

# Cook Book

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## IBM® Tivoli® Access Manager for Enterprise Single Sign-On SAP GUI for Windows AccessProfile

Version 1.2

**First Edition (Sept 30, 2011)**

This edition applies to version 1.2 of the Tivoli Access Manager for Enterprise Single Sign-On, Enterprise Software Profile and to all subsequent releases and modifications until otherwise indicated in new editions.

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## 1. Preface

Welcome to the Cookbook for *SAP GUI for Windows AccessProfile*.

This cookbook provides an overview of the SAP GUI for Windows AccessProfile. Topics covered include features, default configurations, supported environments and workflows, error messages and warnings.

Due to the technical nature of this document, the intended audience for this document are system administrators, I.T. security administrators and AccessProfile developers.

## 2. AccessProfile Features and Purpose

The SAP GUI for Windows AccessProfile is designed to allow Tivoli Access Manager for Enterprise Single Sign-On users to single sign-on into SAP Systems using the SAP GUI for Windows application.

Some features of this AccessProfile are :

- Automatic capture of SAP credentials.
- Automatic sign-on to SAP System using the captured SAP credentials.
- Supports Multiple SAP Systems landscapes such as SAP Load Balancer, Multiple SAP Systems Instances, Group servers, etc.
- Supports changing SAP passwords with auto-generated random password.
- Supports multiple languages: English, French, Italian, German, Portuguese, Spanish and Dutch.

The AccessProfile is highly customizable. However, a customized AccessProfiles consists of custom code, custom actions and triggers meant to work in specific environments. Customers are advised to refer to their specific support contract to determine the level of support IBM will provide.

## 3. AccessProfile Name, Authentication Service Id and Data Template

This application consists of 2 individual profiles for the Single Sign-on workflows. For more information, see the following table:

*Table 1: Profile Names, Authentication Service IDs and Data Templates*

| Profile Name      | Authentication Service Id                                      | Data Template                       |
|-------------------|----------------------------------------------------------------|-------------------------------------|
| profile_SAP_LOGON | Indirect                                                       | adt_ciuser_cisecondkey_cspwd_cspwd2 |
| profile_SAP_GUI   | Indirect<br>auth_SAP_Labels<br>auth_SAP_random_password_engine | adt_ciuser_cisecondkey_cspwd_cspwd2 |

**Note:**

*auth\_SAP\_Labels* is used to display the field names while capturing the password.

*auth\_SAP\_random\_password\_engine* is a Enterprise authentication service that is used for generating random passwords.

Administrators can set the random password generator policy for SAP GUI credentials in the IMS Server under **AccessAdmin->System->Authentication service policies-> SAP GUI random password engine**. Only the password policies are applicable (see Figure 1). All other Authentication Policies in the *auth\_SAP\_random\_password\_engine* authentication service will not apply to the SAP GUI AccessProfile.

The Data Templates map to the fields in SAP GUI for Windows as shown in Table Table 3: Error Messages by SAP GUI Detected in AccessProfile .

Table 2: Data Template Mapping

| Data Template Item | Data Template Item Description | Application Field Name |
|--------------------|--------------------------------|------------------------|
| cisecndkey         | Case insensitive second key    | Client Number          |
| ciuser             | Case insensitive username      | User                   |
| cspwd              | Case sensitive password        | Password               |
| cspwd2             | Case insensitive second key    | Language               |

**Administrator**  
Administrator

[Log off](#)

[Setup assistant](#)

[Search users](#)

[Search](#)  
[My users](#)  
[All Administrators](#)  
[All helpdesk users](#)  
[All revoked users](#)

[User Policy Templates](#)  
[New template](#)  
[Template assignments](#)

[Machines](#)  
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[Machine Policy Templates](#)  
[New template](#)  
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[System](#)  
[System policies](#)  
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### Authentication service policies

[SAP GUI random password engine](#)

[Back to Authentication services](#)

#### ▼ Password Policies

Require re-authentication before performing automatic sign-on?

Is the password the Windows logon password?

Minimum password length  
(Minimum:1, Maximum:99)

Maximum password length  
(Minimum:1, Maximum:99)

Minimum number of numeric characters  
(Minimum:0, Maximum:99)

Minimum number of alphabetic characters  
(Minimum:0, Maximum:99)

Minimum number of special characters  
(Minimum:0, Maximum:99)

Maximum number of numeric characters  
(Minimum:0, Maximum:99)

Maximum number of alphabetic characters  
(Minimum:0, Maximum:99)

Maximum number of special characters  
(Minimum:0, Maximum:99)

Enforce the use of both upper case and lower case characters?

[► Authentication Policies](#)

Figure 1: Password Policies Settings in AccessAdmin

## 4. Supported Configurations

SAP GUI for Windows is a highly customizable application with settings that affect logon workflow and security policies. Hence the AccessProfile supports only the default configuration for SAP Systems and SAP GUI for Windows.

The configuration of SAP GUI for Windows can be reset to default using the SAP GUI Configuration tool. Click the **Restore Defaults** button to reset the settings to default configuration (see Figure 2).

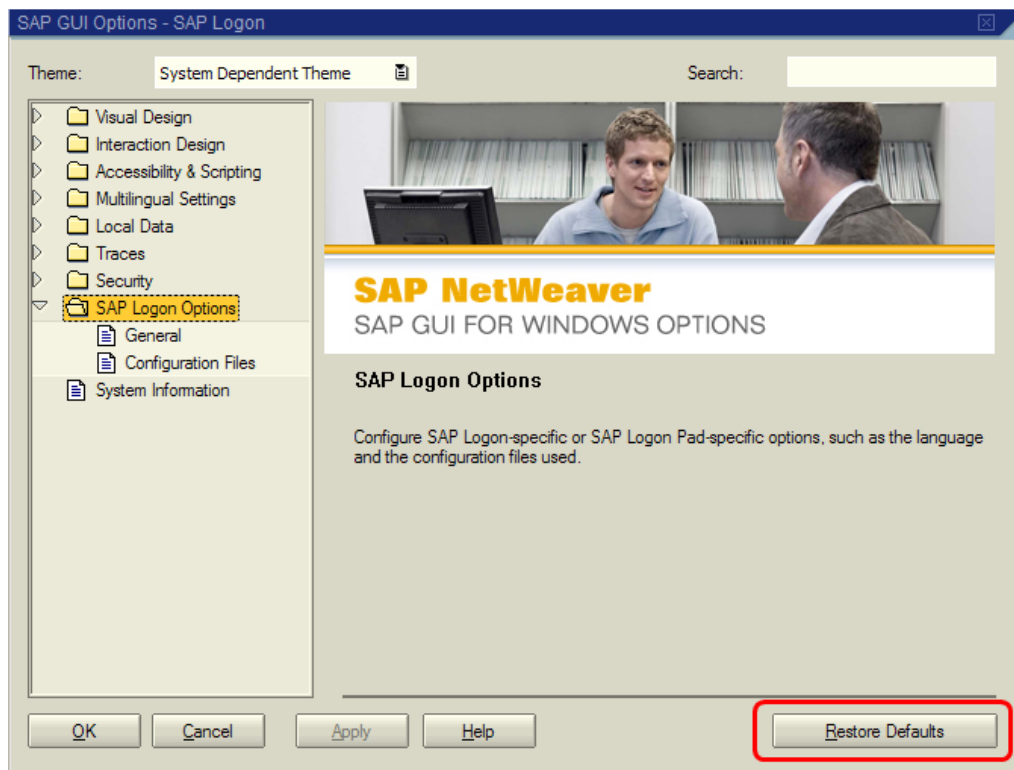


Figure 2: SAP GUI Configuration tool with Restore Defaults button highlighted

The four key SAP client system environment parameters that affect the SAP AccessProfile are:

- location of the *saplogon.ini* file
- name and location of the SAP GUI application executable file (SAPGui .exe)
- location of *sapshortcut.ini* file
- name and location of the SAP Shortcut application executable file (sapshcut.exe)

All these parameters are stored in the profile\_SAP\_Logon and profile\_SAP\_GUI AccessProfiles. To edit any of the parameters, open the AccessProfile in AccessStudio and expand the trigger between the state transition from “state\_start” to “state\_setup” to edit the script with the specific parameters.

### Name and location of saplogon.ini

By default, *saplogon.ini* is located in the following path :

- %APPDATA%\SAP\Common\saplogon.ini  
e.g. C:\Users\AppData\SAP\Common\saplogon.ini

If this file is located in a different path or renamed, modify **both** the profiles *profile\_SAP\_LOGON* and *profile\_SAP\_GUI*. The path is specified in the script that is executed in the transition between the “state\_start” state and the “state\_setup” state.

If this parameter is not explicitly specified in the script, the profile will try to determine the location automatically. The search order and assumptions made are as follows:

1. Determine if the environment variable *SAP\_LOGON\_INI* is set and a *saplogon.ini* file exists in that path.
2. Determine if the *saplogon.ini* file exists in the directory at %APPDATA%\SAP\Common\
3. Determine if the *saplogon.ini* file exists in the directory specified by the registrykey *HKEY\_LOCAL\_MACHINE\SOFTWARE\SAP\SAP Shared\SAPSysdir*
4. Determine if the *saplogon.ini* file exists in the %SYSTEMROOT% directory

### Name and location of SAPGui.exe

By default, SAP GUI application executable file (*SAPGui.exe*) is expected at:

- *%PROGRAMFILES%\SAP\FrontEnd\SAPgui\SAPGui.exe*  
e.g. *C:\Program Files\SAP\FrontEnd\SAPgui\SAPGui.exe*

If the SAP GUI application executable is located in a different path or renamed, modify the *profile\_SAP\_LOGON*. The path is specified in the script that is executed during transition between the “state\_start” state and the “state\_setup” state.

If this parameter is not explicitly specified in the script, the profile will try to determine the location automatically. The search order and assumptions made are as follows:

1. Determine if the *SAPGui.exe* file exists in the directory specified by the registrykey *HKEY\_LOCAL\_MACHINE\SOFTWARE\SAP\SAP Shared\SAPSysdir*
2. Determine if the *SAPGui.exe* file exists in the *%PROGRAMFILES%\SAP\FrontEnd\SAPgui\* directory

### Name and location of sapshortcut.ini

By default, *sapshortcut.ini* is located in the same folder as *saplogon.ini*

- *%APPDATA%\SAP\Common\sapshortcut.ini*  
e.g. *C:\Users\AppData\SAP\Common\sapshortcut.ini*

If this file is located in a different path or renamed, modify the profile *profile\_SAP\_LOGON*. The path is specified in the script that is executed in the transition between the “state\_start” state and the “state\_setup” state.

If this parameter is not explicitly specified in the script, the profile will try to determine the location automatically. The search order and assumptions made are as follows:

1. Determine if the environment variable *SAP\_LOGON\_INI* is set and a *sapshortcut.ini* file exists in that path.
2. Determine if the *sapshortcut.ini* file exists in the directory at *%APPDATA%\SAP\Common\*
3. Determine if the *sapshortcut.ini* file exists in the directory specified by the registrykey *HKEY\_LOCAL\_MACHINE\SOFTWARE\SAP\SAP Shared\SAPSysdir*
4. Determine if the *sapshortcut.ini* file exists in the *%SYSTEMROOT%* directory

### Name and location of SAPshcut.exe

By default, SAP Shortcut Launcher application executable file (*SAPshcut.exe*) is expected at:

- *%PROGRAMFILES%\SAP\FrontEnd\SAPgui\SAPshcut.exe*  
e.g. *C:\Program Files\SAP\FrontEnd\SAPgui\SAPshcut.exe*

If the SAP Shortcut Launcher application executable is located in a different path or renamed, modify the *profile\_SAP\_LOGON*. The path is specified in the script that is executed during transition between the “state\_start” state and the “state\_setup” state.

If this parameter is not explicitly specified in the script, the profile will try to determine the location automatically. The search order and assumptions made are as follows:

1. Determine if the *SAPshcut.exe* file exists in the directory specified by the registrykey *HKEY\_LOCAL\_MACHINE\SOFTWARE\SAP\SAP Shared\SAPSysdir*
2. Determine if the *SAPshcut.exe* file exists in the *%PROGRAMFILES%\SAP\FrontEnd\SAPgui\* directory

## Registry setting for StartSaplogon

Windows Registry for SAP GUI has to be set at the client machine for the AccessProfile to work as intended. Before using the AccessProfile for single sign-on to SAP GUI for Windows application, set the registry key `HKEY_LOCAL_MACHINE\SOFTWARE\SAP\SAPGUI\StartSaplogon` to 0

If automatic registry change is required, the AccessProfile script that is executed in the state transition from `state_setup` to `state_start_sapgui` states can be modified. The following line in the script specifies whether automatic registry change should be enabled or disabled. The default is disabled. To enable it, change the line in the beginning of the script from `isAutomaticRegistrySetting = 0` to `isAutomaticRegistrySetting = 1`

## Prompting Users On Errors

If the environment settings, paths or the registry entry are not configured correctly (see Table 4: Assertions that Generate Warnings in AccessProfile ), the AccessProfile displays an error message when launching SAP Logon. Set the flag “PromptUserOnErrors” to 0 to disable this behaviour in the script executed during the transition between the “state\_start” state and the “state\_setup” state.

Modify `PromptUserOnErrors = 1` to `PromptUserOnErrors = 0`.

