Scripting Tracker

Development Tool for SAP GUI Scripting
Version 6.10

Scripting Tracker is a utility to support the development of SAP GUI Scripting. The UI of the program is designed to offer a better overview by splitting up the work space into tabs. The Analyzer tab shows a well arranged tree with all SAP sessions and their scripting objects. Also it shows for each scripting object, after the selection in the tree with a single mouse click, a lot of technical details like ID, position etc. The Recorder tab shows a basic editor to load, edit and execute SAP GUI scripts. You can select and use the session you want, to run your script with this session.

The Analyzer offers the possibility to identify each scripting object of the SAP GUI with a red frame. There are two ways to achieve this: The first is to select an object from the hierarchy and to press right mouse button. The second is to select an object from the hierarchy and to press the identify button. Next it is necessary to move the mouse pointer to the selected session window. After the identifying of the scripting object it is possible to copy its technical name, called ID, to the clipboard and to use them in another context. This functionality is equal to the SAP GUI Scripting wizard.

With the Recorder the program offers the possibility to record, edit and execute your SAP GUI activities in PowerShell Windows and PowerShell Core, C# (.NET Framework and .NET), VB.NET, Python, JShell for Java, AutoIt, Visual Basic for Applications (VBA), Visual Basic Script (VBS) via Windows Script Host (WSH) and JScript via WSH. Also you can use the code sequences inside RPA platforms.

Scripting Tracker supports the SAP GUI for Windows, with x86 and x64 architecture, and the NetWeaver Business Client (NWBC) for Desktop.

Current Version from 14.08.2024
First Version from 20.10.2012

Benefit of Scripting Tracker

Under normal circumstances you can do with the SAP GUI Scripting recorder the standard to record and replay your manual SAP GUI activities. But sometimes it is not enough. You need an extra editor to customize your scripts. Also, if you record your script, you have no visual contact to the generated code. It is a blind flying to record your activities. Scripting Trackers recorder has the same functionality as SAP GUI Scripting recorder to record and replay SAP GUI Scripts.

Scripting Tracker brings more transparency. With the recorder of Scripting Tracker you have full visual control about the generated scripting code. You see in the integrated basic editor each line which is generated from recorder. And you have the possibility to enrich the code automatically with additional information. Scripting Tracker adds comment lines about the transaction, title, dynpro - program name and screen number - and the session number into your source code.

And Scripting Tracker supports different scripting engines. With Scripting Tracker it is possible to use *PowerShell Windows*, *PowerShell Core*, *C# (.NET Framework and .NET)*, *VB.NET*, *Python, Java Shell* (JShell), *AutoIt, Visual Basic for Applications (VBA), VBScript (VBS) of Windows Script Host (WSH) and JScript via WSH*. You can record and replay sources of this engines. These different platforms offers now a wide base for total new integration scenarios. With Scripting Tracker it is now easy possible to integrate SAP GUI activities.

Microsoft stops with Windows 7 the delivery of the agents, also known as wizards. But the SAP GUI Scripting tools needs it. Therefore the SAP stops, with the SAP GUI for Windows release 7.20 patch level 9, also the support of the SAP GUI Scripting tools - you can find more information at OSS note 1633639. The Analyzer of Scripting Tracker is an alternative. Scripting Trackers Analyzer has the same functionality as SAP GUI Scripting wizard to identify the scripting objects. It shows all scripting objects in a clearly well arranged tree and, after a selection of one object, a lot of technical details or its position on the GUI with a red frame of the scripting object.

Scripting Tracker supports different SAP UI strategies. Primary it supports SAP GUI Scripting with SAP GUI for Windows, but also with NetWeaver Business Client (NWBC) for Desktop. And it works with Windows 11 and higher. It should also work with Windows 7 and higher, but that is no longer checked.

On the one hand Scripting Tracker optimizes your development process with SAP GUI Scripting. And on the other hand Scripting Tracker offers new horizons of integration between an SAP system and your presentation server. After all, Scripting Tracker brings you a step forward in independence and it increases your efficiency with SAP GUI Scripting.

Supported Languages of Scripting Tracker

Scripting Tracker supports the languages

- PowerShell Windows
- PowerShell Core
- C# (.NET Framework, .NET 6 and 8)
- VB.NET (.NET Framework)
- Python
- JShell (Java Shell)
- AutoIt
- Visual Basic for Applications (VBA) or VBScript (VBS) of the Windows Script Host (WSH)
- JScript of the Windows Script Host (WSH)

To use Scripting Tracker it is necessary to enable and allow the execution of PowerShell on the presentation server, or you can install and use PowerShell Core, AutoIt or Python scripting engine as well as JShell. To use C# with .NET 6 or .NET 8 it is necessary to install the appropriate SDK.

Hint: PowerShell Windows is in a normal case available on any Windows system, but it is necessary to set the execution policy.

Hint: It is not recommended to use VBScript or JScript. These are a deprecated script languages that are no longer being developed. Yes, there are many examples on the internet, especially in VBScript, that can be used, but basically PowerShell should be used for every new development. SAP has described the effects in Note 3484031 - Upcoming deprecation of VBScript by Microsoft - impact on SAP GUI Scripting.

Enable SAP GUI Scripting

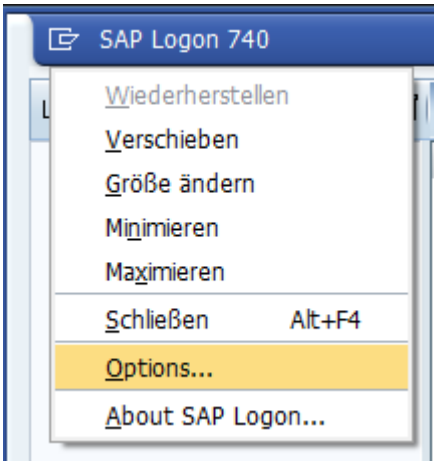
Scripting Tracker uses SAP GUI for Windows with the SAP GUI Scripting API. So it is necessary to enable SAP GUI Scripting on the application and presentation server.

Hint: If the SAP GUI Scripting is disable on one application server, you don't see its sessions in the tree.

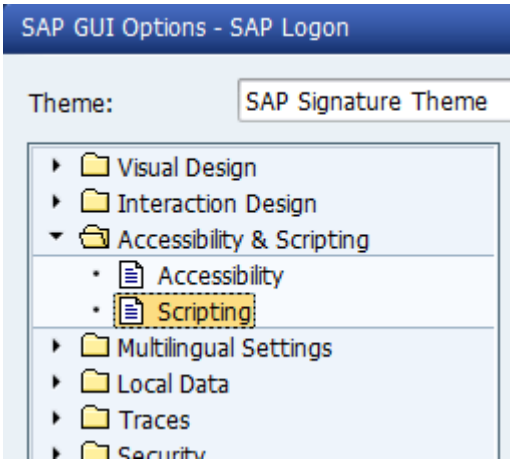
On Presentation Server
On Application Server

Enable SAP GUI Scripting - On Presentation Server

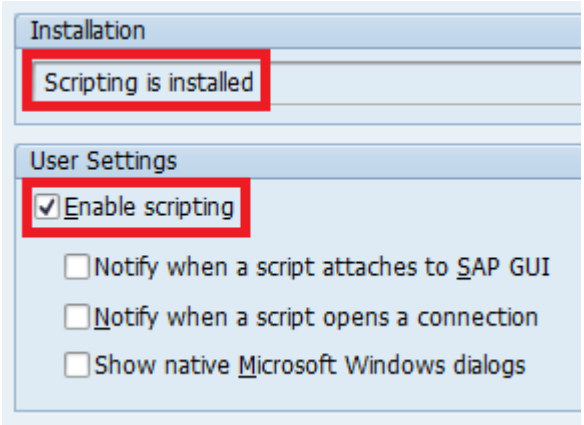
- Choose the menu item Options... from the system menu of the SAP® Logon.



- Choose the node Scripting.



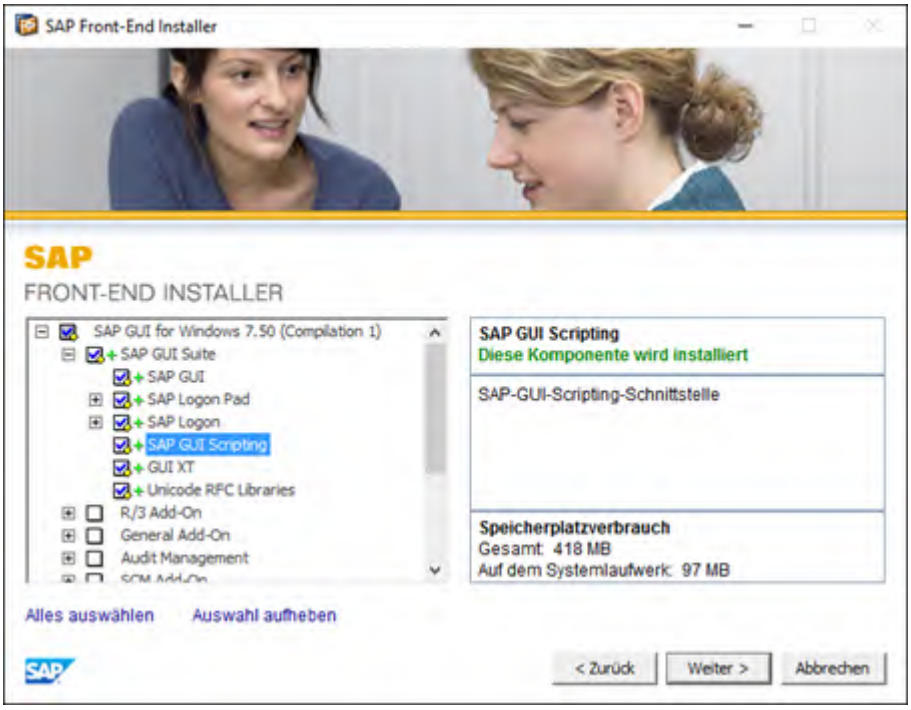
- The Scripting must be installed and activated.



Hint: It is necessary to disable the notifications, otherwise you got a requester for each script execution.

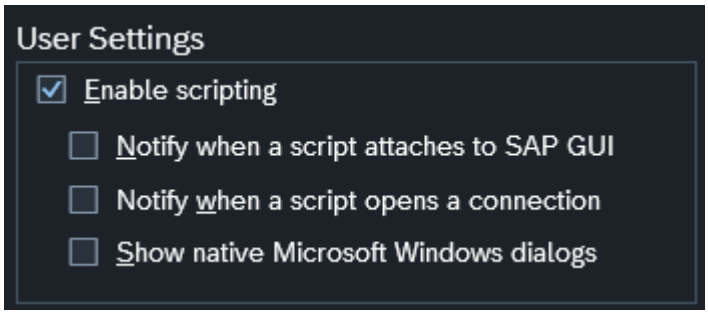
Hint: It is necessary to disable the using of native Windows dialogs. On this way the native Windows dialogs, e.g. like Save as or Open, are replaced with a dynpro-based dialog. So you have the possibility to record your activities also with these dialogs.
An example how it works in the SAP back-end is here available.

Hint: The SAP GUI Scripting is an optional component from the SAP GUI Suite, so it is possible to install the SAP GUI Suite without SAP GUI Scripting and therefore it is necessary to check it.



Registry Entries of the SAP GUI Scripting on the Presentation Server

You can find more information about SAP GUI family at the Wiki.



Enable Scripting
HKEY_CURRENT_USER\Software\SAP\SAPGUI Front\SAP Frontend Server\Security\UserScripting
from type REG_ DWORD, Default: 1, 0 = inactive, 1 = active

Notify when a script attaches to SAP GUI
HKEY_CURRENT_USER\Software\SAP\SAPGUI Front\SAP Frontend Server\Security\WarnOnAttach
from type REG_DWORD, Default: 1, 0 = inactive, 1 = active

Notify when a script opens a connection
HKEY_CURRENT_USER\Software\SAP\SAPGUI Front\SAP Frontend Server\Security\WarnOnConnection
from type REG_DWORD, Default: 1, 0 = inactive, 1 = active

Show native MS Windows dialogs
HKEY_CURRENT_USER\Software\SAP\SAPGUI Front\SAP Frontend Server\Scripting\ShowNativeWinDlgs
from type REG_DWORD, Default: 0, 0 = inactive, 1 = active

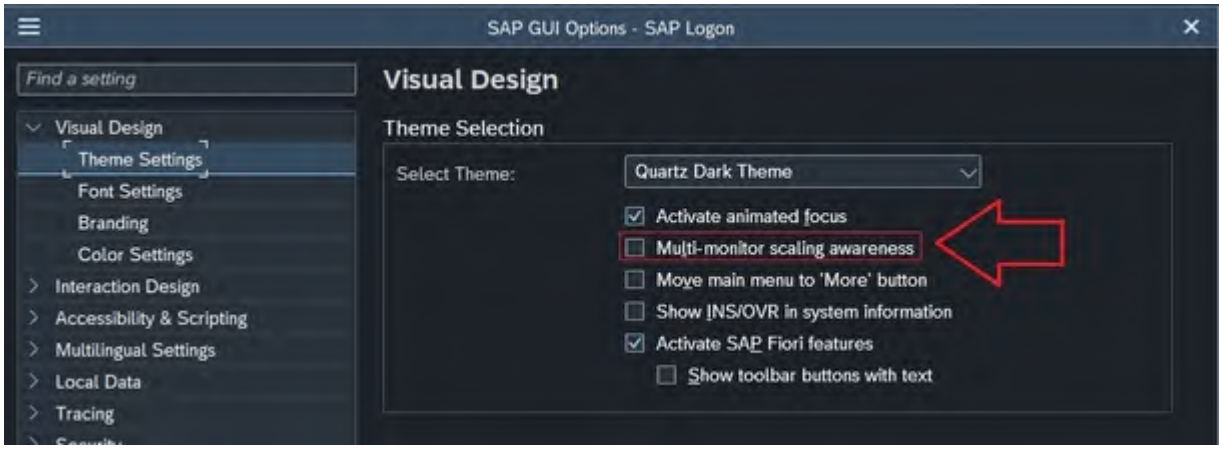
Registry Entries - File Save Dialog

In the ABAP code of the method FILE_SAVE_DIALOG from the class CL_GUI_FRONTEND_SERVICES is an example available how the registry entry ShowNativeWinDlgs is requested. At first a method is called which detects is scripting is active or not. If it is active it calls the function module GUI_FILE_SAVE_DIALOG, instead of FileSaveDialog of the SAPInfo Control module, which calls the native Windows dialog. This works independently from the SAP GUI for Windows version and from its settings.

```
call method IS_SCRIPTING_ACTIVE receiving result = rt_value EXCEPTIONS others
= 1.

if rt_value = 1.

* check the registry key
  call method cl_gui_frontend_services=>registry_get_dword_value
    exporting root = cl_gui_frontend_services=>HKEY_CURRENT_USER
              key = 'Software\SAP\SAPGUI Front\SAP Frontend Server\Scripting'
              value = 'ShowNativeWinDlgs'
    importing reg_value = RCCU
    exceptions
      others = 1.

  call method cl_gui_frontend_services=>registry_get_dword_value
    exporting root = cl_gui_frontend_services=>HKEY_LOCAL_MACHINE
              key = 'Software\SAP\SAPGUI Front\SAP Frontend Server\Scripting'
              value = 'ShowNativeWinDlgs'
    importing reg_value = RCLM
    exceptions
      others = 1.

  call method cl_gui_cfw=>flush.

  if RCCU = 0 or ( RCCU ne 1 and RCLM ne 1 ).
    RT_VALUE = 'X'.
    call FUNCTION 'GUI_FILE_SAVE_DIALOG'
      exporting
        WINDOW_TITLE      = WINDOW_TITLE
        DEFAULT_EXTENSION = DEFAULT_EXTENSION
        DEFAULT_FILE_NAME = DEFAULT_FILE_NAME
        WITH_ENCODING     = WITH_ENCODING
        INITIAL_DIRECTORY = INITIAL_DIRECTORY
        FILE_FILTER       = FILTER
      importing
        FULLPATH      = FULLPATH
        FILE_ENCODING = FILE_ENCODING
        USER_ACTION   = USER_ACTION.
  endif.

endif.
```

Multi-monitor Scaling on Presentation Server

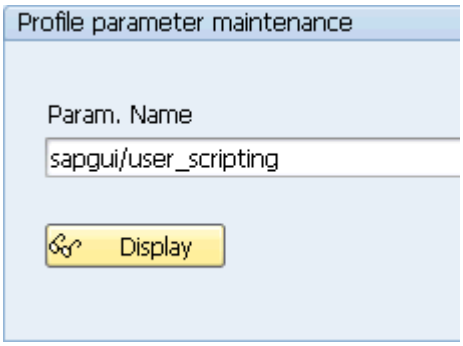
The SAP GUI for Windows supports multi-monitor scaling. If scaling is enabled and different monitors are operated with scaling factors other than 100%, it may be that the identifying and the visualization, with the read frame, is out of position. The highlighted fields won't match the cursor's position. That has nothing to do with Scripting Tracker. To prevent this, close all SAP windows, incl. SAP Logon itself, and set the DPI scaling of all monitors to 100% (means, no scaling) in the Windows display setting.



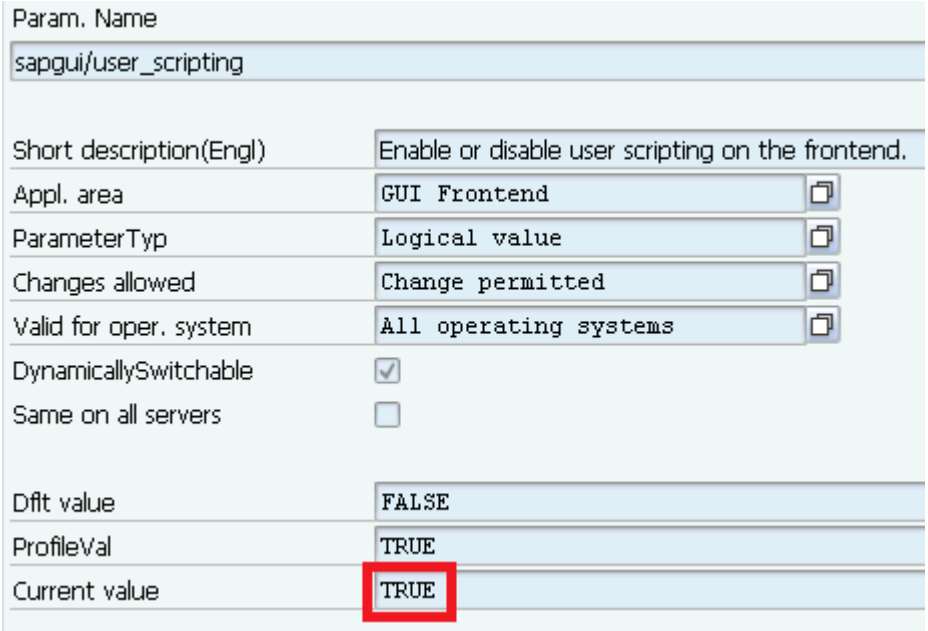
Enable SAP GUI Scripting - On Application Server

- Use the transaction code RZ11 in the ok field.

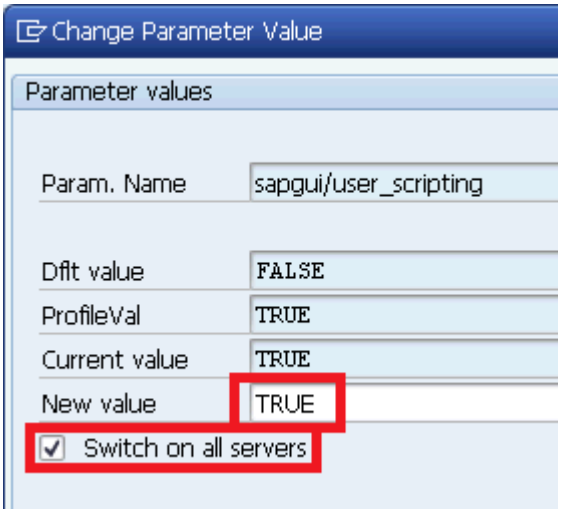
- Use the profile parameter sapgui/user_scripting and press the Display button.



- The current value must be TRUE.

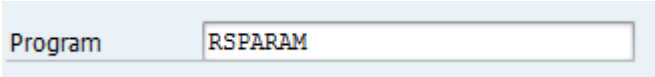


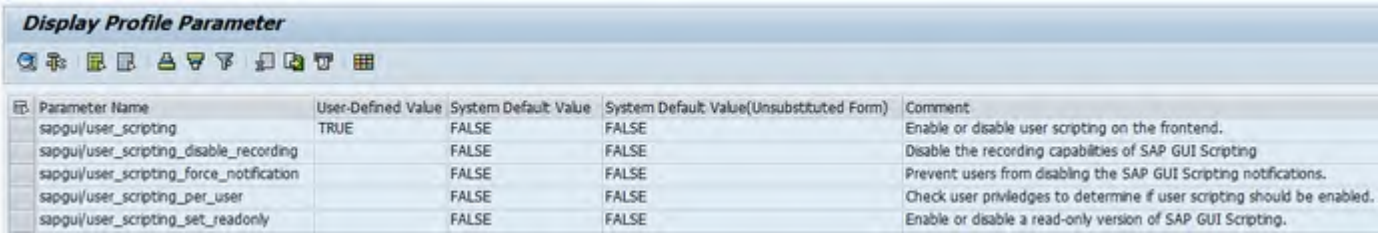
If it is FALSE, press the Change Value button and change it to TRUE on all servers.



Important hint: It is necessary to use only uppercase characters.

- Or to view all profile parameters use the report RSPARAM with transaction code SA38 or SE38.





Parameter Name	User-Defined Value	System Default Value	System Default Value(Unsubstituted Form)	Comment
sapgui/user_scripting	TRUE	FALSE	FALSE	Enable or disable user scripting on the frontend.
sapgui/user_scripting_disable_recording		FALSE	FALSE	Disable the recording capabilities of SAP GUI Scripting
sapgui/user_scripting_force_notification		FALSE	FALSE	Prevent users from disabling the SAP GUI Scripting notifications.
sapgui/user_scripting_per_user		FALSE	FALSE	Check user priviledges to determine if user scripting should be enabled.
sapgui/user_scripting_set_readonly		FALSE	FALSE	Enable or disable a read-only version of SAP GUI Scripting.

- To set the profile parameter permanent, change to the directory SAP\<SID>\SYS\profile and append to the file <SID>_<INSTANCE>_<HOST> e.g. NSP_DVEBMGS00_ABAP the line sapgui/user_scripting = TRUE.

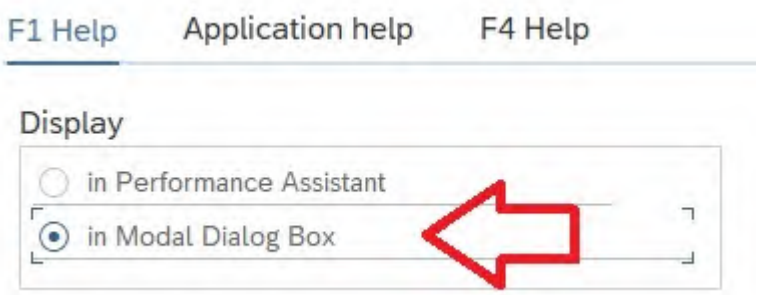
- You can control the SAP GUI Scripting via the following profile parameters:
  `sapgui/user_scripting` = Enable or disable user scripting on the frontend (TRUE)
  `sapgui/user_scripting_disable_recording` = Disable the recording capabilities of SAP GUI Scripting (FALSE)
  `sapgui/user_scripting_force_notification` = Prevent users from disabling the SAP GUI Scripting notifications (FALSE)
  `sapgui/user_scripting_per_user` = Check user priviledges to determine if user scripting should be enabled (FALSE)
  `sapgui/user_scripting_set_readonly` = Enable or disable a read-only version of SAP GUI Scripting (FALSE)

Personal Settings on the Application Server

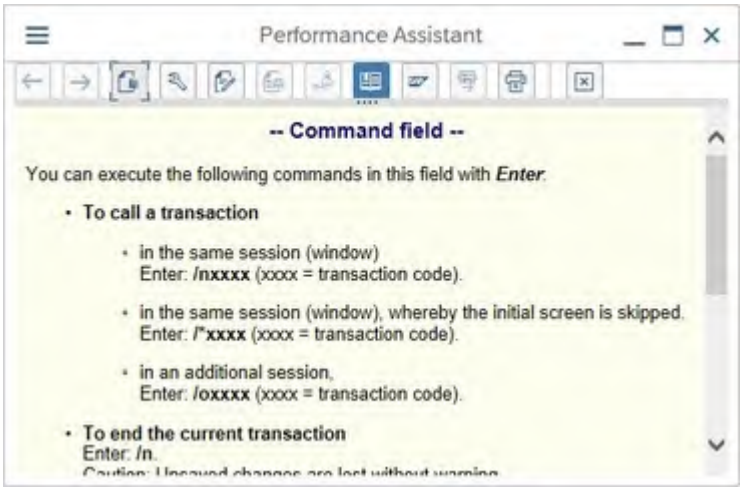
In the menu Help > Settings of the SAP GUI for Windows there is the possibility to customize personal settings. To ensure the automation of the F1 and F4 help, settings must be made at this point.

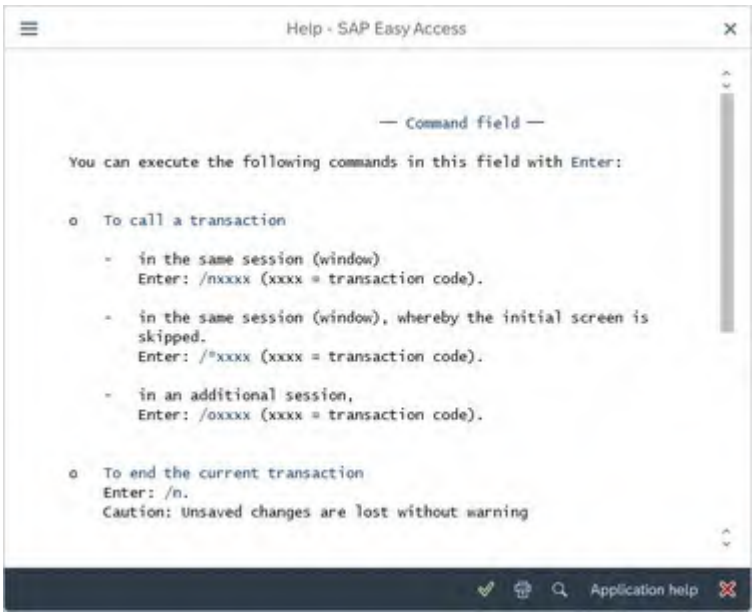
F1 Help

If it is necessary to automate the F1 help, switch from the Performance Assistant to the Modal Dialog Box.



The difference between the Performance Assistant and the Modal Dialog Box is, that the Performance Assistant is an ActiveX control which is not supported by SAP GUI Scripting.

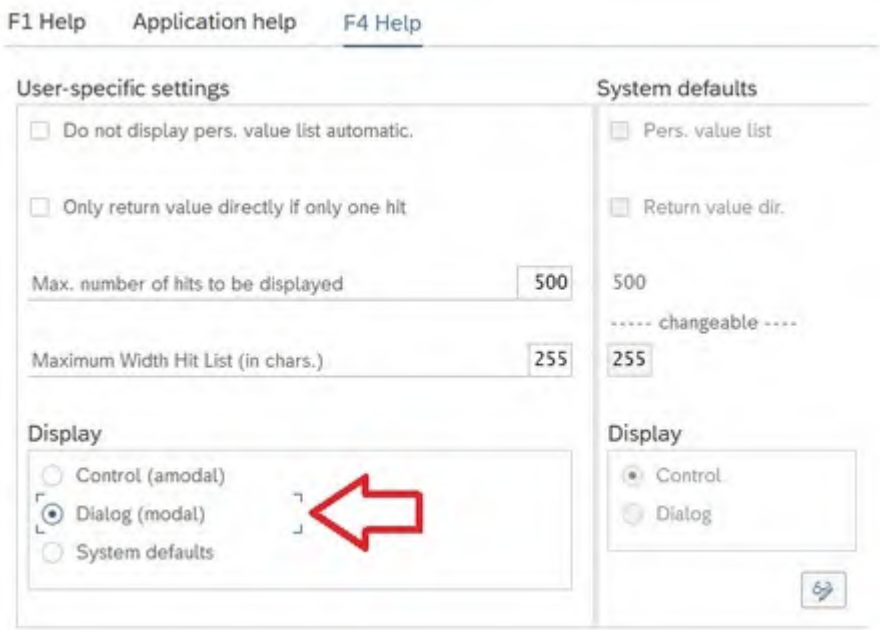




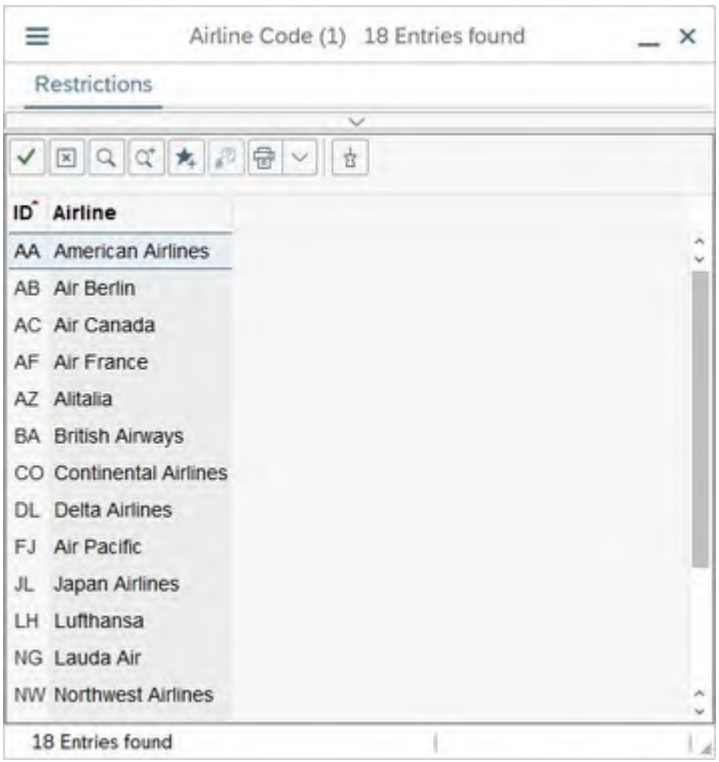
Hint: Only in exceptional cases should it be necessary to automate the F1 help.

F4 Help

To use the F4 help, in the context of an automation, it is necessary to select the Dialog (modal) option in the Display settings.



The difference between the Control (amodal) and the Dialog (modal) is, that the Control (amodal) is an ActiveX control which is not supported by SAP GUI Scripting.



Hint: To test the different dialogs use TAC SE38 with the report DEMO_SELECTION_SCREEN_F4.

Program

Menu
Toolbar
Analyzer
Recorder
  Console
Scripting API
Composer
Comparator
DumpState
Customizing
Notes
Statusbar
Keyboard Shortcuts
Preference file
Snippets file
Unpack Tracker.zip

Program - Menu

Menu	Description
File Exit	Quits Tracker
Tools Scan	Scans scripting objects of all sessions
Tools Always on top	Tracker window always on top
Tools Running Object Table (ROT)...	Opens a dialog which shows the display names of the running instances which are registered in the running object table (ROT).
Tools Export SAP GUI Scripting API...	Saves the SAP GUI Scripting API as CSV file.
Help Help...	Opens this help file
Help SAP GUI Scripting help...	Optional menu item. If the file SAPGUIScripting.chm is in the same directory as Tracker it will be shown. It opens this SAP® GUI Scripting help file.
Help AutoIt help...	Optional menu item. If the keyword AutoItHelp in the ScriptingEngines section of the preference file is set to the AutoIt help file in CHM format, this will be open.
Help About...	Shows an additional window with information about Tracker

Program - Toolbar

Item	Description
Scan scripting objects of all sessions	Actualize the content of the tree. The progress bar under the toolbar shows the scan activities.
Tracker window always on top	This is a toggle button. It makes the program window sticky on the desktop.
About Tracker...	Shows an additional window with information about Tracker.
Opens help...	Opens this help file.

Program - Analyzer

Item	Description
Identify scripting object from SAP® GUI in Tracker hierarchy	This is a toggle button. Put the session to be analysed in foreground, select any object of this session in Tracker hierarchy and switch the button on. Move the mouse pointer to the session and if it is over an scripting object, the object will be marked with a red frame. Also the scripting object and its technical details will be shown in Tracker.
Find scripting object in Tracker hierarchy	Opens a dialog to input a text to find a scripting object in Tracker hierarchy.
Find next scripting object in Tracker hierarchy	Continues the search to find a scripting object in Tracker hierarchy.

Right Mouse Click in the Analyzer Tree

A right mouse click on a session item opens a popup menu.

Menu	Description
Window in foreground	Brings the selected session window in foreground.
Get information	Shows a lot of technical information about the selected session in a message box.
Export IDs to clipboard	Exports all IDs or only the IDs of the user screen of the selected session to the clipboard.
Export IDs to file	Exports all IDs or only the IDs of the user screen of the selected session to a file.

A right mouse click on a scripting object visualize this object with a red frame in the SAP® GUI. This means it shows a red frame around the scripting object in the SAP® GUI of the selected item in Tracker hierarchy tree.

Program - Recorder

Item	Description
Clear editor	Clears the editor. If source was changed, the file save dialog will be opened.
Open file...	Opens a dialog to choose a file to load it in the editor.
Save file...	Opens a dialog to save the source code as file.
Save file with standard code...	Opens a dialog to save the source code as file, with additional standard code for SAP GUI Scripting in the head and foot.
Cut to clipboard	Cuts the selected text from the editor to the clipboard.
Copy to clipboard	Copies the selected text to the clipboard.
Paste from clipboard	Pastes text from the clipboard to the actual position of the text cursor.
Undo	Undo the last activity.
Redo	Redo the last activity.
Open source in external editor	Opens the source code with an external editor. If you press the shift button, you add a few lines of code and information. Configure the editors in the section ProgramConfiguration of the Tracker.ini file.
Reload source from external editor	Reloades the source code from an external editor.
Code snippet	Inserts a code snippet from Snippets.xml into the editor at the actual cursor position. Look here for further information.
Playback script	Executes the script from the editor.
Record SAP® GUI Script	Records SAP® activities to a script in the editor.
	Stops the executing of the scripting process.

Stop script process	
or Antimalware scan	Scans the script code via Antimalware Scan Interface (AMSI) before it is stored. Configure the risk level in the section ScriptingEngines of the Tracker.ini file. Use the keyword AMSIAcceptedRiskLevel. Green check = AMSI activated Red cross = AMSI deactivated **Hint:** Activate with the Group Policy Editor (gpedit.msc) the setting Computer Configuration > Administrative Templates > Windows Components > Windows PowerShell > PowerShell Script Block Logging.
Use PowerShell® Windows Script	Records and executes the script as PowerShell® Windows script file. Configure the path and file name of the PowerShell® engine in the section ScriptingEngines of the Tracker.ini file. Use the keyword PowerShell.
Use PowerShell® Core Script	Records and executes the script as PowerShell® Core script file. Configure the path and file name of the PowerShell® engine in the section ScriptingEngines of the Tracker.ini file. Use the keyword PowerShellCore.
Use C#	Records the script as C# code for .NET 6.0 or 8.0.
Use C#	Records the script as C# code for the .NET Framework.
Use VB.NET	Records the script as VB.NET code for the .NET Framework.
Use Python	Records and executes the script as Python source. Configure the path and file name of the Python engine in the section ScriptingEngines of the Tracker.ini file. Use the keyword Python.
Use JShell	Records and executes the script as JShell source. Configure the path and file name of the JShell engine in the section ScriptingEngines of the Tracker.ini file. Use the keyword JShell.
Use AutoIt Script	Records and executes the script as AutoIt script file. Configure the path and file name of the AutoIt engine in the section ScriptingEngines of the Tracker.ini file. Use the keyword AutoIt.
Use VBA or VBS via Windows Script Host	Records the script as Visual Basic for Applications (VBA) or records and executes VBScript (VBS) file via Windows Script Host (WSH).

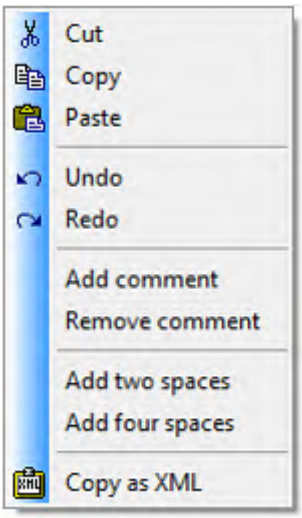
Use JScript via Windows Script Host	Records and executes the script as JScript file via Windows Script Host (WSH).
Additional information in source	Enriches the source with information comment lines about the transaction, title, dynpro - program name and screen number - and the session number.
SAP session	Chooses the SAP session to execute or record the script in it. If a session is selected, the window is set into foreground and some code is added automatically, to identify the connection and session. If no session is chosen the script will be executed as normal script.

Recorder Editor

- With the key combination Alt + Shift + Arrows it is possible to select a block.

Right Mouse Click in the Editor

A right mouse click in the editor opens a popup menu.



Item	Description
Cut to clipboard	Cuts the selected text from the editor to the clipboard.
Copy to clipboard	Copies the selected text to the clipboard.
Paste from clipboard	Pastes text from the clipboard to the actual position of the text cursor.
Undo	Undo the last activity.

Redo	Redo the last activity.
Add comment	Add a comment sign at the begin of the selected lines.
Remove comment	Remove the comment sign from the begin of the selected lines.
Add two spaces	Add two spaces at the begin of the selected lines.
Add four spaces	Add four spaces at the begin of the selected lines.
Copy as XML	Copies the selected text to the clipboard and converts it to XML & to & < to < > to > " to " ' to '

Keyboard Shortcuts

Shortcut	Description
Ctrl + G	Inserts Get-Property code for PowerShell.
Ctrl + I	Inserts Invoke-Method code for PowerShell.
Ctrl + S	Inserts Set-Property code for PowerShell.

Program - Recorder - Console

The Recorder of Scripting Tracker can also be used as independent console application. When the console application is called, the recorded SAP GUI scripting commands are written into the console window.
The recording can be terminated by pressing the Esc key.

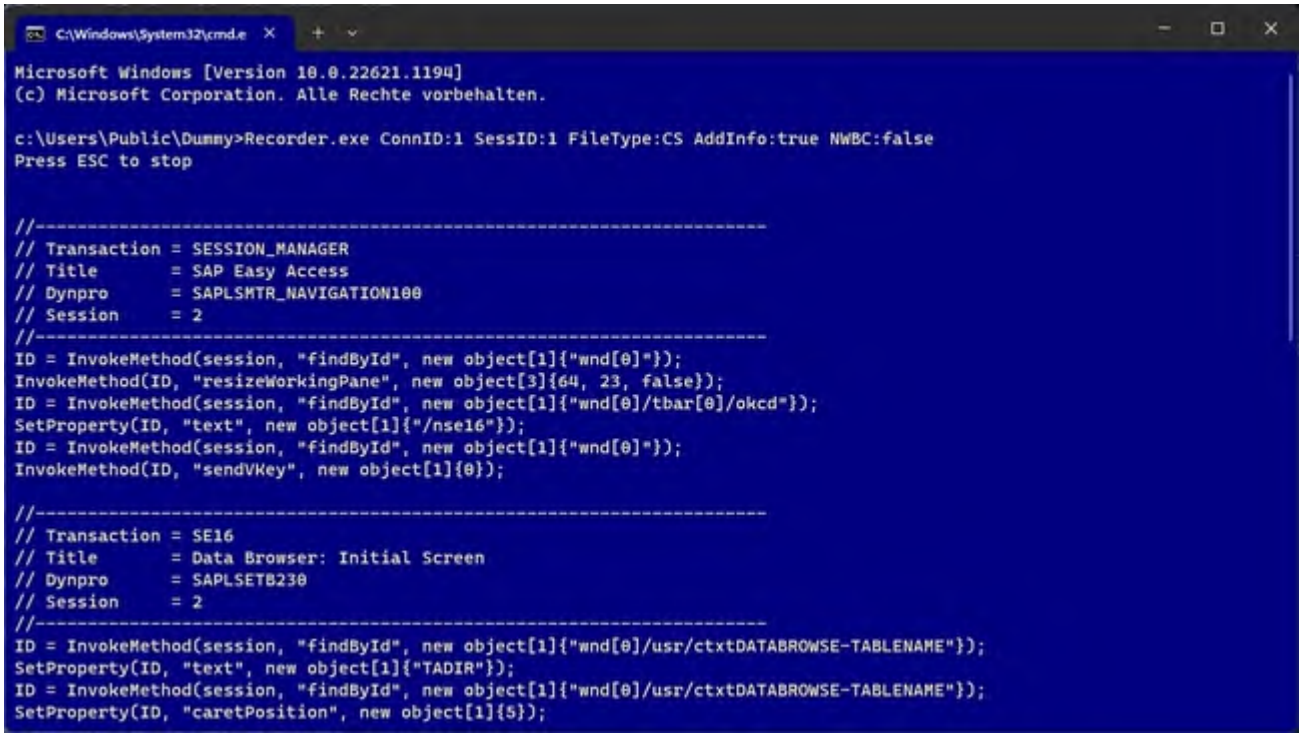
Parameter	Description
ConnID	Connection number as integer, default 0.
SessID	Session number as integer, default 0.
FileType	Type of file as string, default PS1. Permitted values are PS1 for PowerShell, CS for C#, VB for VisualBasic.Net, PY for Python, JAVA for Java, AU3 for AutoIt, VBS for VBScript and JS for JScript.
AddInfo	Flag to add additional information as string, default false or 0. Permitted values are true, 1, false or 0.
NWBC	Flag to automate SAP Business Client as string, default false or 0. Permitted values are true, 1, false or 0.

