines the location and parameters for accessing the IMS database.

IMS Database. The relational database where the IMS Server stores all ESSO system, machine, and user data and audit logs.

IMS Root CA. The root certificate authority that signs certificates for securing traffic between AccessAgent and IMS Server.

IMS Server. An integrated management system for ISAM ESSO that provides a central point of secure access administration for an enterprise. It enables centralized management of user identities, AccessProfiles, authentication policies, provides loss management, certificate management, and audit management for the enterprise.

Indirect auth-info. In profiling, indirect auth-info is an indirect reference to an existing authentication service.

Interactive graphical mode. A series of panels that prompts for information to complete the installation.

IP address. A unique address for a device or logical unit on a network that uses the Internet Protocol standard.

Java Management Extensions (JMX). A means of doing management of and through Java technology. JMX is a universal, open extension of the Java programming language for management that can be deployed across all industries, wherever management is needed.

Java runtime environment (JRE). A subset of a Java developer kit that contains the core executable programs and files that constitute the standard Java platform. The JRE includes the Java virtual machine (JVM), core classes, and supporting files.

Java virtual machine (JVM). A software implementation of a processor that runs compiled Java code (applets and applications).

Keystore. In security, a file or a hardware cryptographic card where identities and private keys are stored, for authentication and encryption purposes. Some keystores also contain trusted, or public, keys.

Lightweight Directory Access Protocol (LDAP). An open protocol that uses TCP/IP to provide access to directories that support an X.500 model. An LDAP can be used to locate people, organizations, and other resources in an Internet or intranet directory.

Lightweight mode. A Server AccessAgent mode. Running in lightweight mode reduces the memory footprint of AccessAgent on a Citrix/Terminal Server and improves the single sign-on startup duration.

Load balancing. The monitoring of application servers and management of the workload on servers. If one server exceeds its workload, requests are forwarded to another server with more capacity.

Lookup user. A user who is authenticated in the Enterprise Directory and searches for other users. IBM Security Access Manager for Enterprise Single Sign-On uses the lookup user to retrieve user attributes from the Active Directory or LDAP enterprise repository.

Main AccessProfile. The AccessProfile that contains one or more AccessProfile widgets

Managed node. A node that is federated to a deployment manager and contains a node agent and can contain managed servers.

Microsoft Cryptographic application programming interface (CAPI). An interface specification from Microsoft for modules that provide cryptographic functionality and that allow access to smart cards.

Mobile ActiveCode (MAC). A one-time password that is used by users for two-factor authentication in Web Workplace, AccessAssistant, and other applications. This OTP is randomly generated and dispatched to user through SMS or email.

Mobile authentication. An authentication factor which allows mobile users to sign-on securely to corporate resources from anywhere on the network.

Network deployment. Also known as a clustered deployment. A type of deployment where the IMS Server is deployed on a WebSphere Application Server cluster.

Node agent. An administrative agent that manages all application servers on a node and represents the node in the management cell.

Nodes. A logical group of managed servers.

One-Time Password (OTP). A one-use password generated for an authentication event, sometimes communicated between the client and the server through a secure channel.

OTP token. A small, highly portable hardware device that the owner carries to authorize access to digital systems and physical assets.

Password aging. A security feature by which the superuser can specify how often users must change their passwords.

Password complexity policy. A policy that specifies the minimum and maximum length of the password, the minimum number of numeric and alphabetic characters, and whether to allow mixed uppercase and lowercase characters.

Personal applications. Windows and web-based applications where AccessAgent can store and enter credentials.

Some examples of personal applications are web-based mail sites such as Company Mail, Internet banking sites, online shopping sites, chat, or instant messaging programs.

Personal desktop. The desktop is not shared with any other users.

Personal Identification Number (PIN). In Cryptographic Support, a unique number assigned by an organization to an individual and used as proof of identity. PINs are commonly assigned by financial institutions to their customers.

Pinnable state. A state from the AccessProfile widget that is declared as 'Can be pinned in another AccessProfile'.

Pinned state. A pinnable state that is attached to a state in the main AccessProfile.

Policy template. A predefined policy form that helps users define a policy by providing the fixed policy elements that cannot be changed and the variable policy elements that can be changed.

Portal. A single, secure point of access to diverse information, applications, and people that can be customized and personalized.

Presence detector. A device that, when fixed to a computer, detects when a person moves away from it. This device eliminates manually locking the computer upon leaving it for a short time.

Primary authentication factor. The IBM Security Access Manager for Enterprise Single Sign-On password or directory server credentials.

Private desktop. Under this desktop scheme, users have their own Windows desktops in a workstation. When a previous user return to the workstation and unlocks it, AccessAgent switches to the desktop session of the previous user and resumes the last task.

Private key. In computer security, the secret half of a cryptographic key pair that is used with a public key algorithm. The private key is known only to its owner. Private keys are typically used to digitally sign data and to decrypt data that has been encrypted with the corresponding public key.