## Permission to read registry keys, Windows Management Instrumentation (WMI) data, configuration files and run executable files in Plugin API

AccessAgent must be configured to have the appropriate permissions to read registry keys mentioned in this section, WMI data (`Win32_Process`) and configuration files (`saplogon.ini` and `sapshortcut.ini`). These information are required for the AccessProfile to function normally. In addition, the script in the AccessProfile must be able to execute the `SAPGui.exe` and `SAPShcut.exe` files.

# 5. Supported Single Sign-On Workflows

## a. Logon

By default, the logon scenario workflow loads when SAP GUI for Windows profile detects an instance of `SAPLogon.exe` or `SAPLgpad.exe` application launch.

### i. Normal logon scenario using SAP Logon

Typically, SAP Logon is invoked to login to SAP Systems from the user's workstation. An example of SAP Logon window is shown in Figure 3. When this window is detected, TAM ESSO traverses through the states as depicted in Figure 4. The state names in Figure 4 corresponds directly with the state names in the `profile_SAP_LOGON` AccessProfile.

The user can select the SAP System to login. Once a System is selected for login, SAP GUI for Windows main logon dialog will be displayed (Figure 5).

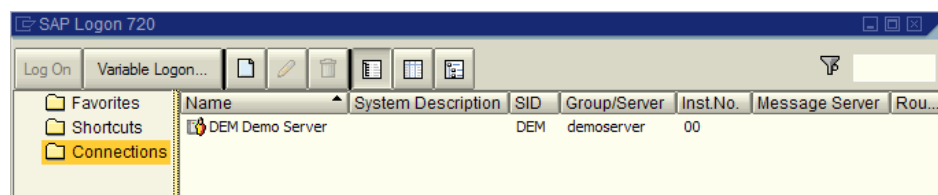


Figure 3: SAP Logon Window

## 1. Setup parameters

2(a). Logon Manager window is found

2(b). When Shortcut window is found, relaunch the shortcut process from cmd

In some versions, "saplogon.exe" will be created when launching SAPShortcut from shortcut file

3(a). Parse SAP .ini file and build system arrays

3(b). Terminate the workflow if "StartSapLogon" registry is not configured successfully

4(a). When SAP .ini file is parsed successfully, continue the workflow

4(b). When SAP .ini file is not found, terminate the workflow

5(a). When GUI window is found, relaunch the GUI process from cmd

5(b). When Shortcut window is found, relaunch the Shortcut process cmd

6(a). Terminate the workflow if SapEXE is not found

6(b). After GUI/Shortcut is successfully launched, wait for another GUI/Shortcut to be launched

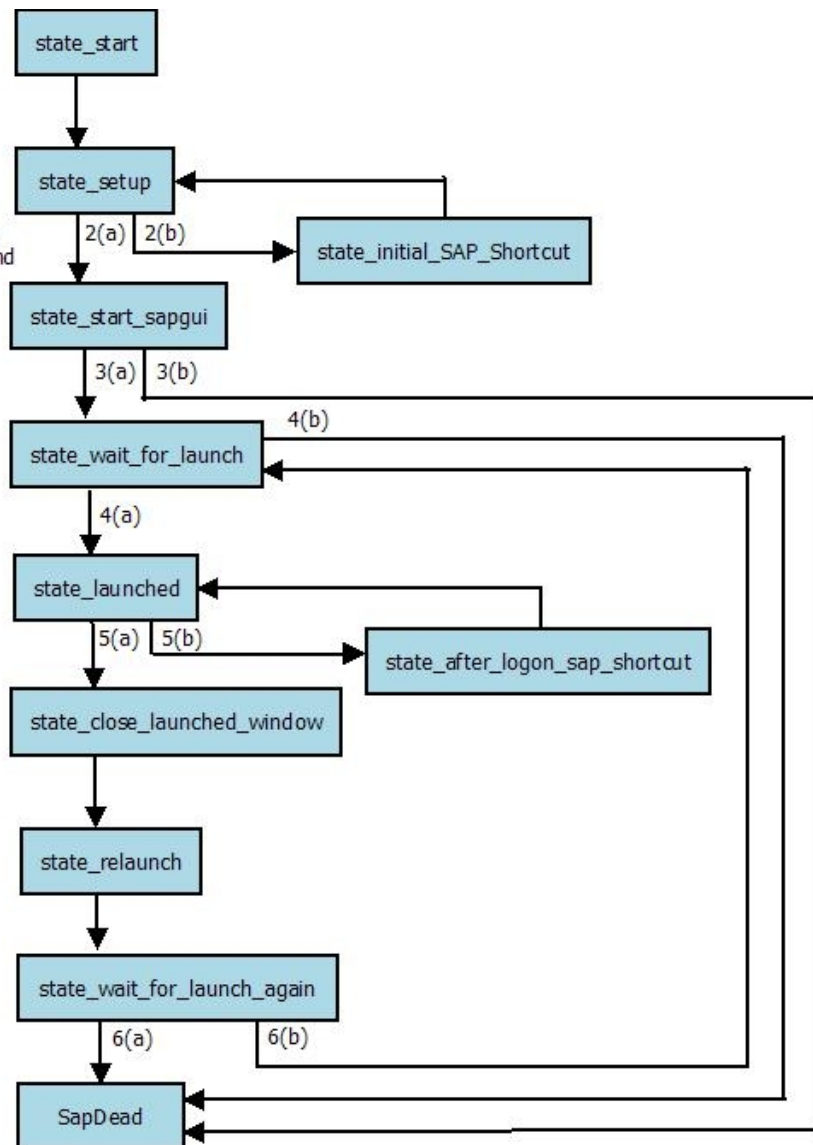


Figure 4: Workflow for the SAP Logon

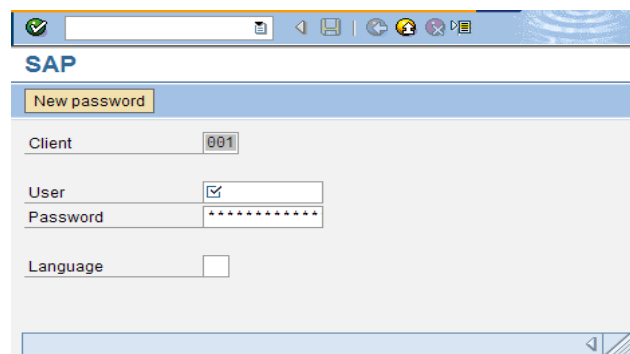


Figure 5: SAP GUI for Windows Default Logon Window

When the *SAPGui.exe* application is launched the profile\_SAP\_GUI AccessProfile gets loaded and enters the *state\_start* initial state. If the logon window is detected, it proceeds to the state

*SAP\_GUI\_Logon\_Window\_Displayed*. The profile then traverses the states as displayed in Figure 6.