Examples

Windows Console

```
Recorder.exe ConnID:1 SessID:1 FileType:CS AddInfo:true NWBC:false
```

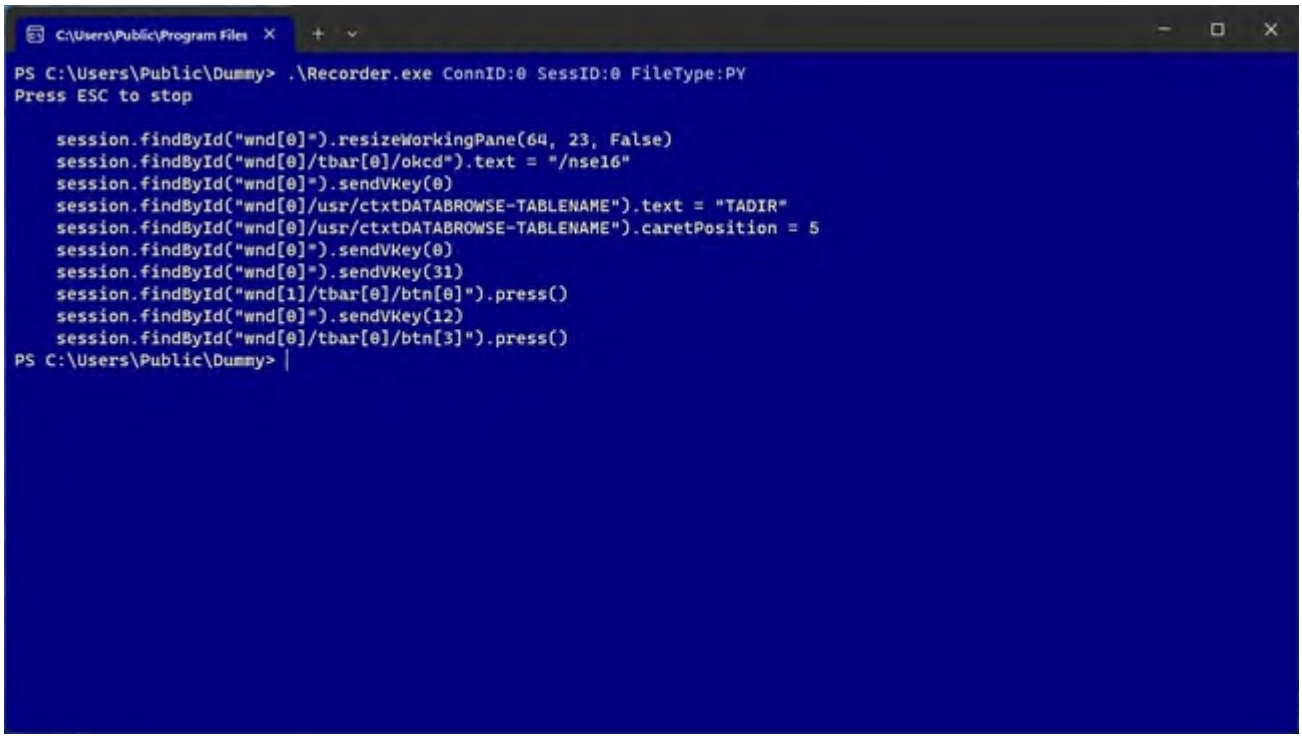
This command executes the Recorder in a console window, to connect to SAP session 1 of connection 1 and records the SAP GUI Scripting commands in C# style with additional information.



PowerShell

```
.\Recorder.exe ConnID:0 SessID:0 FileType:PY
```

This command executes the Recorder in a PowerShell console window, to connect to SAP session 0 of connection 0 and records the SAP GUI Scripting commands in Python style.




```
.\Recorder.exe ConnID:0 SessID:3 FileType:AU3 AddInfo:true >
test.au3
```

This command executes the Recorder in a PowerShell console window, to connect to SAP session 3 of connection 0, records the SAP GUI Scripting commands in AutoIt style with additional information and redirects the output to the file test.au3.

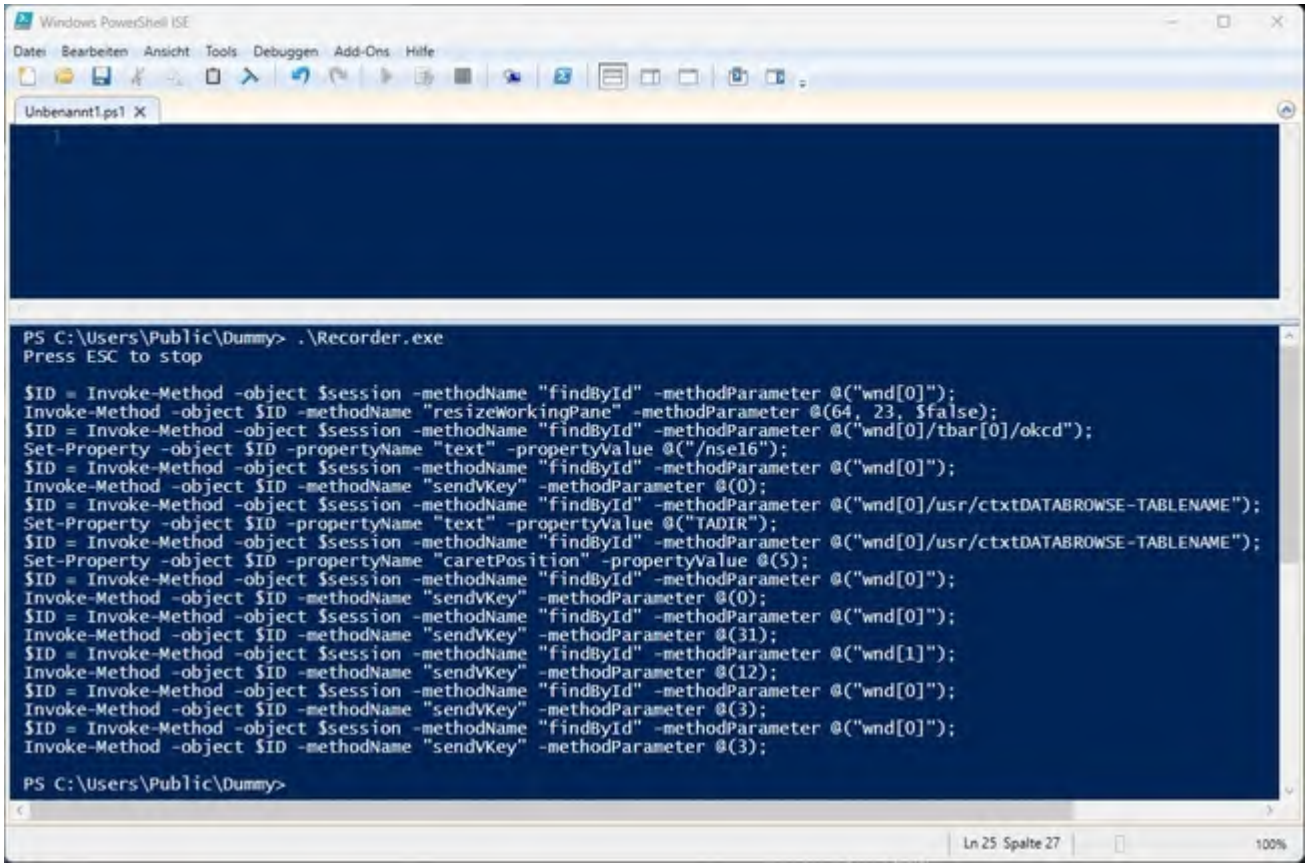
Hint: To terminate the recording process activate the PowerShell console window and press the escape key. Do not forget to delete the first line, which contains `Press ESC to stop`, in the source.

PowerShell ISE

```
.\Recorder.exe
```

This command executes the Recorder in a PowerShell ISE window, with the default parameter values.

Hint: To terminate the recording process activate the PowerShell console window and press the Ctrl and Break key. Do not forget to delete the first line, which contains `Press ESC to stop`, in the source.



Bash

```
./Recorder.exe ConnID:3 SessID:1 FileType:VB
```

This command executes the Recorder in a bash console window, to connect SAP session 1 of connection 3 and records the SAP GUI Scripting command in VB.NET style.

```
/cygdrive/c/Users/Public/Dummy

Stefan@DESKTOP-URF232C /cygdrive/c/Users/Public/Dummy
$ ./Recorder.exe ConnID:3 SessID:1 FileType:VB
Press ESC to stop

session.findById("wnd[0]").resizeWorkingPane(64, 23, vbFalse)
session.findById("wnd[0]/tbar[0]/okcd").text = "/nse16"
session.findById("wnd[0]").sendVKey(0)
session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = "TADIR"
session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").caretPosition = 5
session.findById("wnd[0]").sendVKey(0)
session.findById("wnd[0]").sendVKey(31)
session.findById("wnd[1]/tbar[0]/btn[0]").press
session.findById("wnd[0]/tbar[0]/btn[3]").press
session.findById("wnd[0]").sendVKey(3)

Stefan@DESKTOP-URF232C /cygdrive/c/Users/Public/Dummy
$ |
```

```
./Recorder.exe
```

This command executes the Recorder in a bash console window, to connect SAP session 0 of connection 0 and records the SAP GUI Scripting commands in PowerShell style. In this example we use the default values ConnID 0, SessID 0, FileType PS1 for PowerShell, AddInfo false and NWBC false.

```
/cygdrive/c/Users/Public/Dummy

Stefan@DESKTOP-URF232C /cygdrive/c/Users/Public/Dummy
$ ./Recorder.exe
Press ESC to stop

$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[0]");
Invoke-Method -object $ID -methodName "resizeWorkingPane" -methodParameter @(64, 23, $false);
$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[0]/tbar[0]/okcd");
Set-Property -object $ID -propertyName "text" -propertyValue @("/nse16");
$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[0]");
Invoke-Method -object $ID -methodName "sendVKey" -methodParameter @(0);
$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[0]/usr/ctxtDATABROWSE-TABLENAME");
Set-Property -object $ID -propertyName "text" -propertyValue @("TADIR");
$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[0]/usr/ctxtDATABROWSE-TABLENAME");
Set-Property -object $ID -propertyName "caretPosition" -propertyValue @(5);
$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[0]");
Invoke-Method -object $ID -methodName "sendVKey" -methodParameter @(0);
$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[0]");
Invoke-Method -object $ID -methodName "sendVKey" -methodParameter @(31);
$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[1]/tbar[0]/btn[0]");
Invoke-Method -object $ID -methodName "press";
$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[0]/tbar[0]/btn[3]");
Invoke-Method -object $ID -methodName "press";
$ID = Invoke-Method -object $session -methodName "findById" -methodParameter @("wnd[0]");
Invoke-Method -object $ID -methodName "sendVKey" -methodParameter @(3);

Stefan@DESKTOP-URF232C /cygdrive/c/Users/Public/Dummy
$
```

```
./Recorder.exe FileType:Java > test.java
```

This command executes the Recorder in a bash console window, to connect SAP session 0 of connection 0, records the SAP GUI Scripting commands in Java style and redirects the output to the file test.java.

Hint: To terminate the recording process activate the console window and press the escape key. Do not forget to delete the first line, which contains `Press ESC to stop`, in the source.

Program - Scripting API

The Scripting API shows in a tree all classes, with its methods and properties, and the enumerations of the SAP GUI Scripting API. Also it shows the arguments and the types of the methods and properties, also the constants of the enumerations. With a double click on a node the text is copied into the clipboard. With a single right click you open the SAP GUI Scripting API help. It is necessary to set the sapfewse variable in the preference file, here it must set the path to sapfewse.ocx file, e.g. like `C:\Program Files (x86)\SAP\FrontEnd\SAPgui` for the 32-bit version or `C:\Program Files\SAP\FrontEnd\SAPgui` for the 64-bit version. In the section below you see the Scripting API sorted by methods and properties, to see in which classes are they available. With a double click on one of the classes it will open the class in the tree above.

Program - Composer

With the composer is it possible to arrange all snippets on an easy way. Choose the type of UI and the programming language. Now you can choose the snippet you like which is inserting at the actual caret position.

Item	Description
Clear editor	Clears the editor.
Open file...	Opens a dialog to choose a file to load it in the editor.
Save file...	Opens a dialog to save the source code as file.
Cut to clipboard	Cuts the selected text from the editor to the clipboard.
Copy to clipboard	Copies the selected text to the clipboard.
Paste from clipboard	Pastes text from the clipboard to the actual position of the text cursor.
Undo	Undo the last activity.
Redo	Redo the last activity.
C# to PowerShell	Converts selected C# WebDriver code to PowerShell convention
UTF8 / ASCII	Encoding of the file, default UTF8.

SAPGUI

A set of snippets to handle SAP® GUI for Windows UI automation via SAP® GUI Scripting API. These are the same snippets as in the recorder.

Web

A set of snippets to handle web UI automation via Selenium.

- Selenium
- Chrome Browser (Offline Installer)
- Chrome WebDriver or from Storage
- Firefox Browser
- Mozilla Gecko WebDriver
- Edge WebDriver
- Katalon Automation Recorder or from Chrome Web Store

Mobile

A set of snippets to handle mobile UI automation for Android devices via Appium.

- Appium
- Appium Client Library (Selenium Webdriver extension for Appium)
- Selenium WebDriver (Supporting browser automation)
- Selenium WebDriver Support (Supporting Selenium WebDriver)
- Newtonsoft JSON (JSON framework for .NET)
- Castle Core (DynamicProxy, Logging Abstractions and DictionaryAdapter)

Program - Comparator

Item	Description
Compare screen elements	Compares the selected screens to find different screen elements. This functionality compares the ID, the type and the changeable attribute. If a file is selected, only the IDs are compared.

Program - DumpState

Hint: DumpState ist a method of the GuiVComponent object.

Item	Description
Dump Dumps the state of an object	Delivers a hierarchy of collections with information about the state of an object. The parameter InnerObject may be used to secify for which internal object the data should be dumped. The most complex components supports this parameter. In the most cases it is an empty string. The following OpCodes are used: • GPR = Get Property and Return value • MR = Method and Return value • GP = Get Property • M = Method

Examples

- Call transaction `SESSION_MANAGER` in the SAP GUI for Windows, this is the start screen. Choose in the Analyzer the tree shell and copy the ID in the clipboard. Switch to DumpState, paste the ID and press the Dump button. Now all OpCodes are displayed.

- Call transaction `SE38` with the report `SAP_PICTURE_DEMO`. Choose in the Analyzer the picture shell and copy the ID in the clipboard. Switch to DumpState, paste the ID and press Dump button. Now all OpCodes are displayed.

Program - Customizing

The button "Edit Preference File" opens the Note tab and the Tracker.ini file.
The button "Edit Snippet File" opens the Note tab and the Snippet.xml file.

Program

- Path for temporary files
  With the customizing is it possible to change the path of the temporary files on the runtime of Scripting Tacker on restricted areas.

- Delete temporary files

- Execute script without session
  Here you can decide if you want to executes the scripts without a choosen session.

- Add SAP® standard code in source
  If this checkbox is enabled, Tracker enriches the external source file with standard code.

PowerShell

- Minimized window style for PowerShell session
  Sets the window style of PowerShell to minimized.

- PowerShell session does not exit after running
  Does not close the PowerShell session after executing.

C#

- Use lambda expressions instead of methods
  To use late binding a set of methods is used, with this option a set of lambda expressions is used instead. The generated source code of the main routine can then be copied directly into the UiPath Invoke Code activity. Uncomment the lines and delete the following line and add a variable from the type Microsoft.VisualBasic.

Python

- Python session does not exit after running
  Does not close the Python session after executing.

JShell

- JShell session does not exit after running
  Does not close the JShell session after executing.

WScript

- Use CScript instead of WScript
  Use console application instead of windows application.

- Shows the registry information about the customizing of enabling Windows Script Host in SysWOW64 node for x86 application, value of `Enabled` in path `SOFTWARE\Microsoft\Windows Script Host\Settings`.

SAP GUI Scripting User Settings

Shows a few registry information about the customization of SAP GUI Scripting in SysWOW64 node for x86 application. You can find more information here.

- Enable Scripting
- Notify when a script attaches to SAP GUI
- Notify when a script opens a connection
- Show native Microsoft Windows dialogs

Program - Notes

Notes is nothing more than a tiny editor where you can store different text informations.

Item	Description
Clear notes	Clears the note.
Open file...	Opens a dialog to choose a file to load it in the note.
Save file...	Opens a dialog to save the note as file.
Cut to clipboard	Cuts the selected text from the note to the clipboard.
Copy to clipboard	Copies the selected text to the clipboard.
Paste from clipboard	Pastes text from the clipboard to the actual position of the text cursor.
Undo	Undo the last activity.
Redo	Redo the last activity.
UTF8 / ASCII	Encoding of the file, default UTF8.

Program - Statusbar

The statusbar on the bottom of the UI is segmented in four areas:

1. Status of the program - Ready or Active.
2. Version of the SAP GUI Scripting.
3. SAPGUI if an instance exists.
4. SAPGUISERVER if one or more instances exists, and in brackets the number of instances.
5. Message from Anti Malware Scan Interface (AMSI)

Program - Keyboard Shortcuts

Shortcut	Description
Alt + S	Scans the SAP® GUI Scripting objects of all sessions and refresh the content of the tree.
Alt + R	Shrinks the window to the title bar and vis-à-vis.
Alt + Q	Disable the identify scripting object button
Alt + F4	Quits Tracker.
F1	Opens this help file.

Program - Preference file

It is possible to configure Scripting Tracker via the preference file Tracker.ini. The preference file must be in the same directory as Tracker.exe.

The preference file has two sections. With the first `ProgramConfiguration` it is possible to configure Tracker and with the second `ScriptingEngines` it is possible to set the path to the different scripting engines.

- `ProgramConfiguration`

Keyword	Description
EditorFont	Name of the using font in the editor, default `Consolas`.
EditorFontSize	Size of the using font in the editor, default `10`.
EditorExternalWSH	Path and name of the VisualBasic® editor, default notepad.exe.
EditorExternalAU3	Path and name of the AutoIt editor, default notepad.exe.
EditorExternalPS1	Path and name of the PowerShell® Windows editor, default C:\Windows\System32\WindowsPowerShell\v1.0\powershell_ise.exe.
EditorExternalCorePS1	Path and name of the PowerShell® Core editor, default notepad.exe.
EditorExternalCS	Path and name of the C# editor, default notepad.exe.
EditorExternalVB	Path and name of the VB.NET editor, default notepad.exe.
EditorExternalPY	Path and name of the Python editor, default notepad.exe.
EditorExternalJSH	Path and name of the JShell editor, default notepad.exe
WindowPosSave	0 or 1 to save the window position, default 0
WindowPosX	X position of the window, default 10
WindowPosY	Y position of the window, default 10
WindowPosWidth	Width of the window, default 800
WindowPosHeight	Height of the window, default 800
sapfewse	Path to SAP® frontend Windows® scripting

	engine (sapfewse.ocx)
CodePage	Number of the codepage for the VBS ANSI files, default 1252
NotesFont	Name of the using font in the notes, default `Calibri`.
NotesFontSize	Size of the using font in the notes, default `12`.

- `ScriptingEngines`

Keyword	**Description**
AutoIt	Path and name of the AutoIt engine.
AutoItHelp	Path and name of the AutoIt help.
PowerShell	Path and name of the PowerShell® Windows engine.
PowerShellCore	Path and name of the PowerShell® Core engine.
Python	Path and name of the Python engine.
JShell	Path and name of the JShell engine.
AMSIAcceptedRiskLevel	The antimalware provider returns a result between 0 and 32767, inclusive an estimated risk level. With this keyword it is possible to set the sensitivity of the risk level. If the risk level is exceeded, a request dialog appears.

- `Tools`

In the `[Tools]` section you have the possibility to implement tools you like in the toolbar of Scripting Tracker. The keyword is shown as tooltip and the value is the program name you want to start.

Hint: You can use for the engines, exception PowerShell, and for the external editor paths the %userprofile% environment variable. This contains the profile directory of the user. Typical path is C:\Users\Username.
You can use for JShell path the %java_home% environment variable.
You can use %programfiles%, %programfiles(x86)%, %windir% and %systemroot% environment variable.

Example:

```
[ProgramConfiguration]
EditorFont = Consolas
EditorFontSize = 11
EditorExternalPS1 = %WINDIR%\sysnative\WindowsPowerShell\v1.0\powershell_ise.exe
EditorExternalCorePS1 = %SYSTEMROOT%\SysWOW64\notepad.exe
EditorExternalCS = %SYSTEMROOT%\SysWOW64\notepad.exe
EditorExternalVB = %SYSTEMROOT%\SysWOW64\notepad.exe
EditorExternalWSH = %SYSTEMROOT%\SysWOW64\notepad.exe
EditorExternalAU3 = %SYSTEMROOT%\SysWOW64\notepad.exe
EditorExternalPY = %SYSTEMROOT%\SysWOW64\notepad.exe
EditorExternalJSH = %SYSTEMROOT%\SysWOW64\notepad.exe
WindowPosSave = 0
WindowPosX = 5
WindowPosY = 10
WindowPosWidth = 640
WindowPosHeight = 760
sapfewse = %PROGRAMFILES(X86)%\SAP\FrontEnd\SAPgui
CodePage = 1252
NotesFont = Calibri
NotesFontSize = 12
[ScriptingEngines]
PowerShell = %WINDIR%\sysnative\WindowsPowerShell\v1.0\powershell.exe
PowerShellCore = %USERPROFILE%\PowerShellCore\pwsh.exe
AutoIt = %PROGRAMFILES(X86)%\AutoIt3\AutoIt3.exe
AutoItHelp = %PROGRAMFILES(X86)%\AutoIt3\AutoIt.chm
Python = %USERPROFILE%\Python\python.exe
JShell = %JAVA_HOME%\bin\jshell.exe
[Tools]
AutoItRecorder = C:\Language\AutoIt\Au3Recorder.exe
```

Program - Snippets file

It is possible to define code snippets via the XML file Snippets.xml. The snippets file must be in the same directory as Tracker.exe.

With the title tag you define the text which is shown in the combobox. With the language tag you define the programming language in whose context the snippet is shown, allowed is here `PowerShell`, `VBNet`, `CSharp`, `WScript`, `AutoIt`, `Python` and `Java`. In the ui tag you can use any type you like, Scripting Tracker uses `SAPGUI`, `Web` and `All`. With the code tag you define the code which is copied into the editor at the actual cursor position.

```
<?xml version="1.0" encoding="ISO-8859-1"?>

<!DOCTYPE snippets [
<!ELEMENT snippets (snippet)+>
<!ELEMENT snippet (title, language, ui, code)>
<!ELEMENT title (#PCDATA)>
<!ELEMENT language (#PCDATA)>
<!ELEMENT ui (#PCDATA)>
<!ELEMENT code (#PCDATA)>
]>

<snippets>

  <snippet>
    <title>Begin</title>
    <language>WScript</language>
    <ui>SAPGUI</ui>
    <code>
'-Begin-----------------------------------------------------------------
</code>
  </snippet>

</snippets>
```

Hint: Don't use comments in the XML file.

Program - Unpack Tracker.zip

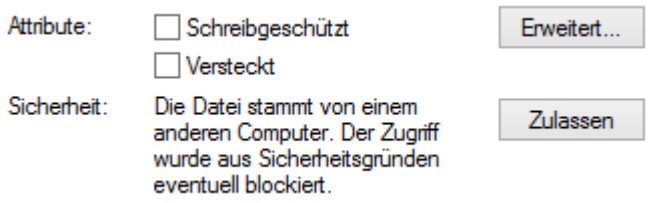
To unpack Tracker.zip use an external unpacker e.g. like 7-Zip. The internal Windows unpacker creates additional files with the extension Zone.Identifier of the unpacked files. These Zone.Identifier files contains information about the source of the file, it is an Alternate Data Stream (ADS). It describes the security zone associated with the file, which may the Internet (3), local intranet (1), trusted site (2), restricted site (4) or local computer (0). Zone identifier files are generated automatically by Internet Explorer and other programs when files are downloaded to a Windows computer. You can see this files with the command `DIR /R`. The content looks e.g. like this:

```
[ZoneTransfer]
ZoneId=3
```

Hint: You can view the file with notepad e.g. like this:

```
notepad Tracker.exe:Zone.Identifier
```

When Tracker.zip is unpacked with an external unpacker, the file properties dialog no longer displays the security notice that the file came from another computer.



Hints, Tips and Tricks

- If you got an error, it is possible that the line number of the error message is different from the line number in the editor, because Tracker adds a few lines header automatically.

- If you want to compile the C# or VB.NET code, you can use the command lines
  `vbc.exe [Name of your script file].vb`
  or
  `csc.exe /reference:Microsoft.VisualBasic.dll [Name of your script file].cs`
  For C# it is necessary to add a reference to Microsoft.VisualBasic.dll.

  You can download the Roslyn .NET compiler platform from the Nuget Gallery:
  https://www.nuget.org/packages/Microsoft.CodeDom.Providers.DotNetCompilerPlatform

- Scripting Tracker uses VBScript® only in the context of Windows® Script Host (WSH). If you want to start the SAP® GUI Script via Customize Local Layout > Script Recording and Playback or via drag-and-drop to the session be sure that you don't use any possibilities of the WSH, otherwise you will get an error.

- The WSH offers a lot of additional possibilities, look at the help file, item Windows Script Host Object Model.

- If the program crashes it tries to write a Panic.sav file in the directory of Scripting Tracker.

- If you use another font size in the display setting as 100%, it could be possible that not all field descriptions are fully visible.

- Do not forget to switch the identify button off.

- If you use Scripting Tracker with Windows PowerShell version 2 you must add the following stub in front of your recorded code, because in PowerShell 2 is the variable `$PSScriptRoot` not available :

  ```
  If ($PSVersionTable.PSVersion.Major -eq 2) {
    $PSScriptRoot = Split-Path $($MyInvocation.InvocationName)
  -Parent
  }
  ```

- Scripting Tracker offers for transparency different information via OutputDebugString
  - External program calls
  - Details about recording
  Use Sysinternals DebugView to get the information.

- If you use the x86 version of the SAP GUI for Windows, it is recommended to use also the x86 version of Scripting Tracker.
  The x64 version of Scripting Tracker works with the x86 version of SAP GUI for Windows, but in this case the Scripting API cannot be parsed. The result is that the Scripting API tab not being displayed.

SAP GUI Scripting - List of Objects

Hint: More transaction codes for testing purposes.

UI Object	Type	Transaction Code / Script / Library
GUIABAPEditor	GuiShell SubType ABAPEditor	SE80 AbapEditorScripting.dll
GUIApoGrid		
GUIApplication	GuiApplication	
GUIBarChart	GuiShell SubType BarChart	SE38 - BARCOCX1 SapBarcScripting.dll
GUIBox	GuiBox	SE38 - DEMO_DYNPRO_SPLITTER_CONTROL
GUIButton	GuiButton	GUIBIBS SE38 - DEMO_DYNPRO_PUSH_BUTTON
GUICalendar	GuiShell SubType Calendar	SE38 - SAPCALENDAR_DEMO1 SapCalenScripting.dll
GUIChart	GuiShell SubType Chart	SE38 - GFW_PROG_TUTORIAL SE38 - GFW_PROG_PIE ChartScripting.dll
GUICheckBox	GuiCheckBox	GUIBIBS
GUICollection	GuiCollection	
GUIColorSelector	GuiShell SubType ColorSelector	SE38 - DEMO_COLORSEL SapSelScripting.dll
GUIComboBox	GuiComboBox	GUIBIBS SE38 - DEMO_DYNPRO_DROPDOWN_LISTBOX ListControlScripting.dll

GUIComboBoxControl		
GUIComboBoxEntry		
GUIComponent		
GUIComponentCollection		
GUIConnection	GuiConnection	
GUIContainer		
GUIContainerShell	GuiContainerShell	SE38 - GRAPHICS_GUI_CE_DEMO
GUIContextMenu		
GUICTextField		
GUICustomControl	GuiCustomControl	SE38 - RSDEMO_CUSTOM_CONTROL
GUIDialogShell		
GUIEAIViewer2D		EAI2DScripting.dll
GUIEAIViewer3D		EAI3DScripting.dll
GUIFrameWindow		
GUIGOSShell	GuiShell SubType ToolBar	SGOSTEST SE38 - GOS_TOOLBOX_TEST
GUIGraphAdapt		
GUIGridView	GuiShell SubType GridView (ALV-Grid)	SE80 - Package SLIS Programs BCALV_GRID* SE38 - BCALV_TEST_SUITE GridViewScripting.dll
GUIHTMLViewer	GuiShell	SE38 - DEMO_CREATE_HTML_MODERN

	SubType HTMLViewer	SE38 - SAPHTML_DEMO1 SE80 - Package SAPHTML Programs SAPHTML_* To try Edge (based on Chromium) use SE38 - RSDEMO_HTML_VIEWER Open, with a right mouse click, the context menu and choose Inspect to open the developer tools, before you load a site. SapHtmlScripting.dll
GUIInputFieldControl	GuiShell SubType Inputfield	SE38 - SAP_LISTBOX_DEMO_TEST ListControlChildScripting.dll
GUILabel	GuiLabel	GUIBIBS
GUIMainWindow	GuiMainWindow	SESSION_MANAGER GUIBIBS
GUIMap		SapMapScripting.dll
GUIMenu	GuiMenu	SESSION_MANAGER
GUIMenuBar		
GUIMessageWindow		
GUIModalWindow	GuiModalWindow	SE38 - DEMO_CALCULATOR_MODERN1 SE37 - POPUP_TO_INFORM
GUINetChart		SapNetzScripting.dll
GUIOfficeIntegration	GuiShell SubType OfficeIntegration	SE38 - SAPRDEMO_FORM_INTERFACE SAPSDCCScripting.dll
GUIOkCodeField	GuiOkCodeField	SESSION_MANAGER
GUIPasswordField	GuiPasswordField	SESSION_MANAGER
GUIPicture	GuiShell SubType Picture	SE38 - SAP_PICTURE_DEMO SapImageScripting.dll
GUIRadioButton	GuiRadioButton	GUIBIBS

GUISapChart		SapChartScripting.dll
GUIScrollbar	GuiScrollbar	GUIBIBS
GUIScrollContainer	GuiScrollContainer	SE38 - DEMO_DYNPRO_SPLITTER_CONTROL
GUISession	GuiSession	
GUISessionInfo	GuiSessionInfo	GuiSessionInfo
GUIShell		
GUISimpleContainer	GuiSimpleContainer	SE38 - DEMO_DYNPRO_SUBSCREENS
GUISplit		SE38 - DEMO_CFW SE38 - DEMO_CFW2 SapSplitScripting.dll
GUISplitterContainer	GuiSplitterContainer	SE38 - DEMO_DYNPRO_SPLITTER_CONTROL
GUIStage		SapStageScripting.dll
GUIStatusbar	GuiStatusbar	GUIBIBS
GUIStatusbarLink		
GUIStatusPane	GuiStatusPane	GUIBIBS
GUITab	GuiTab	GUIBIBS SE38 - DEMO_DYNPRO
GUITableColumn		
GUITableControl	GuiTableControl	GUIBIBS
GUITableRow		
GUITabStrip	GuiTabStrip	SE38 - DEMO_DYNPRO

GUITextEdit	GuiTextEdit	SE80 - Package SAPTEXTEDIT Programs SAPTEXTEDIT_* SE38 - SAP_FULLSCREEN_CONTAINER_DEMO TextEditScripting.dll
GUITextField	GuiTextField	GUIBIBS
GUITitleBar	GuiTitleBar	
GUIToolBar	GuiShell SubType ToolBar	SE38 - BCALV_TREE_DND_MULTIPLE SapToolbScripting.dll
GUIToolBarControl		
GUITree	GuiShell SubType Tree	SE80 - Package SLIS Programs BCALV_TREE* WdtTreeScripting.dll
GUIUserArea	GuiUserArea	
GUIUtils	GuiUtils	GuiUtils
GUIVComponent		
GUIVContainer		
GUIViewSwitchTarget		

SAP GUI Scripting - List Of Objects - GuiSessionInfo

```
#-Begin-----------------------------------------------------------------

$Info = Get-Property -object $session "Info"
$Transaction = Get-Property -object $Info -propertyName "Transaction"
Write-Host "Tansaction:   " $Transaction
$Program = Get-Property -object $Info -propertyName "Program"
Write-Host "Program:      " $Program
$ScreenNumber = Get-Property -object $Info -propertyName "ScreenNumber"
Write-Host "ScreenNumber: " $ScreenNumber
$CodePage = Get-Property -object $Info -propertyName "CodePage"
Write-Host "CodePage:     " $CodePage
$GuiCodePage = Get-Property -object $Info -propertyName "GuiCodePage"
Write-Host "GuiCodePage:  " $GuiCodePage
$I18NMode = Get-Property -object $Info -propertyName "I18NMode"
Write-Host "I18NMode:     " $I18NMode
$Language = Get-Property -object $Info -propertyName "Language"
Write-Host "Language:     " $Language
$IsLowSpeed = Get-Property -object $Info -propertyName "IsLowSpeedConnection"
Write-Host "IsLowSpeed:   " $IsLowSpeed
[Void][Console]::WriteLine("Press key...")
[Void][Console]::ReadKey("NoEcho,IncludeKeyDown")

#-End-------------------------------------------------------------------
```

SAP GUI Scripting - List of Objects - GuiUtils

```
#-Begin-----------------------------------------------------------------

$Utils = Get-Property -object $application -propertyName "Utils"
$hFile = Invoke-Method -object $Utils -methodName "OpenFile"  `
  -methodParam @("Test.txt")
If ($hFile -ne 0) {
  Invoke-Method -object $Utils -methodName "WriteLine" `
    -methodParam @($hFile, "This is a test")
  Invoke-Method -object $Utils -methodName "CloseFile" -methodParam @($hFile)
}
$MsgIcon = Get-Property -object $Utils -propertyName "MESSAGE_OPTION_OK"
$MsgType = Get-Property -object $Utils -propertyName "MESSAGE_TYPE_PLAIN"
Invoke-Method -object $Utils -methodName "ShowMessageBox" `
  -methodParam @("Hint", "Ready", $MsgIcon, $MsgType) > $Null

#-End-------------------------------------------------------------------
```

SAP GUI Scripting - List of Objects - GuiGridView (ALV)

The ABAP List Viewer (ALV) offers the possibility to view data in a tabular or hierarchical format. The ALV is also known as SAP List Viewer. It offers a friendly interface with a toolbar that allows to adjust the presented layout, to sort or filter data and to export data very easily. SAP offers three different types of the table display.

ABAP List

This is not an ALV display, this output using the ABAP WRITE command. The difference to the ALV List is the toolbar, e.g. you can not sum, export or filter.

MANDT	CARRID	CONNID	FLDATE	PRICE	CURRENCY	PLANETYPE	SEATSMAX	SEATSOCC	PAYMENTSUM	SEATSMAX_B	SEATSOCC
001	AA	0017	16.12.2020	422,94	USD	747-400	385	375	193.072,35	31	3
001	AA	0017	13.01.2021	422,94	USD	747-400	385	372	192.780,52	31	3
001	AA	0017	10.02.2021	422,94	USD	747-400	385	370	192.463,16	31	2
001	AA	0017	10.03.2021	422,94	USD	747-400	385	371	191.706,31	31	3
001	AA	0017	07.04.2021	422,94	USD	747-400	385	366	190.661,54	31	3
001	AA	0017	05.05.2021	422,94	USD	747-400	385	373	191.680,80	31	3
001	AA	0017	02.06.2021	422,94	USD	747-400	385	372	193.973,26	31	3
001	AA	0017	30.06.2021	422,94	USD	747-400	385	374	191.828,89	31	2

ALV List

The ALV List, also known as Classic SAP List Viewer, is very comparable to the ABAP list from the automation perspective, it uses labels too. The data presentation is different and the toolbar offers more features.

MANDT	CARRID	CONNID	FLDATE	PRICE	CURRENCY	PLANETYPE	SEATSMAX	SEATSOCC	PAYMENTSUM	SEATSMAX_B	SEATSOCC
001	AA	17	16.12.2020	422,94	USD	747-400	385	375	193072,35	31	3
001	AA	17	13.01.2021	422,94	USD	747-400	385	372	192780,52	31	3
001	AA	17	10.02.2021	422,94	USD	747-400	385	370	192463,16	31	2
001	AA	17	10.03.2021	422,94	USD	747-400	385	371	191706,31	31	3
001	AA	17	07.04.2021	422,94	USD	747-400	385	366	190661,54	31	3
001	AA	17	05.05.2021	422,94	USD	747-400	385	373	191680,80	31	3
001	AA	17	02.06.2021	422,94	USD	747-400	385	372	193973,26	31	3
001	AA	17	30.06.2021	422,94	USD	747-400	385	374	191828,89	31	2

ALV Grid

The ALV Grid is more like an Microsoft Excel table format

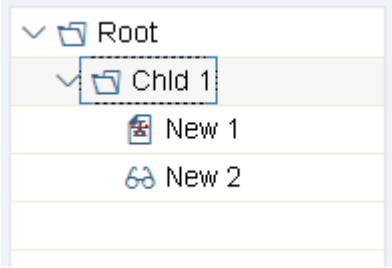
MANDT	CARRID	CONNID	FLDATE	PRICE	CURRENCY	PLANETYPE	SEATSMAX	SEATSOCC	PAYMENTSUM	SEATSMAX_B	SEATSOCC
001	AA	17	16.12.2020	422,94	USD	747-400	385	375	193.072,35	31	3
001	AA	17	13.01.2021	422,94	USD	747-400	385	372	192.780,52	31	3
001	AA	17	10.02.2021	422,94	USD	747-400	385	370	192.463,16	31	2
001	AA	17	10.03.2021	422,94	USD	747-400	385	371	191.706,31	31	3
001	AA	17	07.04.2021	422,94	USD	747-400	385	366	190.661,54	31	3
001	AA	17	05.05.2021	422,94	USD	747-400	385	373	191.680,80	31	3
001	AA	17	02.06.2021	422,94	USD	747-400	385	372	193.973,26	31	3
001	AA	17	30.06.2021	422,94	USD	747-400	385	374	191.828,89	31	2

SAP GUI Scripting - List of Objects - GuiTree

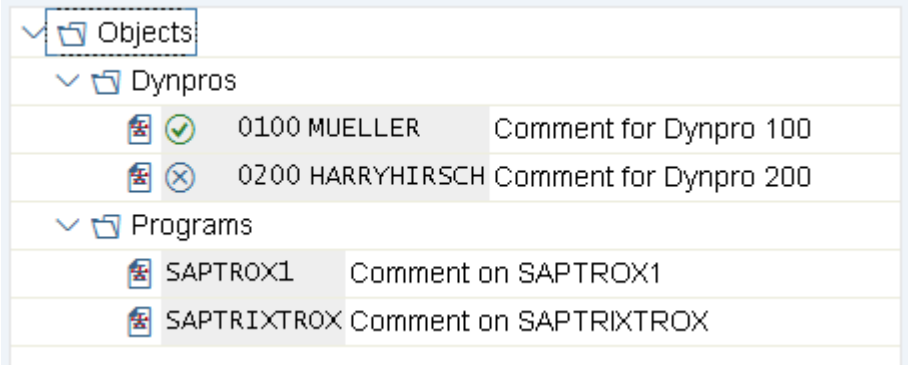
Development Class
SEU_TREE_MODEL

Reports
SAPSIMPLE_TREE_MODEL_DEMO
SAPTLIST_TREE_MODEL_DEMO
SAPTLIST_TREE_CONTROL_DEMO_HDR
SAPCOLUMN_TREE_MODEL_DEMO

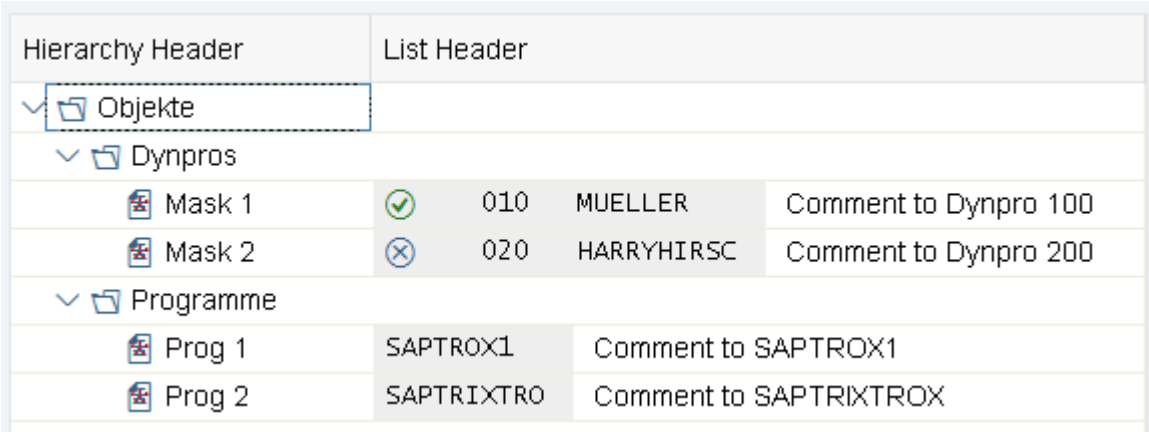
Simple Tree



List Tree without header



List Tree with header



Column Tree

Hierarchy Header	Column2	Column3
Root Column1	Root Column2	Root Column3
Chld1 Column1	Chld1 Column2	Chld1 Column3
New1 Column1		New1 Column3
New2 Column1	New2 Column2	New2 Column3

SAP GUI Scripting - Object Model

The ID of an UI element represents a object hierarchy for a unique identification.

An example:
/app/con[0]/ses[0]/wnd[0]/usr/cntlIMAGE_CONTAINER

The ID contains the following elements:

app = GuiApplication
Represents the process in which all SAP GUI activities runs, of the SAPlogon process.

con = GuiConnection
Represents the connection between SAP GUI and an application server.

ses = GuiSession
Represents the context in which a user performs their tasks, e.g. working with a transaction.

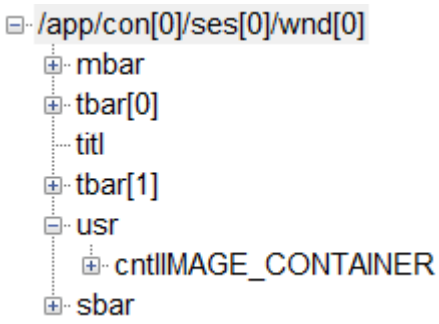
wnd = GuiMainWindow or GuiModalWindow
Represents the main window of a SAP GUI session.