Provisioning API. An interface that allows IBM Security Access Manager for Enterprise Single Sign-On to integrate with user provisioning systems.

Provisioning bridge. An automatic IMS Server credential distribution process with third party provisioning systems that uses API libraries with a SOAP connection.

Provisioning system. A system that provides identity lifecycle management for application users in enterprises and manages their credentials.

Provision. To provide, deploy, and track a service, component, application, or resource.

Public Key Cryptography Standards. A set of industry-standard protocols used for secure information exchange on the Internet. Domino® Certificate Authority and Server Certificate Administration applications can accept certificates in PKCS format.

Published application. Application installed on Citrix XenApp server that can be accessed from Citrix ICA Clients.

Published desktop. A Citrix XenApp feature where users have remote access to a full Windows desktop from any device, anywhere, at any time.

Radio Frequency Identification (RFID). An automatic identification and data capture technology that identifies unique items and transmits data using radio waves.

Random password. An arbitrarily generated password used to increase authentication security between clients and servers.

Registry hive. In Windows systems, the structure of the data stored in the registry.

Registry. A repository that contains access and configuration information for users, systems, and software.

Remote Authentication Dial-In User Service (RADIUS). An authentication and accounting system that uses access servers to provide centralized management of access to large networks.

Remote Desktop Protocol (RDP). A protocol that facilitates remote display and input over network connections for Windows-based server applications. RDP supports different network topologies and multiple connections.

Replication. The process of maintaining a defined set of data in more than one location. Replication involves copying designated changes for one location (a source) to another (a target) and synchronizing the data in both locations.

Revoke. To remove a privilege or an authority from an authorization identifier.

Root certificate authority (CA). The certificate authority at the top of the hierarchy of authorities by which the identity of a certificate holder can be verified.

Scope. A reference to the applicability of a policy, at the system, user, or machine level.

Secret question. A question whose answer is known only to the user. A secret question is used as a security feature to verify the identity of a user.

Secure Remote Access. The solution that provides web browser-based single sign-on to all applications from outside the firewall.

Secure Sockets Layer (SSL). A security protocol that provides communication privacy. With SSL, client/server applications can communicate in a way that is designed to prevent eavesdropping, tampering, and message forgery.

Secure Sockets Layer virtual private network (SSL VPN). A form of VPN that can be used with a standard web browser.

Security Token Service (STS). A web service used for issuing and exchanging of security tokens.

Security trust service chain. A group of module instances that are configured for use together. Each module instance in the chain is called in turn to perform a specific function as part of the overall processing of a request.

Self-service features. Features in IBM Security Access Manager for Enterprise Single Sign-On which users can use to perform basic tasks such as resetting passwords and secrets with minimal assistance from Help desk or your Administrator.

Serial ID Service Provider Interface (SPI). A programmatic interface intended for integrating AccessAgent with third-party Serial ID devices used for two-factor authentication.

Serial number. A unique number embedded in the IBM Security Access Manager for Enterprise Single Sign-On Keys, which is unique to each Key and cannot be changed.

Server AccessAgent. AccessAgent deployed on a Microsoft Windows Terminal Server or a Citrix server.

Server locator. A locator that groups a related set of web applications that require authentication by the same authentication service. In AccessStudio, server locators identify the authentication service with which an application screen is associated.

Service Provider Interface (SPI). An interface through which vendors can integrate any device with serial numbers with IBM Security Access Manager for Enterprise Single Sign-On and use it as a second factor in AccessAgent.

Session management. Management of user session on private desktops and shared desktops.

Shared desktop. A desktop configuration where multiple users share a generic Windows desktop.

Shared workstation. A workstation shared among users.

Sign up. To request a resource.

sign-on automation. A technology that works with application user interfaces to automate the sign-on process for users.

sign-on information. Information required to provide access to users to any secure application. This information can include user names, passwords, domain information, and certificates.

Signature. In profiling, unique identification information for any application, window, or field.

Silent mode. A method for installing or uninstalling a product component from the command line with no GUI display. When using silent mode, you specify the data required by the installation or uninstallation program directly on the command line or in a file (called an option file or response file).

Simple Mail Transfer Protocol (SMTP). An Internet application protocol for transferring mail among users of the Internet.

Simple Object Access Protocol (SOAP). A lightweight, XML-based protocol for exchanging information in a decentralized, distributed environment. SOAP can be used to query and return information and invoke services across the Internet.

Single sign-on. An authentication process in which a user can access more than one system or application by entering a single user ID and password.

Smart card middleware. Software that acts as an interface between smart card applications and the smart card hardware. Typically the software consists of libraries that implement PKCS#11 and CAPI interfaces to smart cards.

Smart card. An intelligent token that is embedded with an integrated circuit chip that provides memory capacity and computational capabilities.

Stand-alone deployment. A deployment where the IMS Server is deployed on an independent WebSphere Application Server profile.