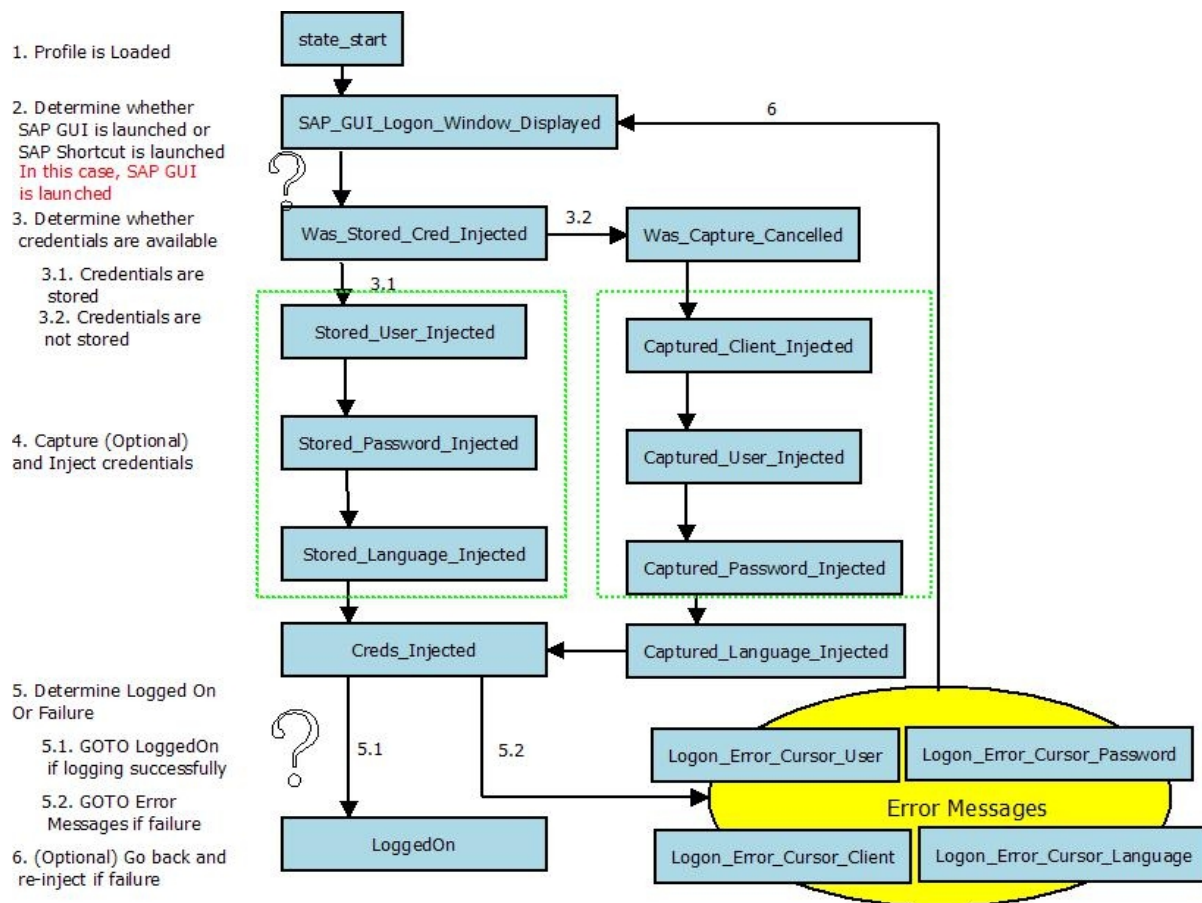


Figure 6: Workflow for logon of SAP GUI for Windows

## ii. Alternate logon scenario using SAP Shortcuts

The AccessProfile supports logging on to SAP Systems using SAP Shortcuts. When a Shortcut is launched, an instance of the *SAPGui.exe* application is created that displays the default SAP Shortcut logon dialog (Figure 7). The AccessProfile detects this dialog and then proceeds with the states as depicted in Figure 8.