After the window follows the element of the session, in this example **usr** for the user screen. But it could also be mbar (menu bar) or tbar (tool bar).

The sum of all these elements are called *parent object ID*.

Now it follows the name of the object, consisting of a prefix, in our case **cntl**, and its technical name, **IMAGE_CONTAINER**.

If an ID is not unique an one or two dimensional index is added, [0] or [1,2].



SAP GUI Scripting - Restrictions

This text is an citation from SAP note 587202.

Some technologies are not supported during scripting.

- *F4 search help control (amodal)*
  The control is not supported in the scripting. Instead, a standard dialog is opened. In some transactions, this dialog does not open and a short dump occurs due to an error in the application. Until a Support Package corrects the application, you can work around this error by using the menu path "Help->Settings->F4" to select the modal dialog manually.

- *SAPscript*
  The text control of the SAPscript component is not supported. It is replaced by a line editor, as described in SAP Notes 64634 and 100358 (point 10).

- *Drag and Drop*
  Drag and Drop is not supported in scripting. However, you should have the option of using the function without drag and drop in all applications.

- Low-speed connection
  If the low-speed connection indicator is set for a connection, the system transfers less information to the SAP GUI. As a result, the scripting component is missing the field names that are required for the names and IDs of the objects in the scripting model. Errors then occur (for example, with FindById).

- *Missing support in individual transactions*
  Certain transactions use dynamic keywords when communicating with the SAP system; these dynamic keywords change each time the transaction is called. This problem may occur when you select entries from the menu of the toolbar control in particular. If the script that is recorded in this transaction is run again, errors occur due to invalid parameters (for example, in the method SelectMenuItem).

- *Missing support for certain ActiveX components*
  In order for you to reach an ActiveX control from scripting, scripting support must be made available explicitly. This has already been done for the standard controls. However, some applications contain controls that were developed by customers; no support for scripting exists for them.

- *No support for Microsoft common dialogs*
  Scripting for common dialogs (such as FileSave, FileOpen) is not supported.

- *No recording of key combinations or actions that do not change the status of the control*
  The key combinations or other actions that do not cause standard changes of the control - for example, "Copy to Clipboard" (CTRL + C) - are not recorded.

- The "advanced search" in input fields is not supported while scripting is active.

SAP GUI Scripting - HistoryEnabled

The HistoryEnabled property is set to false, to improve the performance of the SAP GUI.

`HistoryEnabled` (Read-write) `Public Property HistoryEnabled As Byte`	The local history function can be enabled or disabled using this property. Disabling it will significantly improve the performance of SAP GUI, which may be crucial during load tests, for example.

SAP GUI Scripting - Backslash in ID

In a few programming languges is it necessary to escape the backshlash \ in a string, e.g. in C#, Python or Java. This means it is necessary to add to a single backslash \ character the escape character \. On this way you double the backslash to \\. This prevents that the following character is recognized as a function character.

In SAP is it possible that IDs contains a backslash. Therefore it is necessary to add here an escape character.

An example: The following ID ...

```
wnd[0]/usr/tabsTAXI_TABSTRIP_HEAD/tabpT\13/ssubSUBSCREEN_BODY:SAPMV45A:4312/su
b8309:SAPMV45A:8309/txtVBAK-ZZCON
```

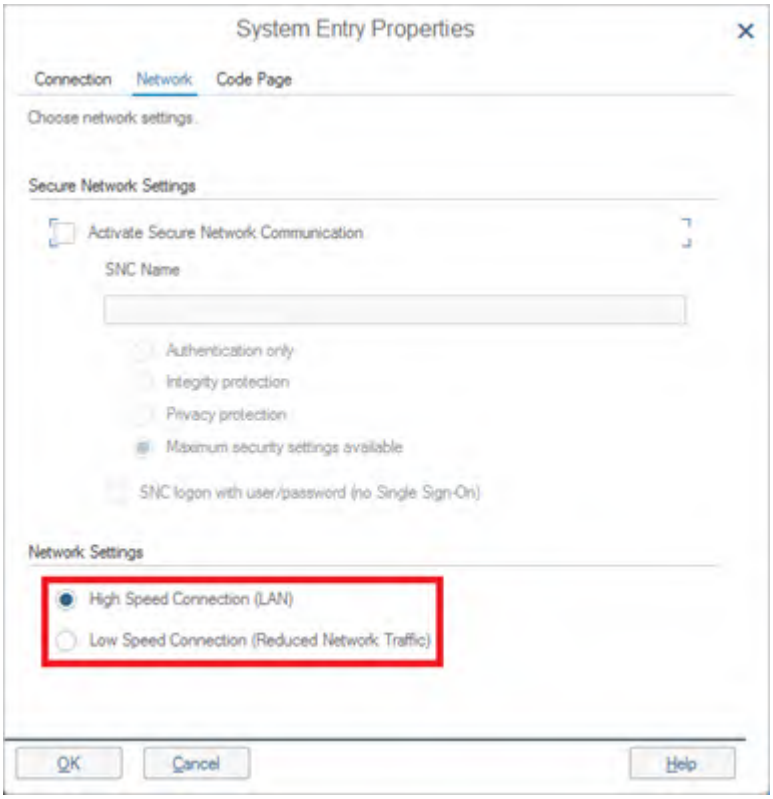
... must be changed.

```
wnd[0]/usr/tabsTAXI_TABSTRIP_HEAD/tabpT\\
13/ssubSUBSCREEN_BODY:SAPMV45A:4312/sub8309:SAPMV45A:8309/txtVBAK-ZZCON
```

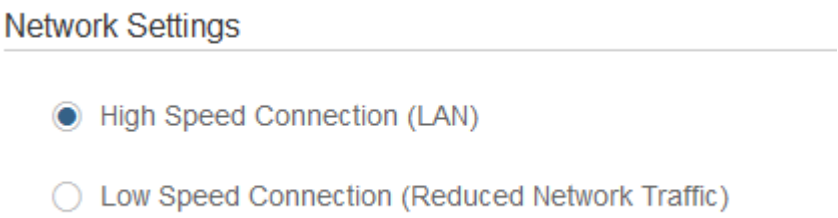
Otherwise the error message "Control ID not found" occurs.

SAP GUI Scripting - Network Settings

It is necessary to set the network settings of a system entry to high speed connection. If it is set to low speed connection the names of the SAP GUI Scripting objects are not transmitted and therefore IDs don't work.



You can switch between high and low speed of your LAN connection in the properties of each connection in the SAP Logon.



With low speed connection you loose in some cases information of the ID, here an example. At first recorded code with high speed LAN connection:

```
session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE80"
session.findById("wnd[0]").sendVKey 0
session.findById("wnd[0]/shellcont/shell/shellcont[3]/shell/shellcont[2]/shel
l").selectNode "          1"
session.findById("wnd[0]/shellcont/shell/shellcont[3]/shell/shellcont[2]/shel
l").nodeContextMenu "          1"
session.findById("wnd[0]/shellcont/shell/shellcont[3]/shell/shellcont[2]/shel
l").selectContextMenuItem "_P__WB_CREATE"
session.findById("wnd[1]/usr/chkRSEUR-WITH_TOP").selected = false
session.findById("wnd[1]/usr/txtRSEUR-TDPROGRAM").text = "Z_TEST"
session.findById("wnd[1]/usr/txtRSEUR-TDPROGRAM").caretPosition = 6
session.findById("wnd[1]/tbar[0]/btn[0]").press
session.findById("wnd[1]/usr/cmbTRDIR-RSTAT").setFocus
session.findById("wnd[1]/usr/cmbTRDIR-RSTAT").key = "T"
session.findById("wnd[1]/tbar[0]/btn[0]").press
```

Here now the same code with low speed LAN connection:

```
session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE80"
session.findById("wnd[0]").sendVKey 0
session.findById("wnd[0]/shellcont/shell/shellcont[3]/shell/shellcont[2]/shel
l").selectNode "          1"
session.findById("wnd[0]/shellcont/shell/shellcont[3]/shell/shellcont[2]/shel
l").nodeContextMenu "          1"
session.findById("wnd[0]/shellcont/shell/shellcont[3]/shell/shellcont[2]/shel
l").selectContextMenuItem "_P__WB_CREATE"
session.findById("wnd[1]/usr/chk").selected = false
session.findById("wnd[1]/usr/txt").text = "Z_TEST"
session.findById("wnd[1]/usr/txt").caretPosition = 6
session.findById("wnd[1]/tbar[0]/btn[0]").press
session.findById("wnd[1]/usr/cmb[1]").setFocus
session.findById("wnd[1]/usr/cmb[1]").key = "T"
session.findById("wnd[1]/tbar[0]/btn[0]").press
```

Here the explanation from SAP note 161053:
When activating the "Low Speed Connection", the dataset sent to the front end is reduced at the expense of the usability. In addition, if you use the "Low Speed Connection" flag, problems can occur in SAP GUI Scripting, since the field names are no longer available in full. Specifically, this results in problems with the use of the command FindById, but also with other commands.

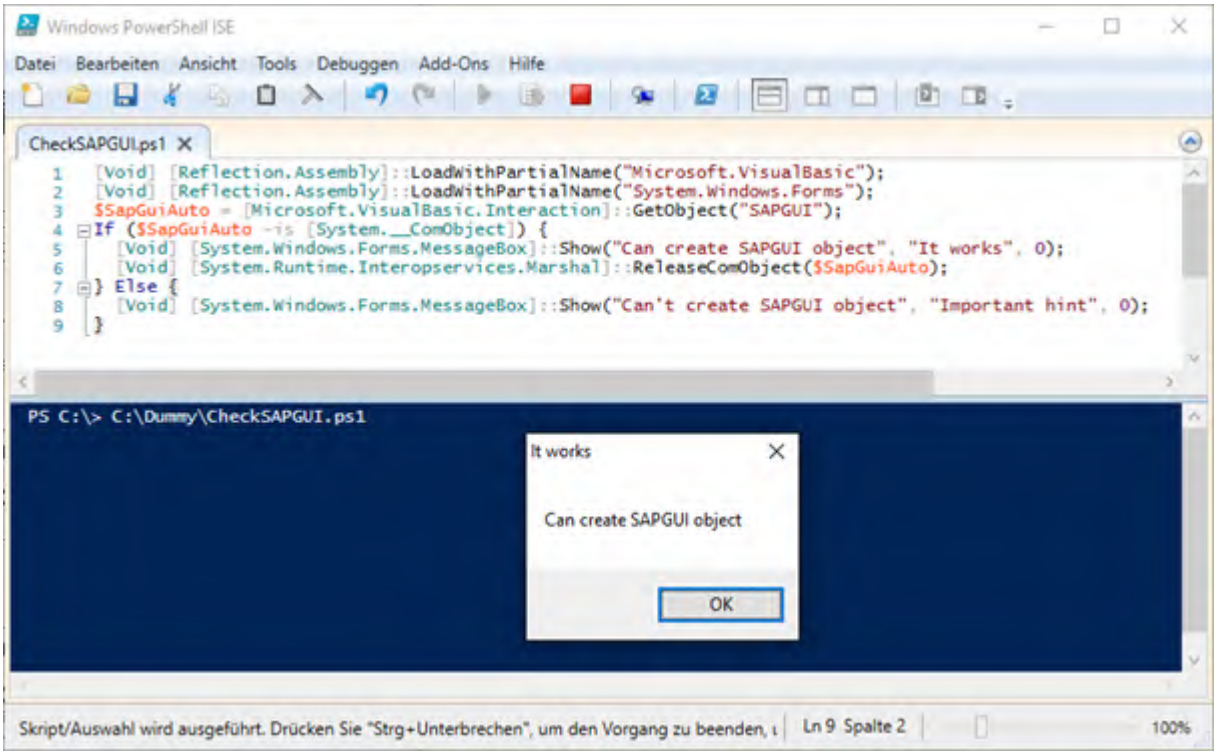
SAP GUI Scripting - SAPGUI Object

Hint: Do not forget to set the execution policy of PowerShell first.

Execute the following code inside your PowerShell ISE to check the SAP GUI class instanciation.

```
Add-Type -AssemblyName "Microsoft.VisualBasic"
Add-Type -AssemblyName "System.Windows.Forms"

$SapGuiAuto = [Microsoft.VisualBasic.Interaction]::GetObject("SAPGUI")

If ($SapGuiAuto -is [System.__ComObject]) {
  [Void] [System.Windows.Forms.MessageBox]::Show("Can create SAPGUI object",
"It works", 0)
  [Void]
[System.Runtime.Interopservices.Marshal]::ReleaseComObject($SapGuiAuto)
} Else {
  [Void] [System.Windows.Forms.MessageBox]::Show("Can't create SAPGUI object",
"Important hint", 0)
}
```

You should see a message box like in the image below.



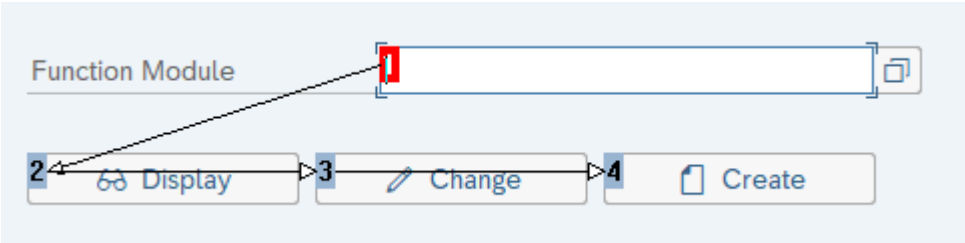
SAP GUI for Windows - Local Tab Order

The SAP GUI for Windows allows to define for each screen a customizing of the tab order.If you press Ctrl and right mouse button you can find at the end of the context menu these items:

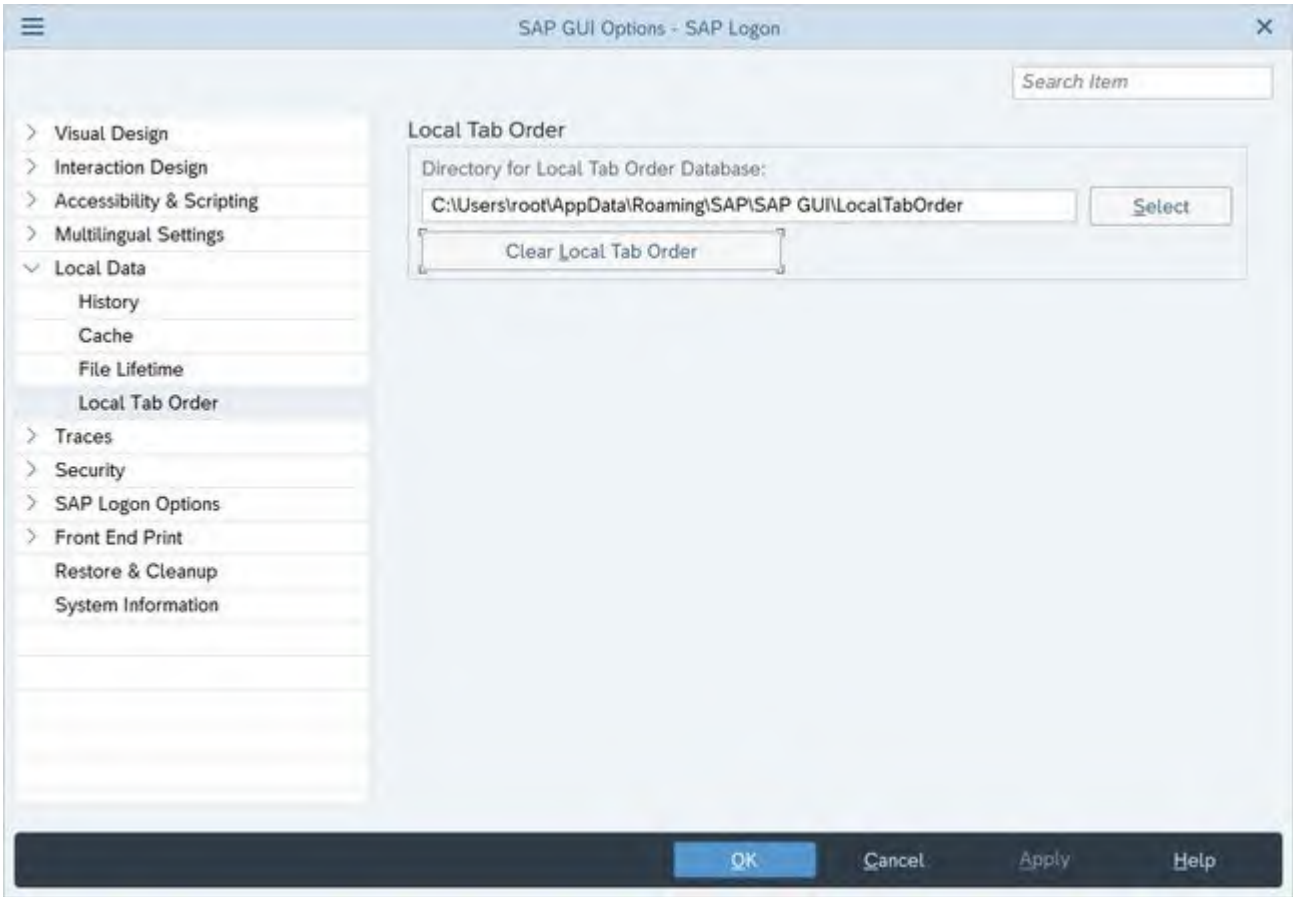
Configure Local Tab Order (Shift+Ctrl+L)

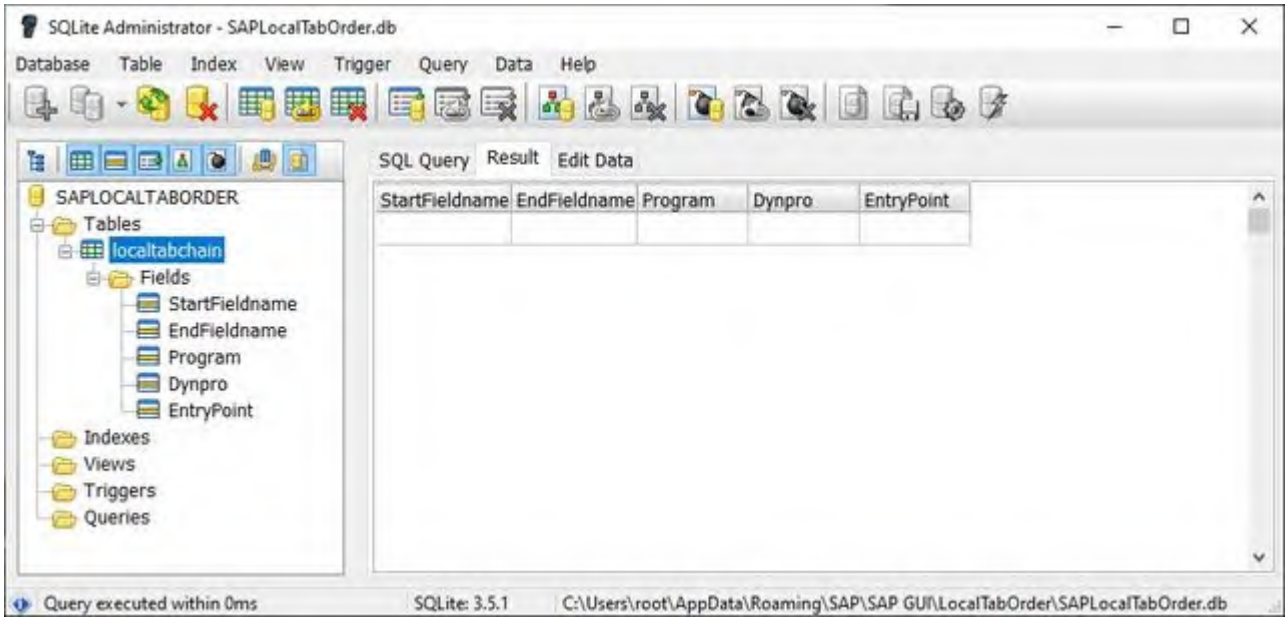
Visualize Local Tab Order (Shift+Ctrl+A to G)

With Visualize Local Tab Order you can see the sequence of fields if you press the tab key.

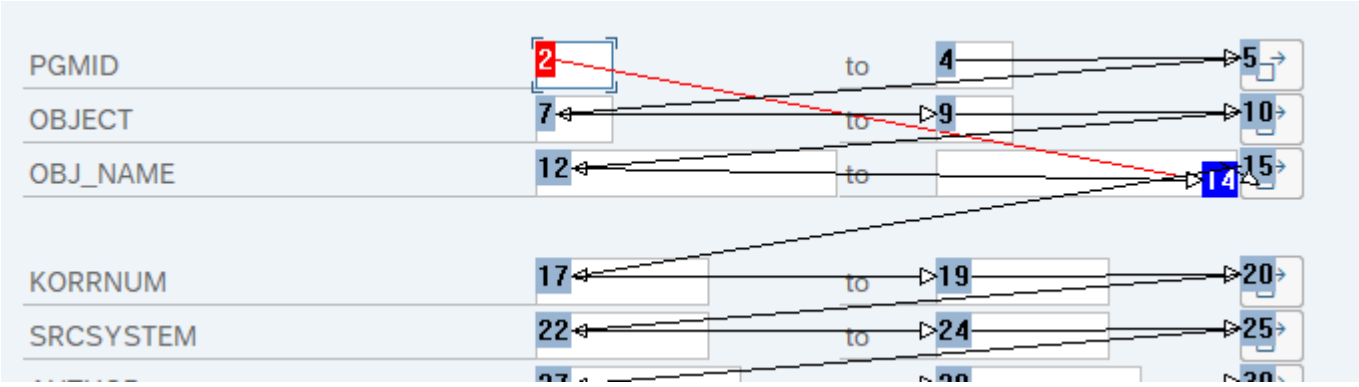


All sequences are stored in a SQLite database, which is defined in the SAP GUI Options:

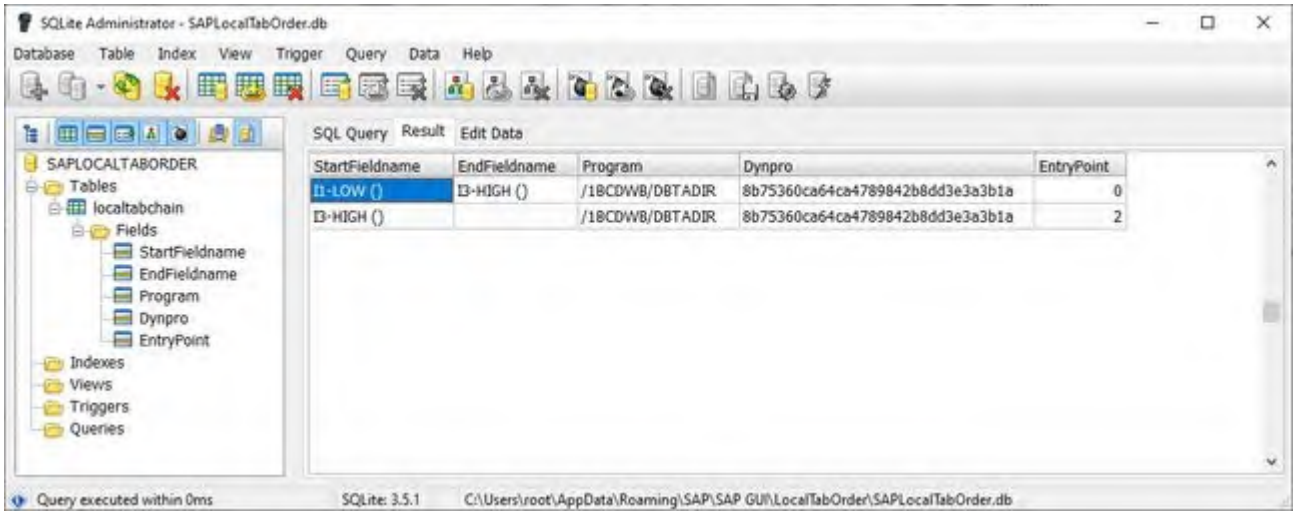




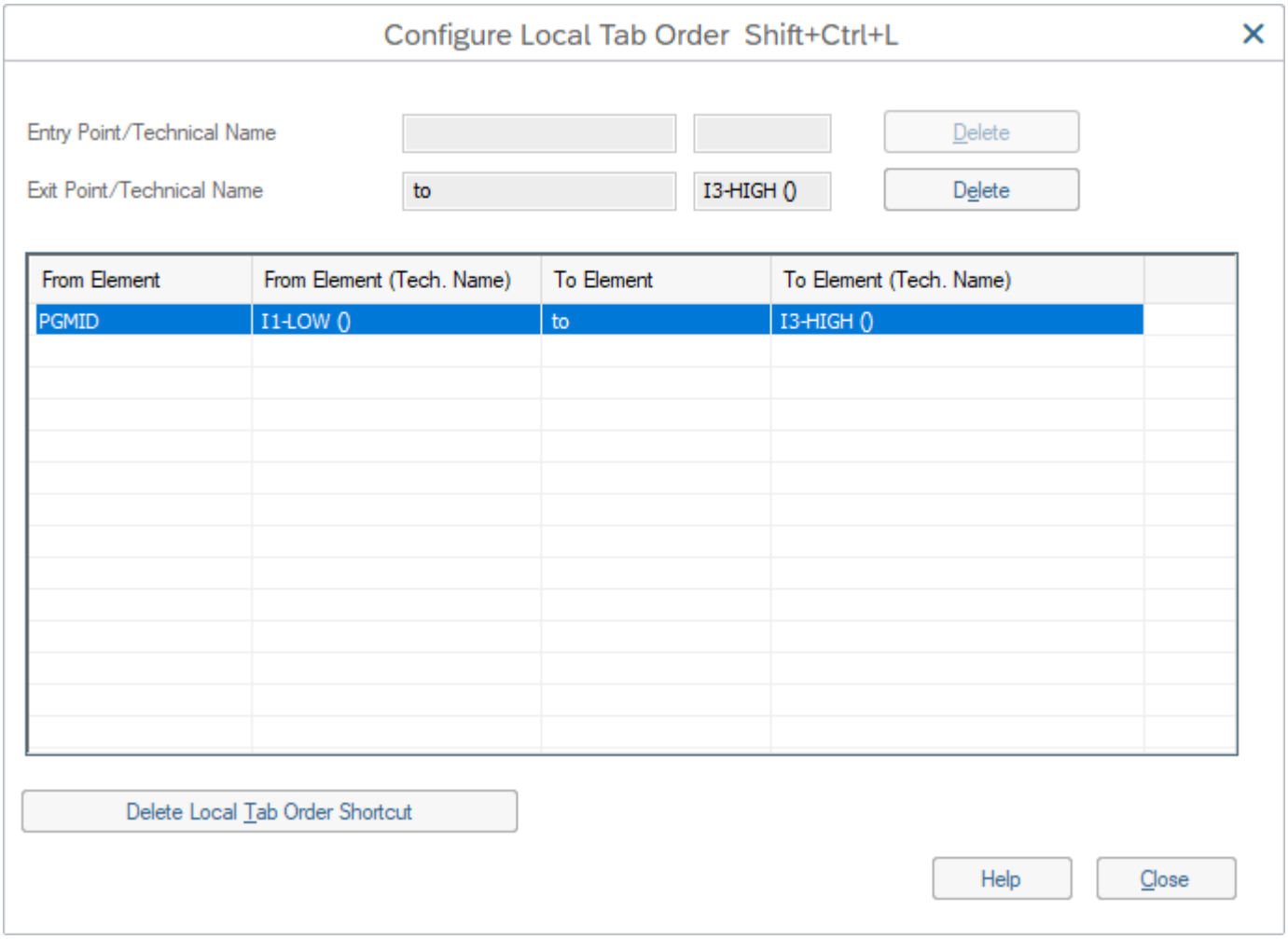
Each user has the possiblity to define its own tab order for each screen, with the menu item Configure Local Tab Order. The following example jumps directly from field 2 to 14.



In the SQLite database you can find exact this as Start- and EndFieldname.



Also it is possible to define an exit point at field 14, this means the pressing of the tab key jumps to back button. Here a different perspective via the Configure Local Tab Order dialog.



Effects on Automation Workflows

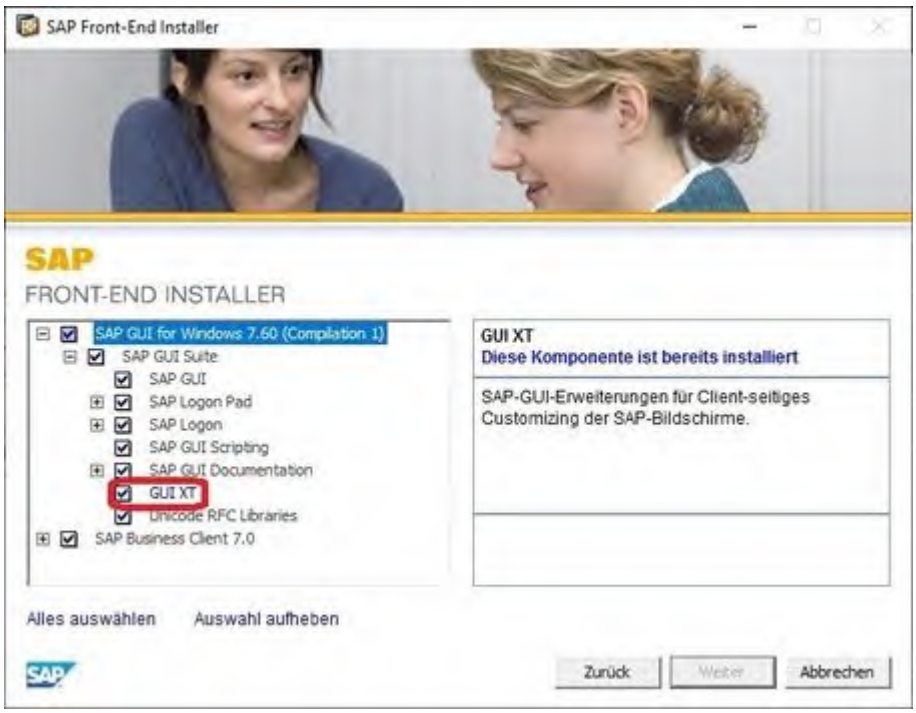
It is possible that your automation doesn't run correctly, when the tab key is used to switch to the fields and the user which executes the workflow has defined a local tab order. There are a lot of conditions. Perhaps there is a small chance that they will occur. But when it does occur, you can spend a lot of time to analyze it to find the reasons of this behavior.

How can we react to that?

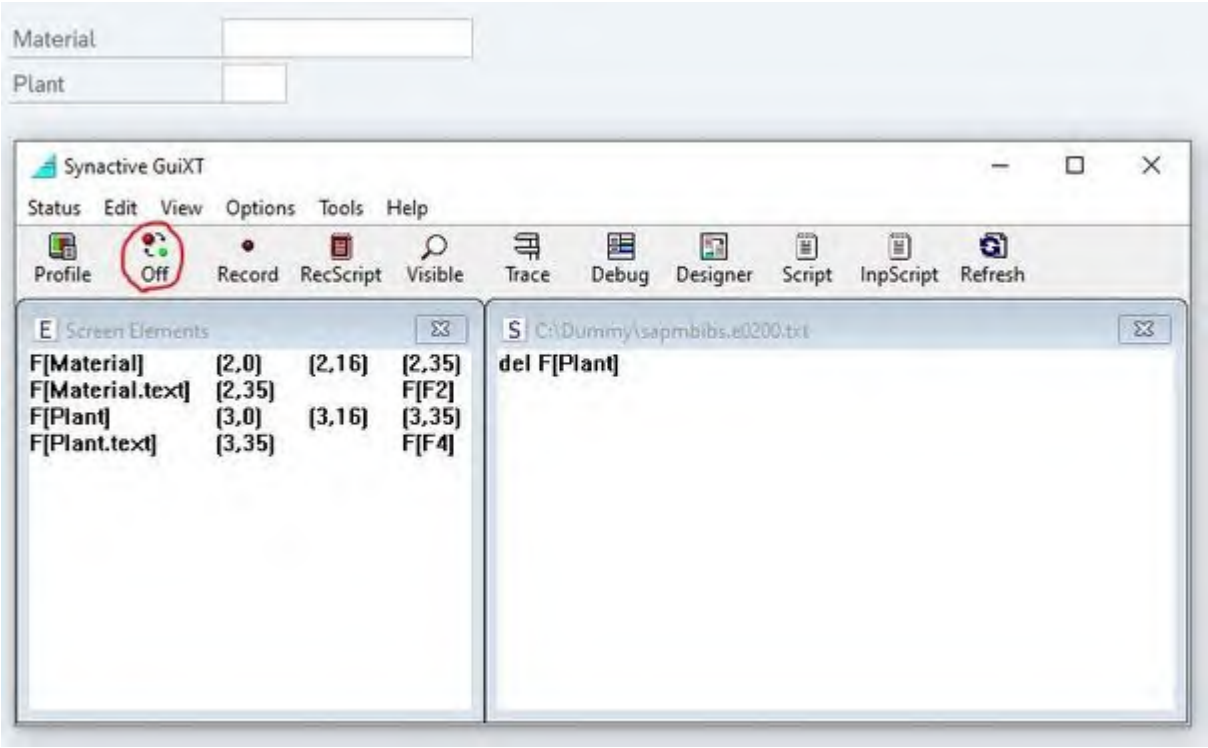
- Don't use the tab key to switch to the fields.
- Use only the IDs of the fields.
- It would also be possible to simply clear the database. But here we intervene in the sovereignty of the user settings. In my opinion not a good idea.

SAP GUI for Windows - GuiXT

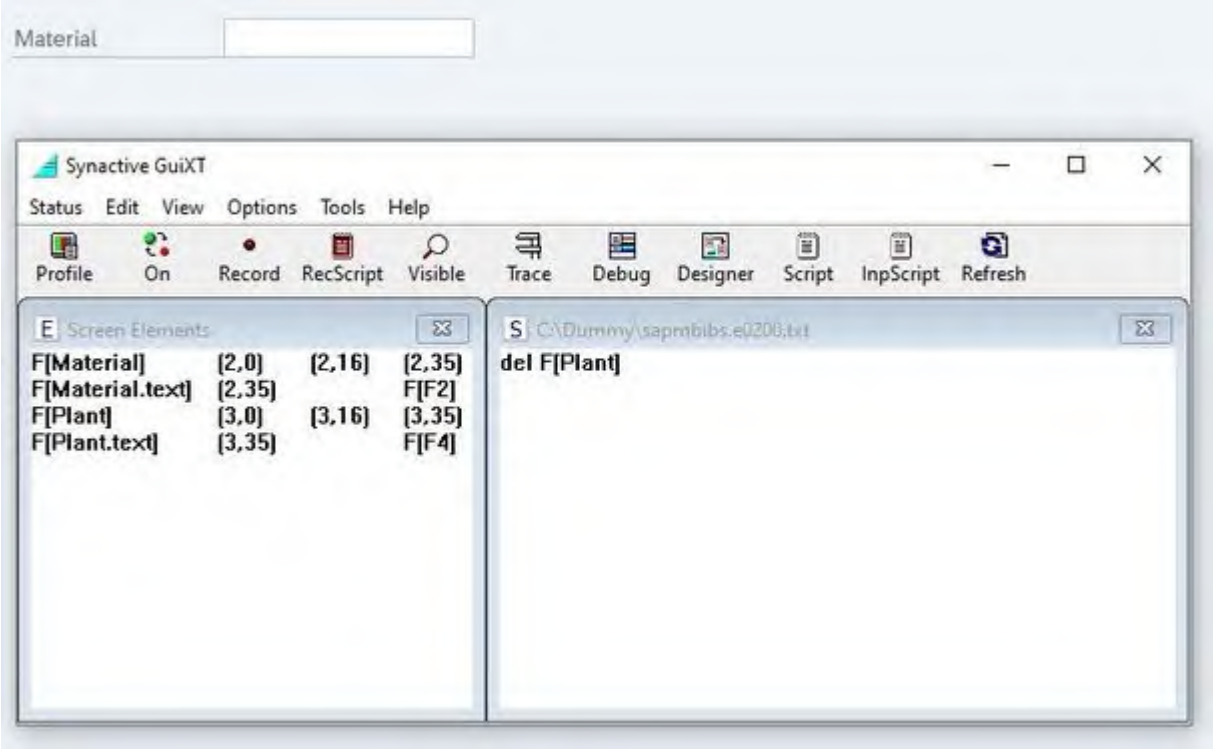
GuiXT is a very impressive SAP GUI for Windows extension. With GuiXT you have the possibility to change existing SAP GUI user screens as you like. A basis functionality is part of the installation of the SAP GUI for Windows.



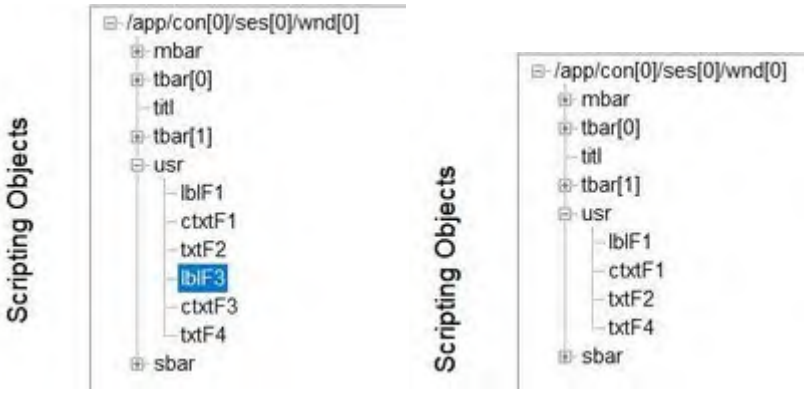
With GuiXT is it possible to change any user screen you like. Here an easy example with labels and fields. In the screen elements you see all UI elements which are available on the user screen. On the right side you see a tiny script, which deletes the Plant label and field, but GuiXT is off.



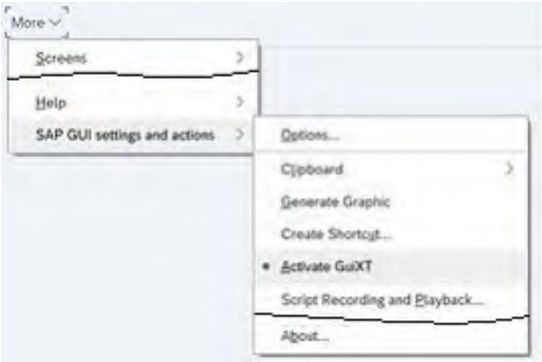
Now GuiXT is on and the screen is refreshed. The label and field Plant are no more longer available.



It is the same in the SAP GUI Scripting object hierarchy. On the left side the label and text F3 are available, but on the right side not, with activated GuiXT.



You can activate GuiXT very easily in the menu.



But what does that possibility mean for SAP automation?
There is a possibility, if you design an automation and the user which runs it uses GuiXT, that it “meets” screens, that it can’t process. Fields can’t be visible and other fields can exist. GuiXT offers fantastic possibilities here. When analyzing errors, it is always necessary to ask about the use of GuiXT. This can sometimes save you a lot of time and confusion.

Hint: GuiXT should always disable in an automation context, because it slows down the UI composition by about 10%. The data stream, via the proprietary Dynamic Information and Action

Gateway (DIAG) protocol, is modified according to the GuiXT scripts. These changes take time and that reduces the performance.

PowerShell - Set Execution Policy

It is necessary to set the execution policy of PowerShell. Open the PowerShell Integrated Scripting Environment (ISE) as administrator and type the following command into the commandline and press return.

```
Set-ExecutionPolicy -ExecutionPolicy RemoteSigned
```

Hint: It is necessary to set the execution policy twice, one time for x64 and on time for x86 version. Start one time the ISE from System32 subdirectory and one time from SysWOW64.

PowerShell - Array of Objects

In a few cases it is possible that PowerShell delivers, instead of one COM object, an array of COM objects. In this case it is not possible to get or set a single property or to call a single method.

The following example, which selects a row in a GuiTableControl and which was recorded, doesn't work:

```
$ID = Invoke-Method -object $ID -methodName "getAbsoluteRow" `
  -methodParameter @(14)
$ID.selected = -1
```

To set the selected property it is necessary to use the following code respectively the code must be adjusted manually:

```
$ID.getAbsoluteRow(14).selected = -1
```

Because getAbsoluteRow delivers in PowerShell a collection of the columns in the row.

PowerShell - Get Properties of __ComObject

The following code provides information about the characteristics for a GuiShell component with the subtype HTMLViewer, such as its attributes, properties and events.

```
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/cntlHTML/shellcont/shell")

# The Get-Member cmdlet gets the members, properties and methods of objects.
# But in case of HTMLViewer it delivers only a subset.
$ID | Get-Member

# The GetProperties method of the TypeDescriptor class delivers all
information.
[System.ComponentModel.TypeDescriptor]::GetProperties($ID)
```

Here an example of a property.

```
Attributes               : {System.ComponentModel.BrowsableAttribute,
System.Runtime.InteropServices.DispIdAttribute}
CanShow                  : True
ComponentType            : System.Windows.Forms.UnsafeNativeMethods+IDispatch
Converter                :
System.Windows.Forms.ComponentModel.Com2Interop.Com2PropertyDescriptor+Com2PropDescMainConverter
ConvertingNativeType     : False
DISPID                   : 4
DisplayName              : BrowserHandle
IsReadOnly               : True
PropertyType             : System.Windows.Forms.UnsafeNativeMethods+IDispatch
TargetObject             : System.__ComObject
IsLocalizable            : False
SerializationVisibility  : Visible
SupportsChangeEvents     : False
Category                 : Sonstiges
Description              :
IsBrowsable              : False
Name                     : BrowserHandle
DesignTimeOnly           : False
```

Hint: The property BrowserHandle works only with browser control Internet Explorer in the control settings of the interaction design of the SAP Logon settings.

Python

- The approach to use SAP GUI Scripting with Python needs PyWin32 https://github.com/mhammond/pywin32.

Java™ and JShell

- The approach to use SAP GUI Scripting with Java™ or JShell needs an JDK version 9 or higher.

- Set the JAVA_HOME environment variable to your JDK directory.

- Add to your path environment variable the bin directory of the JDK directory.

- The approach to use SAP GUI Scripting with Java™ or JShell needs Java COM Bridge (Jacob).
  Jacob is delivered with Scripting Tracker.
  You can find it here: github.com/freemansoft/jacob-project.