Stand-alone server. A fully operational server that is managed independently of all other servers, and it uses its own administrative console.

Strong authentication. A solution that uses multi-factor authentication devices to prevent unauthorized access to confidential corporate information and IT networks, both inside and outside the corporate perimeter.

Strong digital identity. An online persona that is difficult to impersonate, possibly secured by private keys on a smart card.

System modal message. A system dialog box that is typically used to display important messages. When a system modal message is displayed, nothing else can be selected on the screen until the message is closed.

Terminal emulator. A program that allows a device such as a microcomputer or personal computer to enter and receive data from a computer system as if it were a particular type of attached terminal

Thin client. A client machine that has little or no installed software. It has access to applications and desktop sessions that is running on network servers that are connected to it. A thin client machine is an alternative to a full-function client such as a workstation.

Tivoli Common Reporting tool. A reporting component that you can use to create, customize, and manage reports.

Tivoli Identity Manager adapter. An intermediary software component that allows IBM Security Access Manager for Enterprise Single Sign-On to communicate with Tivoli Identity Manager.

Transparent screen lock. A feature that, when enabled, permits users to lock their desktop screens but still see the contents of their desktop.

Trigger. In profiling, an event that causes transitions between states in a states engine, such as, the loading of a web page or the appearance of window on the desktop.

Trust service chain. A chain of modules operating in different modes. For example: validate, map and issue.

Truststore. In security, a storage object, either a file or a hardware cryptographic card, where public keys are stored in the form of trusted certificates, for authentication purposes in web transactions. In some applications, these trusted certificates are moved into the application keystore to be stored with the private keys.

TTY (terminal type). A generic device driver for a text display. A tty typically performs input and output on a character-by-character basis.

Two-factor authentication. The use of two factors to authenticate a user. For example, the use of password and an RFID card to log on to AccessAgent.

Uniform resource identifier. A compact string of characters for identifying an abstract or physical resource.

User credential. Information acquired during authentication that describes a user, group associations, or other security-related identity attributes, and that is used to perform services such as authorization, auditing, or delegation. For example, a user ID and password are credentials that allow access to network and system resources.

User deprovisioning. Removing the user account from IBM Security Access Manager for Enterprise Single Sign-On.

User provisioning. The process of signing up a user to use IBM Security Access Manager for Enterprise Single Sign-On.

Virtual appliance. A virtual machine image with a specific application purpose that is deployed to virtualization platforms.

Virtual channel connector. A connector that is used in a terminal services environment. The virtual channel connector establishes a virtual communication channel to manage the remote sessions between the Client AccessAgent component and the Server AccessAgent.

Virtual Member Manager (VMM). A WebSphere Application Server component that provides applications with a secure facility to access basic organizational entity data such as people, logon accounts, and security roles.

Virtual Private Network (VPN). An extension of a company intranet over the existing framework of either a public or private network. A VPN ensures that the data that is sent between the two endpoints of its connection remains secure.

Visual Basic (VB). An event-driven programming language and integrated development environment (IDE) from Microsoft.

Wallet caching. When performing single sign-on for an application, AccessAgent retrieves the logon credentials from the user credential Wallet. The user credential Wallet is downloaded on the user machine and stored securely on the IMS Server. So users can access their Wallet even when they log on to IBM Security Access Manager for Enterprise Single Sign-On from a different machine later.

Wallet manager. The IBM Security Access Manager for Enterprise Single Sign-On GUI component that users can use to manage application credentials in the personal identity Wallet.

Wallet Password. A password that secures access to the Wallet.

Wallet. A secured data store of access credentials of a user and related information, which includes user IDs, passwords, certificates, encryption keys.

Web server. A software program that is capable of servicing Hypertext Transfer Protocol (HTTP) requests.

Web service. A self-contained, self-describing modular application that can be published, discovered, and invoked over a network using standard network protocols. Typically, XML is used to tag the data, SOAP is used to transfer the data, WSDL is used for describing the services available, and UDDI is used for listing what services are available.

Web Workplace. A web-based interface that users can log on to enterprise web applications by clicking links without entering the passwords for individual applications. This interface can be integrated with the existing portal or SSL VPN of the customer.

WebSphere Administrative console. A graphical administrative Java application client that makes method calls to resource beans in the administrative server to access or modify a resource within the domain.

WebSphere Application Server profile. The WebSphere Application Server administrator user name and profile. Defines the runtime environment.

WebSphere Application Server. Software that runs on a web server and that can deploy, integrate, execute, and manage e-business applications.

Windows logon screen, Windows logon UI mode. The screen where users enter their user name and password to log on to the Windows desktop.

Windows native fast user switching. A Windows XP feature which allows users to quickly switch between user accounts.

Windows Terminal Services. A Microsoft Windows component that users use to access applications and data on a remote computer over a network.

WS-Trust. A web services security specification that defines a framework for trust models to establish trust between web services.

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