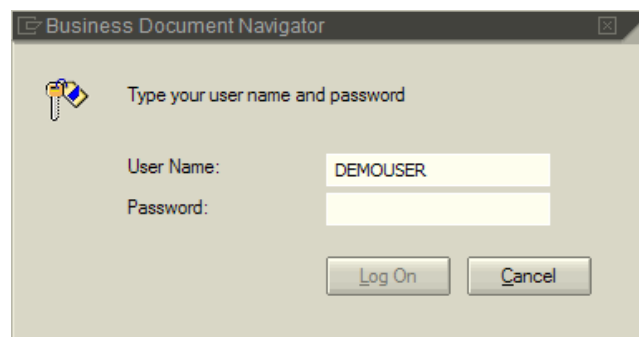


Figure 7: SAP Shortcut Logon Dialog

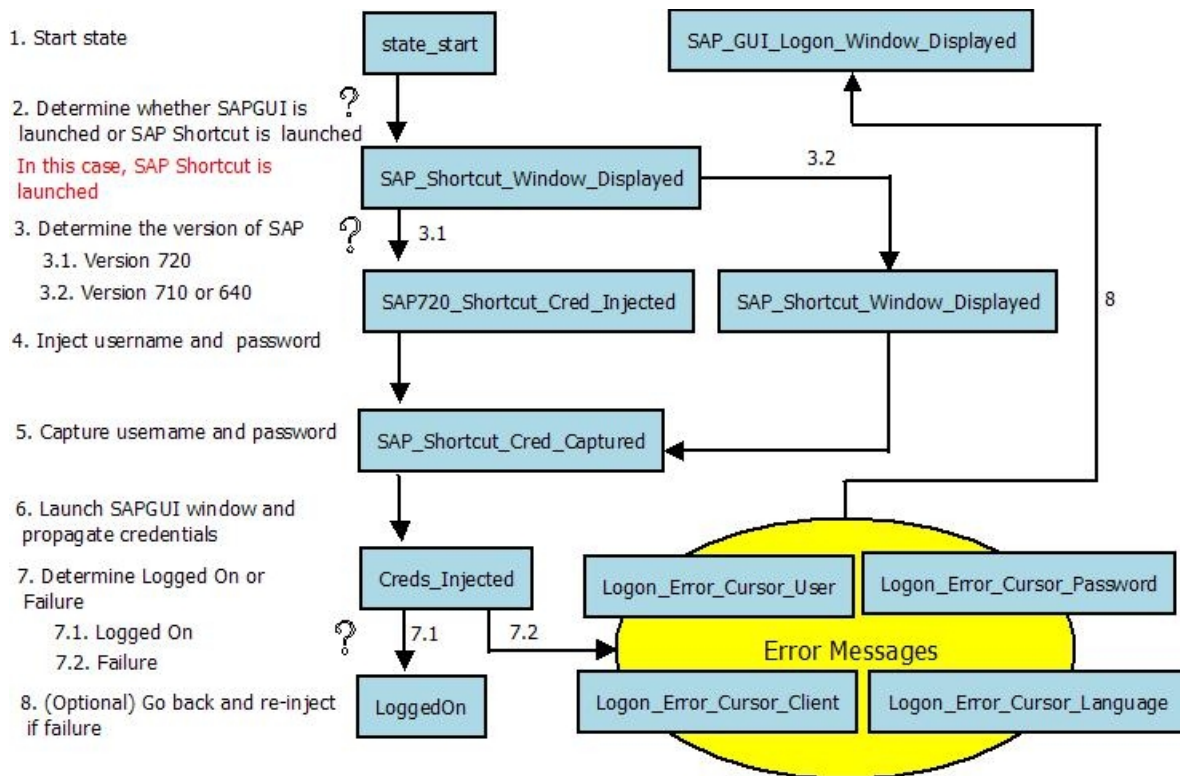


Figure 8: Workflow for login to the SAP via SAP Shortcuts

If a login error is encountered during SAP Shortcut login, then the main SAP GUI login window is displayed to the user. The AccessProfile workflow continues with the Logon Error Scenario. If there are no errors, the profile proceeds to Successful Logon Scenario instead.

### iii. Successful Logon Scenario

Upon successful login from scenarios i. and ii., the SAP GUI main panel is replaced by the SAP Easy Access menu similar to Figure 9. The profile\_SAP\_GUI AccessProfile detects this transition and considers it a successful login. If a new set of credentials were injected into SAP GUI, AccessAgent prompts the user to save the credentials into the wallet. You can override this behaviour by configuring user-level policies to save without prompting.

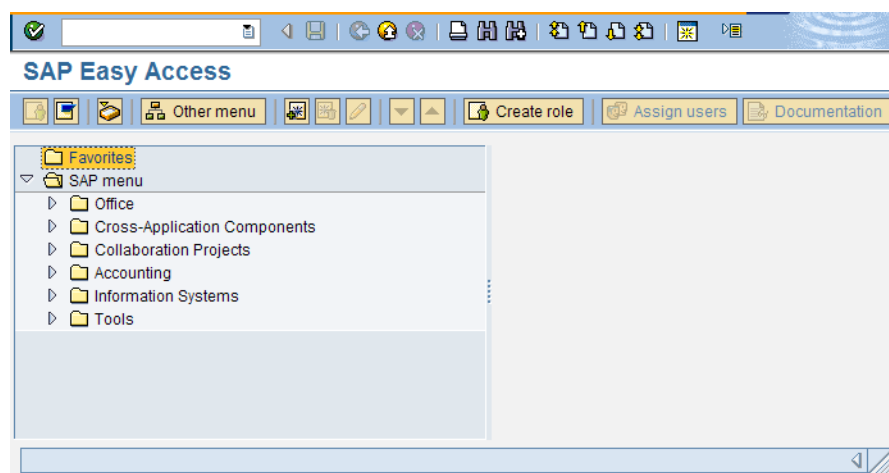


Figure 9: SAP Easy Access Menu

### **b. Logon Error Scenario**

If the SAP GUI application is unable to login due to any reason, it displays an error message in the bottom of the window. Figure 10 is an example screen where the user has entered invalid credentials. See Table 3: Error Messages by SAP GUI Detected in AccessProfile for details on the errors handled by the profile.

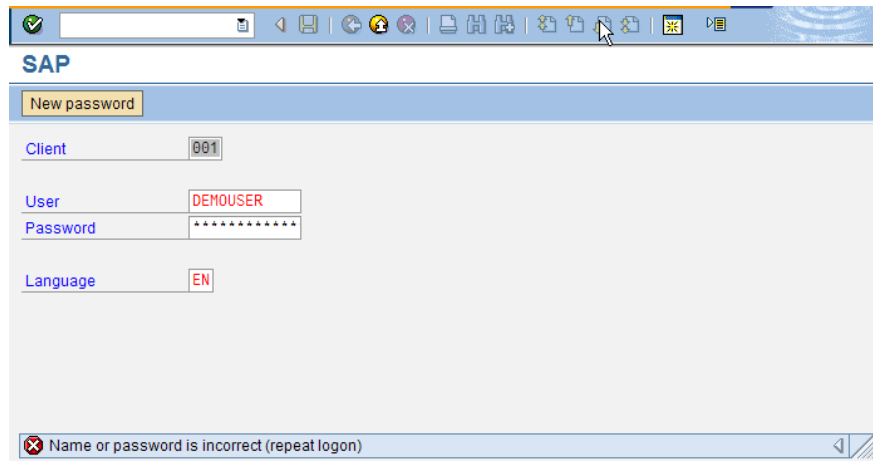


Figure 10: SAP GUI Logon Error Message for Invalid Credentials

If a recognized error is encountered in either scenario i. or ii., the profile\_SAP\_GUI AccessProfile proceeds to execute the logon sequence as depicted in the Normal Logon Scenario (scenario i.).

### **c. Logoff Scenario**

You can close the SAP GUI application by canceling the capture password dialog prompted by AccessAgent (see Figure 11). This will terminate the *SAPGui.exe* application thread. Alternatively, when a logoff from SAP GUI is initiated then the corresponding *SAPGui.exe* application thread is terminated. The AccessProfile will be unloaded when the *SAPGui.exe* application thread is terminated.

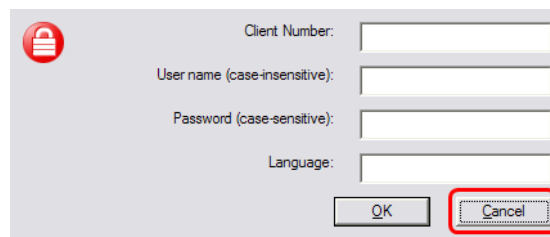


Figure 11: AccessAgent Capture Password Dialog

### **d. Change Password Manually Scenario**

The profile supports manual password change at logon. To initiate a manual password change, either click the SAP "New Password" button or press the F5 key during logon. You may not be able to initiate a manual password change at logon if the password injection policy for the Authentication Service is set to "Auto-logon" because this policy instructs AccessAgent to automatically sign on the user. Therefore, the user will not be able to click on the "New Password" button or press the F5 key at the logon screen.