- It is necessary to add the path of the Jacob.jar file to the class path of the Java™ compiler, if you want to compile your code, e.g.
  ```
  javac -CP C:\Dummy\JaCoB SAPGUIScripting.java
  ```

- It is necessary to add the path of the Jacob.jar file to the class path and
  the path to the native Jacob-DLLs to the java.exe via -Djava.library.path=[Path], if you want to execute your code with Java™ e.g.
  ```
  java -CP .;C:\Dummy\JaCoB -Djava.library.path=C:\Dummy\JaCoB
  SAPGUIScripting
  ```

- It is necessary to add the path of Jacob.jar file to the class path of JShell, Scripting Tracker does that for you automatically, e.g.
  ```
  /env -class-path C:\Dummy\JaCoB\jacob.jar
  ```

- It is necessary to add the path to the native Jacob-DLLs to the Windows Path environment variable.

dotNET and VBS - Speed Comparison

VBScript

```
'-Begin------------------------------------------------------------------

' Sub Main
Sub Main()

  Dim SapGuiAuto, app, connection, session
  Dim StartTime, EndTime

  On Error Resume Next
  Set SapGuiAuto = GetObject("SAPGUI")
  On Error GoTo 0
  If Not IsObject(SapGuiAuto) Then
    MsgBox "Can not get SapGuiAuto", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set app = SapGuiAuto.GetScriptingEngine
  On Error GoTo 0
  If Not IsObject(app) Then
    MsgBox "Can not get application", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set connection = app.Children(0)
  On Error GoTo 0
  If Not IsObject(connection) Then
    MsgBox "Can not get connection", vbOkOnly, "Hint"
    Exit Sub
  End If

  If connection.DisabledByServer = True Then
    MsgBox "Scripting is disabled by server", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set session = connection.Children(0)
  On Error GoTo 0
  If Not IsObject(session) Then
    MsgBox "Can not get session", vbOkOnly, "Hint"
    Exit Sub
  End If

  If session.Info.IsLowSpeedConnection = True Then
    MsgBox "Connection is low speed", vbOkOnly, "Hint"
    Exit Sub
  End If

  StartTime = Timer()
  For i = 1 To 10
    session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE16"
    session.findById("wnd[0]").sendVKey 0
    session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = "TADIR"
    session.findById("wnd[0]").sendVKey 0
    session.findById("wnd[0]").sendVKey 31
    session.findById("wnd[1]/tbar[0]/btn[0]").press
```

```
    session.findById("wnd[0]/tbar[0]/btn[3]").press
    session.findById("wnd[0]/tbar[0]/btn[3]").press
  Next
  EndTime = Timer()

  MsgBox CStr(FormatNumber(EndTime - StartTime, 2))

End Sub

' Main
Main

'-End-----------------------------------------------------------------
```

VB.NET

```
'-Begin---------------------------------------------------------------

Imports System.Windows.Forms
Imports System.Diagnostics

Public Module SAPGUIScripting

  Sub Main()

    Dim SapGuiAuto As Object
    Dim app As Object
    Dim connection As Object
    Dim session As Object

    Try
      SapGuiAuto = GetObject("SAPGUI")
      app = SapGuiAuto.GetScriptingEngine
      connection = app.Children(0)
      If connection.DisabledByServer = True Then
        Exit Sub
      End If
      session = connection.Children(0)
      If session.Info.IsLowSpeedConnection = True Then
        Exit Sub
      End If
    Catch
      Exit Sub
    End Try

    Dim watch As Stopwatch = Stopwatch.StartNew()
    For i = 1 To 10
      session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE16"
      session.findById("wnd[0]").sendVKey(0)
      session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = "TADIR"
      session.findById("wnd[0]").sendVKey(0)
      session.findById("wnd[0]").sendVKey(31)
      session.findById("wnd[1]/tbar[0]/btn[0]").press
      session.findById("wnd[0]/tbar[0]/btn[3]").press
      session.findById("wnd[0]/tbar[0]/btn[3]").press
    Next
    watch.Stop()
    MessageBox.Show(CStr(watch.Elapsed.TotalMilliseconds))

  End Sub

End Module
```

```
'-End-----------------------------------------------------------------
```

C#

```
//-Begin----------------------------------------------------------------

using System;
using System.Reflection;
using System.Runtime.InteropServices;
using System.Diagnostics;
using Microsoft.VisualBasic;

public class SAPGUIScripting {

  static dynamic InvokeMethod(object obj, string methodName, object[]
methodParams = null) {
    return obj.GetType().InvokeMember(methodName, BindingFlags.InvokeMethod,
null, obj, methodParams);
  }

  static dynamic GetProperty(object obj, string propertyName, object[]
propertyParams = null) {
    return obj.GetType().InvokeMember(propertyName, BindingFlags.GetProperty,
null, obj, propertyParams);
  }

  static dynamic SetProperty(object obj, string propertyName, object[]
propertyParams = null) {
    return obj.GetType().InvokeMember(propertyName, BindingFlags.SetProperty,
null, obj, propertyParams);
  }

  static void FreeObject(object obj) {
    Marshal.ReleaseComObject(obj);
  }

  static void Main() {

    object session = null;
    try {
      object SapGuiAuto = Interaction.GetObject("SAPGUI");
      object app = InvokeMethod(SapGuiAuto, "GetScriptingEngine");
      object connection = GetProperty(app, "Children", new object[1]{0});
      session = GetProperty(connection, "Children", new object[1]{0});
    } catch {
      return;
    }
    dynamic ID = null;

    Stopwatch watch = Stopwatch.StartNew();
    for(var i = 1; i <= 10; i++) {
      ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/tbar[0]/okcd"});
      SetProperty(ID, "text", new object[1]{"/nSE16"});
      ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
      InvokeMethod(ID, "sendVKey", new object[1]{0});
      ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/ctxtDATABROWSE-TABLENAME"});
      SetProperty(ID, "text", new object[1]{"TADIR"});
      ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
      InvokeMethod(ID, "sendVKey", new object[1]{0});
```

```
      ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
      InvokeMethod(ID, "sendVKey", new object[1]{31});
      ID = InvokeMethod(session, "findById", new
object[1]{"wnd[1]/tbar[0]/btn[0]"});
      InvokeMethod(ID, "press");
      ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/tbar[0]/btn[3]"});
      InvokeMethod(ID, "press");
      ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/tbar[0]/btn[3]"});
      InvokeMethod(ID, "press");
    }
    watch.Stop();
    Console.WriteLine(watch.Elapsed.TotalMilliseconds.ToString());

  }

}

//-End-----------------------------------------------------------------
```

Result

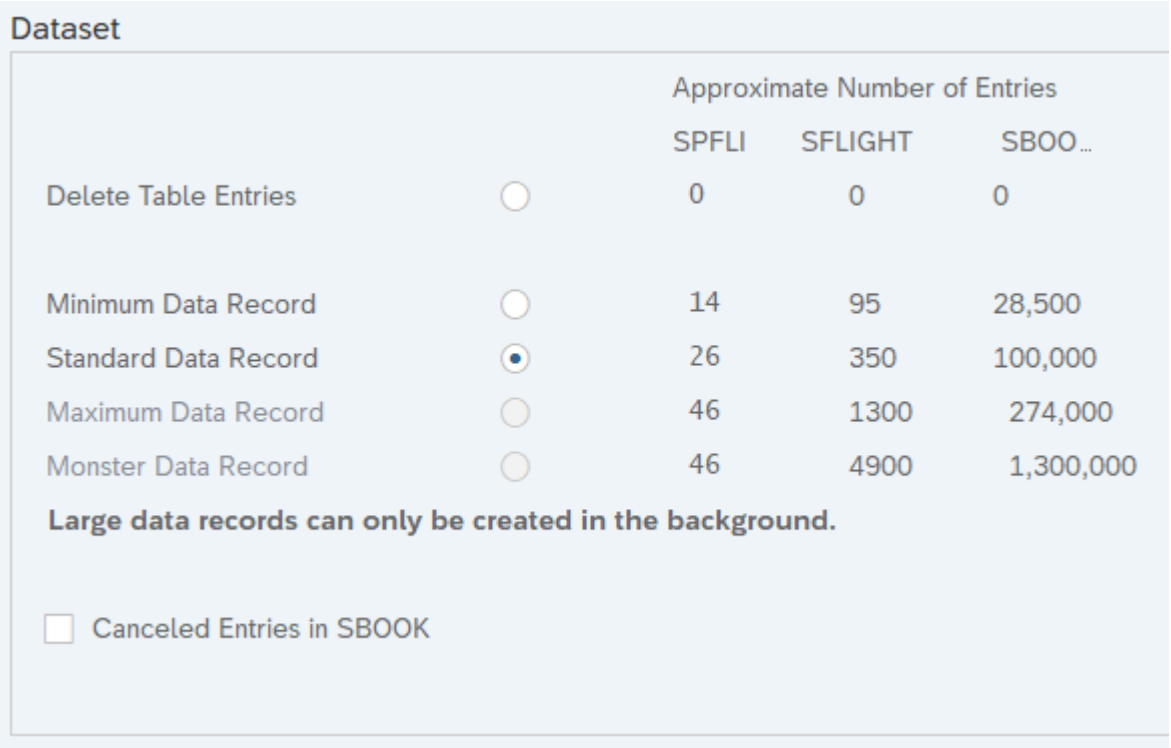
Time in seconds

Try	WSH	VB.NET	C#
1	7,05	7,04	7,52
2	6,89	6,92	7,46
3	6,92	6,96	7,55
4	7,06	6,85	7,58
5	6,95	6,90	7,74
6	6,84	6,82	7,60
7	7,07	6,83	7,65
8	7,13	6,69	7,36
9	6,98	6,85	7,37
10	6,93	7,02	7,33
Average	6,98	6,89	7,52
Percent	100%	99%	108%

SAP Application Server - SFLIGHT

Generate Data

It is possible to create or reset the data for the SAP SFLIGHT model via transaction code SE38 and the report SAPBC_DATA_GENERATOR. Or you can use the transaction code BC_DATA_GEN. The additional SFLIGHT_DATA_GEN report fills the database tables STICKET and SNVOICE.



The following tables will be filled with the report:

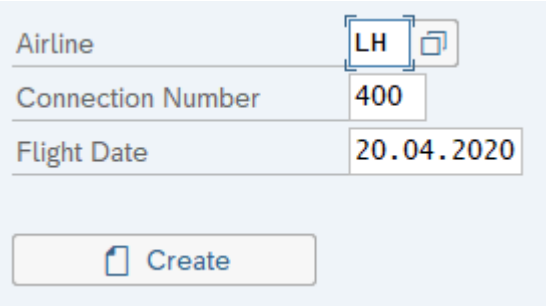
Number	Tablename	Description
1	SCARR	Airline
2	SCURX	Currency
3	SCURR	Exchange rates
4	SGEOCITY	Geographical position of a city
5	SAIRPORT	Airports
6	SCITAIRP	City-Airport assignment
7	SAPLANE	Plane
8	SCPLANE	Cargo plane
9	SCUSTOM	Flight customers
10	STRAVELAG	Travel agency
11	SBUSPART	Airline partner
12	SCOUNTER	Sales counter
13	SPFLI	Flight schedule
14	SFLCONNPOS	Stage of a flight connection
15	SFLCONN	Flight connection offered by travel agency

16	SCARPLAN	Plain-airline assignment
17	SMEAL	Inflight meal
18	SMEALT	Inflight meal description
19	SSTARTER	Inflight meal / Appetizer
20	SMACOURSE	Inflight meal / Main course
21	SDESSERT	Inflight meal / Dessert
22	SMENU	Menu
23	SBOOK	Single flight booking
24	SFLIGHT	Flight

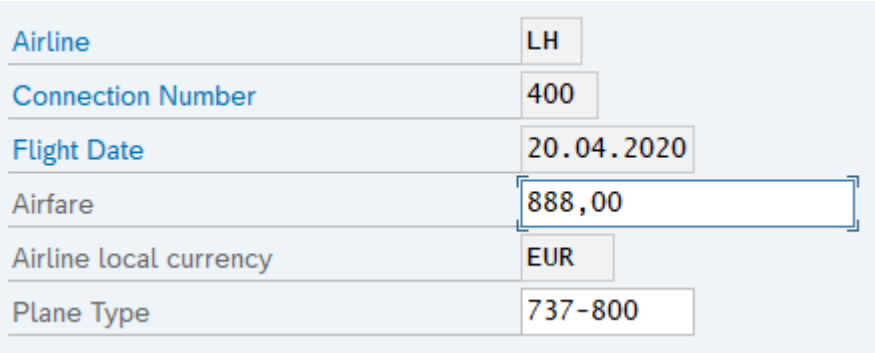
Add Records

With the transaction code BC_GLOBAL_SFLGH_CREA, which calls the report SAPBC_GLOBAL_SFLIGHT_CREATE, it is possible to add additional records to the SFLIGHT table.

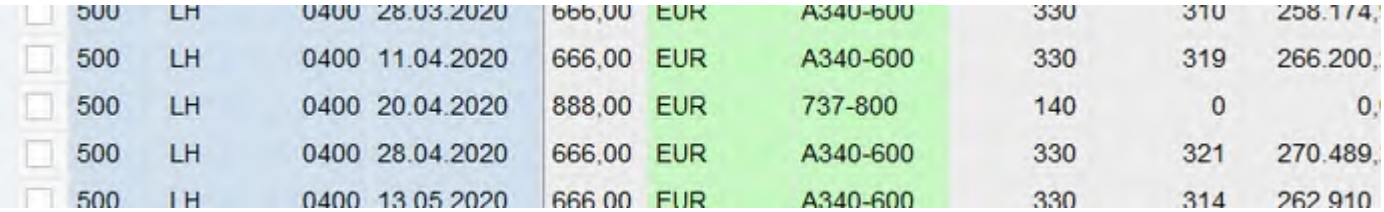
1. Select a flight and press Create.



2. Add the necessary data and press the save button.



3. Now you can find the additional record in the table SFLIGHT.



500	LH	0400	28.03.2020	666,00	EUR	A340-600	330	310	258.174,
500	LH	0400	11.04.2020	666,00	EUR	A340-600	330	319	266.200,
500	LH	0400	20.04.2020	888,00	EUR	737-800	140	0	0,
500	LH	0400	28.04.2020	666,00	EUR	A340-600	330	321	270.489,
500	LH	0400	13.05.2020	666,00	EUR	A340-600	330	314	262.910

SAP Application Server - eCATT Export Scripts

```
*********************************************************************
*
* Export of all or a selection eCATT scripts
*
*********************************************************************

"-Begin-------------------------------------------------------------
REPORT z_get_all_ecatt_scripts.

  DATA:
    lt_line TYPE STANDARD TABLE OF ecscr_line,
    ls_line TYPE ecscr_line,
    ls_ec_line TYPE ecscr_line,
    lt_lines TYPE STANDARD TABLE OF string,
    lv_filename TYPE string,
    lt_ecscr_xml TYPE STANDARD TABLE OF ecscr_xml_str,
    lo_conv_in TYPE REF TO cl_abap_conv_in_ce,
    lv_str TYPE string,
    lv_path TYPE string.

  FIELD-SYMBOLS:
    <ls_ecscr_xml> TYPE ecscr_xml_str.

  SELECTION-SCREEN BEGIN OF BLOCK ui.
    SELECTION-SCREEN SKIP 1.
    SELECTION-SCREEN BEGIN OF LINE.
      SELECTION-SCREEN COMMENT 2(15) path FOR FIELD pa_path.
      PARAMETERS pa_path TYPE sapb-sappfad LOWER CASE.
    SELECTION-SCREEN END OF LINE.
    SELECTION-SCREEN SKIP 1.
    SELECTION-SCREEN BEGIN OF LINE.
      SELECTION-SCREEN COMMENT 2(15) scrname FOR FIELD pa_sname.
      PARAMETERS pa_sname(31) TYPE c.
    SELECTION-SCREEN END OF LINE.
    SELECTION-SCREEN SKIP 1.
    SELECTION-SCREEN BEGIN OF LINE.
      SELECTION-SCREEN COMMENT 2(37) xml FOR FIELD pa_xml.
      PARAMETERS pa_xml AS CHECKBOX.
    SELECTION-SCREEN END OF LINE.
  SELECTION-SCREEN END OF BLOCK ui.

  INITIALIZATION.
    path = 'Outputpath'.                                    "#EC NOTEXT
    pa_path = 'C:\Dummy\eCATT\'.                            "#EC NOTEXT
    scrname = 'Scriptname'.                                 "#EC NOTEXT
    xml = 'Export SAP GUI Scripts as XML files'.            "#EC NOTEXT

  AT SELECTION-SCREEN ON VALUE-REQUEST FOR pa_path.

    CALL METHOD cl_gui_frontend_services=>directory_browse
      EXPORTING
        window_title    = 'Outputpath'
      CHANGING
        selected_folder = lv_path
      EXCEPTIONS
        OTHERS          = 1.                                "#EC NOTEXT
    IF sy-subrc = 0.
      pa_path = lv_path.
    ENDIF.
```

```
AT SELECTION-SCREEN.

  SELECT *
    FROM ecscr_line
    INTO TABLE lt_line
    WHERE name LIKE pa_sname
    ORDER BY name version xml_lnr.
  CHECK sy-subrc = 0.

  LOOP AT lt_line INTO ls_line GROUP BY ( name = ls_line-name
    version = ls_line-version ).

    CLEAR lt_lines.

    LOOP AT GROUP ls_line INTO ls_ec_line.
      APPEND ls_ec_line-xml_line TO lt_lines.
    ENDLOOP.

    lv_filename = ls_line-name.
    REPLACE ALL OCCURRENCES OF '/' IN lv_filename WITH '_'.

    cl_gui_frontend_services=>gui_download(
      EXPORTING
        filename = pa_path && lv_filename && '_' &&
          ls_line-version && '.eCATT'
      CHANGING
        data_tab = lt_lines
      EXCEPTIONS
        OTHERS   = 1
    ).                                                    "#EC NOTEXT
    IF sy-subrc <> 0.

    ENDIF.

    IF pa_xml = 'X'. "-Save SAP GUI Scripting data in XML format------

      SELECT * FROM ecscr_xml_str INTO TABLE lt_ecscr_xml
        WHERE name = ls_line-name AND version = ls_line-version
        ORDER BY name version pname ptyp varid.
      CHECK sy-subrc = 0.

      LOOP AT lt_ecscr_xml ASSIGNING <ls_ecscr_xml>.

        lo_conv_in = cl_abap_conv_in_ce=>create(
          input = <ls_ecscr_xml>-pxml_stream
        ).
        lo_conv_in->read( IMPORTING data = lv_str ).

        CHECK lv_str CS '<GuiScripting'.                  "#EC NOTEXT

        CLEAR lt_lines.
        APPEND lv_str TO lt_lines.

        cl_gui_frontend_services=>gui_download(
          EXPORTING
            filename = pa_path && lv_filename && '_' &&
              ls_line-version && '.' && <ls_ecscr_xml>-pname && '.xml'
          CHANGING
            data_tab = lt_lines
          EXCEPTIONS
            OTHERS   = 1
        ).                                                "#EC NOTEXT
        IF sy-subrc <> 0.

        ENDIF.
```

```
        ENDLOOP.

      ENDIF.

    ENDLOOP.

"-End-----------------------------------------------------------------
```

SAP Application Server - Object, Prefix and Dynpro

Assignment of SAP GUI Scripting class and the name prefix used in the ID to the Dynpro field type of the ABAP definition.

Hint: To get the Dynpro element type, use the ABAP program Z_EXPORT_FIELDS.

No.	UI Object	Prefix	Dynpro Element Type
1	GUIABAPEditor	cntl	CUCTR
2	GUIApoGrid		
3	GUIApplication	app	
4	GUIBarChart		
5	GUIBox	box	FRAME
6	GUIButton	btn	PUSH
7	GUICalendar	cntl	CUCTR
8	GUIChart		
9	GUICheckBox	chk	CHECK
10	GUICollection		
11	GUIColorSelector	cntl	CUCTR
12	GUIComboBox	cmb	I/O
13	GUIComboBoxControl		
14	GUIComboBoxEntry		
15	GUIComponent		
16	GUIComponentCollection		
17	GUIConnection	con	

18	GUIContainer		
19	GUIContainerShell	shellcont	
20	GUIContextMenu		
21	GUICTextField	ctxt	I/O
22	GUICustomControl	cntl	CUCTR
23	GUIDialogShell	shellcont	
24	GUIEAIViewer2D		
25	GUIEAIViewer3D		
26	GUIFrameWindow	wnd	
27	GUIGOSShell	shellcont	
28	GUIGraphAdapt		
29	GUIGridView		
30	GUIHTMLViewer	cntl	CUCTR
31	GUIInputFieldControl		
32	GUILabel	lbl	TEXT
33	GUIMainWindow	wnd	
34	GUIMap		
35	GUIMenu	menu	
36	GUIMenuBar	mbar	
37	GUIMessageWindow		

38	GUIModalWindow	wnd	
39	GUINetChart		
40	GUIOfficeIntegration	cntl	CUCTR
41	GUIOkCodeField	okcd	OK
42	GUIPasswordField	pwd	
43	GUIPicture		
44	GUIRadioButton	rad	RADIO
45	GUISapChart		
46	GUIScrollbar		
47	GUIScrollContainer	ssub	SUBSC
48	GUISession	ses	
49	GUISessionInfo		
50	GUIShell	shell	
51	GUISimpleContainer	sub	
52	GUISplit		
53	GUISplitterContainer	splc	SPCTR
54	GUIStage		
55	GUIStatusbar	sbar	
56	GUIStatusbarLink		
57	GUIStatusPane	pane	
58	GUITab	tabp	PUSH

59	GUITableColumn		
60	GUITableControl	tbl	TABLE
61	GUITableRow		
62	GUITabStrip	tabs	TBSTR
63	GUITextEdit		
64	GUITextField	txt	I/O
65	GUITitleBar	titl	
66	GUIToolBar	tbar	
67	GUIToolBarControl		
68	GUITree		
69	GUIUserArea	usr	
70	GUIUtils		
71	GUIVComponent		
72	GUIVContainer		
73	GUIViewSwitchTarget		

SAP Application Server - Z_EXPORT_FIELDS

```
"-Begin-----------------------------------------------------------------
"-
"- ABAP program to export all dynpro fields of a development class as
"- a csv file
"-
"- Tried with SAP_BASIS 754 and SAP_ABA 75E on S4HANA on premise 1909.
"-
"-----------------------------------------------------------------------
REPORT z_export_fields.

  INCLUDE MSEUSBIT.

  DATA: BEGIN OF id,
          p TYPE progname,
          d TYPE sydynnr,
        END OF id.

  TYPES: BEGIN OF ty_id,
           prog TYPE progname,
           dnum TYPE sydynnr,
         END OF ty_id.

  TYPES: BEGIN OF ty_prog,
           object TYPE trobjtype,
           devclass TYPE devclass,
           obj_name TYPE sobj_name,
         END OF ty_prog.

  TYPES: BEGIN OF ty_res,
           devclass TYPE devclass,       "Development Class
           prog TYPE progname,           "Programname
           obj_type TYPE trobjtype,      "PROG or FUGR
           dnum TYPE sychar04,           "Dynpro-Number
           cupo TYPE fnam_____4,         "Dynpro-Name
           fname TYPE fnam_____4,        "Fieldname
           type_short TYPE scrfgtyp,     "Fieldtype short
           type_long TYPE scrfgtyp,      "Fieldtype long
           stext TYPE stxt_____1,        "Fieldtext
           ddicfield TYPE boolean,       "Flag if data dictionary field
           rollname TYPE rollname,       "Data element
           checktable TYPE checktable,   "Table name of the foreign key
           inttype TYPE inttype,         "ABAP data type
           intlen  TYPE intlen,          "Length in Bytes
         END OF ty_res.

  DATA:
    lv_header TYPE d020s,
    ls_field TYPE d021s,
    lt_field TYPE TABLE OF d021s,
    lt_flow_logic TYPE TABLE OF d022s,
    lt_matchcode_info TYPE TABLE OF d023s,
    ls_id TYPE ty_id,
    lt_id TYPE STANDARD TABLE OF ty_id,
    ls_res TYPE ty_res,
    lt_res TYPE STANDARD TABLE OF ty_res,
    lv_res_fname TYPE fnam_____4,
    lv_file TYPE string,
    ls_prog TYPE ty_prog,
    lt_prog TYPE STANDARD TABLE OF ty_prog,
    lv_tablename TYPE tabname,
```

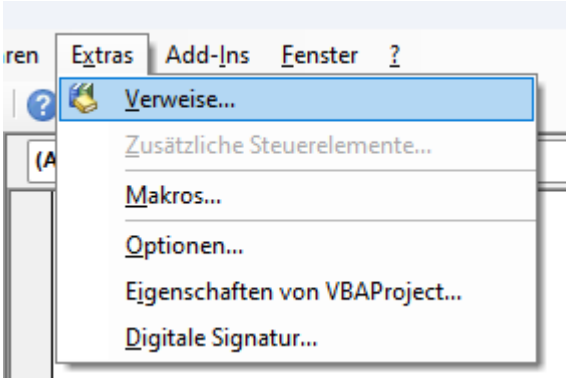
```
  lv_fieldname TYPE fieldname,
  ls_dd03l TYPE dd03l,
  lv_off TYPE i,
  lv_len TYPE i.

FIELD-SYMBOLS:
  <ls_prog>  TYPE ty_prog,
  <ls_res>   TYPE ty_res.

SELECTION-SCREEN BEGIN OF SCREEN 1001.
  SELECTION-SCREEN BEGIN OF LINE.
    SELECTION-SCREEN COMMENT 1(30) cm_devcl FOR FIELD p_devcl.
    PARAMETERS: p_devcl TYPE DEVCLASS OBLIGATORY.
  SELECTION-SCREEN END OF LINE.
  SELECTION-SCREEN BEGIN OF LINE.
    SELECTION-SCREEN COMMENT 1(30) cm_file FOR FIELD p_file.
    PARAMETERS: p_file TYPE sapb-sappfad OBLIGATORY LOWER CASE.
  SELECTION-SCREEN END OF LINE.
SELECTION-SCREEN END OF SCREEN 1001.

CALL SELECTION-SCREEN 1001.

INITIALIZATION.
  cm_devcl = 'Development Class:'.
  cm_file = 'Filename:'.

START-OF-SELECTION.

  "-Select programs (PROG) and function groups (FUGR)-----------------
  SELECT object, devclass, obj_name
    FROM TADIR
    INTO CORRESPONDING FIELDS OF TABLE @lt_prog
    WHERE devclass LIKE @p_devcl AND
      ( object = 'PROG' OR object = 'FUGR' )
    ORDER BY devclass, obj_name.
  CHECK sy-subrc = 0.

  "-Modify program names of function groups---------------------------
  LOOP AT lt_prog ASSIGNING <ls_prog>.
    CHECK <ls_prog>-object = 'FUGR'.
    IF <ls_prog>-obj_name(1) = '/'.
      FIND FIRST OCCURRENCE OF REGEX '(?!.*\/).*' IN <ls_prog>-obj_name
        MATCH OFFSET lv_off MATCH LENGTH lv_len.
      <ls_prog>-obj_name = <ls_prog>-obj_name+0(lv_off) && 'SAPL' &&
        <ls_prog>-obj_name+lv_off(lv_len).
      CONDENSE <ls_prog>-obj_name.
    ELSE.
      <ls_prog>-obj_name = 'SAPL' && <ls_prog>-obj_name.
    ENDIF.
  ENDLOOP.

  LOOP AT lt_prog INTO ls_prog.

    SELECT prog, dnum
      FROM D020S
      INTO CORRESPONDING FIELDS OF TABLE @lt_id
      WHERE prog = @ls_prog-obj_name
      ORDER BY prog, dnum.
    CHECK sy-subrc = 0.

    LOOP AT lt_id INTO ls_id.

      id-p = ls_id-prog.
      id-d = ls_id-dnum.
```

```
        "-Gets data from DYNPSOURCE table-------------------------------
        IMPORT DYNPRO lv_header lt_field lt_flow_logic lt_matchcode_info ID
id.

        LOOP AT lt_field INTO ls_field.

          ls_res-devclass = ls_prog-devclass.
          ls_res-prog = lv_header-prog.
          ls_res-obj_type = ls_prog-object.
          ls_res-dnum = lv_header-dnum.
          ls_res-cupo = lv_header-cupo.
          ls_res-fname = ls_field-fnam.
          IF ls_field-stxt CN '_ '.
            ls_res-stext = ls_field-stxt.
          ELSE.
            ls_res-stext = ''.
          ENDIF.

          CALL FUNCTION 'RS_SCRP_GET_FIELD_TYPE_TEXT'
            EXPORTING
              field = ls_field
              text_kind = 'SHORT'
            IMPORTING
              field_type_without_modif = ls_res-type_short
            EXCEPTIONS
              OTHERS = 1.
          TRANSLATE ls_res-type_short TO UPPER CASE.

          CALL FUNCTION 'RS_SCRP_GET_FIELD_TYPE_TEXT'
            EXPORTING
              field = ls_field
            IMPORTING
              field_type_without_modif = ls_res-type_long
            EXCEPTIONS
              OTHERS = 1.

          IF ls_field-flg1 O FLG1DDF.
            CASE ls_res-type_short.
              WHEN 'I/O' OR 'TEXT' OR 'OK' OR 'CHECK' OR 'RADIO'.
                ls_res-ddicfield = abap_true.
              WHEN OTHERS.
                ls_res-ddicfield = abap_false.
            ENDCASE.
          ELSE.
            ls_res-ddicfield = abap_false.
          ENDIF.

          APPEND ls_res TO lt_res.

        ENDLOOP.

      ENDLOOP.

    ENDLOOP.

    LOOP AT lt_res ASSIGNING <ls_res> WHERE ddicfield = abap_true.
      IF <ls_res>-fname(1) = '*'.
        lv_len = strlen( <ls_res>-fname ) - 1.
        lv_res_fname = <ls_res>-fname+1(lv_len).
      ELSE.
        lv_res_fname = <ls_res>-fname.
      ENDIF.
      SPLIT lv_res_fname AT '-' INTO lv_tablename lv_fieldname.
      SELECT SINGLE tabname, fieldname, as4local, rollname, checktable,
        inttype, intlen
```

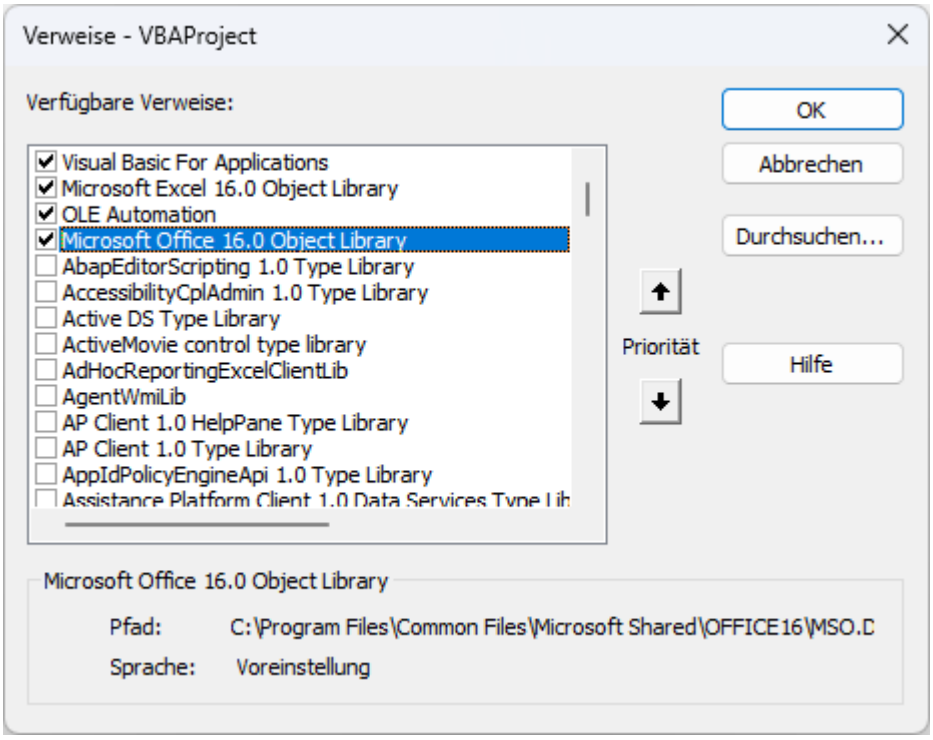
```
        FROM dd03l
        INTO CORRESPONDING FIELDS OF @ls_dd03l
        WHERE tabname = @lv_tablename AND
          fieldname = @lv_fieldname AND
          as4local = 'A'.
      CHECK sy-subrc = 0.
      <ls_res>-rollname = ls_dd03l-rollname.
      <ls_res>-checktable = ls_dd03l-checktable.
      <ls_res>-inttype = ls_dd03l-inttype.
      <ls_res>-intlen = ls_dd03l-intlen.
    ENDLOOP.

    lv_file = p_file.

    Call Method cl_gui_frontend_services=>gui_download
      EXPORTING
        filename                  = lv_file
        filetype                  = 'ASC'
        write_field_separator     = 'X'
        trunc_trailing_blanks     = 'X'
        trunc_trailing_blanks_eol = 'X'
      CHANGING
        data_tab                  = lt_res
      EXCEPTIONS
        others                    = 1.

"-End-----------------------------------------------------------------
```

VBA - Add Object Library Reference

After opening the Visual Basic for Applications (VBA) IDE choose menu item Tools (Extras) and References... (Verweise...).

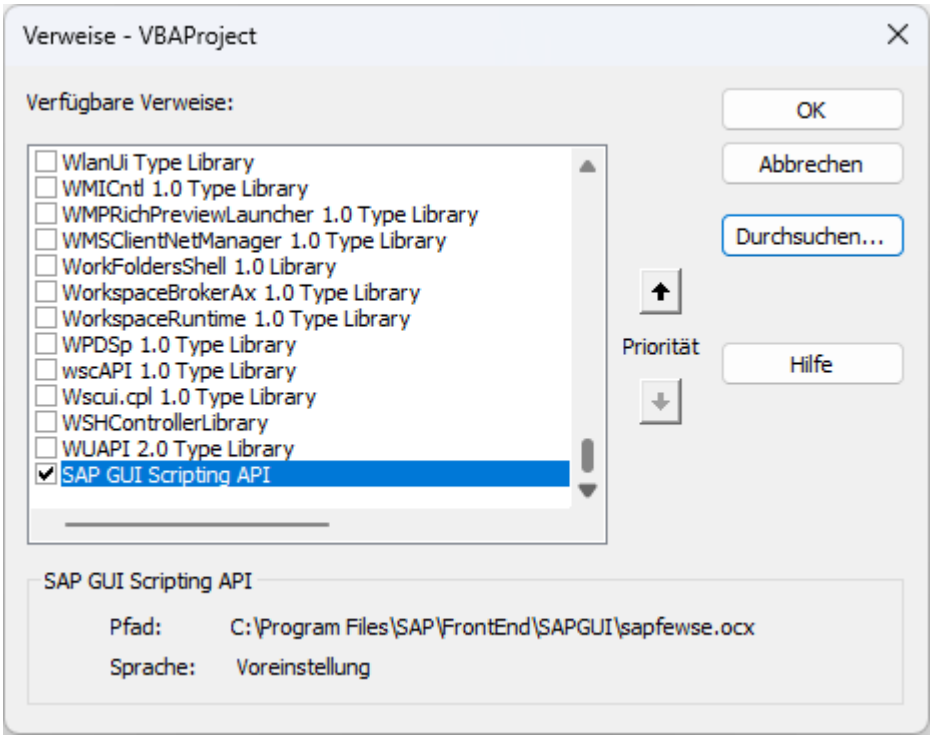


Press Browse... (Durchsuchen...) button.

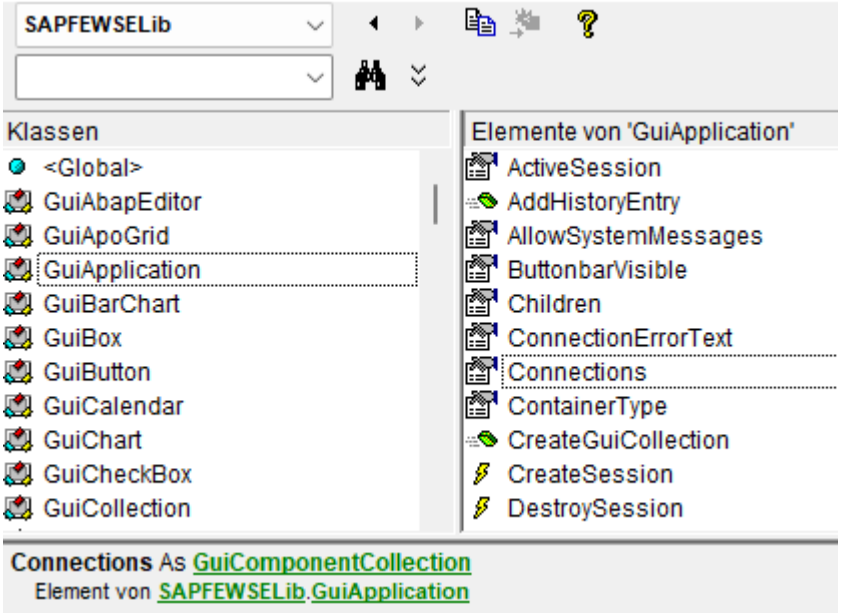


Choose the file `sapfewse.ocx`, from the standard path `C:\Program Files\SAP\FrontEnd\SAPGUI`.

Now the SAP GUI Scripting API is directly available in VBA.



Open the Object Browser (Objektkatalog) with F2, to view the object hierarchy with its methods and attributes.



WSH - Disable

It is possible to disable the Windows Script Host feature on the client.

- Press the **WINDOWS + R** keys, then type **regedit** to open the system registry in edit mode.

- Navigate to
  `HKEY_CURRENT_USER\Software\Microsoft\Windows Script Host\Settings\`

- Create (if it doesn't exist already) a new REG_DWORD key,
  call it **Enabled** and assign a value of **0** (zero) to it.

- Navigate to
  `HKEY_LOCAL_MACHINE\Software\Microsoft\Windows Script Host\Settings\`

- Create (if it doesn't exist already) a new REG_DWORD key,
  call it **Enabled** and assign a value of **0** (zero) to it.

After that the WSH block should be effective.
To enable the WSH again, set Enabled on the same way to 1 (one).

Robotic Process Automation

Robotic Process Automation (RPA) platforms, like UiPath or Blue Prism, uses the SAP GUI Scripting API to automate SAP GUI for Windows. The combination of RPA with SAP GUI Scripting offers interesting automation possibilities. The code, generated by Scripting Tracker, can be easily transferred to RPA. This speeds up the development of SAP GUI for Windows code sequences and reduces the possibilities of errors.

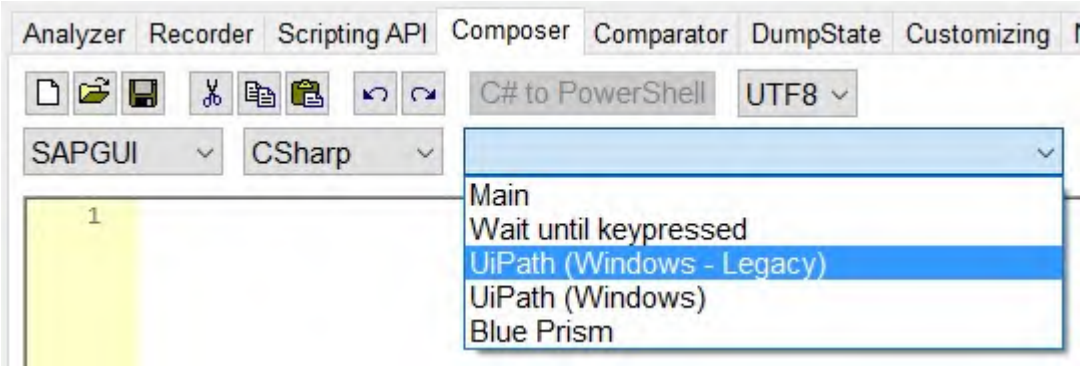
Integration scenarios of Scripting Tracker in the development workflow of UiPath on the example of different programming and scripting languages.
Integration Scenario - UiPath - C#
Integration Scenario - UiPath - PowerShell Windows
Integration Scenario - UiPath - AutoIt
Integration Scenario - UiPath - VBScript

Integration scenarios of Scripting Tracker in the development workflow of Blue Prism with different programming languages.
Integration Scenario - Blue Prism - C#
Integration Scenario - Blue Prism - VB.NET

Identifiers play an essential role at automation in the SAP GUI for Windows environment. The highest hierarchical levels are the connection and the session. RPA platforms detects these themselves to ensure high flexibility. Here approaches to use this information in integration scenarios.
Connection and Session Number - UiPath
Session ID and Session Number - UiPath

RPA - Integration Scenario - UiPath - C#

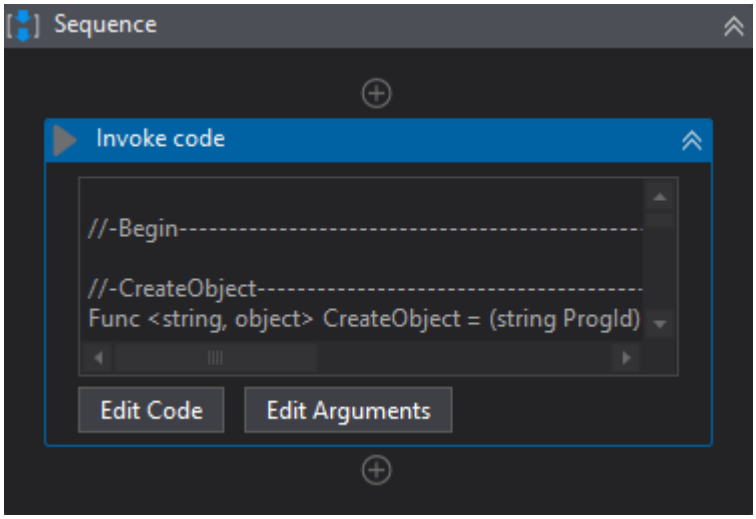
To use C# code with the UiPath Invoke Code activity is very easy. At first you must record your SAP activities with C#. Switch to the Composer tab and insert the SAPGUI > CSharp > UiPath (Windows - Legacy) or UiPath (Windows) code sequence.



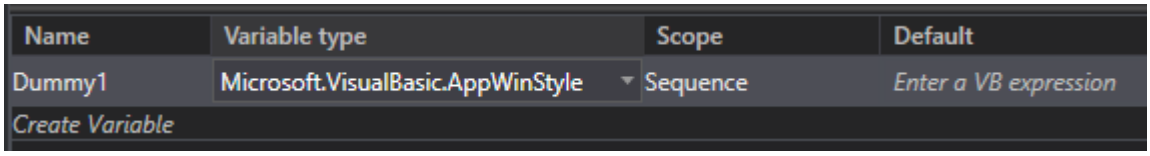
Move your recorded SAP activities into the code sequence and replace with it the line `//>Insert your SAP GUI Scripting code here<.`

```
56  dynamic ID = null;
57
58  //>Insert your SAP GUI Scripting code here<
59
60  FreeObject(session);
```

Copy now this whole code from the Composer into your UiPath Invoke Code activity.



Hint: If your UiPath project is Windows - Legacy it is necessary to add a dummy variable from type Microsoft.VisualBasic.* to your workflow sequence.



Testing

This approach was successfully tested with UiPath 22.7.0 and SAP GUI for Windows 7.70 PL 7 on Windows 11 in the compatibility modes Windows - Legacy and Windows.

RPA - Integration Scenario - UiPath - PowerShell Windows

Hint: Don't forget to set the execution policy first.

PowerShellScript

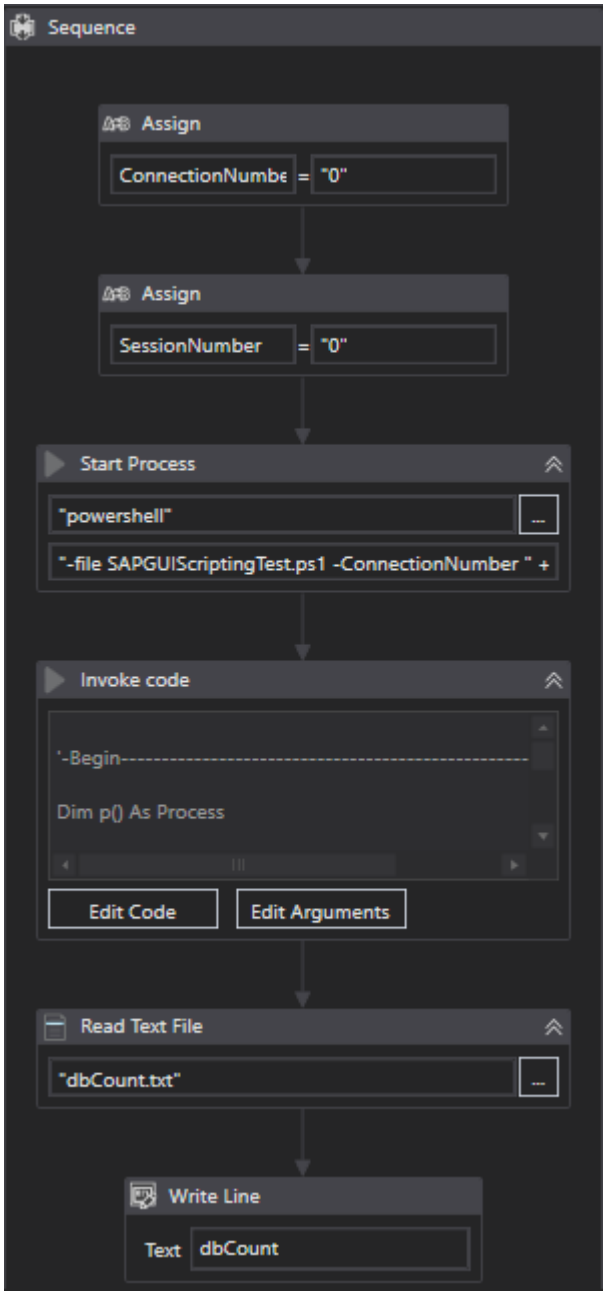
```
# Begin-----------------------------------------------------------------

# Parameters
Param(
  [String]$ConnectionNumber = "0",
  [String]$SessionNumber = "0"
)

# Includes
."$PSScriptRoot\COM.ps1"

# Main
$SapGuiAuto = Get-Object( , "SAPGUI")
If ($SapGuiAuto -isnot [__ComObject]) {
  Exit
}

$application = Invoke-Method $SapGuiAuto "GetScriptingEngine"
If ($application -isnot [__ComObject]) {
  Free-Object $SapGuiAuto
  Exit
}

$connection = Get-Property $application "Children"
@([convert]::ToInt32($ConnectionNumber, 10))
If ($Null -eq $connection) {
  Free-Object $SapGuiAuto
  Exit
}

$session = Get-Property $connection "Children"
@([convert]::ToInt32($SessionNumber, 10))
If ($Null -eq $session) {
  Free-Object $SapGuiAuto
  Exit
}

$ID = Invoke-Method $session "findById" @("wnd[0]/tbar[0]/okcd")
Set-Property $ID "text" @("/nSE16")
$ID = Invoke-Method $session "findById" @("wnd[0]")
Invoke-Method $ID "sendVKey" @(0)
$ID = Invoke-Method $session "findById"
@("wnd[0]/usr/ctxtDATABROWSE-TABLENAME")
Set-Property $ID "text" @("TADIR")
$ID = Invoke-Method $session "findById"
@("wnd[0]/usr/ctxtDATABROWSE-TABLENAME")
Set-Property $ID "caretPosition" @(5)
$ID = Invoke-Method $session "findById" @("wnd[0]")
Invoke-Method $ID "sendVKey" @(0)
$ID = Invoke-Method $session "findById" @("wnd[0]")
Invoke-Method $ID "sendVKey" @(31)

$ID = Invoke-Method $session "findById" @("wnd[1]/usr/txtG_DBCOUNT")
$dbCount = Get-Property $ID "text"
```

```
$ID = Invoke-Method $session "findById" @("wnd[1]/tbar[0]/btn[0]")
Invoke-Method $ID "press"
$ID = Invoke-Method $session "findById" @("wnd[0]")
Invoke-Method $ID "sendVKey" @(3)
$ID = Invoke-Method $session "findById" @("wnd[0]")
Invoke-Method $ID "sendVKey" @(3)

Free-Object $SapGuiAuto

Set-Content dbCount.txt $dbCount

# End-----------------------------------------------------------------
```

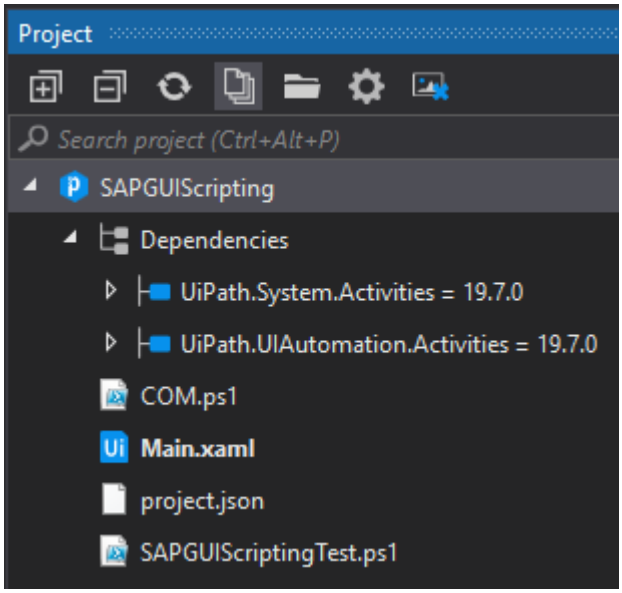
Variables in UiPath

Name	Variable type	Scope	Default
dbCount	String	Sequence	*Enter a VB expression*
ConnectionNumber	String	Sequence	*Enter a VB expression*
SessionNumber	String	Sequence	*Enter a VB expression*
Create Variable			

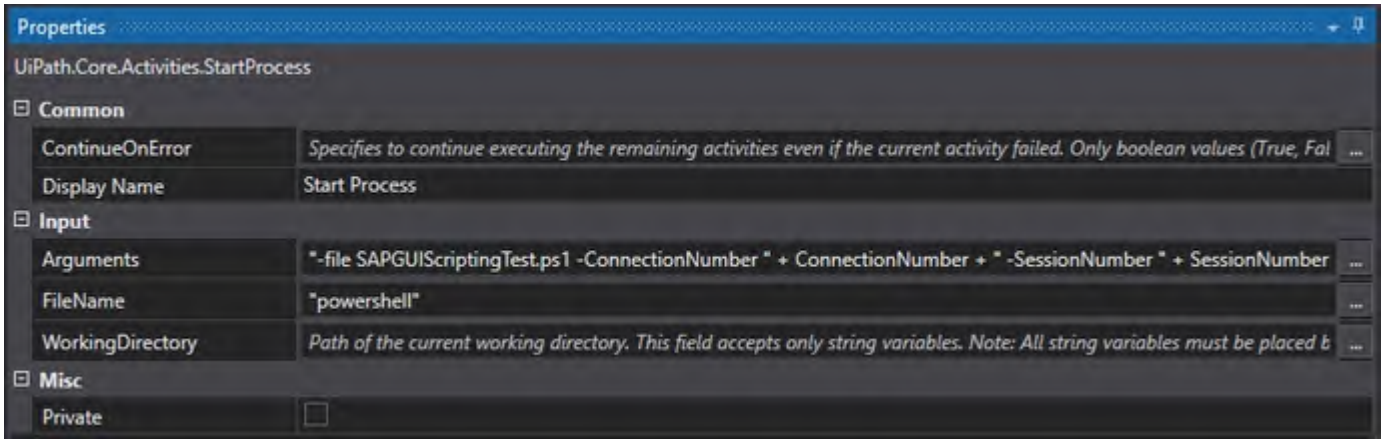
Sequence in UiPath



Hint: Store the PowerShell script file and the include into your project folder.



Properties of Start-Process activity



Code for Invoke Code activity

```
' Begin-----------------------------------------------------------------

Dim p() As Process

Do
  p = System.Diagnostics.Process.GetProcessesByName("powershell")
  System.Threading.Thread.Sleep(500)
Loop Until p.Length = 0

' End-------------------------------------------------------------------
```

Hint: To get the result from the PowerShell script the content of the file dbCount.txt is read.

RPA - Integration Scenario - UiPath - AutoIt

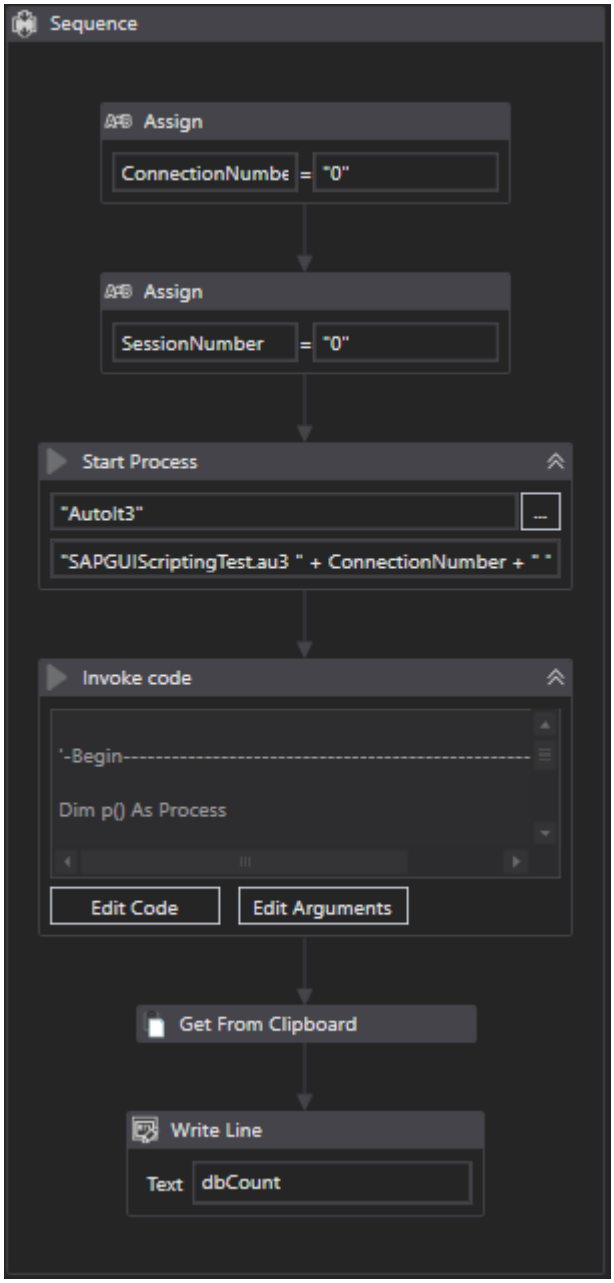
AutoItScript

```
; Begin-----------------------------------------------------------------

AutoItSetOption("MustDeclareVars", 1)

Dim $ConnectionNumber, $SessionNumber
Dim $SapGuiAuto, $application, $connection, $session, $dbCount

$ConnectionNumber = Number($CmdLine[1])
$SessionNumber = Number($CmdLine[2])

$SapGuiAuto = ObjGet("SAPGUI")
If Not IsObj($SapGuiAuto) Or @Error Then
  Exit
EndIf

$application = $SapGuiAuto.GetScriptingEngine()
If Not IsObj($application) Then
  Exit
EndIf

$connection = $application.Children($ConnectionNumber)
If Not IsObj($connection) Then
  Exit
EndIf

$session = $connection.Children($SessionNumber)
If Not IsObj($session) Then
  Exit
EndIf

$session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE16"
$session.findById("wnd[0]").sendVKey(0)
$session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = "TADIR"
$session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").caretPosition = 5
$session.findById("wnd[0]").sendVKey(0)
$session.findById("wnd[0]").sendVKey(31)

$dbCount = $session.findById("wnd[1]/usr/txtG_DBCOUNT").text

$session.findById("wnd[1]/tbar[0]/btn[0]").press
$session.findById("wnd[0]").sendVKey(3)
$session.findById("wnd[0]").sendVKey(3)

Clipput($dbCount)

; End-------------------------------------------------------------------
```

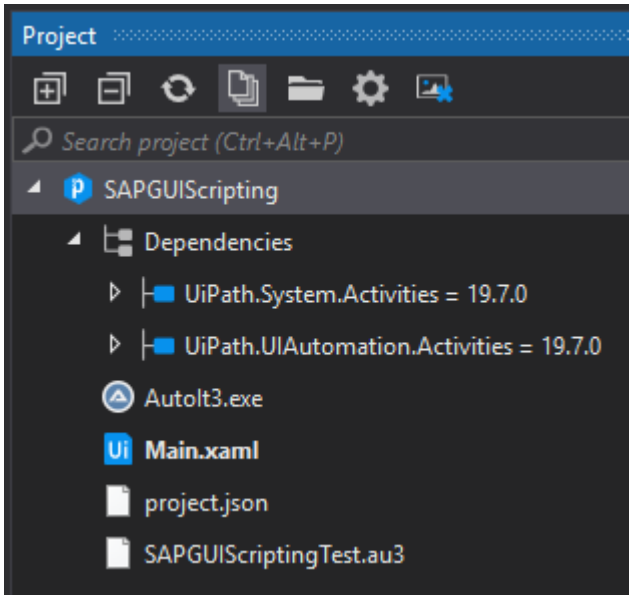
Variables in UiPath

Name	Variable type	Scope	Default
dbCount	String	Sequence	*Enter a VB expression*
ConnectionNumber	String	Sequence	*Enter a VB expression*
SessionNumber	String	Sequence	*Enter a VB expression*
Create Variable			

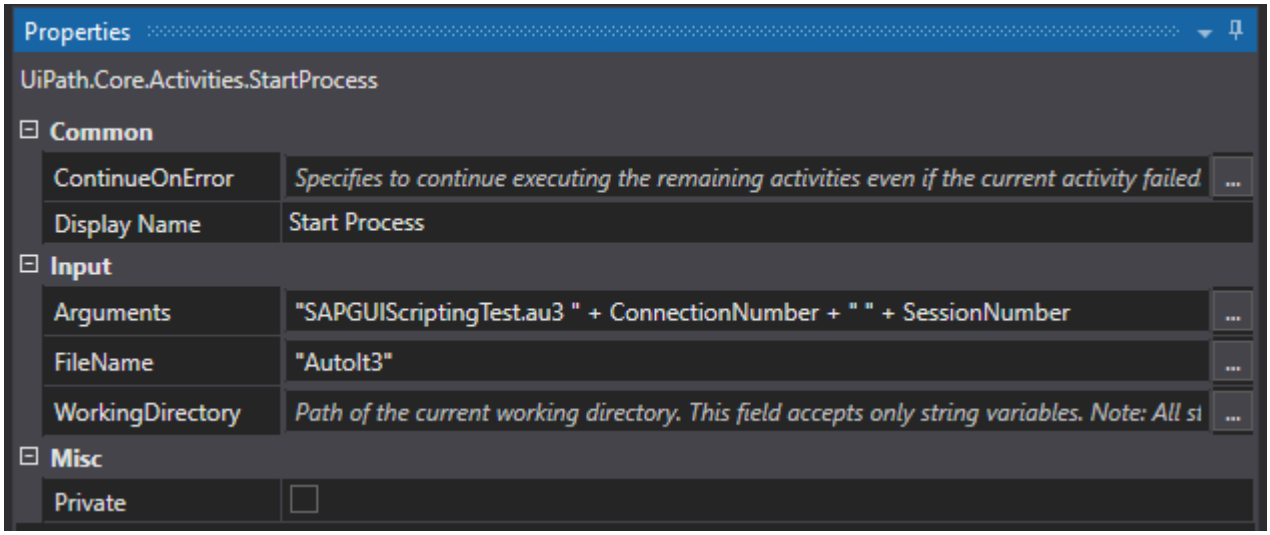
Sequence in UiPath



Hint: Store the AutoIt script file and the AutoIt3.exe into your project folder.



Properties of Start Process activity



Hint: For the Inter Process Communication (IPC) with the AutoIt interpreter the clipboard is using. To synchronize the Start Process activity an Invoke Code activity is used.

Code for Invoke Code activity

```
' Begin-----------------------------------------------------------------

Dim p() As Process

Do
  p = System.Diagnostics.Process.GetProcessesByName("AutoIt3")
  System.Threading.Thread.Sleep(500)
Loop Until p.Length = 0

' End-------------------------------------------------------------------
```

Hint: To get the result from the AutoIt script the content of the clipboard is read.

RPA - Integration Scenario - UiPath - VBScript

VBScript

Hint: It is no longer recommended to use VBScript. It is a deprecated script language that is no longer being developed. Yes, there are many examples on the Internet that can be used, but basically PowerShell should be used for every new development.

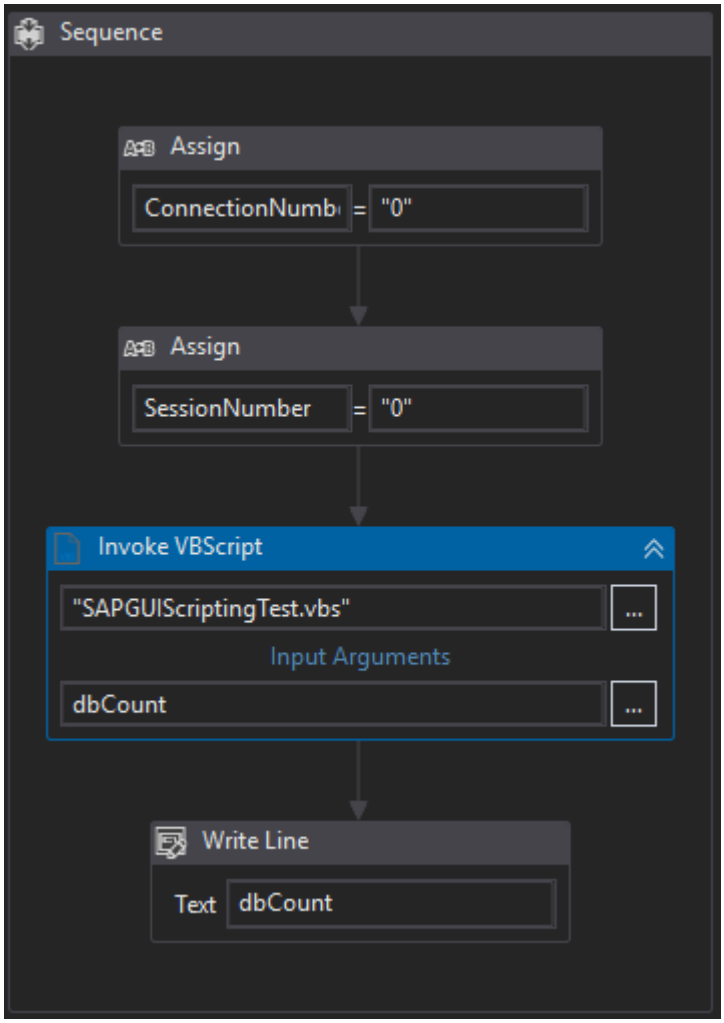
```
' Begin-----------------------------------------------------------------

Option Explicit

Dim ConnectionNumber, SessionNumber
Dim SapGuiAuto, application, connection, session, dbCount

ConnectionNumber = WScript.Arguments.Item(0)
SessionNumber = WScript.Arguments.Item(1)

If Not IsObject(application) Then
  Set SapGuiAuto = GetObject("SAPGUI")
  Set application = SapGuiAuto.GetScriptingEngine
End If

If Not IsObject(connection) Then
  Set connection = application.Children(CInt(ConnectionNumber))
End If

If Not IsObject(session) Then
  Set session = connection.Children(CInt(SessionNumber))
End If

session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE16"
session.findById("wnd[0]").sendVKey 0
session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = "TADIR"
session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").caretPosition = 5
session.findById("wnd[0]").sendVKey 0
session.findById("wnd[0]").sendVKey 31

dbCount = session.findById("wnd[1]/usr/txtG_DBCOUNT").Text

session.findById("wnd[1]/tbar[0]/btn[0]").press
session.findById("wnd[0]").sendVKey 3
session.findById("wnd[0]").sendVKey 3

WScript.Echo CStr(dbCount)

' End-------------------------------------------------------------------
```

Hint: If you use Option Explicit you must define the arguments of Invoke VBScript activity too.

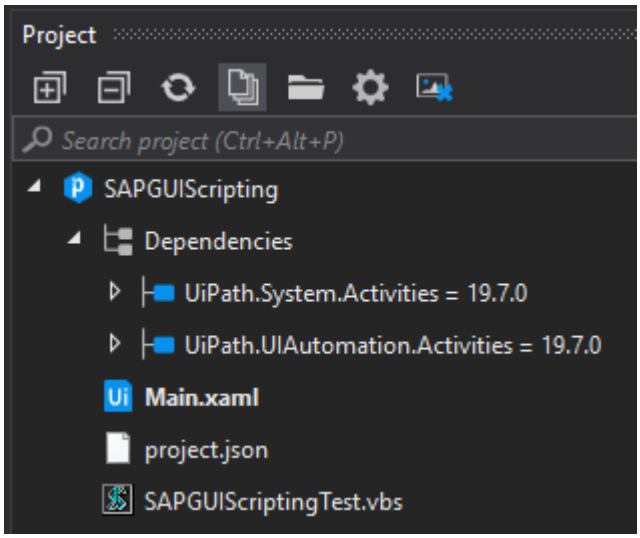
Variables in UiPath

Name	Variable type	Scope	Default
dbCount	String	Sequence	*Enter a VB expression*
ConnectionNumber	String	Sequence	*Enter a VB expression*
SessionNumber	String	Sequence	*Enter a VB expression*
Create Variable			

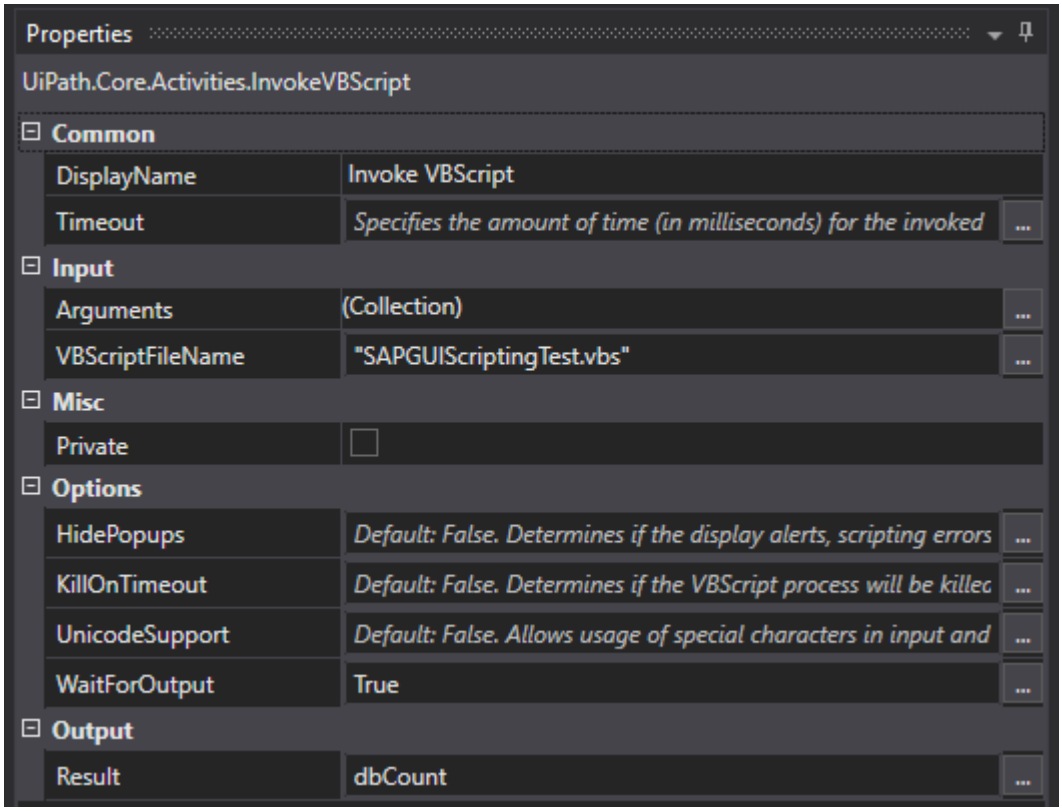
Sequence in UiPath



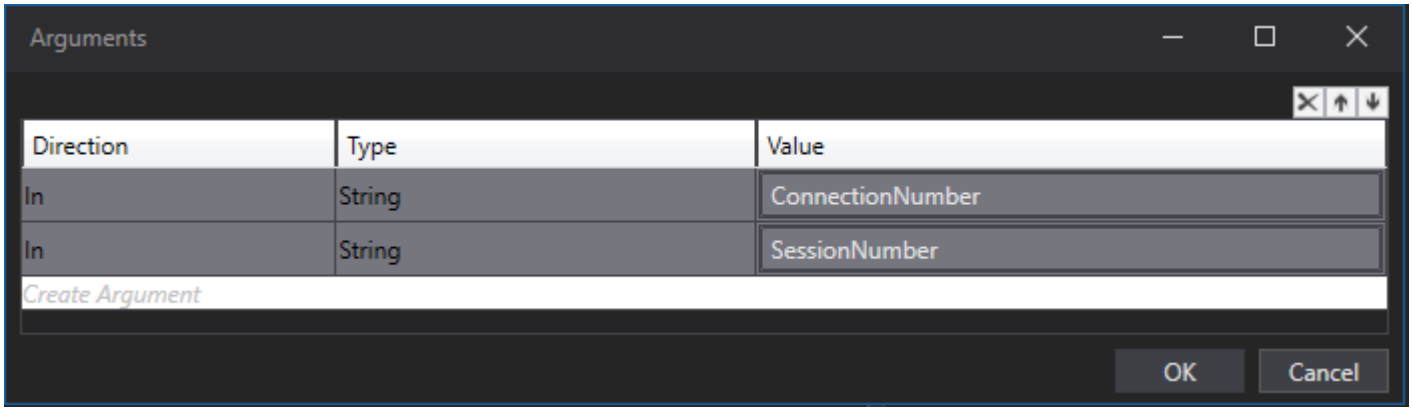
Hint: Store the VBScript file into your project folder.



Properties of Invoke VBScript activity

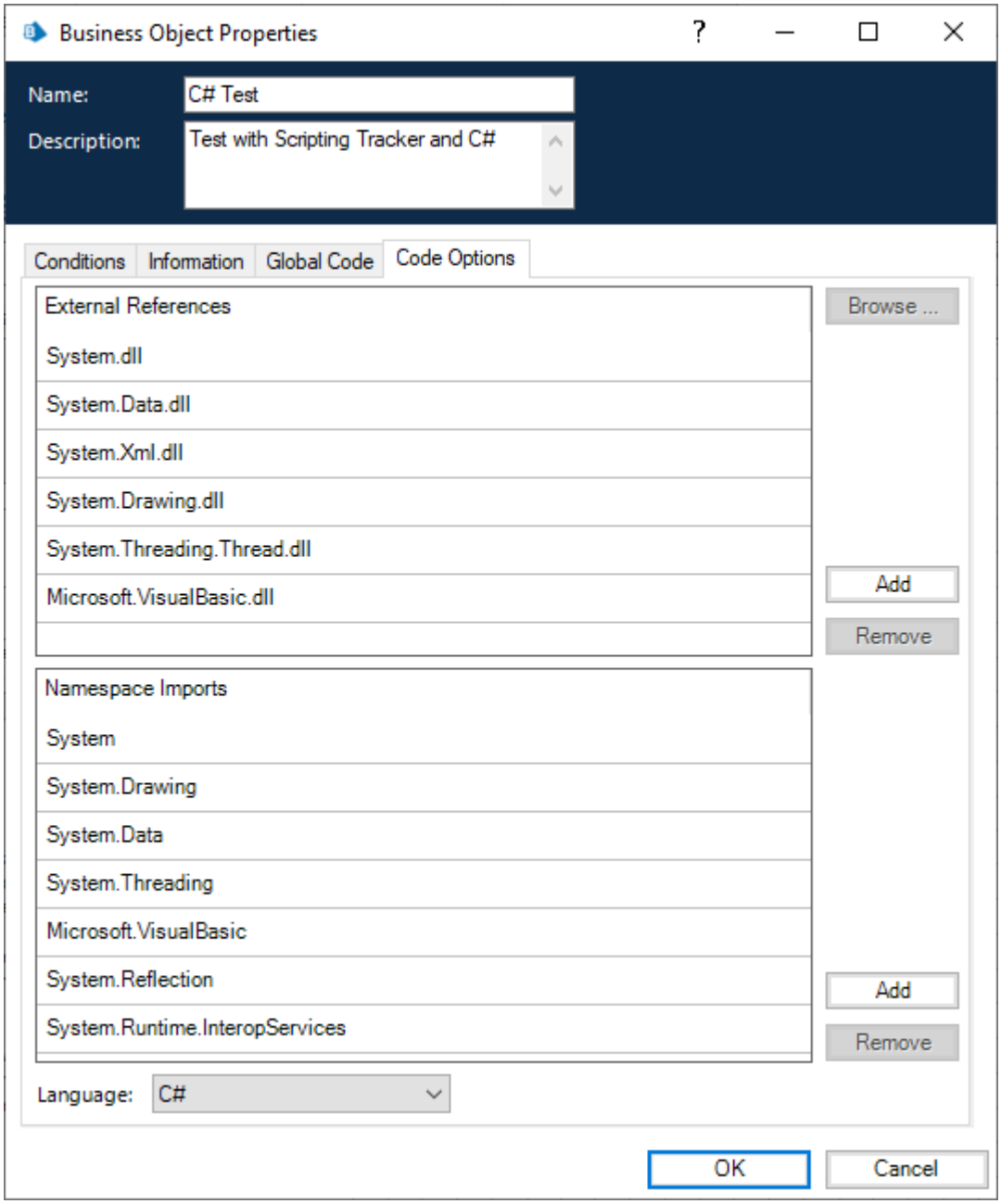


Arguments of Invoke VBScript activity

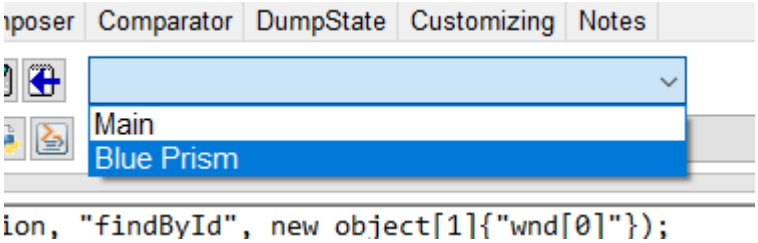


RPA - Integration Scenario - Blue Prism - C#

Before you can use the C# code, which was recorded with Scripting Tracker, you must add an external reference. It is necessary to add the library Microsoft.VisualBasic.dll, because the GetObject method is used. Also the namespaces Microsoft.VisualBasic, System.Reflection and System.Runtime.InteropServices must be imported.



Record your activities with C#, add the code snippet Blue Prism, ...



... move your recorded code to the correct position and copy and paste your C# code from Scripting Tracker to your code stage.

Code Properties

Name: Code1

Description:

Inputs Outputs Code

```
1
2  //-Begin----------------------------------------------------------------
3
4  dynamic InvokeMethod(object obj, string methodName, object[] methodParams = null) {
5    return obj.GetType().InvokeMember(methodName, BindingFlags.InvokeMethod, null, obj, methodParams);
6  }
7
8  dynamic GetProperty(object obj, string propertyName, object[] propertyParams = null) {
9    return obj.GetType().InvokeMember(propertyName, BindingFlags.GetProperty, null, obj, propertyParams);
10 }
11
12 dynamic SetProperty(object obj, string propertyName, object[] propertyParams = null) {
13   return obj.GetType().InvokeMember(propertyName, BindingFlags.SetProperty, null, obj, propertyParams);
14 }
15
16 object session = null;
17 try {
18   object SapGuiAuto = Interaction.GetObject("SAPGUI");
19   object app = InvokeMethod(SapGuiAuto, "GetScriptingEngine");
20   object connection = GetProperty(app, "Children", new object[1]{0});
21   session = GetProperty(connection, "Children", new object[1]{0});
22 } catch {
23   return;
24 }
25
26 dynamic ID = null;
27
28 ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
29 InvokeMethod(ID, "resizeWorkingPane", new object[3]{84, 29, 0});
30 ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]/tbar[0]/okcd"});
31 SetProperty(ID, "text", new object[1]{"/nsel6"});
32 ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
33 InvokeMethod(ID, "sendVKey", new object[1]{0});
```

Check Code

Parameters

Stage logging: Disabled

Warning threshold: System Default Number of minutes: 5 (0 to disable)

OK Cancel

RPA - Integration Scenario - Blue Prism - VB.NET

To work with VB.NET is the most comfortable way to execute SAP GUI Scripting with Blue Prism. Record your activities with VB.NET, press the button open source in external editor and ...

C:\Dummy\Tracker\Tracker_EditScript.vb - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

Tracker_EditScript.vb

```vb

'-Begin------------------------------------------------------------------

Public Module SAPGUIScripting

  Sub Main()

    Dim SapGuiAuto As Object
    Dim app As Object
    Dim connection As Object
    Dim session As Object

    Try
      SapGuiAuto = GetObject("SAPGUI")
      app = SapGuiAuto.GetScriptingEngine
      connection = app.Children(0)
      If connection.DisabledByServer = True Then
        Exit Sub
      End If
      session = connection.Children(0)
      If session.Info.IsLowSpeedConnection = True Then
        Exit Sub
      End If
    Catch
      Exit Sub
    End Try

  session.findById("wnd[0]").resizeWorkingPane(84, 29, 0)
  session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE16"
  session.findById("wnd[0]").sendVKey(0)
  session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = "TADIR"
  session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").caretPosition = 5
  session.findById("wnd[0]").sendVKey(0)
  session.findById("wnd[0]").sendVKey(31)
  session.findById("wnd[1]/tbar[0]/btn[0]").press
  session.findById("wnd[0]/tbar[0]/btn[3]").press
  session.findById("wnd[0]/tbar[0]/btn[3]").press

  End Sub

End Module

'-End--------------------------------------------------------------------

```

Visual Ba: length : 1.251 lines : 44 Ln : 44 Col : 1 Sel : 0 | 0 Windows (CR LF) UTF-8-BOM INS

... copy the code sequence between Sub Main() and End Sub into your code stage.

Code Properties

Name: Code1

Description:

Inputs Outputs Code

Parameters

```
1      Dim SapGuiAuto As Object
2      Dim app As Object
3      Dim connection As Object
4      Dim session As Object
5
6      Try
7        SapGuiAuto = GetObject("SAPGUI")
8        app = SapGuiAuto.GetScriptingEngine
9        connection = app.Children(0)
10       If connection.DisabledByServer = True Then
11         Exit Sub
12       End If
13       session = connection.Children(0)
14       If session.Info.IsLowSpeedConnection = True Then
15         Exit Sub
16       End If
17     Catch
18       Exit Sub
19     End Try
20
21 session.findById("wnd[0]").resizeWorkingPane(84, 29, 0)
22 session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE16"
23 session.findById("wnd[0]").sendVKey(0)
24 session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = "TADIR"
25 session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").caretPosition = 5
26 session.findById("wnd[0]").sendVKey(0)
27 session.findById("wnd[0]").sendVKey(31)
28 session.findById("wnd[1]/tbar[0]/btn[0]").press
29 session.findById("wnd[0]/tbar[0]/btn[3]").press
30 session.findById("wnd[0]/tbar[0]/btn[3]").press
```

Check Code

Stage logging: Disabled

Warning threshold: System Default Number of minutes 5 (0 to disable)

OK Cancel

RPA - Connection and Session Number - UiPath

In the area of SAP GUI for Windows automation plays the identifier (ID) of the UI elements an important role. It looks e.g. like this:

```
/app/con[0]/ses[0]/wnd[0]/usr/cntlIMAGE_CONTAINER/shellcont/shell
```

The ID starts always with /app, the GuiApplication. Then follows /con[0], which is the connection with its number, the GuiConnection. Then follows /ses[0], which is the session with its number, the GuiSession. You can find more information here about the SAP GUI Scripting Object Model. When you log on to an SAP system, you establish a connection.

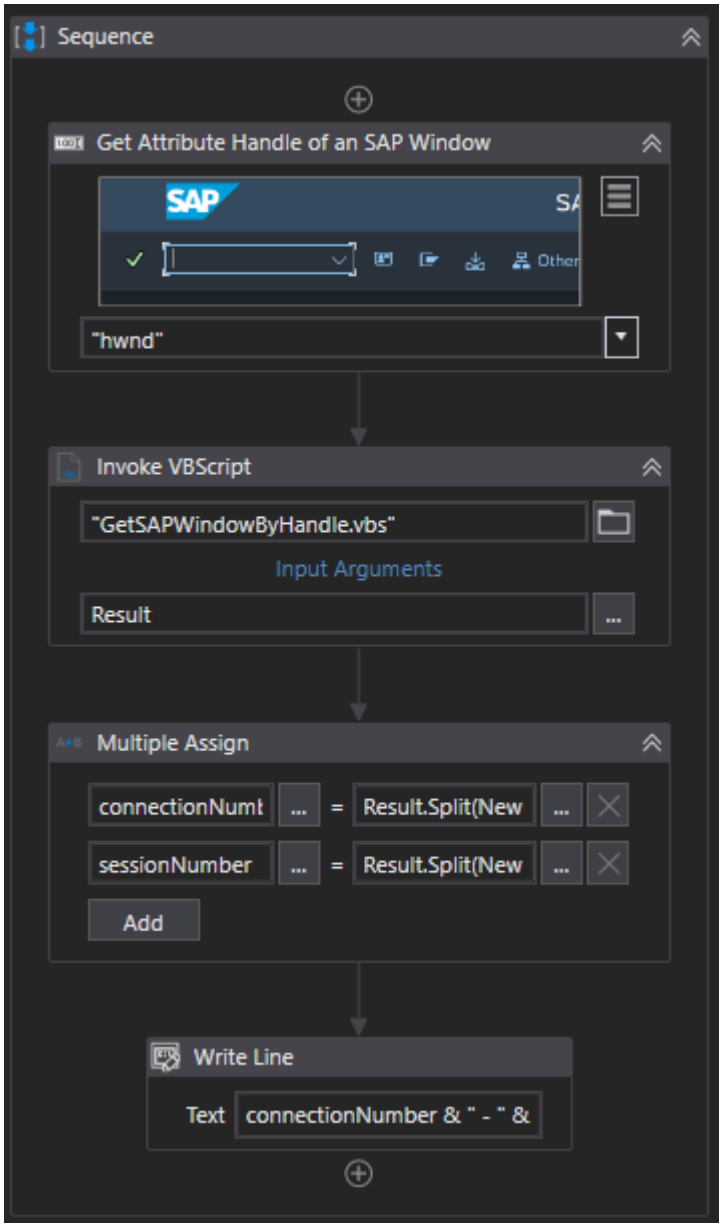
In the context of UiPath are the application, connection and session without significance. UiPath detects the window and an UI element with a selector e.g. like this:

```
<wnd app='saplogon.exe' cls='SAP_FRONTEND_SESSION' title='SAP Easy Access*' />
<sap id='usr/cntlIMAGE_CONTAINER/shellcont/shell' />
```

As we can see the window is identified with other selectors and below the window the SAP GUI Scripting ID is used, beginning with the user screen /usr.

To get the connection and session number in UiPath it is possible to use the Get Attribute activity with the handle of the window, hwnd. The handle is transfered to a VBScript and the script delivers the session ID, the connection and session number back to the project. But this is not necessary at all. A recorded SAP GUI script can also be inserted in the main routine instead.