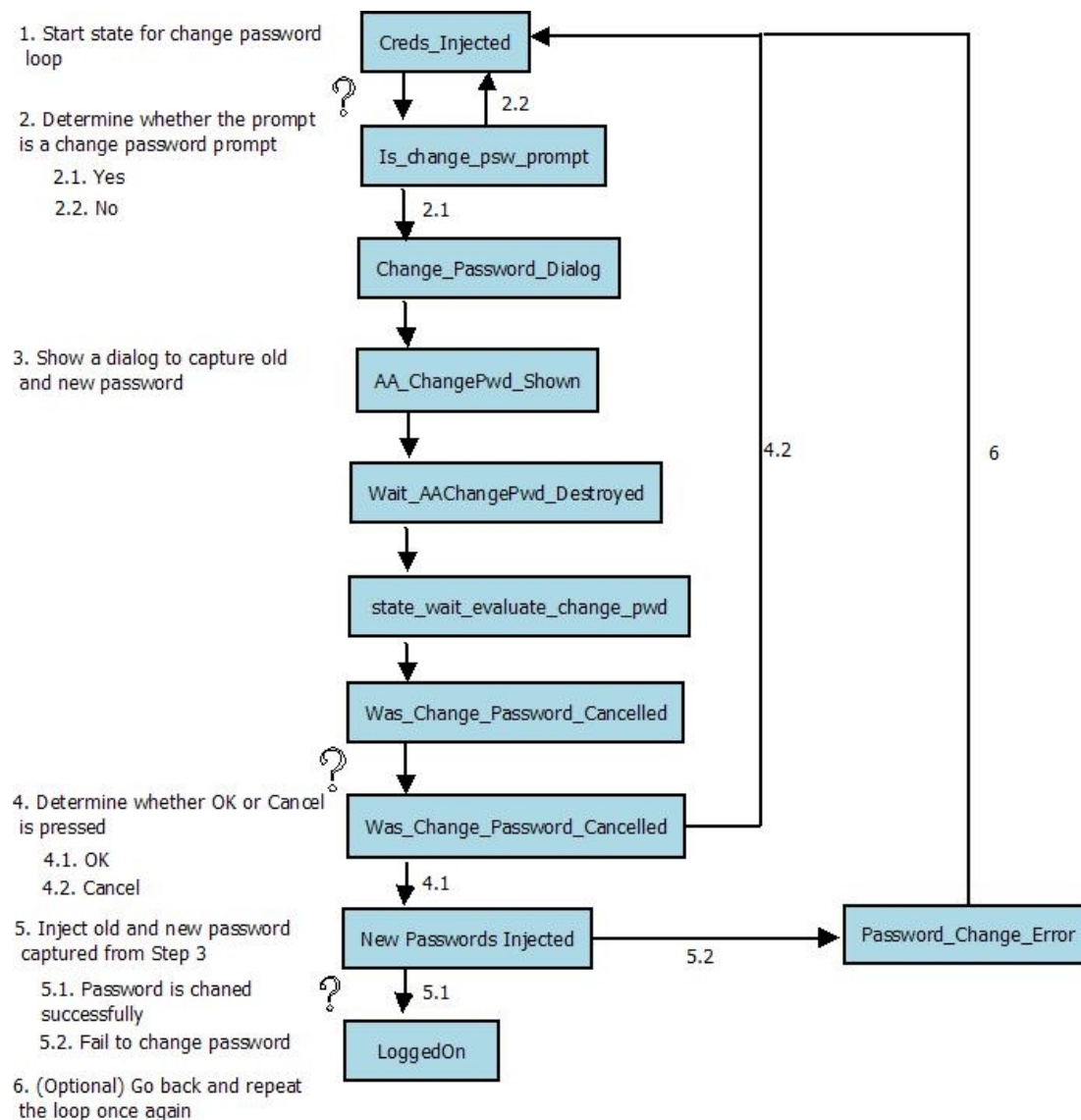


Figure 12: Workflow for Changing Password in SAP GUI for Windows.

When a change password prompt similar to Figure 13 is detected, AccessAgent displays a dialog over the SAP Change Password dialog; AccessAgent will prompt for the new password (Figure 14). If the SAP GUI random password engine authentication service `auth_SAP_random_password_engine` is enabled and password policies are set, then the AccessAgent dialog will be pre-populated with a randomly generated password conforming to the policies specified in the `auth_SAP_random_password_engine`.

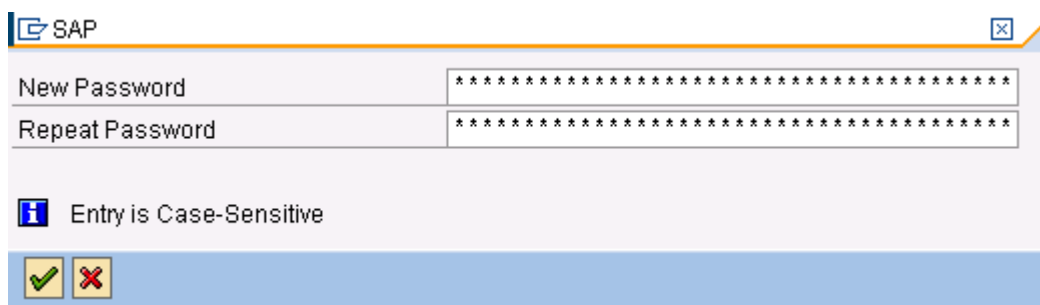


Figure 13: Change Password Dialog by SAP GUI for Windows

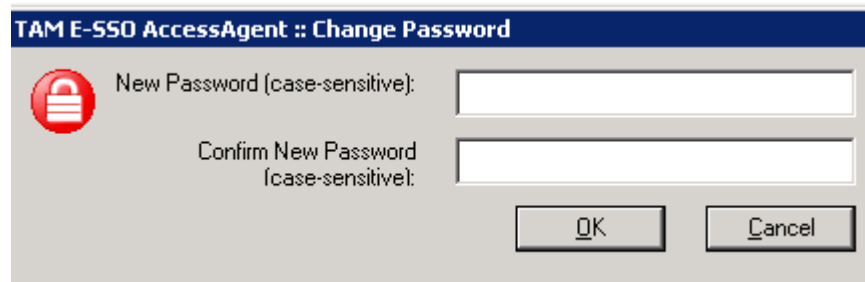


Figure 14: Change Password Dialog by AccessAgent

If the user cancels the AccessAgent dialog, the corresponding SAP GUI Change Password dialog will automatically be canceled .

### e. Change Password Manually Error Scenario

If there was any password error encountered with the password change process, SAP will display an error message indicating the problem encountered, similar to Figure 15. The user will have 10 seconds\* to read and acknowledge the error before the dialog is automatically closed by the profile\_SAP\_GUI AccessProfile. The user can close the dialog anytime before the 10 seconds time-out.