With this approach we have the possibility to use existing SAP GUI scripts seamlessly in UiPath. All we have to do is change the recorded connection and session number with variables. The advantages of this approach are, that we can use all the possibilities of the SAP GUI Scripting API and that we can use existing consolidated scripts furthermore. The disadvantage of this approach is, that we pass the control of the automation to another engine, so the complexity increases. It depends on the use case.




```
' Begin-----------------------------------------------------------------

' Directives
Option Explicit

' Function FindSAPWindowsByHandle
Function FindSAPWindowByHandle(hSAPWnd)

  Dim SapGuiAuto, app, CollCon, oCon, CollSes, oSes, hWnd, i, j

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Function
  End If

  Set app = SapGuiAuto.GetScriptingEngine
  If Not IsObject(app) Then
    Exit Function
  End If

  ' Get all connections
  Set CollCon = app.Connections()
  If Not IsObject(CollCon) Then
```

```
    Exit Function
  End If

  ' Loop over connections
  For i = 0 To CollCon.Count() - 1
    Set oCon = app.Children(CLng(i))
    If Not IsObject(oCon) Then
      Exit Function
    End If

    ' Get all sessions of a connection
    Set CollSes = oCon.Sessions()
    If Not IsObject(CollSes) Then
      Exit Function
    End If

    ' Loop over sessions
    For j = 0 To CollSes.Count() - 1

      Set oSes = oCon.Children(CLng(j))
      If Not IsObject(oSes) Then
        Exit Function
      End If

      If oSes.Busy() = vbFalse Then
        hWnd = oSes.findById("wnd[0]").Handle
        If hSAPWnd = hWnd Then
          FindSAPWindowByHandle = oSes.ID
        End If
      End If

    Next

  Next

End Function

' Sub Main
Sub Main()

  Dim HandleSAPWindow
  Dim sessionId, connectionNumber, sessionNumber
  Dim pos, Len

  HandleSAPWindow = CLng(WScript.Arguments.Item(0))
  sessionId = CStr(FindSAPWindowByHandle(HandleSAPWindow))

  pos = InStr(sessionId, "con[") + 4
  Len = InStr(pos, sessionId, "]") - pos
  connectionNumber = CLng(Mid(sessionId, pos, Len))

  pos = InStr(sessionId, "ses[") + 4
  Len = InStr(pos, sessionId, "]") - pos
  sessionNumber = CLng(Mid(sessionId, pos, Len))

  WScript.Echo(sessionId & ";" & connectionNumber & ";" & sessionNumber)

End Sub

' Main
Main

' End-----------------------------------------------------------------
```

RPA - Session ID and Session Number - UiPath

Beside the handle of the window, which is decribed here, how to handle Connection and Session Number, it is also possible to use instead the session ID and session number to identify an SAP session window unique.

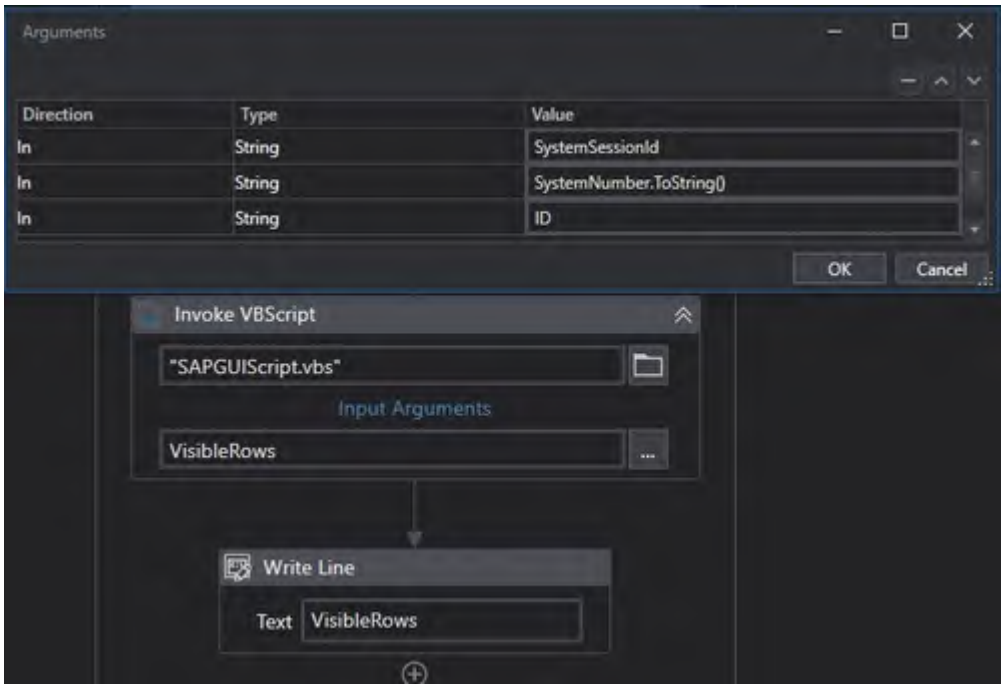
The script detects the session via SystemSessionID and SessionNumber. Both information delivers the Get Attribute activity. It loops over all connections and sessions to find the correct one. When it has found the right session it calls the Sub Action. In this sub routine you can use the attributes which are not supported by the Get Attribute activity, in this example VisibleRowCount.

```
' Begin-----------------------------------------------------------------

Option Explicit

' Sub Action
Sub Action(session)

  Dim Id, oElement
  Id = "wnd[0]/" + WScript.Arguments.Item(2)
  Set oElement = session.findById(Id)
  WScript.Echo CStr(oElement.VisibleRowCount)

End Sub

' Sub GetSession
Sub GetSession(SessionID, SessionNumber)

  Dim SapAppl, SapGuiAuto, CollCon, i, oCon, CollSes, j, oSes
  Dim oSesInf, SessID, SessNumber

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    WScript.Echo "Error: GetObject"
    Exit Sub
  End If

  Set SapAppl = SapGuiAuto.GetScriptingEngine
  If Not IsObject(SapAppl) Then
    WScript.Echo "Error: GetScriptingEngine"
    Exit Sub
  End If

  Set CollCon = SapAppl.Connections()
  If Not IsObject(CollCon) Then
    WScript.Echo "Error: No Connections"
    Exit Sub
  End If

  ' Loop over connections
  For i = 0 To CollCon.Count() - 1

    Set oCon = SapAppl.Children(CLng(i))
    If Not IsObject(oCon) Then
      WScript.Echo "Error at Connection"
      Exit Sub
    End If

    Set CollSes = oCon.Sessions()
    If Not IsObject(CollSes) Then
      WScript.Echo "Error: No Sessions"
```

```
      Exit Sub
    End If

    ' Loop over sessions
    For j = 0 To CollSes.Count() - 1

      Set oSes = oCon.Children(CLng(j))
      If Not IsObject(oSes) Then
        WScript.Echo "Error at Session"
        Exit Sub
      End If

      If oSes.Busy() = vbFalse Then

        Set oSesInf = oSes.Info()

        If IsObject(oSesInf) Then

          SessID = oSesInf.SystemSessionID()
          SessNumber = CStr(oSesInf.SessionNumber() - 1)

          If SessID = SessionID And SessNumber = SessionNumber Then
            Action oSes
          End If

        End If

      End If

    Next

  Next

End Sub

' Sub Main
Sub Main()
  GetSession WScript.Arguments.Item(0), WScript.Arguments.Item(1)
End Sub

' Main
Main

' End-----------------------------------------------------------------
```

In the UiPath workflow I detect at first the attributes SystemSessionId, SessionNumber and the ID of the UI element, in this example a table control.


Get Attribute 'TableControl SAPMBIBST...'
"sapSysSessionId"
Get Attribute 'TableControl SAPMBIBST...'
"sapSysNumber"
Get Attribute 'TableControl SAPMBIBST...'
"id"


Arguments
Direction
Type
Value
In
String
SystemSessionId
In
String
SystemNumber.ToString()
In
String
ID
OK
Cancel
Invoke VBScript
"SAPGUIScript.vbs"
Input Arguments
VisibleRows
Write Line
Text
VisibleRows

Restrictions

- See also OSS note 587202 - Restrictions when using SAP GUI Scripting.

- Changing's in long texts with the full screen editor are not recorded, because no change event is fired from SAP GUI for Windows.
  To check this call TAC SO10, choose menu item Settings > SAPscript > PC Editor and enable the checkbox Graphical PC Editor. Choose a standard text and press display.

- In ALV-Grid the first position of the conext menu is not recorded, because no change event is fired from SAP GUI for Windows.

- The text of a TextEdit control is not read because text lengths over 16702 characters cause a crash.

- Scripting Trackers recorder use the change event from SAP GUI Scripting. If no event is fired from SAP GUI for Windows, Scripting Tracker can't record the activities, equally the SAP standard.

- Scripting Tracker is an UTF8 version, it supports ANSI only with VBS files.

- Differences between SAP GUI for Windows and NetWeaver Business Client (NWBC)

  - The correct entry in the running object table (ROT) for the SAP GUI Scripting inside NWBC is SAPGUISERVER.

  - In the NWBC is no Toolbar[1] visible and not useable. Older SAP GUI Scripts will not work and there is no equivalent.

  - If a second NWBC window is open and the method `Connections` from the `Application` object with the property `Count` is used, it is not possible to detect more than one connection. SAP GUI Scripting uses only the first NWBC client window, because NWBC creates multiple instances of SAPGUISERVER in the running object table (ROT) and `GetObject` gets the first entry.

  - If a SAP® GUI Script is running in an NWBC window and the script is calling the method GetScriptingEngine a SAPGUI entry is registering in the ROT.

  Momentary conclusion: SAP GUI Scripting in the context of NWBC offers not the same possibilities as in SAP GUI for Windows context now.

- Differences between SAP GUI for Windows and SAP GUI window in ABAP in Eclipse

  - The correct entry in the running object table (ROT) for the SAP GUI Scripting inside ABAP in Eclipse is SAPGUISERVER.

- Using SAP GUI for Windows, NWBC and ABAP in Eclipse with SAP GUI Scripting parallel at the same time

  Momentary recommendation: Don't use SAP GUI for Windows, NWBC and/or ABAP in Eclipse with Scripting Tracker parallel and use only one instance of NWBC or ABAP in Eclipse at the same time with Scripting Tracker.

Frames

Collection of code snippets as frames to use SAP GUI Scripting easily.

PowerShell
C#
VB.NET
Python
JShell
AutoIt
VBA
WSH - VBScript
WSH - JScript

Frames - PowerShell

```
# Begin-----------------------------------------------------------------

."$PSScriptRoot\COM.ps1"

Function Main {

  $SapGuiAuto = Get-Object( , "SAPGUI")
  If ($SapGuiAuto -isnot [System.__ComObject]) {
    Return
  }

  $application = Invoke-Method $SapGuiAuto "GetScriptingEngine"
  If ($application -isnot [System. __ComObject]) {
    Free-Object -object $SapGuiAuto
    Return
  }

  Set-Property -object $application -propertyName "HistoryEnabled" `
    -propertyValue $False

  $connection = Get-Property $application "Children" @(0)
  If ($connection -eq $Null) {
    Free-Object -object $application
    Free-Object -object $SapGuiAuto
    Return
  }

  $DisabledByServer = Get-Property $connection "DisabledByServer"
  If ($True -eq $DisabledByServer) {
    Return
  }

  $session = Get-Property $connection "Children" @(0)
  If ($session -eq $Null) {
    Free-Object -object $connection
    Free-Object -object $application
    Free-Object -object $SapGuiAuto
    Return
  }

  $Busy = Get-Property $session "Busy"
  If ($True -eq $Busy) {
    Free-Object -object $session
    Free-Object -object $connection
    Free-Object -object $application
    Free-Object -object $SapGuiAuto
    Return;
  }

  $Info = Get-Property $session "Info"
  $IsLowSpeedConnection = Get-Property $Info "IsLowSpeedConnection"
  If ($True -eq $IsLowSpeedConnection) {
    Free-Object -object $session
    Free-Object -object $connection
    Free-Object -object $application
    Free-Object -object $SapGuiAuto
    Return
  }
```

```
  Set-Property -object $application -propertyName "HistoryEnabled"
-propertyValue @($True)

  Free-Object -object $session
  Free-Object -object $connection
  Free-Object -object $application
  Free-Object -object $SapGuiAuto

}

# Main
Main

# End-----------------------------------------------------------------
```

COM

```
# Begin-----------------------------------------------------------------

# Load assembly
If($PSVersionTable.PSVersion.Major -le 5) {
  Add-Type -AssemblyName "Microsoft.VisualBasic"
  Add-Type -AssemblyName "System.Windows.Forms"
} ElseIf ($PSVersionTable.PSVersion.Major -ge 7) {
  Add-Type -AssemblyName "System.Windows.Forms"
}

# Function Create-Object
Function Create-Object {

  Param(
    [String]$objectName
  )

  Try {
    New-Object -ComObject $objectName
  } Catch {
    If(($PSVersionTable.PSVersion.Major -le 5) -or `
      ($PSVersionTable.PSVersion.Major -ge 7)) {
      [Void][System.Windows.Forms.MessageBox]::Show(
        "Can't create object", "Important hint", 0)
    }
  }

}

# Function Get-Object
Function Get-Object {

  Param(
    [String]$class
  )

  If($PSVersionTable.PSVersion.Major -le 5) {
    [Microsoft.VisualBasic.Interaction]::GetObject($class)
  } ElseIf($PSVersionTable.PSVersion.Major -ge 6) {
    $SapROTWr = New-Object -ComObject "SapROTWr.SapROTWrapper"
    $SapROTWr.GetROTEntry($class)
  }

}
```

```
# Sub Free-Object
Function Free-Object {

  Param(
    [__ComObject]$object
  )

  [Void][System.Runtime.Interopservices.Marshal]::ReleaseComObject($object)

}

# Function Get-Property
Function Get-Property {

  Param(
    [__ComObject]$object,
    [String]$propertyName,
    $propertyParameter
  )

  $objectType = [System.Type]::GetType($object)
  $objectType.InvokeMember($propertyName,
    [System.Reflection.Bindingflags]::GetProperty,
    $null, $object, $propertyParameter)

}

# Sub Set-Property
Function Set-Property {

  Param(
    [__ComObject]$object,
    [String]$propertyName,
    $propertyValue
  )

  $objectType = [System.Type]::GetType($object)
  [Void] $objectType.InvokeMember($propertyName,
    [System.Reflection.Bindingflags]::SetProperty,
    $null, $object, $propertyValue)

}

# Function Invoke-Method
Function Invoke-Method {

  Param(
    [__ComObject]$object,
    [String]$methodName,
    $methodParameter
  )

  $objectType = [System.Type]::GetType($object)
  $output = $objectType.InvokeMember($methodName,
    [System.Reflection.BindingFlags]::InvokeMethod,
    $null, $object, $methodParameter)
  if ( $output ) { $output }

}

# End-----------------------------------------------------------------
```

WebDriver

```
# Begin-----------------------------------------------------------------

# Includes
."$PSScriptRoot\COM.ps1"

# Sub Main
Function Main {

  # Set SapGuiAuto = GetObject("SAPGUI")
  $SapGuiAuto = Get-Object( , "SAPGUI")
  If ($SapGuiAuto -isnot [__ComObject]) {
    Return
  }

  # Set application = SapGuiAuto.GetScriptingEngine
  $application = Invoke-Method $SapGuiAuto "GetScriptingEngine"
  If ($application -isnot [__ComObject]) {
    Free-Object $SapGuiAuto
    Return
  }

  # Set connection = application.Children(0)
  $connection = Get-Property $application "Children" @(0)
  If ($connection -eq $Null) {
    Free-Object $SapGuiAuto
    Return
  }

  # Set session = connection.Children(0)
  $session = Get-Property $connection "Children" @(0)
  If ($session -eq $Null) {
    Free-Object $SapGuiAuto
    Return
  }

  # Your activties in the SAP GUI for Windows


  # Load libraries
  Add-Type -Path "C:\Program
Files\Selenium\Selenium.WebDriverBackedSelenium.dll"
  Add-Type -Path "C:\Program Files\Selenium\WebDriver.dll"
  Add-Type -Path "C:\Program Files\Selenium\WebDriver.Support.dll"

  # Set path to chrome browser
  $Options = New-Object OpenQA.Selenium.Chrome.ChromeOptions
  $Options.BinaryLocation = "C:/Program
Files/Google/Chrome/Application/chrome.exe"

  # Opens a web browser window
  $WebDriver = New-Object OpenQA.Selenium.Chrome.ChromeDriver("C:\Program
Files\Selenium", $Options)
  $WebDriver.Url = "
http://nsp.stschnell.de:8630/sap/bc/webdynpro/sap/demo_wd_car_rental"

  # Your activities in the browser


  $WebDriver.Close()
  $WebDriver.Quit()

}
```

```
# Main
Main

# End-----------------------------------------------------------------
```

Parallel

```
# Begin---------------------------------------------------------------

  # Parameters
  Param($SessionNo)

  # Includes
  ."$PSScriptRoot\COM.ps1"

  # Main----------------------------------------------------------------
  $SapGuiAuto = Get-Object( , "SAPGUI")
  If ($SapGuiAuto -isnot [__ComObject]) {
    Exit
  }

  $application = Invoke-Method $SapGuiAuto "GetScriptingEngine"
  If ($application -isnot [__ComObject]) {
    Free-Object $SapGuiAuto
    Exit
  }

  $connection = Get-Property $application "Children" @(0)
  If ($connection -eq $Null) {
    Free-Object $SapGuiAuto
    Exit
  }

  $session = Get-Property $connection "Children" @(0)
  If ($session -eq $Null) {
    Free-Object $SapGuiAuto
    Exit
  }

  # Your Script here


  Free-Object $SapGuiAuto

# End-----------------------------------------------------------------
```

Here the script to execute it parallel:

```
# Begin---------------------------------------------------------------

start-job -Name job1 -FilePath C:\Dummy\test.ps1 -ArgumentList 0
start-job -Name job2 -FilePath C:\Dummy\test.ps1 -ArgumentList 1

wait-job -name job1
wait-job -name job2

receive-job -name job1
receive-job -name job2

# End-----------------------------------------------------------------
```

Frames - C#

```
// Begin-----------------------------------------------------------------

using Microsoft.VisualBasic;
using System.Reflection;
using System.Runtime.InteropServices;

public class SAPGUIScripting {

  static dynamic InvokeMethod(object obj, string methodName, object[]
methodParams = null) {
    return obj.GetType().InvokeMember(methodName, BindingFlags.InvokeMethod,
null, obj, methodParams);
  }

  static dynamic GetProperty(object obj, string propertyName, object[]
propertyParams = null) {
    return obj.GetType().InvokeMember(propertyName, BindingFlags.GetProperty,
null, obj, propertyParams);
  }

  static dynamic SetProperty(object obj, string propertyName, object[]
propertyParams = null) {
    return obj.GetType().InvokeMember(propertyName, BindingFlags.SetProperty,
null, obj, propertyParams);
  }

  static void FreeObject(object obj) {
    Marshal.ReleaseComObject(obj);
  }

  static void Main() {

    object SapGuiAuto = null;
    object app = null;
    object connection = null;
    object session = null;

    try {
      SapGuiAuto = Interaction.GetObject("SAPGUI");
      app = InvokeMethod(SapGuiAuto, "GetScriptingEngine");
      SetProperty(app, "HistoryEnabled", new object[1]{false});
      connection = GetProperty(app, "Children", new object[1]{0});
      session = GetProperty(connection, "Children", new object[1]{0});
      if(GetProperty(session, "Busy") == true) {
        return;
      }
      object info = GetProperty(session, "Info");
      if(GetProperty(info, "IsLowSpeedConnection") == true) {
        return;
      }
    } catch {
      return;
    }

    dynamic ID = null;



    SetProperty(app, "HistoryEnabled", new object[1]{true});
    FreeObject(session);
```

```
    FreeObject(connection);
    FreeObject(app);
    FreeObject(SapGuiAuto);

  }

}

// End-----------------------------------------------------------------
```

To compile this code and execute it use the following batch file

```
c:\Windows\Microsoft.NET\Framework64\v4.0.30319\csc.exe /target:exe
/platform:x64 /out:Tracker_RunScript.cs.exe
/reference:"C:\Windows\Microsoft.NET\Framework64\v4.0.30319\Microsoft.VisualBa
sic.dll" Tracker_RunScript.cs
start /min Tracker_RunScript.cs.exe
```

Frames - VB.NET

```
' Begin-----------------------------------------------------------------

Public Module SAPGUIScripting

  Sub Main()

    Dim SapGuiAuto As Object
    Dim app As Object
    Dim connection As Object
    Dim session As Object

    Try
      SapGuiAuto = GetObject("SAPGUI")
      app = SapGuiAuto.GetScriptingEngine
      app.HistoryEnabled = False
      connection = app.Children(0)
      If connection.DisabledByServer = True Then
        Exit Sub
      End If
      session = connection.Children(0)
      If session.Busy = True Then
        Exit Sub
      End If
      If session.Info.IsLowSpeedConnection = True Then
        Exit Sub
      End If
    Catch
      Exit Sub
    End Try



    app.HistoryEnabled = True

  End Sub

End Module

' End-------------------------------------------------------------------
```

To compile this code use the following batch file:

```
c:\Windows\Microsoft.NET\Framework64\v4.0.30319\vbc.exe /target:exe
/platform:x64 /out:Tracker_RunScript.vb.exe Tracker_RunScript.vb
start /min Tracker_RunScript.vb.exe
```

Frames - Python

```
# Begin-----------------------------------------------------------------

import sys, win32com.client

def main():

  try:

    SapGuiAuto = win32com.client.GetObject("SAPGUI")
    if not type(SapGuiAuto) == win32com.client.CDispatch:
      return

    application = SapGuiAuto.GetScriptingEngine
    if not type(application) == win32com.client.CDispatch:
      SapGuiAuto = None
      return

    application.HistoryEnabled = False

    connection = application.Children(0)
    if not type(connection) == win32com.client.CDispatch:
      application = None
      SapGuiAuto = None
      return

    if connection.DisabledByServer == True:
      connection = None
      application = None
      SapGuiAuto = None
      return

    session = connection.Children(1)
    if not type(session) == win32com.client.CDispatch:
      connection = None
      application = None
      SapGuiAuto = None
      return

    if session.Busy == True:
      session = None
      connection = None
      application = None
      SapGuiAuto = None
      return

    if session.Info.IsLowSpeedConnection == True:
      session = None
      connection = None
      application = None
      SapGuiAuto = None
      return



  except:
    print(sys.exc_info()[0])

  finally:

    application.HistoryEnabled = True
```

```
    session = None
    connection = None
    application = None
    SapGuiAuto = None

# Main
if __name__ == "__main__":
  main()

# End-----------------------------------------------------------------
```

Frames - JShell

```
// Begin-----------------------------------------------------------------

// Classpath
/env --class-path C:\Users\MyUser\Tracker\jacob\jacob.jar

import com.jacob.activeX.*;
import com.jacob.com.*;
import javax.swing.JOptionPane;

void Main() {

  ActiveXComponent SAPROTWr, application, connection, session, obj;
  Dispatch ROTEntry;
  Variant Value, ScriptEngine;
  Variant[] arg;
  boolean DisabledByServer, Busy, IsLowSpeedConnection;

  ComThread.InitSTA();

  application = null;

  try {

    // Set SapGuiAuto = GetObject("SAPGUI")
    SAPROTWr = new ActiveXComponent("SapROTWr.SapROTWrapper");
    ROTEntry = SAPROTWr.invoke("GetROTEntry", "SAPGUI").toDispatch();

    // Set application = SapGuiAuto.GetScriptingEngine
    ScriptEngine = Dispatch.call(ROTEntry, "GetScriptingEngine");
    application = new ActiveXComponent(ScriptEngine.toDispatch());

    application.setProperty("HistoryEnabled", false);

    // Set connection = application.Children(0)
    connection = new ActiveXComponent(
      application.invoke("Children", 0).toDispatch()
    );

    DisabledByServer =
connection.getProperty("DisabledByServer").changeType(Variant.VariantBoolean).
getBoolean();
    if(DisabledByServer == true) {
      System.out.println("Scripting is disabled by server");
      ComThread.Release();
      return;
    }

    // Set session = connection.Children(0)
    session = new ActiveXComponent(
      connection.invoke("Children", 0).toDispatch()
    );

    Busy =
session.getProperty("Busy").changeType(Variant.VariantBoolean).getBoolean();
    if(Busy == true) {
      System.out.println("Session is busy");
      ComThread.Release();
      return;
    }
```

```
    IsLowSpeedConnection =
session.getPropertyAsComponent("Info").getProperty("IsLowSpeedConnection").cha
ngeType(Variant.VariantBoolean).getBoolean();
    if(IsLowSpeedConnection == true) {
      System.out.println("Connection is low speed");
      ComThread.Release();
      return;
    }



  } catch (Exception e) {
    System.out.println(e.getMessage().toString());
  } finally {
    application.setProperty("HistoryEnabled", true);
    ComThread.Release();
  }

}

// Main
Main();
/exit

// End-------------------------------------------------------------------
```

Frames - AutoIt

```
; Begin-----------------------------------------------------------------

AutoItSetOption("MustDeclareVars", 1)

Func Main()

  Local $SapGuiAuto, $application, $connection, $session

  $SapGuiAuto = ObjGet("SAPGUI")
  If Not IsObj($SapGuiAuto) Or @Error Then
    Return
  EndIf

  $application = $SapGuiAuto.GetScriptingEngine()
  If Not IsObj($application) Then
    Return
  EndIf

  $application.HistoryEnabled = False

  $connection = $application.Children(0)
  If Not IsObj($connection) Then
    Return
  EndIf

  If $connection.DisabledByServer = True Then
    Return
  EndIf

  $session = $connection.Children(0)
  If Not IsObj($session) Then
    Return
  EndIf

  If $session.Busy = True Then
    Return
  EndIf

  If $session.Info.IsLowSpeedConnection = True Then
    Return
  EndIf



  $application.HistoryEnabled = True

EndFunc

; Main
Main()

; End-------------------------------------------------------------------
```

Frames - VBA

```
' Begin ----------------------------------------------------------------

Option Explicit

Sub Main()

  Dim SapGuiAuto As Object
  Dim app As SAPFEWSELib.GuiApplication
  Dim connection As SAPFEWSELib.GuiConnection
  Dim session As SAPFEWSELib.GuiSession

  If app Is Nothing Then
    Set SapGuiAuto = GetObject("SAPGUI")
    Set app = SapGuiAuto.GetScriptingEngine
  End If

  If connection Is Nothing Then
    Set connection = app.Children(0)
  End If

  If session Is Nothing Then
    Set session = connection.Children(0)
  End If



End Sub

' End ---------------------------------------------------------------
```

Preparation for VBA

To use SAP GUI Scripting inside VBA you can reference to the ActiveX library. In this case the VBA-IDE supports you with code completion, of the methods and attributes, and with the Object browser (F2).
Here the description for referencing the object library.

Frames - WSH - VBScript

The Windows Script Host (WSH) is an automation technology from Microsoft and it is independent from the scripting language. Visual Basic Scripting, also known as VBScript, is an Active Scripting language which bases on the WSH. The language of VBScript is modeled on Visual Basic. VBScript is widely used and the SAP GUI Scripting Recorder, of the SAP GUI for Windows, uses VBScript as its standard language.

Hint: It is no longer recommended to use VBScript. It is a deprecated script language that is no longer being developed. Yes, there are many examples on the Internet that can be used, but basically PowerShell should be used for every new development.
SAP has described the effects in Note 3484031 - Upcoming deprecation of VBScript by Microsoft - impact on SAP GUI Scripting.
More information are available at https://learn.microsoft.com/en-us/previous-versions/t0aew7h6(v=vs.85) [2024/08/14]

```
' Begin-----------------------------------------------------------------

Option Explicit

Sub Main()

  Dim SapGuiAuto, app, connection, session

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Sub
  End If

  Set app = SapGuiAuto.GetScriptingEngine
  If Not IsObject(app) Then
   Exit Sub
  End If

  app.HistoryEnabled = False

  Set connection = app.Children(0)
  If Not IsObject(connection) Then
   Exit Sub
  End If

  If connection.DisabledByServer = True Then
    Exit Sub
  End If

  Set session = connection.Children(0)
  If Not IsObject(session) Then
   Exit Sub
  End If

  If session.Busy = True Then
    Exit Sub
  End If

  If session.Info.IsLowSpeedConnection = True Then
    Exit Sub
  End If
```

```
  app.HistoryEnabled = True

End Sub

' Main
Main

' End-----------------------------------------------------------------
```

Frames - WSH - JScript

The Windows Script Host (WSH) is an automation technology from Microsoft and it is independent from the scripting language. JScript, Microsofts implementation of the ECMA 262 language specification (JavaScript, ECMAScript Edition 3), is an Active Scripting language which bases on the WSH. SAP has described in Note 3484031 - Upcoming deprecation of VBScript by Microsoft - impact on SAP GUI Scripting - that is planed to use JScript as an alternative script recording feature in SAP GUI for Windows 8.10.
More information are available at https://learn.microsoft.com/en-us/previous-versions/hbxc2t98 (v=vs.85) [2024/08/14]

```
// Begin-----------------------------------------------------------------

function main() {

  try {

    var SapGuiAuto = GetObject("SAPGUI");
    if (
      !SapGuiAuto || SapGuiAuto === "null" || SapGuiAuto === "undefined"
    ) {
      WScript.Echo("Can't get object SAPGUI");
      return;
    }

    var app = SapGuiAuto.GetScriptingEngine;
    if (!app || app === "null" || app === "undefined") {
      WScript.Echo("Can't get scripting engine");
      return;
    }

    app.HistoryEnabled = false;

    var connection = app.Children(0);
    if (
      !connection || connection === "null" || connection === "undefined"
    ) {
      WScript.Echo("Can't get connection");
      return;
    }

    if (connection.DisabledByServer === true) {
      WScript.Echo("Connection disabled by server");
      return;
    }

    var session = connection.Children(0);
    if (!session || session === "null" || session === "undefined") {
      WScript.Echo("Can't get session");
      return;
    }

    if (session.Busy === true) {
      WScript.Echo("Session busy");
      return;
    }

    if (session.Info.IsLowSpeedConnection === true) {
      WScript.Echo("Session has low speed connection");
      return;
    }
```

```
    app.HistoryEnabled = true;

  } catch (exception) {
    if (!exception.description) {
      WScript.Echo("An exception " + (exception.number & 0xFFFF) +
        " occurred");
    } else {
      WScript.Echo("An exception " + (exception.number & 0xFFFF) +
        " occurred:\n" + exception.description);
    }
  }

}

// Main
main();

// End-------------------------------------------------------------------
```

Examples

Collection of additional examples.

PowerShell
C#
AutoIt
VBA
WSH - VBScript

Examples - PowerShell

ComboBox
Excel
Generic Object Services (GOS)
Get Session List
OpenConnection
StatusBar
Read TableControl
Start SAP GUI
Start SAP GUI with Logon
Tree

Examples - PowerShell - ComboBox

```
# Begin ----------------------------------------------------------------

# Includes
."$PSScriptRoot\COM.ps1"

# Main
$SapGuiAuto = Get-Object -class "SAPGUI"
If ($SapGuiAuto -isnot [__ComObject]) {
  Exit
}

$application = Invoke-Method -object $SapGuiAuto `
  -methodName "GetScriptingEngine"
If ($application -isnot [__ComObject]) {
  Free-Object -object $SapGuiAuto
  Exit
}

$connection = Get-Property -object $application -propertyName "Children" `
  -propertyParameter @(0)
If ($Null -eq $connection) {
  Free-Object -object $SapGuiAuto
  Exit
}

$session = Get-Property -object $connection -propertyName "Children" `
  -propertyParameter @(0)
If ($Null -eq $session) {
  Free-Object -object $SapGuiAuto
  Exit
}

# Start TAC GUIBIBS
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/tbar[0]/okcd")
Set-Property -object $ID -propertyName "text" -propertyValue @("/nGUIBIBS")
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]")
Invoke-Method -object $ID -methodName "sendVKey" -methodParameter @(0)

# Goto Possible Entries
For($i = 1; $i -le 29; $i++) {
  $ID = Invoke-Method -object $session -methodName "findById" `
    -methodParameter @("wnd[0]/tbar[1]/btn[19]")
  Invoke-Method -object $ID -methodName "press"
}

$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/cmbT005X-LAND")
$Entries = Get-Property -object $ID -propertyName "Entries"
If($PSVersionTable.PSVersion.Major -le 5) {
  $Count = $Entries.Count
} Else {
  $Count = Get-Property -object $Entries -propertyName "Count"
}

For($i = 0; $i -lt $Count; $i++) {
  If($PSVersionTable.PSVersion.Major -le 5) {
    $Item = $Entries[$i]
  } Else {
    $Item = Get-Property -object $Entries -propertyName "ElementAt" `
```

```
      -propertyParameter @($i)
  }
  $Pos = Get-Property -object $Item -propertyName "Pos"
  $Key = Get-Property -object $Item -propertyName "Key"
  $Value = Get-Property -object $Item -propertyName "Value"
  Write-Host $Pos " " $Key " " $Value
}

Free-Object -object $SapGuiAuto

# End ------------------------------------------------------------------
```

Examples - PowerShell - Excel

```
# Begin ----------------------------------------------------------------

Function CreateExcel {

  $Excel = New-Object -ComObject Excel.Application
  $Excel.Visible = $True
  $WorkBook = $Excel.Workbooks.Add()
  $WorkSheet = $Excel.ActiveSheet
  Return $Excel, $WorkBook, $WorkSheet

}

Function OpenExcel {

  Param(
    [String]$FilePath,
    [String]$SheetName
  )

  $Excel = New-Object -ComObject Excel.Application
  $Excel.Visible = $True
  $WorkBook = $Excel.Workbooks.Open($FilePath)
  $WorkSheet = $WorkBook.Sheets($SheetName)
  Return $Excel, $WorkBook, $WorkSheet

}

Function Main {

  $Excel, $WorkBook, $WorkSheet = OpenExcel -FilePath "C:\Dummy\Test.xlsx" `
    -SheetName "Tabelle1"

  $LastCol =
$WorkSheet.UsedRange.Columns($WorkSheet.UsedRange.Columns.Count).Column
  $LastRow = $WorkSheet.UsedRange.Rows($WorkSheet.UsedRange.Rows.Count).Row

  $Range = $WorkSheet.Range($WorkSheet.Cells(1,1), $WorkSheet.Cells($LastRow,
$LastCol))

  For($i = 1; $i -le $LastRow; $i++) {
    For($j = 1; $j -le $LastCol; $j++) {
      Write-Host -NoNewline $Range.Cells($i, $j).Text
    }
    Write-Host
  }

  #$WorkBook.SaveAs("C:\Dummy\Test.xlsx")
  $Excel.Quit()

}

# Main
Main

# End ------------------------------------------------------------------
```

Examples - PowerShell - Generic Object Services (GOS)

```
# Begin ----------------------------------------------------------------

<#
 # This program is language dependent, it is localized German.
 #
 # To bypass the SAP GUI Security native Windows dialog,
 # define rules in the Security Configuration of the SAP Logon.
 #>

# Includes
."$PSScriptRoot\COM.ps1"

Function Main() {

  $SapGuiAuto = Get-Object "SAPGUI"
  If ($SapGuiAuto -IsNot [System.__ComObject]) {
    Return
  }

  $Application = Invoke-Method $SapGuiAuto "GetScriptingEngine"
  If ($Application -IsNot [System.__ComObject]) {
    Return
  }

  $Connection = Get-Property $Application "Children" @(0)
  If ($Null -eq $Connection) {
    Return
  }

  $Session = Get-Property $Connection "Children" @(0)
  If ($Null -eq $Session) {
    Return
  }

  $ID = Invoke-Method -object $session -methodName "findById" `
    -methodParameter @("wnd[0]/tbar[0]/okcd")
  Set-Property -object $ID -propertyName "text" -propertyValue @("/nsgostest")
  $ID = Invoke-Method -object $session -methodName "findById" `
    -methodParameter @("wnd[0]")
  Invoke-Method -object $ID -methodName "sendVKey" -methodParameter @(0)
  $ID = Invoke-Method -object $session -methodName "findById" `
    -methodParameter @("wnd[0]/tbar[1]/btn[8]")
  Invoke-Method -object $ID -methodName "press"

  $Path = "C:\Dummy"
  $FilesToAttach = $Path + "\Files2Attach"
  $Files = Get-ChildItem $FilesToAttach

  ForEach($File In $Files) {

    $ID = Invoke-Method -object $session -methodName "findById" `
      -methodParameter @("wnd[0]/titl/shellcont/shell")
    Invoke-Method -object $ID -methodName "pressContextButton" `
      -methodParameter @("%GOS_TOOLBOX")

    $ID = Invoke-Method -object $session -methodName "findById" `
      -methodParameter @("wnd[0]/titl/shellcont/shell")
    Invoke-Method -object $ID -methodName "selectContextMenuItem" `
      -methodParameter @("%GOS_PCATTA_CREA")
```

```
    # Set Path
    $ID = Invoke-Method -object $session -methodName "findById" `
      -methodParameter @("wnd[1]/usr/ctxtDY_PATH")
    Set-Property -object $ID -propertyName "text" `
      -propertyValue @("$($FilesToAttach)")

    # Set FileName
    $ID = Invoke-Method -object $session -methodName "findById" `
      -methodParameter @("wnd[1]/usr/ctxtDY_FILENAME")
    Set-Property -object $ID -propertyName "text" `
      -propertyValue @("$($File.Name)")

    <#
     # Parallel job to close the SAP GUI Security native dialog,
     # if no other security rules have been defined.
     #>
    $Job = Start-Job -ScriptBlock {

      $Win32API = @'
        [DllImport("user32.dll", CharSet=CharSet.Auto)]
        public static extern IntPtr FindWindow(string className, string
windowName)
        [DllImport("user32.dll")]
        [return: MarshalAs(UnmanagedType.Bool)]
        public static extern bool SetForegroundWindow(IntPtr hWnd)
'@

      Add-Type -MemberDefinition $Win32API -Name API -Namespace Win32
-PassThru
      Add-Type -AssemblyName System.Windows.Forms

      $hWnd = [Win32.API]::FindWindow("#32770", "SAP-GUI-Sicherheit")
      #$hWnd = [Win32.API]::FindWindow("#32770", "SAP GUI Security")
      [Win32.API]::SetForegroundWindow($hWnd)

      # It might be necessary to close the dialog mulitple times.
      Start-Sleep -Milliseconds 2500
      [System.Windows.Forms.SendKeys]::SendWait("%Z")
      #[System.Windows.Forms.SendKeys]::SendWait("%A")

    }

    $ID = Invoke-Method -object $session -methodName "findById" `
      -methodParameter @("wnd[1]")
    Invoke-Method -object $ID -methodName "sendVKey" -methodParameter @(0)

    # Now the native modal dialog box is open and served by the job
    $Job | Remove-Job -Force

    $ID = Invoke-Method -object $Session -methodName "findById" `
      -methodParameter @("wnd[0]/sbar/pane[0]")
    $StatusBar = Get-Property -object $ID -propertyName "text"
    If($StatusBar -eq "Das Dokument wurde angelegt") {
      Write-Host $File.FullName "erfolgreich angelegt" -ForegroundColor Green
    } Else {
      Write-Host $File.FullName "nicht angelegt" -ForegroundColor Red
    }

  }

}

# Main
Main
```

```
# End ------------------------------------------------------------------
```

Examples - PowerShell - Get Session List

```
# Begin ----------------------------------------------------------------

<#
 # This program delivers a session list as PowerShell custom object.
 # Blocked sessions are skipped by querying Busy property.
 #>

# Includes
."$PSScriptRoot\COM.ps1"

Function Get-SessionList {

  Param(
    $sessionList
  )

  $SapGuiAuto = Get-Object "SAPGUI"
  If ($SapGuiAuto -IsNot [System.__ComObject]) {
    Return
  }

  $Application = Invoke-Method $SapGuiAuto "GetScriptingEngine"
  If ($Application -IsNot [System.__ComObject]) {
    Return
  }

  $Connections = Get-Property $Application "Connections"
  ForEach ($Connection In $Connections) {

    $Sessions = Get-Property $Connection "Sessions"
    ForEach ($Session In $Sessions) {

      If (-Not $Session.Busy()) {
        $Info = Get-Property $Session "Info"
        If ($Info -Is [System.__ComObject]) {
          $ActiveWindow = Get-Property $Session "ActiveWindow"
          $WindowName = Get-Property $ActiveWindow "Text"
          $SystemName = Get-Property $Info "SystemName"
          $sessionList += [PSCustomObject]@{
            WindowName = $WindowName
            SystemName = $SystemName
          }
        }
      }

    }

  }

  return $sessionList;

}

Function Main {
  $sessionList = @()
  $sessionList = Get-SessionList($sessionList)
  ForEach ($session in $sessionList) {
    Write-Host $session
  }
}
```

```
# Main
Main

# End ------------------------------------------------------------------
```

Examples - PowerShell - OpenConnection

```
# Begin ----------------------------------------------------------------

# Includes
."$PSScriptRoot\COM.ps1"

# Main
$SapGuiAuto = Get-Object -class "SAPGUI"
If ($SapGuiAuto -isnot [__ComObject]) {
  Exit
}

$application = Invoke-Method -object $SapGuiAuto `
  -methodName "GetScriptingEngine"
If ($application -isnot [__ComObject]) {
  Free-Object -object $SapGuiAuto
  Exit
}

$connection = Invoke-Method -object $application -methodName "OpenConnection"
`
  -methodParameter @("NSP")
If ($Null -eq $connection) {
  Free-Object -object $SapGuiAuto
  Exit
}

$session = Get-Property -object $connection -propertyName "Children" `
  -propertyParameter @(0)
If ($Null -eq $session) {
  Free-Object -object $SapGuiAuto
  Exit
}

$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/txtRSYST-MANDT")
Set-Property -object $ID -propertyName "text" -propertyValue @("001")
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/txtRSYST-BNAME")
Set-Property -object $ID -propertyName "text" -propertyValue @("bcuser")
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/pwdRSYST-BCODE")
Set-Property -object $ID -propertyName "text" -propertyValue @("minisap")
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/txtRSYST-LANGU")
Set-Property -object $ID -propertyName "text" -propertyValue @("EN")
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]")
Invoke-Method -object $ID -methodName "sendVKey" -methodParameter @(0)

Free-Object -object $SapGuiAuto

# End ------------------------------------------------------------------
```

Examples - PowerShell - StatusBar

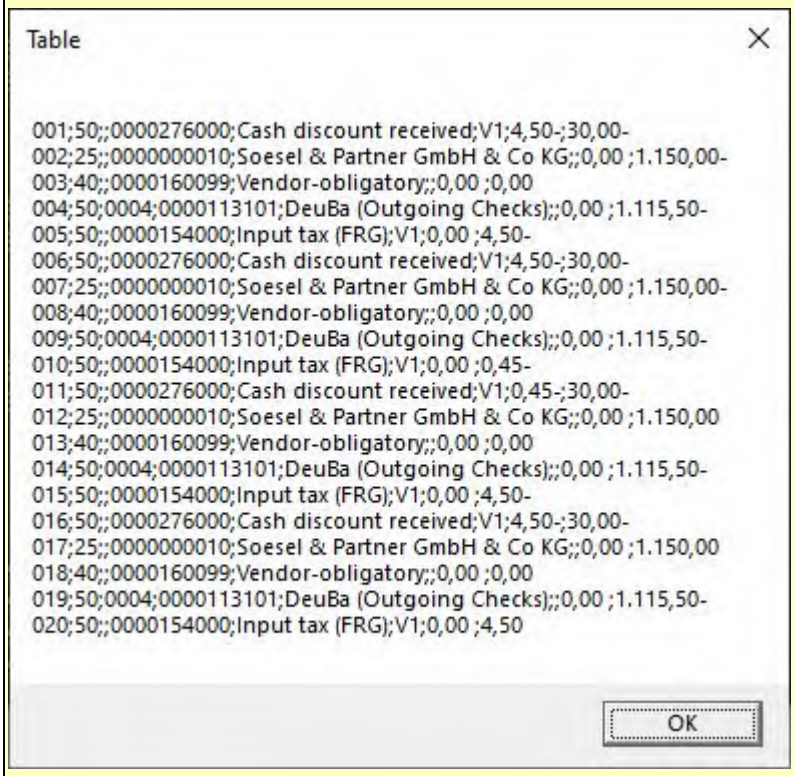
```
# Begin ----------------------------------------------------------------

# Includes
."$PSScriptRoot\COM.ps1"

# Main
$SapGuiAuto = Get-Object -class "SAPGUI"
If ($SapGuiAuto -isnot [__ComObject]) {
  Exit
}

$application = Invoke-Method -object $SapGuiAuto `
  -methodName "GetScriptingEngine"
If ($application -isnot [__ComObject]) {
  Free-Object -object $SapGuiAuto
  Exit
}

$connection = Get-Property -object $application -propertyName "Children" `
  -propertyParameter @(0)
If ($Null -eq $connection) {
  Free-Object -object $SapGuiAuto
  Exit
}

$session = Get-Property -object $connection -propertyName "Children" `
  -propertyParameter @(0)
If ($Null -eq $session) {
  Free-Object -object $SapGuiAuto
  Exit
}

# Start TAC GUIBIBS
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/tbar[0]/okcd")
Set-Property -object $ID -propertyName "text" -propertyValue @("/nGUIBIBS")
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]")
Invoke-Method -object $ID -methodName "sendVKey" -methodParameter @(0)

# Goto Messages in Primary Windows
For($i = 1; $i -le 39; $i++) {
  $ID = Invoke-Method -object $session -methodName "findById" `
    -methodParameter @("wnd[0]/tbar[1]/btn[19]")
  Invoke-Method -object $ID -methodName "press"
}

# Button Success
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/btnPB1")
Invoke-Method -object $ID -methodName "press"
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/sbar")
$StatusBarText = Get-Property -object $ID -propertyName "Text"
$MsgType = Get-Property -object $ID -propertyName "MessageType"
[Void][System.Windows.Forms.MessageBox]::Show($StatusBarText, $MsgType, 0)

# Button Warning
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/btnPB2")
```

```
Invoke-Method -object $ID -methodName "press"
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/sbar")
$StatusBarText = Get-Property -object $ID -propertyName "Text"
$MsgType = Get-Property -object $ID -propertyName "MessageType"
[Void][System.Windows.Forms.MessageBox]::Show($StatusBarText, $MsgType, 0)

# Button Error
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/btnPB3")
Invoke-Method -object $ID -methodName "press"
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/sbar")
$StatusBarText = Get-Property -object $ID -propertyName "Text"
$MsgType = Get-Property -object $ID -propertyName "MessageType"
[Void][System.Windows.Forms.MessageBox]::Show($StatusBarText, $MsgType, 0)

# Button Status bar
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/btnPB5")
Invoke-Method -object $ID -methodName "press"
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/sbar")
$StatusBarText = Get-Property -object $ID -propertyName "Text"
$MsgType = Get-Property -object $ID -propertyName "MessageType"
[Void][System.Windows.Forms.MessageBox]::Show($StatusBarText, $MsgType, 0)

Free-Object -object $SapGuiAuto

# End ------------------------------------------------------------------
```

Examples - PowerShell - Read TableControl

```
# Begin ---------------------------------------------------------------

<#
 #  TAC GUIBIBS
 #>

# Includes
."$PSScriptRoot\COM.ps1"

# Main
$SapGuiAuto = Get-Object -class "SAPGUI"
If ($SapGuiAuto -isnot [__ComObject]) {
  Exit
}

$application = Invoke-Method -object $SapGuiAuto `
  -methodName "GetScriptingEngine"
If ($application -isnot [__ComObject]) {
  Free-Object -object $SapGuiAuto
  Exit
}

$connection = Get-Property -object $application -propertyName "Children" `
  -propertyParameter @(0)
If ($Null -eq $connection) {
  Free-Object -object $SapGuiAuto
  Exit
}

$session = Get-Property -object $connection -propertyName "Children" `
  -propertyParameter @(0)
If ($Null -eq $session) {
  Free-Object -object $SapGuiAuto
  Exit
}

# Start TAC GUIBIBS
$ID = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/tbar[0]/okcd")
Set-Property -object $ID -propertyName "text" -propertyValue @("/nGUIBIBS")

# Go to overview screen
$wnd0 = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]")
Invoke-Method -object $wnd0 -methodName "sendVKey" -methodParameter @(0)
Invoke-Method -object $wnd0 -methodName "sendVKey" -methodParameter @(19)
Invoke-Method -object $wnd0 -methodName "sendVKey" -methodParameter @(19)
Invoke-Method -object $wnd0 -methodName "sendVKey" -methodParameter @(19)
Invoke-Method -object $wnd0 -methodName "sendVKey" -methodParameter @(19)

# Read GuiTableControl
$Table = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @("wnd[0]/usr/tblSAPMBIBSTC535")
$vScrollBar = Get-Property -object $Table -propertyName "VerticalScrollbar"
$RowCount = Get-Property -object $Table -propertyName "RowCount"
$Columns = Get-Property -object $Table -propertyName "Columns"

If($PSVersionTable.PSVersion.Major -le 5) {
  $ColCount = $Columns.Count
} Else {
```

```
  $ColCount = Get-Property -object $Columns -propertyName "Count"
}

For($Row = 0; $Row -lt $RowCount; $Row++) {
  Set-Property -object $vScrollBar -propertyName "position" `
    -propertyValue @($Row)
  $Table = Invoke-Method -object $session -methodName "findById" `
    -methodParameter @("wnd[0]/usr/tblSAPMBIBSTC535")
  $vScrollBar = Get-Property -object $Table -propertyName "VerticalScrollbar"
  For($Col = 0; $Col -lt $ColCount; $Col++) {
    $Cell = Invoke-Method -object $Table -methodName "getCell" `
      -methodParameter @(0, $Col)
    $CellText = Get-Property -object $Cell -propertyName "Text"
    If($Col -lt $ColCount - 1) {
      $Out += $CellText + ";"
    } Else {
      $Out += $CellText + "`n"
    }
  }
  $vScrollBarPosition = Get-Property -object $vScrollBar `
    -propertyName "position";
  $vScrollBarMaximum = Get-Property -object $vScrollBar `
    -propertyName "Maximum";
  If($vScrollBarPosition -eq $vScrollBarMaximum) {
    Break;
  }
}

If($PSVersionTable.PSVersion.Major -ne 6) {
  # Output in a message box
  [Void][System.Windows.Forms.MessageBox]::Show($Out, "Table", 0)
```




```
  # Output in a grid view
  $OutGrid = $Out | ConvertFrom-Csv -Delimiter ";" -Header
"Pos","UV","BA","Account","Description","VA","Tax","Amount"
  $OutGrid | Out-GridView
```

$OutGrid | Out-GridView;

Filter

Add criteria

Pos	UV	BA	Account	Description	VA	Tax	Amount
001	50		0000276000	Cash discount received	V1	4,50-	30,00-
002	25		0000000010	Soesel & Partner GmbH & Co KG		0,00	1.150,00-
003	40		0000160099	Vendor-obligatory		0,00	0,00
004	50	0004	0000113101	DeuBa (Outgoing Checks)		0,00	1.115,50-
005	50		0000154000	Input tax (FRG)	V1	0,00	4,50-
006	50		0000276000	Cash discount received	V1	4,50-	30,00-
007	25		0000000010	Soesel & Partner GmbH & Co KG		0,00	1.150,00-
008	40		0000160099	Vendor-obligatory		0,00	0,00
009	50	0004	0000113101	DeuBa (Outgoing Checks)		0,00	1.115,50-
010	50		0000154000	Input tax (FRG)	V1	0,00	0,45-
011	50		0000276000	Cash discount received	V1	0,45-	30,00-
012	25		0000000010	Soesel & Partner GmbH & Co KG		0,00	1.150,00
013	40		0000160099	Vendor-obligatory		0,00	0,00
014	50	0004	0000113101	DeuBa (Outgoing Checks)		0,00	1.115,50-
015	50		0000154000	Input tax (FRG)	V1	0,00	4,50-
016	50		0000276000	Cash discount received	V1	4,50-	30,00-
017	25		0000000010	Soesel & Partner GmbH & Co KG		0,00	1.150,00
018	40		0000160099	Vendor-obligatory		0,00	0,00
019	50	0004	0000113101	DeuBa (Outgoing Checks)		0,00	1.115,50-
020	50		0000154000	Input tax (FRG)	V1	0,00	4,50

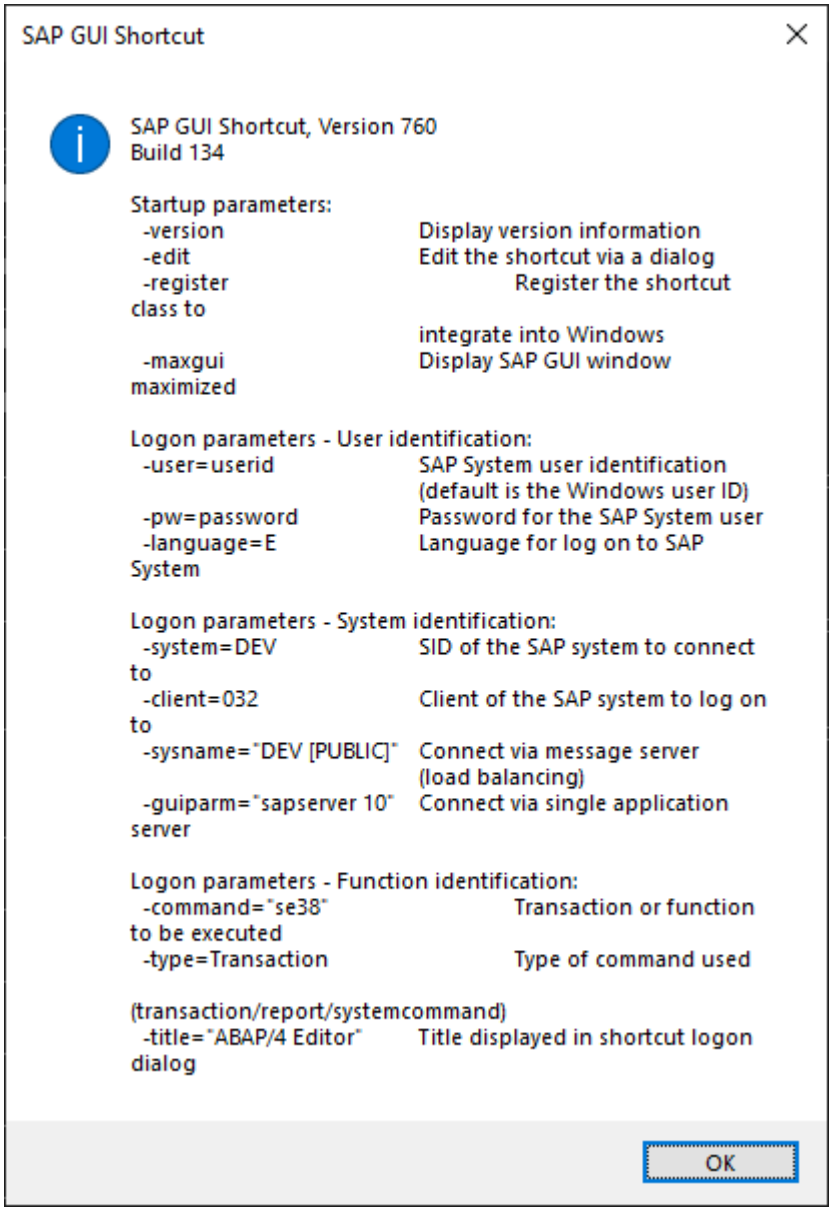
```
} Else {
  Write-Output $Out
}

Free-Object -object $SapGuiAuto

# End ------------------------------------------------------------------
```

Examples - PowerShell - Start SAP GUI

```
# Begin ----------------------------------------------------------------

$Sig = @'
[DllImport("user32.dll", CharSet = CharSet.Auto)]
public static extern IntPtr FindWindow(string lpClassName, string
lpWindowName)
'@

# Add FindWindow function
$Win32 = Add-Type -Namespace Win32 -Name Funcs -MemberDefinition $Sig
-PassThru

# Set the path to the SAP GUI directory
$SAPGUIPath = "C:\Program Files (x86)\SAP\FrontEnd\SAPgui\"

# Set the SAP system ID or the IP address
$SID = "NSP"

# Set the instance number of the SAP system
$InstanceNo = "00"

# Starts the SAP GUI
$SAPGUI = $SAPGUIPath + "sapgui.exe"
& $SAPGUI $SID $InstanceNo

While ($Win32::FindWindow("SAP_FRONTEND_SESSION", "SAP") -eq 0) {
  Start-Sleep -Milliseconds 250
}
Write-Host "Here now your script..."

# End ------------------------------------------------------------------
```

Examples - PowerShell - Start SAP GUI with Logon

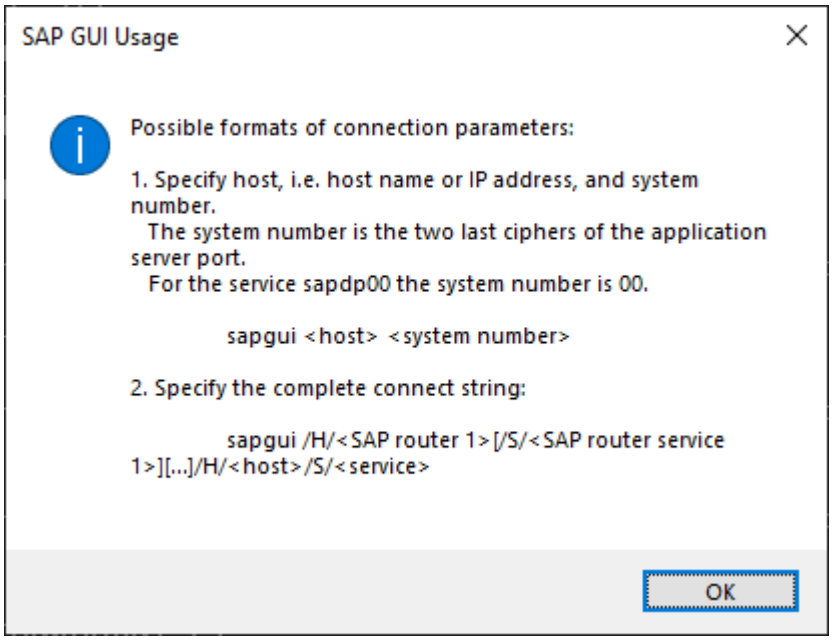
Variant 1 - Via SAP GUI Shortcut




```
# Begin ----------------------------------------------------------------

$Sig = @'
[DllImport("user32.dll", CharSet = CharSet.Auto)]
public static extern IntPtr FindWindow(string lpClassName, string
lpWindowName)
'@

$Win32 = Add-Type -Namespace Win32 -Name Funcs -MemberDefinition $Sig
-PassThru

& 'C:\Program Files (x86)\SAP\FrontEnd\SAPgui\sapshcut.exe' -system=NSP `
-client=001 -user=bcuser -PW=minisap -language=E -maxgui -command=SE16

While ($Win32::FindWindow("SAP_FRONTEND_SESSION", "Data Browser: Initial
Screen") -eq 0) {
  Start-Sleep -Milliseconds 250
}
```

```
# End ------------------------------------------------------------------
```

Variant 2 - Via SAP GUI




```
# Begin ----------------------------------------------------------------

#Includes
."$PSScriptRoot\COM.ps1";

# Signatures
$Sig = @'
[DllImport("user32.dll", CharSet = CharSet.Auto)]
public static extern IntPtr FindWindow(string lpClassName, string
lpWindowName);
'@

# Add FindWindow function
$Win32 = Add-Type -Namespace Win32 -Name Funcs -MemberDefinition $Sig
-PassThru;

# Set the path to the SAP GUI directory
$SAPGUIPath = "C:\Program Files (x86)\SAP\FrontEnd\SAPgui\";
# $SAPGUIPath = "C:\Program Files\SAP\FrontEnd\SAPgui\";

# Set the SAP system ID
$SID = "localhost";

# Set the instance number of the SAP system
$InstanceNo = "00";

# Start the SAP GUI
$SAPGUI = $SAPGUIPath + "sapgui.exe";
& $SAPGUI $SID $InstanceNo;

# Wait until the session is available
While ($Win32::FindWindow("SAP_FRONTEND_SESSION", "SAP") -eq 0) {
  Start-Sleep -Milliseconds 250;
}

# Logon to SAP GUI session
$SapGuiAuto = [Microsoft.VisualBasic.Interaction]::GetObject("SAPGUI");
```

```
$application = Invoke-Method $SapGuiAuto "GetScriptingEngine";
$connection = Get-Property $application "Children" @(0);
$session = Get-Property $connection "Children" @(0);

$ID = Invoke-Method $session "findById" @("wnd[0]/usr/txtRSYST-MANDT");
Set-Property $ID "Text" @("001");
$ID = Invoke-Method $session "findById" @("wnd[0]/usr/txtRSYST-BNAME");
Set-Property $ID "Text" @("BCUSER");
$ID = Invoke-Method $session "findById" @("wnd[0]/usr/pwdRSYST-BCODE");
Set-Property $ID "Text" @("minisap");
$ID = Invoke-Method $session "findById" @("wnd[0]/usr/txtRSYST-LANGU");
Set-Property $ID "Text" @("EN");
$ID = Invoke-Method $session "findById" @("wnd[0]");
Invoke-Method $ID "sendVKey" @(0);

Write-Host "Here now your script...";

# End ------------------------------------------------------------------
```

Examples - PowerShell - Tree

Detect Type
Get All Icons

Examples - PowerShell - Tree - Detect Type

```
# Begin -----------------------------------------------------------------

<#
 # TAC SESSION_MANAGER
 #>

# Main
[String]$treeId =
"wnd[0]/usr/cntlIMAGE_CONTAINER/shellcont/shell/shellcont[0]/shell"

[__ComObject]$id = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @($treeId)

$treeType = Get-Property -object $id -propertyName "GetTreeType"

switch($treeType) {

  0 {
    Write-Host "Simple Tree"
  }

  1 {
    Write-Host "List Tree"
  }

  2 {
    Write-Host "Column Tree"
  }

}

# End -------------------------------------------------------------------
```

Examples - PowerShell - Tree - Get All Icons

```
# Begin ----------------------------------------------------------------

<#
 # TAC SESSION_MANAGER
 #
 # Show all available icons with TAC SE38 and report SHOWICON,
 # it displays all icons in a list.
 #>

# Main
[String]$treeId =
"wnd[0]/usr/cntlIMAGE_CONTAINER/shellcont/shell/shellcont[0]/shell"

[__ComObject]$id = Invoke-Method -object $session -methodName "findById" `
  -methodParameter @($treeId)

[Array]$tree = Invoke-Method -object $id -methodName "GetAllNodeKeys" `
  -methodParameter @()

foreach($node in $tree) {

  [String]$abapImage = Invoke-Method -object $id `
    -methodName "GetNodeAbapImage" -methodParameter @($node)

  [String]$nodeText = Invoke-Method -object $id `
    -methodName "GetNodeTextByKey" -methodParameter @($node)

  Write-Host "$($abapImage) - $($nodeText)"

}

# End ------------------------------------------------------------------
```

Examples - C#

Start Multiple TACs

Examples - C# - Start Multiple TACs

```
// Begin ---------------------------------------------------------------

using System;
using System.Reflection;
using System.Runtime.InteropServices;
using System.Threading;
using Microsoft.VisualBasic;

namespace ThreadingDemo {

  class Program {

    // COM Interface
    static dynamic InvokeMethod(object obj, string methodName, object[]
methodParams = null) {
      return obj.GetType().InvokeMember(methodName, BindingFlags.InvokeMethod,
null, obj, methodParams);
    }

    static dynamic GetProperty(object obj, string propertyName, object[]
propertyParams = null) {
      return obj.GetType().InvokeMember(propertyName,
BindingFlags.GetProperty, null, obj, propertyParams);
    }

    static dynamic SetProperty(object obj, string propertyName, object[]
propertyParams = null) {
      return obj.GetType().InvokeMember(propertyName,
BindingFlags.SetProperty, null, obj, propertyParams);
    }

    static void FreeObject(object obj) {
      Marshal.ReleaseComObject(obj);
    }

   static void Main(string[] args) {

      Console.WriteLine("Main Thread Started");

      Thread SE37 = new Thread(MethodSE37) {
          Name = "ThreadSE37"
      };
      Thread SE16 = new Thread(MethodSE16) {
          Name = "ThreadSE16"
      };

      SE37.Start();
      SE16.Start();

      Console.WriteLine("Main Thread Ended");

    }

    // SE37
    static void MethodSE37() {

      object SapGuiAuto = null;
      object app = null;
      object connection = null;
      object session = null;
```

```
      try {
        SapGuiAuto = Interaction.GetObject("SAPGUI");
        app = InvokeMethod(SapGuiAuto, "GetScriptingEngine");
        SetProperty(app, "HistoryEnabled", new object[1]{false});
        connection = GetProperty(app, "Children", new object[1]{0});
        session = GetProperty(connection, "Children", new object[1]{1});
      } catch {
        return;
      }

      dynamic ID = null;

      for (int i = 1; i <= 5; i++) {
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/tbar[0]/okcd"});
        SetProperty(ID, "text", new object[1]{"/nse37"});
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
        InvokeMethod(ID, "sendVKey", new object[1]{0});
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/ctxtRS38L-NAME"});
        SetProperty(ID, "text", new object[1]{"RFC_READ_TABLE"});
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
        InvokeMethod(ID, "sendVKey", new object[1]{7});
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpHEADER"});
        InvokeMethod(ID, "select");
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpIMPORT"});
        InvokeMethod(ID, "select");
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpEXPORT"});
        InvokeMethod(ID, "select");
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpCHANGE"});
        InvokeMethod(ID, "select");
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpTABLES"});
        InvokeMethod(ID, "select");
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpEXCEPT"});
        InvokeMethod(ID, "select");
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpSOURCE"});
        InvokeMethod(ID, "select");
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
        InvokeMethod(ID, "sendVKey", new object[1]{3});
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
        InvokeMethod(ID, "sendVKey", new object[1]{3});
      }

      SetProperty(app, "HistoryEnabled", new object[1]{true});
FreeObject(session);

      FreeObject(connection);
      FreeObject(app);
      FreeObject(SapGuiAuto);

    }

    // SE16
    static void MethodSE16() {

      object SapGuiAuto = null;
      object app = null;
```

```
      object connection = null;
      object session = null;

      try {
        SapGuiAuto = Interaction.GetObject("SAPGUI");
        app = InvokeMethod(SapGuiAuto, "GetScriptingEngine");
        SetProperty(app, "HistoryEnabled", new object[1]{false});
        connection = GetProperty(app, "Children", new object[1]{0});
        session = GetProperty(connection, "Children", new object[1]{2});
      } catch {
        return;
      }

      dynamic ID = null;

      for (int i = 1; i <= 10; i++) {
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/tbar[0]/okcd"});
        SetProperty(ID, "text", new object[1]{"/nse16"});
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
        InvokeMethod(ID, "sendVKey", new object[1]{0});
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/ctxtDATABROWSE-TABLENAME"});
        SetProperty(ID, "text", new object[1]{"TADIR"});
        ID = InvokeMethod(session, "findById", new
object[1]{"wnd[0]/usr/ctxtDATABROWSE-TABLENAME"});
        SetProperty(ID, "caretPosition", new object[1]{5});
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
        InvokeMethod(ID, "sendVKey", new object[1]{7});
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
        InvokeMethod(ID, "sendVKey", new object[1]{31});
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[1]"});
        InvokeMethod(ID, "sendVKey", new object[1]{0});
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
        InvokeMethod(ID, "sendVKey", new object[1]{3});
        ID = InvokeMethod(session, "findById", new object[1]{"wnd[0]"});
        InvokeMethod(ID, "sendVKey", new object[1]{3});
      }

      SetProperty(app, "HistoryEnabled", new object[1]{true});

      FreeObject(session);
      FreeObject(connection);
      FreeObject(app);
      FreeObject(SapGuiAuto);

    }

  }

}

// End ------------------------------------------------------------------
```

Examples - AutoIt

CheckTAC
Session
Start SAP Logon

Examples - AutoIt - CheckTAC

```
; Begin ----------------------------------------------------------------

AutoItSetOption("MustDeclareVars", 1)

#include <StringConstants.au3>

Func CheckTAC()

  Local $SapGuiAuto, $application, $connections, $connection
  Local $sessions, $session, $UserArea, $OrderType, $cmbOrderType

  $SapGuiAuto = ObjGet("SAPGUI")
  If Not IsObj($SapGuiAuto) Or @Error Then
    Return
  EndIf

  $application = $SapGuiAuto.GetScriptingEngine()
  If Not IsObj($application) Then
    Return
  EndIf

  $connections = $application.Connections()
  If Not IsObj($connections) Then
    Return
  EndIf

  For $connection In $connections

    If $connection.DisabledByServer = True Then
      ContinueLoop
    EndIf

    $sessions = $connection.Sessions()
    If Not IsObj($sessions) Then
      ContinueLoop
    EndIf

    For $session In $sessions

      If $session.Busy = True Then
        ContinueLoop
      EndIf

      If $session.Info.IsLowSpeedConnection = True Then
        ContinueLoop
      EndIf

      Select
        Case $session.Info.Transaction = "ME21N"
        ; Create Purchase Order


        Case $session.Info.Transaction = "ME22N"
        ; Change Purchase Order


        Case $session.Info.Transaction = "ME23N"
        ; Display Purchase Order

          $UserArea = $session.findById("wnd[0]/usr")
```

```
          $cmbOrderType = $UserArea.findByName("MEPO_TOPLINE-BSART",
"GuiComboBox")
          $OrderType = $cmbOrderType.Text
          $OrderType = StringStripWS($OrderType, $STR_STRIPALL)

          Select
            Case $OrderType = "Normalbestellung"

              MsgBox(0, "Belegart", "Normalbestellung")

            Case $OrderType = "Rahmenbestellung"

              MsgBox(0, "Belegart", "Rahmenbestellung")

          EndSelect

      EndSelect

    Next

  Next

EndFunc

Func Main()

  While 1
    CheckTAC()
    Sleep(1000)
  Wend

EndFunc

; Main
Main()

; End ------------------------------------------------------------------
```

Examples - AutoIt - Session

```
; Begin ----------------------------------------------------------------

; Attempt to determine all sessions, even if they are blocked with a
; debugger.

AutoItSetOption("MustDeclareVars", 1)

Func Main()

  Local $connection, $sessions, $session, $output

  Local $SapGuiAuto = ObjGet("SAPGUI")
  If Not IsObj($SapGuiAuto) Or @Error Then
    Return
  EndIf

  Local $application = $SapGuiAuto.GetScriptingEngine()
  If Not IsObj($application) Then
    Return
  EndIf

  Local $connections = $application.Connections()
  If $connections.count = 0 Then
    Return
  EndIf

  For $connection In $connections

    If $connection.DisabledByServer = True Then
      ContinueLoop
    EndIf

    $sessions = $connection.Sessions()
    If $sessions.count = 0 Then
      ContinueLoop
    EndIf

    For $session In $sessions

      If $session.Busy = True Then
        ContinueLoop
      EndIf

      If $session.Info.IsLowSpeedConnection = True Then
        ContinueLoop
      EndIf

      $output = $output & $session.Info.SystemName & " > " & _
        $session.ActiveWindow.Text & @CRLF

    Next

  Next

  MsgBox(0, "", $output)

EndFunc

; Main
Main()
```

```
; End ------------------------------------------------------------------
```

Examples - AutoIt - Start SAP Logon

```
; Begin ----------------------------------------------------------------

#include <MsgBoxConstants.au3>

AutoItSetOption("MustDeclareVars", 1)

Func Main()

  Local $processList = ProcessList("saplogon.exe")
  If $processList[0][0] = 0 Then
    Run("c:\Program Files\SAP\FrontEnd\SAPGUI\sapgui.exe " & _
      "/H/applicationServer/S/sapdp00")
    ; Alternative is /H/applicationServer/S/3200
    WinWait("[CLASS:SAP_FRONTEND_SESSION]")
  EndIf

  Local $SapGuiAuto = ObjGet("SAPGUI")
  If Not IsObj($SapGuiAuto) Or @Error Then
    MsgBox($MB_OK + $MB_ICONERROR, "Error", "No reference found")
    Return
  EndIf

  Local $application = $SapGuiAuto.GetScriptingEngine()
  If Not IsObj($application) Then
    MsgBox($MB_OK + $MB_ICONERROR, "Error", "No scripting engine found")
    Return
  EndIf

  $application.HistoryEnabled = False
  Local $connection = $application.Children(0)
  If Not IsObj($connection) Then
    MsgBox($MB_OK + $MB_ICONERROR, "Error", "No connection found")
    Return
  EndIf

  If $connection.DisabledByServer = True Then
    Return
  EndIf

  Local $session = $connection.Children(0)
  If Not IsObj($session) Then
    MsgBox($MB_OK + $MB_ICONERROR, "Error", "No session found")
    Return
  EndIf

  If $session.Busy = True Then
    Return
  EndIf

  If $session.Info.IsLowSpeedConnection = True Then
    Return
  EndIf

  ;>Insert your SAP GUI Scripting code here<

  $application.HistoryEnabled = True

EndFunc

; Main
```

```
Main()

; End ------------------------------------------------------------------
```

To start SAP Logon it is also possible to use SAP shortcut.

```
sapshcut.exe -system=ABC -client=001 -user=USER -pw=secret -language=EN
```

But there seem to be problems with the SAPGUI entry in the Running Object Table (ROT) when used alternately with saplogon.exe.

Examples - VBA (Visual Basic for Applications)

You can find information to prepare VBA here.

ClearAllChangeable Fields
Native Window Dialogs
Session

Examples - VBA - ClearAllChangeableFields

In some cases users have defined specific default values. In the case of automation, this can lead to processing errors. To exclude this, all contents of fields of a screen can be deleted with this approach.

```
' Begin ----------------------------------------------------------------

Option Explicit

' ClearAllChangeableFields ------------------------------------------
'
'  Clear all changeable fields of an SAP GUI session
'
' ------------------------------------------------------------------
Sub ClearAllChangeableFields(obj As Object)

  Dim cntSess As Integer
  Dim i As Integer
  Dim Child As Object

  On Error Resume Next

  cntSess = obj.Children.Count()
  If cntSess = 0 Then
    On Error GoTo 0
    Exit Sub
  End If

  For i = 0 To cntSess - 1
    Set Child = obj.Children.Item(CLng(i))
    ClearAllChangeableFields Child
    If Child.Changeable = vbTrue And Child.ContainerType = vbFalse Then
      Select Case Child.Type()
        Case "GuiCheckBox"
          Child.Selected = 0
        Case "GuiCTextField", "GuiTextField"
          Child.Text = ""
        Case "GuiComboBox"
          Child.Key = " "
      End Select
    End If
  Next

  On Error GoTo 0

End Sub

Sub Main()

  Dim SapGuiAuto As Object
  Dim app As SAPFEWSELib.GuiApplication
  Dim connection As SAPFEWSELib.GuiConnection
  Dim session As SAPFEWSELib.GuiSession

  Set SapGuiAuto = GetObject("SAPGUI")
  Set app = SapGuiAuto.GetScriptingEngine
  Set connection = app.Children(1)
  Set session = connection.Children(0)

  ClearAllChangeableFields session
```

```
End Sub

' End ------------------------------------------------------------------
```

Examples - VBA - Native Window Dialogs

```
" Begin ------------------------------------------------------------------

REPORT Z_DIALOG.

DATA:
  LV_FILENAME TYPE STRING VALUE '',
  LV_PATH TYPE STRING VALUE '',
  LV_RESULT TYPE I.

CALL METHOD CL_GUI_FRONTEND_SERVICES=>FILE_SAVE_DIALOG
  EXPORTING
    WINDOW_TITLE = 'Descarga de archivos'
    DEFAULT_EXTENSION = 'pdf'
  CHANGING
    FILENAME = LV_FILENAME
    PATH = LV_PATH
    FULLPATH = LV_PATH
    USER_ACTION = LV_RESULT.

WRITE: / LV_FILENAME, / LV_PATH, / LV_RESULT.

" End --------------------------------------------------------------------
```

```
' Begin -------------------------------------------------------------------

' PtrSafe keyword is necessary to work correctly on
' 32-bit and 64-bit platforms.

Private Declare PtrSafe Function FindWindow Lib "user32.dll" Alias
"FindWindowA"  ( _
  ByVal lpClassName As String, ByVal lpWindowName As String) As Long

Private Declare PtrSafe Function SetForegroundWindow Lib "user32" ( _
  ByVal hwnd As Long) As Long

Private Declare PtrSafe Sub Sleep Lib "kernel32" ( _
  ByVal dwMilliseconds As Long)

Sub automateNativeWindowsDialog()

  Dim hwnd As Long

  hwnd = FindWindow(vbNullString, "Descarga de archivos")

  If hwnd > 0 Then

    SetForegroundWindow hwnd

    Sleep 1000

    SendKeys "Test.txt", True
    SendKeys "{TAB}{TAB}{TAB}", True
    SendKeys "{ENTER}", True

  End If

End Sub
```

```
' End ----------------------------------------------------------------
```

Examples - VBA - Session

```
' Begin-----------------------------------------------------------------

'
' Attempt to determine all sessions, even if they are blocked with a
' debugger.
'
' Hint: This approach doesn't work, because as soon as the session is
' handled in the For Each loop, the program blocks until the session is
' no longer blocked by the debugger.
'
' To reproduce this, simply call the debugger in a session with /h in
' the Ok field and start any transaction.
'
' The same approach works with PowerShell.
'

Option Explicit

Sub Main()

  On Error GoTo errorHandler

  Dim SapGuiAuto, App, Connections, Connection, Sessions, Session, Info

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Sub
  End If

  Set App = SapGuiAuto.GetScriptingEngine
  If Not IsObject(App) Then
    Exit Sub
  End If

  App.HistoryEnabled = False

  Set Connections = App.Connections()
  For Each Connection In Connections

    If Connection.DisabledByServer = True Then
      GoTo nextConnection
    End If

    Set Sessions = Connection.Sessions()
    For Each Session In Sessions

      If Not IsObject(Session) Then
        GoTo nextSession
      End If

      Set Info = Session.Info()

      If Session.Busy = False And Info.IsLowSpeedConnection = False Then
          Debug.Print Info.SystemName + " > " + Session.ActiveWindow.Text
      End If

nextSession:
    Next

nextConnection:
```

```
  Next

  App.HistoryEnabled = True

  Exit Sub

errorHandler:
  Debug.Print Err.Description

End Sub

' End-----------------------------------------------------------------
```

Examples - WSH (Windows Script Host)

Hint: It is no longer recommended to use VBScript. It is a deprecated script language that is no longer being developed. Yes, there are many examples on the Internet that can be used, but basically PowerShell should be used for every new development.
SAP has described the effects in Note 3484031 - Upcoming deprecation of VBScript by Microsoft - impact on SAP GUI Scripting.