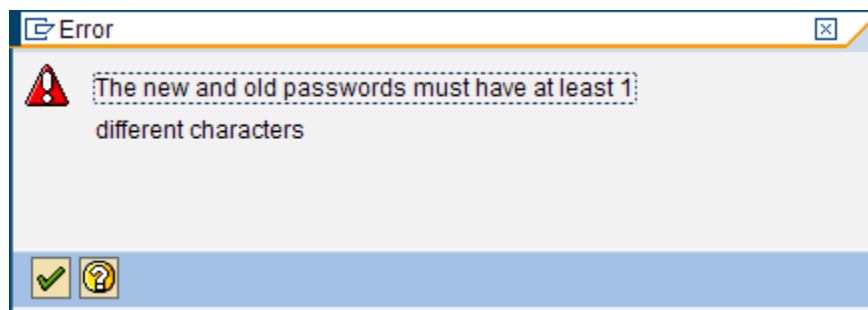


Figure 15: SAP GUI Change Password Error Message Dialog Popup

\* The 10 seconds default time-out is configurable by editing the time-out setting in the *Fire after specified time* trigger in the state transition from Password\_Change\_Error to Cancel\_SAP\_Error\_Dialog.

### f. Expired Password Change Scenario

In the SAP GUI application, expired passwords are handled similar to the Change Password Manually scenario, except that the user does not initiate the Change Password Dialog, manually. The Change Password Dialog is displayed automatically by SAP GUI.

### g. Expired Password Change Error Scenario

Expired password change errors are handled similar to Change Password Manually Error Scenario.

## 6. Assertions and Error Messages Handled by the AccessProfile

Table 3 is a list of error messages that the AccessProfile detects and handles as a Logon Error Scenario workflow. There may be other messages that SAP displays to the user during logon but the AccessProfile does not handle those messages.

Table 3: Error Messages by SAP GUI Detected in AccessProfile

| Error message                                                               | State transition in profile                                |
|-----------------------------------------------------------------------------|------------------------------------------------------------|
| <b>Profile: profile_SAP_GUI</b>                                             |                                                            |
| Logon Failed: Incorrect username or password                                | <i>state_start</i> → <i>SAP_Shortcut_Window_Displayed</i>  |
| Logon Failed: Logon error (e.g. expired initial password or account locked) | <i>Creds_Injected</i> → <i>Logon_Error_Cursor_User</i>     |
| Logon Failed: Missing username or password                                  | <i>Creds_Injected</i> → <i>Logon_Error_Cursor_Password</i> |
| Logon Failed: The specified client is unknown                               | <i>Creds_Injected</i> → <i>Logon_Error_Cursor_Client</i>   |
| Logon Failed: The specified language is unknown                             | <i>Creds_Injected</i> → <i>Logon_Error_Cursor_Language</i> |
| Information dialog prompts, e.g. warning dialog                             | <i>Creds_Injected</i> → <i>Information_Dialog</i>          |

The following table is a list of assertions that the AccessProfile makes before continuing with the normal single sign-on workflows. If the assertion fails, then an error message box is shown to the user (depending on the settings of PromptUserOnErrors described in the chapter Supported Configurations)

Table 4: Assertions that Generate Warnings in AccessProfile

| Assertions                                                                              | State transition in profile                                                                                                                                              |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Profile: profile_SAP_LOGON</b>                                                       |                                                                                                                                                                          |
| StartSaplogon registry value is not set to 0                                            | <i>state_setup</i> → <i>state_start_sapgui</i> → <i>SapDead</i>                                                                                                          |
| saplogon.ini file path is not correctly set or not found in the default locations       | <i>state_start_sapgui</i> → <i>state_wait_for_launch</i> → <i>SapDead</i>                                                                                                |
| SAP GUI executable file path is not correctly set or not found in the default locations | <i>state_relaunch</i> → <i>state_wait_for_launch_again</i> → <i>SapDead</i>                                                                                              |
| sapshcut.exe file path is not correctly set or not found in the default locations       | <i>state_setup</i> → <i>state_initial_SAP_Shortcut</i> → <i>state_setup</i><br><br><i>state_launched</i> → <i>state_after_logon_sap_shortcut</i> → <i>state_launched</i> |
| sapshortcut.ini file path is not correctly set or not found in the default locations    | <i>state_launched</i> → <i>state_after_logon_sap_shortcut</i> → <i>state_launched</i>                                                                                    |
| <b>Profile: profile_SAP_GUI</b>                                                         |                                                                                                                                                                          |
| saplogon.ini file path is not correctly set or not found in the default locations       | <i>state_start</i> → <i>SAP_Shortcut_Window_Displayed</i>                                                                                                                |

## 7. Caveats and Limitations

### a. Change password after logon not supported

Besides changing password at logon page, user may also choose to change password after logon. Figure 16 shows an example of a transaction that allows password change after logon.

The profile does not capture new credentials if user chooses to change password with this approach. Therefore if the SAP password is changed using this method, the user must manually change the

password in the wallet or delete the credential from the wallet to allow AccessAgent to re-capture the credentials.

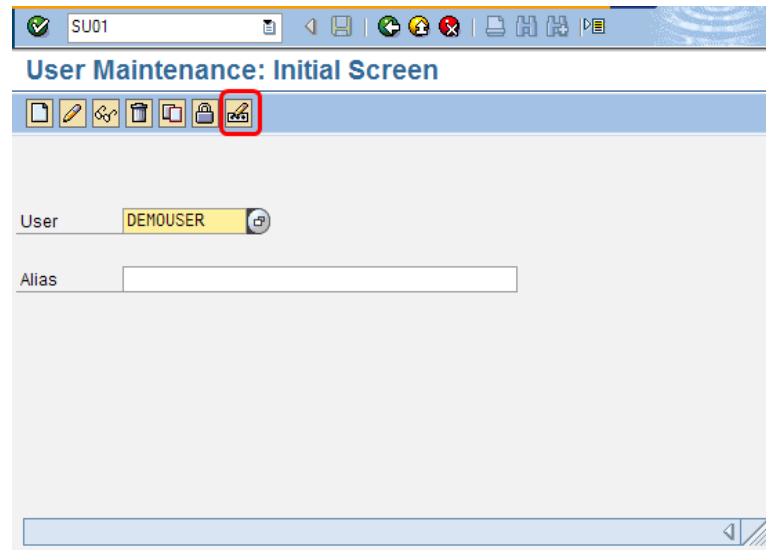


Figure 16: SAP Transaction for User Maintenance

### ***b. Looping behavior for auto-logon with an incorrect credential***

When the credentials in the wallet is incorrect and the injection policy is set to auto-logon, the profile will create an endless loop for logon (i.e. logon → fail → logon → fail ...). See the following figures for more information to this behavior:

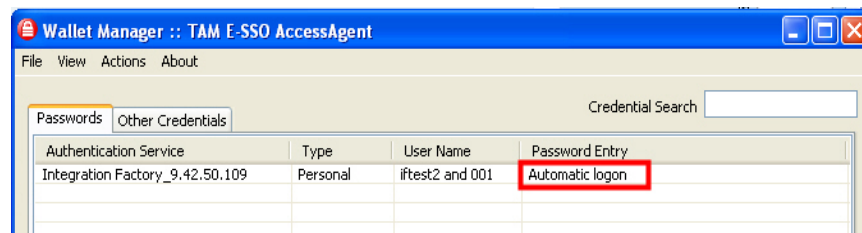


Figure 17: Credentials in the wallet is wrong and policy is set to be auto-logon

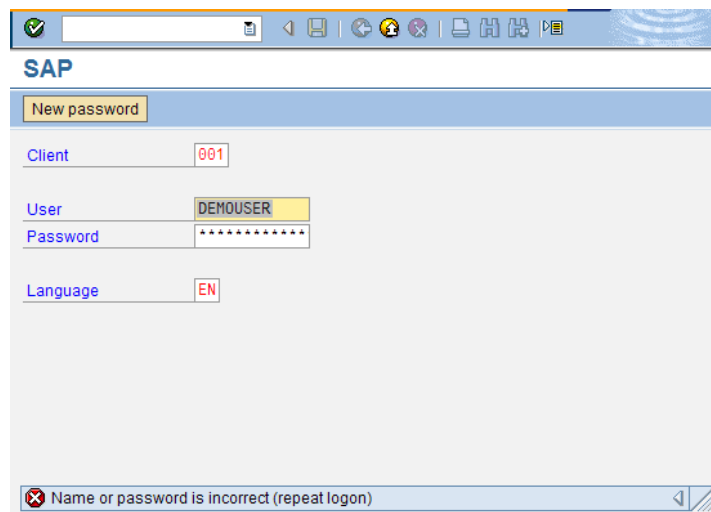


Figure 18: The profile creates an endless logon loop

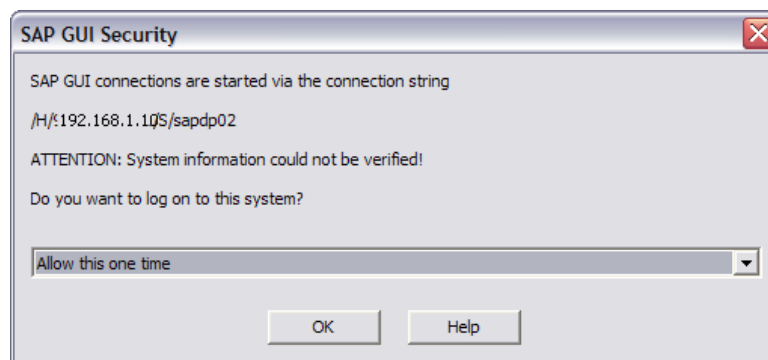
When this behavior is encountered, the user must change the existing password in the wallet to match with the correct credential in SAP.

Refer to [IBM Technote #1512123](#) for further details and step-by-step guide solution.

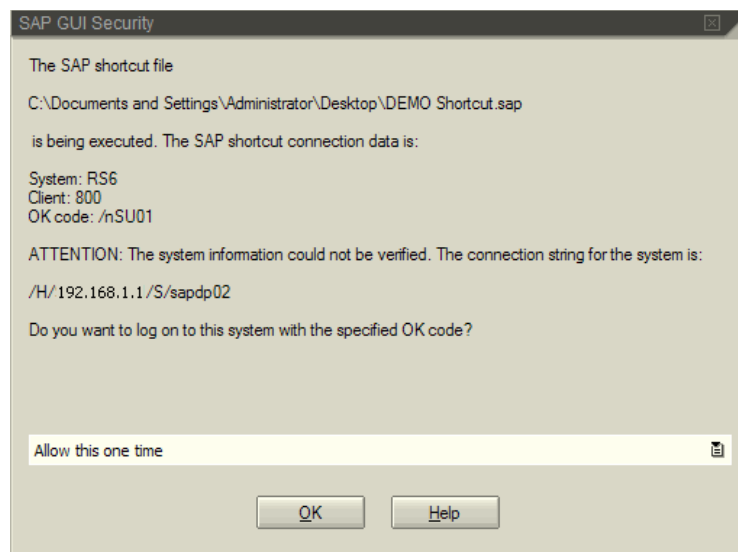
### **c. SAP GUI Security Dialog prompt**

SAP introduced new security workflow into the SAP GUI for Windows application. This may have an effect on end users with AccessAgent installed and are using SAP GUI for Windows AccessProfile.

When launching SAP GUI or SAP Shortcuts, a prompt similar to the following figures may appear prior to any logon window being shown:



*Figure 19: SAP GUI Security dialog when logging in to SAP System*



*Figure 20: SAP GUI Security dialog when launching SAP Shortcut*

The recommended user action is to select *Always allow* or *Allow this one time* so that the appropriate SAP System connection can be established successfully.

If you require a system-wide policy to handle this dialog, SAP Help has more details and instructions for setting it up. Also refer to SAP Note #1526048 - *SAP GUI Security: Enhancements for patch 4*.

### **d. Authentication Services Saved as Personal Type**

The default behavior of the AccessProfile is to save all credentials into the wallet as Personal Type Authentication Service.

If you require the ability to set authentication service policies in IMS, then the authentication services must be converted to Enterprise type first. Please refer to the *Setup Guide for IMS* and also [IBM Technote #1504803](#) for details and instructions.

### ***e. Authentication Service Id Naming Convention***

The default naming convention used by the AccessProfile is in the following form:  
[Description]\_[Application Server / Message Server / Router]

For example, the authentication service Id for Figure 3 is: *DEM Demo Server\_demoserver*

This setting should be appropriate for most environments. However, you can change the naming convention used by the AccessProfile if required. In the profile\_SAP\_Logon AccessProfile, you must edit the script that gets executed between “state\_relaunch” state and “state\_wait\_for\_launch\_again” state. At the beginning of the script, edit the following line:

```
strAuthService = global_profile_sap_logon_desc & "_" & strAuthService
```

The statements to the right side of the equals sign “=” can be replaced with any combination of variable names in Table 5. The resulting statement must be a valid VBScript syntax.

You must duplicate the changes to the naming convention in the script that is executed between the “state\_setup” state and “SAP\_Shortcut\_Window\_Displayed” state found in profile\_SAP\_GUI AccessProfile.

*Table 5: Available variables for use with Authentication Service Id naming*

| <b>Variable Name</b>               | <b>Description</b>                                        |
|------------------------------------|-----------------------------------------------------------|
| global_profile_sap_logon_server    | The application server                                    |
| global_profile_sap_logon_router    | Router to the application and message server              |
| global_profile_sap_logon_mssysname | 3-character abbreviation of SAP system ID                 |
| global_profile_sap_logon_database  | SAP database number                                       |
| global_profile_sap_logon_mssrvname | Host name of the message server                           |
| global_profile_sap_logon_mssrvport | The port number of the TCP link                           |
| global_profile_sap_logon_desc      | Description of an SAP link as it appears in the SAP Logon |
| global_profile_sap_logon_origin    | Type of entry: MS_SEL_GROUPS, MS_SEL_SERVER or USEREDIT   |

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