GetConnectionSessionNumber
FindSAPWindowByHandle
FindSAPWindowBySIDTAC
FindByTypeName
FindByText
FindByIdPart
Session
Splitter
Sum All Column Numbers
Table
Tree
Start Multiple TACs (1)
Start Multiple TACs (2)
HTMLViewer
Copy Table Data to Clipboard with AutoItX

Examples - WSH - GetConnectionSessionNumber

```
' Begin ------------------------------------------------------------
'
' Example how to get connection and session number from session ID
'
' ------------------------------------------------------------------

pos = InStr(session.Id(), "con[") + 4
len = InStr(pos, session.Id(), "]") - pos
connectionNumber = CLng(Mid(session.Id(), pos, Len))

pos = InStr(session.Id(), "ses[") + 4
len = InStr(pos, session.Id(), "]") - pos
sessionNumber = CLng(Mid(session.Id(), pos, Len))

MsgBox "ConnectionNumber: " & CStr(connectionNumber) & _
  " SessionNumber: " & CStr(sessionNumber)

' End ---------------------------------------------------------------
```

Examples - WSH - FindSAPWindowByHandle

```
' Function FindSAPWindowByHandle ---------------------------------------
'
' Function to find an SAP window by its handle
' hSAPWnd = Handle of the SAP window
'
' ----------------------------------------------------------------------
Function FindSAPWindowByHandle(hSAPWnd)

  Dim SapGuiAuto, app, CollCon, oCon, CollSes, oSes, hWnd, i, j

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Function
  End If

  Set app = SapGuiAuto.GetScriptingEngine
  If Not IsObject(app) Then
    Exit Function
  End If

  ' Get all connections
  Set CollCon = app.Connections()
  If Not IsObject(CollCon) Then
    Exit Function
  End If

  ' Loop over connections
  For i = 0 To CollCon.Count() - 1

    Set oCon = app.Children(CLng(i))
    If Not IsObject(oCon) Then
      Exit Function
    End If

    ' Get all sessions of a connection
    Set CollSes = oCon.Sessions()
    If Not IsObject(CollSes) Then
      Exit Function
    End If

    ' Loop over sessions
    For j = 0 To CollSes.Count() - 1

      Set oSes = oCon.Children(CLng(j))
      If Not IsObject(oSes) Then
        Exit Function
      End If

      If oSes.Busy() = vbFalse Then

        hWnd = oSes.findById("wnd[0]").Handle

        If hSAPWnd = hWnd Then
          FindSAPWindowByHandle = oSes.ID
        End If

      End If

    Next
```

```
  Next

End Function
```

Examples - WSH - FindSAPWindowBySIDTAC

```
' Function FindSAPWindowBySIDTAC ----------------------------------------
Function FindSAPWindowBySIDTAC(SID, TAC)

  Dim SapAppl, SapGuiAuto, CollCon, i, oCon, CollSes, j
  Dim oSes, oSesInf

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Sub
  End If

  Set SapAppl = SapGuiAuto.GetScriptingEngine
  If Not IsObject(SapAppl) Then
    Exit Sub
  End If

  Set CollCon = SapAppl.Connections()
  If Not IsObject(CollCon) Then
    Exit Sub
  End If

  ' Loop over connections
  For i = 0 To CollCon.Count() - 1

    Set oCon = SapAppl.Children(CLng(i))
    If Not IsObject(oCon) Then
      Exit Sub
    End If

    Set CollSes = oCon.Sessions()
    If Not IsObject(CollSes) Then
      Exit Sub
    End If

    ' Loop over sessions
    For j = 0 To CollSes.Count() - 1

      Set oSes = oCon.Children(CLng(j))
      If Not IsObject(oSes) Then
        Exit Sub
      End If

      If oSes.Busy() = vbFalse Then

        Set oSesInf = oSes.Info()
        If IsObject(oSesInf) Then
          ' ------------------------------------------------------------
          '
          ' With the session info object is it possible to select a
          ' specific session which executes the activities. In our
          ' example it is the system name and the transaction code, but
          ' it is possible to use all properties of the session info
          ' object you want.
          '
          ' ------------------------------------------------------------

          If SID = oSesInf.SystemName() And TAC = oSesInf.Transaction() Then

            FindSAPWindowBySIDTAC = oSes.ID
```

```
          End If

        End If

      End If

    Next

  Next

End Function
```

Examples - WSH - FindByTypeName

```
' Function FindByTypeName ---------------------------------------------
'
' Function to find an UI element by its type and name, independently
' from program names and screen numbers
'
' oApp    = SAP application
' oArea   = Container to be searched
' strType = Type of UI element which is searched
' strName = Full or part of a name from UI element which is searched
'
' Example call:
' Set oUIItem = FindByTypeName(_
'   session, session.findById("wnd[0]/usr"), "GuiTextField", "F10"_
' )
' MsgBox oUIItem.Id
'
' ---------------------------------------------------------------------
Function FindByTypeName(oApp, oArea, strType, strName)

  For i = 0 To oArea.Children().Count() - 1

    Set Obj = oArea.Children(CInt(i))
    If Obj.Type = strType And InStr(Obj.Name, strName) Then
      'MsgBox Obj.Name & " " & Obj.Type & " " & Obj.Text
      Set FindByTypeName = Obj
      Exit Function
    End If

    If Obj.ContainerType()Then
      If Obj.Children().Count() > 0 Then
        Set NextArea = oApp.findByID(Obj.ID)
        Set FindByTypeName = FindByTypeName(oApp, NextArea, strType, strName)
        If Not FindByTypeName Is Nothing Then
          Exit Function
        End If
        Set NextArea = Nothing
      End If
    End If

    Set Obj = Nothing

  Next

  Set FindByTypeName = Nothing

End Function
```

Examples - WSH - FindByText

```
' Function FindByText ---------------------------------------------------
'
' Function to find an UI element by its text, independently from
' program names and screen numbers, and delivers the ID
'
' oApp = SAP application
' oArea = Container to be searched
' strText = Text of UI element which is searched
'
' Example call:
' Id = FindByText(session, session.findById("wnd[0]/usr"), "monitoring")
'
' ----------------------------------------------------------------------
Function FindByText(oApp, oArea, strText)
  On Error Resume Next
  cntObj = oArea.Children().Count()
  If cntObj > 0 Then
    For i = 0 To cntObj - 1
      Set Child = oArea.Children.Item(CLng(i))
      If InStr(UCase(Child.Text), UCase(strText)) Then
        Id = Child.Id
        Exit For
      End If
      If Child.ContainerType() Then
        If Child.Children().Count() > 0 Then
          FindByText = FindByText(oApp, oApp.findById(Child.Id), strText)
          If FindByText <> "" Then
            On Error GoTo 0
            Exit Function
          End If
        End If
      End If
    Next
  End If
  On Error Goto 0
  FindByText = Id
End Function
```

Examples - WSH - FindByIdPart

```
' Begin ------------------------------------------------------------

' Function FindByIdPart ---------------------------------------------
'
' Function to find an UI element by its Id via Regular Expressions,
' independently from program names and screen numbers
'
' oApp = SAP application
' oArea = Container to be searched
' regexId = Regular Expression of Id of UI element which is searched
'
' Example call:
' Id = FindByIdPart(session, session.findById("wnd[0]/usr"), _
'   ".*wnd\[.*txtSBRF170-VERSION" )
'
' ------------------------------------------------------------------
Function FindByIdPart(oApp, oArea, regexId)

  Set oRegEx = New RegExp
  oRegEx.Pattern = regexId
  oRegEx.IgnoreCase = True
  oRegEx.Global = False

  On Error Resume Next
  If oArea.Children().Count() > 0 Then
    For i = 0 To oArea.Children.Count() - 1
      Set Child = oArea.Children.Item(CLng(i))
      If oRegEx.Test(Child.Id) Then
        FindByIdPart = Child.Id
        On Error GoTo 0
        Exit Function
      End If
      If Child.ContainerType()
        If Child.Children().Count() > 0 Then
          FindByIdPart = FindByIdPart(_
            oApp, oApp.findByID(Child.Id), regexId_
          )
          If FindByIdPart <> "" Then
            On Error GoTo 0
            Exit Function
          End If
        End If
      End If
    Next
  End If
  On Error Goto 0

  FindByIDPart = ""

End Function

' Sub Main ----------------------------------------------------------
Sub Main()

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Sub
  End If

  Set app = SapGuiAuto.GetScriptingEngine
```

```
  If Not IsObject(app) Then
    Exit Sub
  End If

  app.HistoryEnabled = False
  Set connection = app.Children(0)
  If Not IsObject(connection) Then
    Exit Sub
  End If

  If connection.DisabledByServer = True Then
    Exit Sub
  End If

  Set session = connection.Children(1)
  If Not IsObject(session) Then
    Exit Sub
  End If

  If session.Info.IsLowSpeedConnection = True Then
    Exit Sub
  End If

  'Search for
  'wnd[0]/usr/subSSA1:SAPLBRF_MAINTENANCE:3006/txtSBRF170-VERSION
  Id = FindByIDPart(app, session.findById("wnd[0]/usr"), _
    ".*wnd\[.*txtSBRF170-VERSION")

  MsgBox Id

  app.HistoryEnabled = True

End Sub

' Main ------------------------------------------------------------------
Main

' End -------------------------------------------------------------------
```

Examples - WSH - GetObjectTree

```
' Begin ------------------------------------------------------------
'
' GetObjectTree returns the object tree of the current SAP GUI tree as
' a JSON string. It is possible to use this JSON to detect information
' of specific SAP GUI UI elements. This method was introduced in SAP GUI
' for Windows 7.70 patchlevel 3.
'
' ------------------------------------------------------------------

' Add item to array -------------------------------------------------
Function AddItem(arr, value)
  ReDim Preserve arr(UBound(arr) + 1)
  arr(UBound(arr)) = value
  AddItem = arr
End Function

Sub Main()

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Sub
  End If

  Set app = SapGuiAuto.GetScriptingEngine
  If Not IsObject(app) Then
    Exit Sub
  End If

  app.HistoryEnabled = False
  Set connection = app.Children(0)
  If Not IsObject(connection) Then
    Exit Sub
  End If

  If connection.DisabledByServer = True Then
    Exit Sub
  End If

  Set session = connection.Children(0)
  If Not IsObject(session) Then
    Exit Sub
  End If

  If session.Info.IsLowSpeedConnection = True Then
    Exit Sub
  End If

  arrayOfStrings = Array()
  arrayOfStrings = AddItem(arrayOfStrings, "Id")
  arrayOfStrings = AddItem(arrayOfStrings, "Text")
  arrayOfStrings = AddItem(arrayOfStrings, "Type")
  arrayOfStrings = AddItem(arrayOfStrings, "IconName")

  objectTreeJSON = session.GetObjectTree ("wnd[0]/usr", arrayOfStrings)

  app.HistoryEnabled = True

End Sub

' Main --------------------------------------------------------------
```

```
Main

' End ------------------------------------------------------------------
```

Examples - WSH - Session

```
' Begin ------------------------------------------------------------
'
' Example to show how to select a specific session to do SAP GUI
' Scripting activities inside it. It scans all connections with all
' sessions to find the correct one.
'
' ------------------------------------------------------------------

Option Explicit

' Sub Action --------------------------------------------------------
'
' Get the selected session and do the action inside it
'
' ------------------------------------------------------------------
Sub Action(session)

  'Insert your SAP GUI Scripting code from recorder here
  MsgBox session.findById("wnd[0]/titl").text

End Sub

' Function GetSession -----------------------------------------------
'
' Detects the session
'
' ------------------------------------------------------------------
Function GetSession(SID, TAC)

  Dim SapGuiAuto, application, connections, connection, sessions
  Dim session, sessionInfo, j, i

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Function
  End If

  Set application = SapGuiAuto.GetScriptingEngine
  If Not IsObject(application) Then
    Set SapGuiAuto = Nothing
    Exit Function
  End If

  Set connections = application.Connections()
  If Not IsObject(connections) Then
    Set SapGuiAuto = Nothing
    Set application = Nothing
    Exit Function
  End If

  ' Loop over connections
  For Each connection In connections

    Set sessions = connection.Sessions()

    ' Loop over sessions
    For Each session In sessions

      If session.Busy() = vbFalse Then
```

```
        ' ---------------------------------------------------------------
        '
        ' With the session info object is it possible to select a
        ' specific session which executes the activities. In our
        ' example it is the system name and the transaction code, but
        ' you can use all properties of the session info object.
        '
        ' ---------------------------------------------------------------
        Set sessionInfo = session.Info()
        If sessionInfo.SystemName() = SID And _

          sessionInfo.Transaction() = TAC Then
          Set GetSession = session

        End If

      End If

    Next

  Next

End Function

Sub Main()

  Dim session

  Set session = GetSession("NSP", "SE80")
  Action session

End Sub

' Main
Main()

' End ------------------------------------------------------------------
```

Examples - WSH - Splitter

```
' Begin ----------------------------------------------------------------

Set Splitter = session.findById("wnd[0]/usr/shell")

If Splitter.IsVertical = 0 Then
  MsgBox "Horizontal Splitter" & vbCrLf & Splitter.GetRowSize(1), _
    vbOkOnly + vbInformation
  Splitter.SetRowSize 1, 250
ElseIf Splitter.IsVertical = 1 Then
  MsgBox "Vertical Splitter" & vbCrLf & Splitter.GetColSize(1), _
    VBOkOnly + VBInformation
  Splitter.SetColSize 1, 500
ElseIf Splitter.IsVertical = 2 Then
  MsgBox "Horizontal and vertical Splitter" & vbCrLf & _
    Splitter.GetRowSize(1) & " - " & Splitter.GetColSize(1), _
    VBOkOnly + VBInformation
End If

' End ------------------------------------------------------------------
```

Examples - WSH - Sum All Column Numbers

```
' Begin ----------------------------------------------------------------

' Sum all numbers in a column of a GridView (ALV grid)
Set table =
session.findById("wnd[0]/usr/cntlBCALV_GRID_DEMO_0100_CONT1/shellcont/shell")
Set Columns = table.ColumnOrder()
rowTitle = CStr(Columns(7))
For i = 0 To table.RowCount - 1
  table.firstVisibleRow = i
  seatsOCC = seatsOCC + CInt(table.GetCellValue(i, rowTitle))
Next
MsgBox CStr(seatsOCC)

' Sum all numbers in a column of a TableControl
Set scrollBar =
session.findById("wnd[0]/usr/tblSAPMBIBSTC535").VerticalScrollbar
For i = 0 To scrollBar.Maximum

session.findById("wnd[0]/usr/tblSAPMBIBSTC535").VerticalScrollbar.Position(i)
  Steuer = Steuer +
CDbl(session.findById("wnd[0]/usr/tblSAPMBIBSTC535").GetCell(0, 6).Text)
Next
MsgBox CStr(Steuer)

' End -------------------------------------------------------------------
```

Examples - WSH - Table

GridView
Read GridView in File
Read TableControl

Examples - WSH - Table - GridView

Scroll and Search

```
' Begin ----------------------------------------------------------------

Set GridView =
session.findById("wnd[0]/usr/cntlBCALV_GRID_DEMO_0100_CONT1/shellcont/shell")
For i = 0 To GridView.RowCount - 1
  GridView.SetCurrentCell i, "FUNCNAME"
  If GridView.GetCellValue(i, "FUNCNAME") = "/OSP/GET_CHKSUM_BKT" Then
    Exit For
  End If
Next

' End --------------------------------------------------------------------
```

Get Column Names

```
' Begin ----------------------------------------------------------------

Set ALV =
session.findById("wnd[0]/usr/cntlBCALV_GRID_DEMO_0100_CONT1/shellcont/shell")

' Get all columns
Set Columns = ALV.ColumnOrder

' Loop over columns
For i = 0 To ALV.ColumnCount - 1
  ' Column name and the maximum length of the cell
  MsgBox CStr(Columns(i)) & " - Length: " & _
    CStr(ALV.GetCellMaxLength(1, Columns(i)))
Next

' End --------------------------------------------------------------------
```

Examples - WSH - Table - Read GridView in File

```
' Begin ---------------------------------------------------------------

Const Delimiter = ";"

' ReadTableInFile -----------------------------------------------------
Sub ReadTableInFile(session, TableName, FileName)

  ' Reset the session
  session.findById("wnd[0]/tbar[0]/okcd").text = "/n"
  session.findById("wnd[0]/tbar[0]/btn[0]").press

  ' Open TAC SE16
  session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE16"
  session.findById("wnd[0]/tbar[0]/btn[0]").press

  ' View table
  session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = TableName
  session.findById("wnd[0]/tbar[1]/btn[7]").press
  session.findById("wnd[0]/tbar[1]/btn[8]").press

  ' Set display to ALV Grid view

  ' Open user specific parameters dialog
  '  Attention: Here is a language specific code, customize it

  ' German language
  'Set Einstellungen = Menu.FindByName("Einstellungen", "GuiMenu")
  'Set BenutzerPar = Einstellungen.FindByName("Benutzerparameter...", _
  '  "GuiMenu")

  ' English language
  Set Einstellungen = Menu.FindByName("Settings", "GuiMenu")
  Set BenutzerPar = Einstellungen.FindByName("User Parameters...", _
    "GuiMenu")
  BenutzerPar.Select()

  ' Set the display
  Set ALVGridView = session.findById("wnd[1]/usr/tabsG_TABSTRIP/" & _
    "tabp0400/ssubTOOLAREA:SAPLWB_CUSTOMIZING:0400/radRSEUMOD-TBALV_GRID")
  If ALVGridView.Selected = vbFalse Then
    ALVGridView.select()
  End If

  session.findById("wnd[1]/tbar[0]/btn[0]").press
  Set BenutzerPar = Nothing
  Set Einstellungen = Nothing
  Set Menu = Nothing

  ' Get rows and columns
  Set table = session.findById("wnd[0]/usr/cntlGRID1/shellcont/shell")
  Rows = table.RowCount() - 1
  Cols = table.ColumnCount() - 1

  ' Write the table to a CSV file
  Set oFile = CreateObject("Scripting.FileSystemObject")
  If IsObject(oFile) Then
    Set SFlightFile = oFile.CreateTextFile(FileName, True)
    If IsObject(SFlightFile) Then

      ' Get the technical title of all columns in the first line
```

```
      Set Columns = table.ColumnOrder()
      For j = 0 To Cols
        If j = Cols Then
          SFlightFile.Write(CStr(Columns(j)))
        Else
          SFlightFile.Write(CStr(Columns(j)) & Delimiter)
        End If
      Next
      SFlightFile.WriteLine("")

      ' Get the title of all columns in the second line
      For j = 0 To Cols
        Set ColumnTitle = table.GetColumnTitles(CStr(Columns(j)))
        If j = Cols Then
          SFlightFile.Write(CStr(ColumnTitle(0)))
        Else
          SFlightFile.Write(CStr(ColumnTitle(0)) & Delimiter)
        End If
      Next
      SFlightFile.WriteLine("")

      For i = 0 To Rows

        For j = 0 To Cols
          If j = Cols Then
            SFlightFile.Write(table.GetCellValue(i, CStr(Columns(j))))
          Else
            SFlightFile.Write(table.GetCellValue(i, CStr(Columns(j))) & _
              Delimiter)
          End If
        Next

        ' Each 32 lines actualize the grid
        If i Mod 32 = 0 Then
          table.SetCurrentCell i, CStr(Columns(0))
          table.firstVisibleRow = i
        End If

        ' Carriage and return after a line
        If i <> Rows Then
          SFlightFile.WriteLine("")
        End If

      Next
      SFlightFile.Close

    End If

  End If

  Set ALVGridView = Nothing
  Set Columns = Nothing
  Set table = Nothing

End Sub

Sub Main

  If Not IsObject(application) Then
    Set SapGuiAuto = GetObject("SAPGUI")
    Set application = SapGuiAuto.GetScriptingEngine
  End If

  If Not IsObject(connection) Then
    Set connection = application.Children(0)
```

```
  End If

  If Not IsObject(session) Then
    Set session = connection.Children(0)
  End If

  ' Read the table SFLIGHT in a file
  ReadTableInFile session, "SFLIGHT", "C:\\Dummy\\SFlight.csv"

End Sub

' Main ------------------------------------------------------------------
Main

' End -------------------------------------------------------------------
```

Examples - WSH - Table - Read TableControl

```
' Begin ------------------------------------------------------------------
'
'  TAC GUIBIBS
'
' ------------------------------------------------------------------------

Option Explicit

Sub Main()

  Dim SapGuiAuto, application, connection, session
  Dim TableId, Table, RowCount, ColCount, Row, Col, Cell, Out

  If Not IsObject(application) Then
    Set SapGuiAuto = GetObject("SAPGUI")
    Set application = SapGuiAuto.GetScriptingEngine
  End If

  If Not IsObject(connection) Then
    Set connection = application.Children(0)
  End If

  If Not IsObject(session) Then
    Set session = connection.Children(0)
  End If

  TableId = "wnd[0]/usr/tblSAPMBIBSTC535"
  Set Table = session.findById(TableId)
  RowCount = Table.RowCount
  ColCount = Table.Columns.Count

  For Row = 0 To RowCount - 1

    Table.verticalScrollbar.position = Row
    Set Table = session.findById(TableId)
    For Col = 0 To ColCount - 1

      Set Cell = Table.GetCell(0, Col)
      If Col < ColCount - 1 Then
        Out = Out & Cell.Text & ";"
      Else
        Out = Out & Cell.Text
      End If

    Next

    Out = Out & vbNewLine

    If Table.verticalScrollbar.Position = Table.verticalScrollbar.Maximum Then
      Exit For
    End If

  Next

  MsgBox Out

End Sub

' Main ------------------------------------------------------------------
Main()
```

```
' End ------------------------------------------------------------------
```


```
' Begin ----------------------------------------------------------------
'
'  TAC DWDM
'
' ----------------------------------------------------------------------

Option Explicit

Sub Main()

  Dim SapGuiAuto, app, connection, session
  Dim TableId, Table, RowCount, ColCount, Row, Col, Cell, Out
  Dim StartTime, EndTime, ExecTime

  On Error Resume Next
  Set SapGuiAuto = GetObject("SAPGUI")
  On Error GoTo 0
  If Not IsObject(SapGuiAuto) Then
    MsgBox "Can not get SapGuiAuto", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set app = SapGuiAuto.GetScriptingEngine
  On Error GoTo 0
  If Not IsObject(app) Then
    MsgBox "Can not get application", vbOkOnly, "Hint"
    Exit Sub
  End If

  app.HistoryEnabled = False

  On Error Resume Next
  Set connection = app.Children(0)
  On Error GoTo 0
  If Not IsObject(connection) Then
    MsgBox "Can not get connection", vbOkOnly, "Hint"
```

```
    Exit Sub

  End If
  If connection.DisabledByServer = True Then
    MsgBox "Scripting is disabled by server", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set session = connection.Children(0)
  On Error GoTo 0
  If Not IsObject(session) Then
    MsgBox "Can not get session", vbOkOnly, "Hint"
    Exit Sub
  End If

  If session.Busy = True Then
    MsgBox "Session is busy", vbOkOnly, "Hint"
    Exit Sub
  End If

  If session.Info.IsLowSpeedConnection = True Then
    MsgBox "Connection is low speed", vbOkOnly, "Hint"
    Exit Sub
  End If

  StartTime = Timer

  TableID = "wnd[0]/usr/tblRSDEMO_TABLE_CONTROLTABLE_CONTROL"
  set Table = session.findById(TableID)
  RowCount = Table.RowCount
  ColCount = Table.Columns.Count
  For Row = 0 To RowCount - 1

    Table.verticalScrollbar.position = Row

    Set Table = session.findById(TableID)
    For Col = 0 To ColCount - 1
      Set Cell = Table.GetCell(0, Col)
      If Col < ColCount - 1 Then
        Out = Out & Cell.Text & ";"
      Else
        Out = Out & Cell.Text
      End If
    Next

    Out = Out & vbNewLine

    If Table.verticalScrollbar.Position = _
      Table.verticalScrollbar.Maximum Then
      Exit For
    End If

  Next

  EndTime = Timer
  ExecTime = EndTime - StartTime
  MsgBox ExecTime

  app.HistoryEnabled = True

End Sub

' Main ----------------------------------------------------------------
Main
```

```
' End ------------------------------------------------------------------
```

Table control title

Airline	Fli...	Depart.city	D...	Arrival city	Flight...	De
AA American Airline	17	NEW YORK	JFK	SAN FRANCISCO	0:00	11:
AA American Airli...	64	SAN FRANCISCO	SFO	NEW YORK	0:00	09:
AZ Alitalia	555	ROME	FCO	FRANKFURT	0:00	19:
AZ Alitalia	788	ROME	FCO	TOKYO	0:00	12:
AZ Alitalia	789	TOKYO	TYO	ROME	0:00	11:
AZ Alitalia	790	ROME	FCO	OSAKA	0:00	10:
DL Delta Airlines	106	NEW YORK	JFK	FRANKFURT	0:00	19:
DL Delta Airlines	1699	NEW YORK	JFK	SAN FRANCISCO	0:00	17:
DL Delta Airlines	1984	SAN FRANCISCO	SFO	NEW YORK	0:00	10:
JL Japan Airlines	407	TOKYO	NRT	FRANKFURT	0:00	13:
JL Japan Airlines	408	FRANKFURT	FRA	TOKYO	0:00	20:
LH Lufthansa	400	FRANKFURT	FRA	NEW YORK	0:00	10:
LH Lufthansa	401	NEW YORK	JFK	FRANKFURT	0:00	18:
LH Lufthansa	402	FRANKFURT	FRA	NEW YORK	0:00	13:
LH Lufthansa	2402	FRANKFURT	FRA	BERLIN	0:00	10:

Examples - WSH - Tree

Detect Type
Get All Node Keys Text
Read List Items
Read Description (1)
Read Description (2)
Open All Nodes

Examples - WSH - Tree - Detect Type

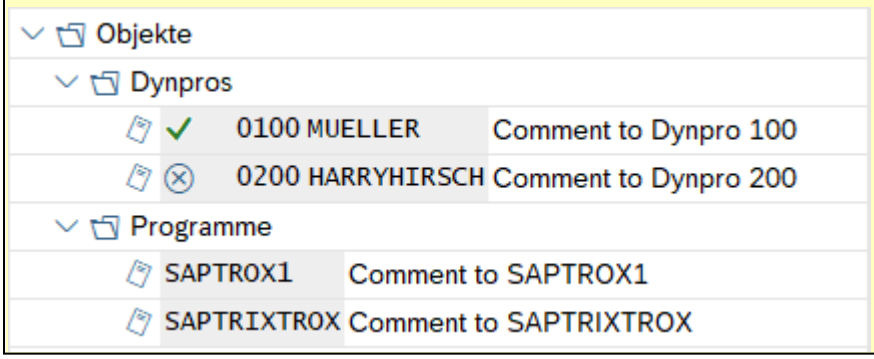
```
' Begin ------------------------------------------------------------------
'
' Detects the tree type (simple, list or column)
'
' ------------------------------------------------------------------------

If Not IsObject(application) Then
  Set SapGuiAuto = GetObject("SAPGUI")
  Set application = SapGuiAuto.GetScriptingEngine
End If

If Not IsObject(connection) Then
  Set connection = application.Children(0)
End If

If Not IsObject(session) Then
  Set session = connection.Children(0)
End If

Set Tree = session.findById("wnd[0]/usr/cntlTREE_CONTAINER/shellcont/shell")

Select Case Tree.GetTreeType
  Case 0
    MsgBox "Simple tree"
  Case 1
    MsgBox "List tree"
  Case 2
    MsgBox "Column tree"
End Select

' End ---------------------------------------------------------------------
```

Examples - WSH - Tree - Get All Node Keys Text

```
' Begin ------------------------------------------------------------------
'
' TAC SESSION_MANAGER or one of the demo reports
'
' ------------------------------------------------------------------------

If Not IsObject(application) Then
  Set SapGuiAuto = GetObject("SAPGUI")
  Set application = SapGuiAuto.GetScriptingEngine
End If

If Not IsObject(connection) Then
  Set connection = application.Children(0)
End If

If Not IsObject(session) Then
  Set session = connection.Children(0)
End If

Set Tree =
session.findById("wnd[0]/usr/cntlIMAGE_CONTAINER/shellcont/shell/shellcont[0]/
shell")
Set AllNodeKeys = Tree.GetAllNodeKeys()

'Get text of last node
MsgBox Tree.GetNodeTextByKey(AllNodeKeys(AllNodeKeys.Count - 1))

'Get key of last node
MsgBox AllNodeKeys(AllNodeKeys.Count - 1)

'Loop over all nodes
For Each NodeKey In AllNodeKeys
  MsgBox CStr(NodeKey) & " - " & Tree.GetNodeTextByKey(NodeKey)
Next

' End ---------------------------------------------------------------------
```

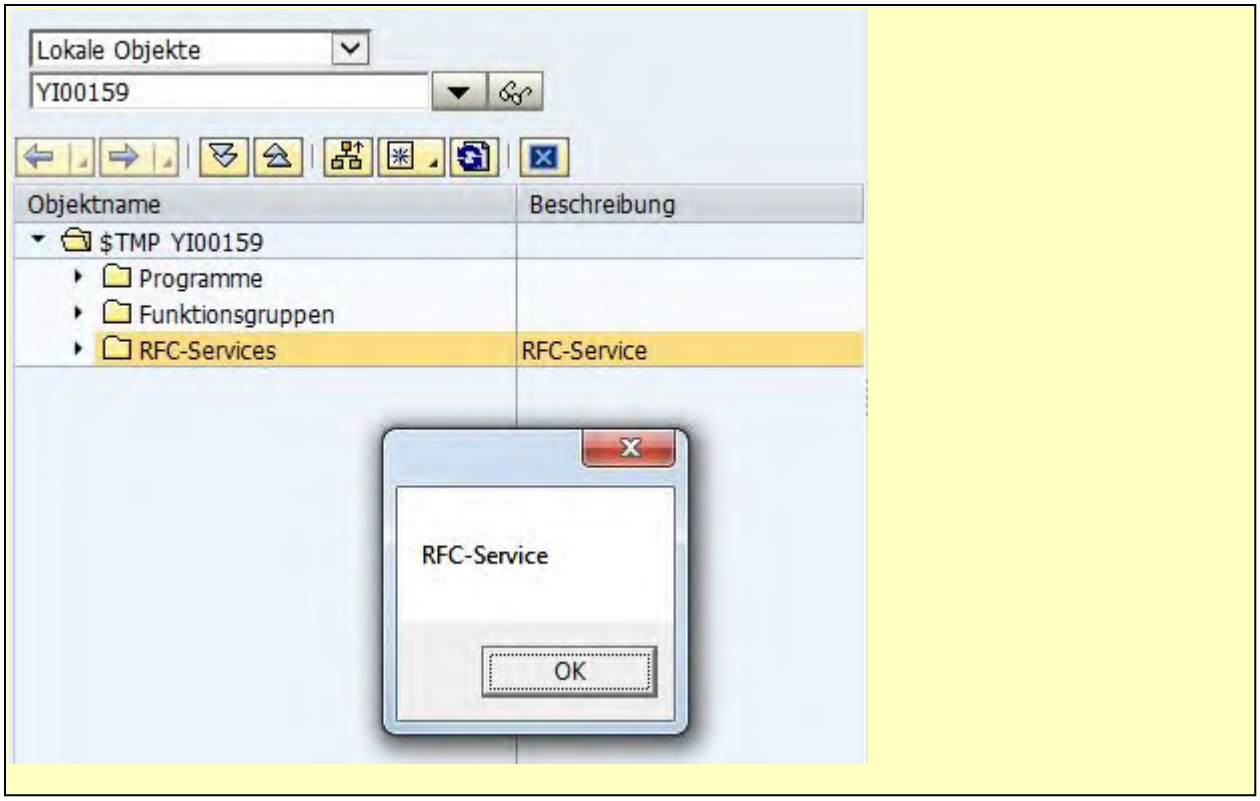
Examples - WSH - Tree - Read List Items

```
' Begin ----------------------------------------------------------------

If Not IsObject(application) Then
  Set SapGuiAuto = GetObject("SAPGUI")
  Set application = SapGuiAuto.GetScriptingEngine
End If

If Not IsObject(connection) Then
  Set connection = application.Children(0)
End If

If Not IsObject(session) Then
  Set session = connection.Children(0)
End If

session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE38"
session.findById("wnd[0]").sendVKey 0
session.findById("wnd[0]/usr/ctxtRS38M-PROGRAMM").text =
"SAPTLIST_TREE_MODEL_DEMO"
session.findById("wnd[0]").sendVKey 8
Set Tree = session.findById("wnd[0]/usr/cntlTREE_CONTAINER/shellcont/shell")

' Expands the nodes of the second level
Set AllNodeKeys = Tree.GetAllNodeKeys()
For Each NodeKey In AllNodeKeys
  If Tree.IsFolderExpandable(NodeKey) Then
    Tree.ExpandNode(NodeKey)
  End If
Next

' Reads the items of the nodes
Set AllNodeKeys = Tree.GetAllNodeKeys()

For Each NodeKey In AllNodeKeys

  MsgBox Tree.GetItemText(NodeKey, "1") + " - " + _
    Tree.GetItemText(NodeKey, "2") + " - " + _
    Tree.GetItemText(NodeKey, "3") + " - " + _
    Tree.GetItemText(NodeKey, "4")

  If InStr(Tree.GetNodeTextByKey(NodeKey), "SAPTRIXTROX") Then
    MsgBox "Ziel erreicht"
  End If

Next

' End ------------------------------------------------------------------
```



Examples - WSH - Tree - Read Description (1)

```
' Begin ----------------------------------------------------------------
'
' Read description of a column tree with TAC SE80
'
' ----------------------------------------------------------------------

If Not IsObject(application) Then
  Set SapGuiAuto = GetObject("SAPGUI")
  Set application = SapGuiAuto.GetScriptingEngine
End If

If Not IsObject(connection) Then
  Set connection = application.Children(0)
End If

If Not IsObject(session) Then
  Set session = connection.Children(0)
End If

Set Tree =
session.findById("wnd[0]/shellcont/shell/shellcont[3]/shell/shellcont[2]/shell
")

'Column 2 is Beschreibung, but the index starts with 0
'To get the correct column 2 minus 1
colName = Tree.GetColumnNames.Item("1")
Set col = Tree.GetColumnCol(colName)

'Get top node
topNode = CStr(Tree.TopNode)

'Counts all sub nodes of the top node
cntSubNodes = Tree.GetNodeChildrenCountByPath(topNode)

'Scan all sub nodes
For i = 1 To cntSubNodes

  'The path of the subnodes is 1/1, 1/2 etc.
  NodeName = Tree.GetNodeTextByPath(topNode & "/" & CStr(i))

  'Search for the correct node name
  If NodeName = "RFC-Services" Then

    'Get the key of the node, index starts also with 0 therefore -1
    Key = CLng(Tree.GetNodeKeyByPath(topNode & "/" & CStr(i))) - 1
    'Get the description
    Beschreibung = col.Item(Key)
    MsgBox Beschreibung

  End If

Next

' End ------------------------------------------------------------------
```


Lokale Objekte
YI00159
Objektname
Beschreibung
$TMP YI00159
Programme
Funktionsgruppen
RFC-Services
RFC-Service
RFC-Service
OK

Examples - WSH - Tree - Read Description (2)

```
' Begin ------------------------------------------------------------------
'
' Read description of a column tree with TAC SRMREGEDIT
'
' ------------------------------------------------------------------------

If Not IsObject(application) Then
  Set SapGuiAuto = GetObject("SAPGUI")
  Set application = SapGuiAuto.GetScriptingEngine
End If

If Not IsObject(connection) Then
  Set connection = application.Children(0)
End If

If Not IsObject(session) Then
  Set session = connection.Children(0)
End If

Set Tree = session.findById("wnd[0]/shellcont/shell/shellcont[2]/shell")
colName = Tree.GetColumnNames.Item("2")
Set col = Tree.GetColumnCol(colName)
topNode = CStr(Tree.TopNode) : Key = topNode

' Counter to get correct index of node
cnt = 1 + Tree.GetNodeChildrenCountByPath(topNode)

' Scan nodes on the first level
For i = 1 To Tree.GetNodeChildrenCountByPath(topNode)

  cnt = cnt + 1
  nodeName = Tree.GetNodeTextByKey(Key)
  nodePath = Tree.GetNodePathByKey(Key)

  If nodeName = "Anwendungs-Registry" Then

    ' Scan nodes on the second level
    For j = 1 To Tree.GetNodeChildrenCount(Key)
      cnt = cnt + 1
      subNode = Tree.GetNodeKeyByPath(nodePath & "/" & CStr(j))
      subNodeName = Tree.GetNodeTextByKey(subNode)
      Select Case subNodeName
        Case "S_AREA_GDMA"
          MsgBox col.Item(cnt)
        Case "S_AREA_RMS"
          MsgBox col.Item(cnt)
      End Select
    Next

  End If

  If i < Tree.GetNodeChildrenCountByPath(topNode) Then
    Key = Tree.GetNextNodeKey(Key)
  End If

Next

' End ----------------------------------------------------------------
```

Examples - WSH - Tree - Open All Nodes

```
' Sub OpenAllNodes -----------------------------------------------------
'
' Opens all nodes of a tree
'
' ----------------------------------------------------------------------
Sub OpenAllNodes(Tree)

  Dim ErrNumber

  Set AllNodeKeys = Tree.GetAllNodeKeys()

  For Each NodeKey In AllNodeKeys

    If Not Tree.IsFolderExpanded(NodeKey) Then
      On Error Resume Next
      Tree.ExpandNode(NodeKey)
      ErrNumber = Err.number
      On Error GoTo 0
      If ErrNumber = 0 Then
        OpenAllNodes(Tree)
      End If
    End If

  Next

End Sub
```

Examples - WSH - Start Multiple TACs (1)

```
' Begin ------------------------------------------------------------

Option Explicit

' Sub Action --------------------------------------------------------
Sub Action(con, ses)

  Dim objShell, RegEx, Matches, con_no, ses_no

  Set RegEx = New RegExp
  RegEx.Pattern = "[\d]+"
  Set Matches = RegEx.Execute(con)
  con_no = Matches(0).Value
  Set Matches = RegEx.Execute(ses)
  ses_no = Matches(0).Value
  Set objShell = Wscript.CreateObject("WScript.Shell")
  objShell.Run "YourScript.vbs " + con_no + " " + ses_no

End Sub

' Function GetSession -----------------------------------------------
Function GetSession(connection, TAC)

  Dim sessions, session, sessionInfo, j, i

  Set sessions = connection.Sessions()

  ' Loop over sessions
  For Each session In sessions
    If session.Busy() = vbFalse Then
      Set sessionInfo = session.Info()
      If sessionInfo.Transaction() = TAC Then
        Set GetSession = session
      End If
    End If
  Next

End Function

Sub Main()

  Dim SapGuiAuto, app, connection, session
  Dim session_SE16, session_SE37, session_SE38
  Dim arr

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Sub
  End If

  Set app = SapGuiAuto.GetScriptingEngine
  If Not IsObject(app) Then
    Exit Sub
  End If

  Set connection = app.Children(0)
  If Not IsObject(connection) Then
    Exit Sub
  End If
```

```
  If connection.DisabledByServer = True Then
    Exit Sub
  End If

  Set session = connection.Children(0)
  If Not IsObject(session) Then
    Exit Sub
  End If

  If session.Info.IsLowSpeedConnection = True Then
    Exit Sub
  End If

  session.findById("wnd[0]/tbar[0]/okcd").text = "/oSE16"
  session.findById("wnd[0]").sendVKey 0
  session.findById("wnd[0]/tbar[0]/okcd").text = "/oSE37"
  session.findById("wnd[0]").sendVKey 0
  session.findById("wnd[0]/tbar[0]/okcd").text = "/oSE38"
  session.findById("wnd[0]").sendVKey 0

  Set session_SE16 = GetSession(connection, "SE16")
  arr = Split(session_SE16.ID, "/")
  WScript.Sleep 500
  Action arr(2), arr(3)

  Set session_SE37 = GetSession(connection, "SE37")
  arr = Split(session_SE37.ID, "/")
  WScript.Sleep 500
  Action arr(2), arr(3)

  Set session_SE38 = GetSession(connection, "SE38")
  arr = Split(session_SE38.ID, "/")
  WScript.Sleep 500
  Action arr(2), arr(3)

End Sub

' Main ------------------------------------------------------------------
Main()

' End -------------------------------------------------------------------
```

YourScript.vbs

```
' Begin -----------------------------------------------------------------

Set Args = WScript.Arguments
con = Args(0)
ses = Args(1)

Set SapGuiAuto = GetObject("SAPGUI")
If Not IsObject(SapGuiAuto) Then
  WScript.Quit
End If

Set app = SapGuiAuto.GetScriptingEngine
If Not IsObject(app) Then
  WScript.Quit
End If

Set connection = app.Children(CLng(con))
If Not IsObject(connection) Then
```

```
  WScript.Quit
End If

If connection.DisabledByServer = True Then
  WScript.Quit
End If

Set session = connection.Children(CLng(ses))
If Not IsObject(session) Then
  WScript.Quit
End If

If session.Info.IsLowSpeedConnection = True Then
  WScript.Quit
End If

MsgBox session.Info.Transaction()

' End ------------------------------------------------------------------
```

Examples - WSH - Start Multiple TACs (2)

To be able to process a higher amount of data in the same time, parallelization is a valid approach. The SAP GUI scripting, as an automation interface to the SAP GUI for Windows, is a basis for many RPA platforms. In this context it is worth to taking a look at the parallelization capabilities of the SAP GUI Scripting.

The following example code has three routines:

1. Main
   Connects the open session, just like the standard does. Then two additional sessions are opened with different transaction codes, in our example the SE16 and SE37. After that the session object via GetSession is detected, based on the transaction code, and an external script is started via Action.

2. GetSession
   Loops over all the sessions of the connection to detect the session with the transaction code and delivers the session object.

3. Action
   Starts an external script with the connection and session number as parameters.

```
' Begin ---------------------------------------------------------------

Option Explicit

' Sub Action ------------------------------------------------------------
'
' Starts external script with the connection nubmer,session number
' and transaction code as parameters
'
' ----------------------------------------------------------------------
Sub Action(con, ses, TAC)

  Dim objShell, RegEx, Matches, con_no, ses_no

  ' Extracts connection and session number
  Set RegEx = New RegExp
  RegEx.Pattern = "[\d]+"
  Set Matches = RegEx.Execute(con)
  con_no = Matches(0).Value
  Set Matches = RegEx.Execute(ses)
  ses_no = Matches(0).Value

  ' Executes the external script
  Set objShell = WScript.CreateObject("WScript.Shell")
  objShell.Run "YourScript." + TAC + ".vbs " + con_no + " " + ses_no

End Sub

' Function GetSession ---------------------------------------------------
'
' Detects a session by transaction code (TAC)
'
' ----------------------------------------------------------------------
Function GetSession(connection, TAC)

  Dim sessions, session, sessionInfo, j, i

  Set sessions = connection.Sessions()
```

```
  ' Loop over sessions
  For Each session In sessions
    If session.Busy() = vbFalse Then
      Set sessionInfo = session.Info()
      If sessionInfo.Transaction() = TAC Then
        Set GetSession = session
      End If
    End If
  Next

End Function

Sub Main()

  Dim SapGuiAuto, app, connection, session
  Dim session_SE16, session_SE37
  Dim arr

  Set SapGuiAuto = GetObject("SAPGUI")
  If Not IsObject(SapGuiAuto) Then
    Exit Sub
  End If

  Set app = SapGuiAuto.GetScriptingEngine
  If Not IsObject(app) Then
    Exit Sub
  End If

  Set connection = app.Children(0)
  If Not IsObject(connection) Then
    Exit Sub
  End If

  If connection.DisabledByServer = True Then
    Exit Sub
  End If

  Set session = connection.Children(0)
  If Not IsObject(session) Then
    Exit Sub
  End If

  If session.Info.IsLowSpeedConnection = True Then
    Exit Sub
  End If

  ' Open different sessions with different TACs
  session.findById("wnd[0]/tbar[0]/okcd").text = "/oSE16"
  session.findById("wnd[0]").sendVKey 0
  session.findById("wnd[0]/tbar[0]/okcd").text = "/oSE37"
  session.findById("wnd[0]").sendVKey 0
  WScript.Sleep 500

  ' Detects the session with TAC SE16 and calls an external script
  Set session_SE16 = GetSession(connection, "SE16")
  arr = Split(session_SE16.ID, "/")
  Action arr(2), arr(3), "SE16"

  ' Detects the session with TAC SE37 and calls an external script
  Set session_SE37 = GetSession(connection, "SE37")
  arr = Split(session_SE37.ID, "/")
  Action arr(2), arr(3), "SE37"

End Sub
```

```
' Main ------------------------------------------------------------------
Main()

' End --------------------------------------------------------------------
```

YourScript.SE16.vbs

Here the script which automates the TAC SE16. First the connection and session number of the arguments are read. Then we have the standard sequence for establishing the connection to the session, with use of the passed arguments. Last but not least a for loop that does the same thing over and over again.

```
' Begin ------------------------------------------------------------------

Set Args = WScript.Arguments
con = Args(0)
ses = Args(1)

Set SapGuiAuto = GetObject("SAPGUI")
If Not IsObject(SapGuiAuto) Then
  WScript.Quit
End If

Set app = SapGuiAuto.GetScriptingEngine
If Not IsObject(app) Then
  WScript.Quit
End If

Set connection = app.Children(CLng(con))
If Not IsObject(connection) Then
  WScript.Quit
End If

If connection.DisabledByServer = True Then
  WScript.Quit
End If

Set session = connection.Children(CLng(ses))
If Not IsObject(session) Then
  WScript.Quit
End If

If session.Info.IsLowSpeedConnection = True Then
  WScript.Quit
End If

For i = 1 To 50
  session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = "TADIR"
  session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").caretPosition = 5
  session.findById("wnd[0]").sendVKey 0
  session.findById("wnd[0]").sendVKey 31
  session.findById("wnd[1]/tbar[0]/btn[0]").press
  session.findById("wnd[0]/tbar[0]/btn[3]").press
Next

' End --------------------------------------------------------------------
```

YourScript.SE37.vbs

Here the script which automates the TAC SE37. It does exactly the same as above.

```
' Begin -------------------------------------------------------------------

Set Args = WScript.Arguments
con = Args(0)
ses = Args(1)

Set SapGuiAuto = GetObject("SAPGUI")
If Not IsObject(SapGuiAuto) Then
  WScript.Quit
End If

Set app = SapGuiAuto.GetScriptingEngine
If Not IsObject(app) Then
  WScript.Quit
End If

Set connection = app.Children(CLng(con))
If Not IsObject(connection) Then
  WScript.Quit
End If

If connection.DisabledByServer = True Then
  WScript.Quit
End If

Set session = connection.Children(CLng(ses))
If Not IsObject(session) Then
  WScript.Quit
End If

If session.Info.IsLowSpeedConnection = True Then
  WScript.Quit
End If

For i = 1 To 25
  session.findById("wnd[0]/usr/ctxtRS38L-NAME").text = "RFC_READ_TABLE"
  session.findById("wnd[0]/usr/ctxtRS38L-NAME").caretPosition = 14
  session.findById("wnd[0]/usr/btnBUT3").press
  session.findById("wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpHEADER").select
  session.findById("wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpIMPORT").select
  session.findById("wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpEXPORT").select
  session.findById("wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpCHANGE").select
  session.findById("wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpTABLES").select
  session.findById("wnd[0]/usr/tabsFUNC_TAB_STRIP/tabpEXCEPT").select
  session.findById("wnd[0]/tbar[0]/btn[3]").press
Next

' End ---------------------------------------------------------------------
```

Now when the script is started, the sessions are opened with the transaction codes. Then other Windows Script Hosts are opened parallel and the scripts for SE16 and SE37 are executed parallel.

Examples - WSH - HTMLViewer

```
' Begin ----------------------------------------------------------------
'
' Get and set the body text of an HTML control on a screen
'
' ---------------------------------------------------------------------

Sub Main()

  Dim SapGuiAuto, app, connection, session
  Dim oBrowser, BrowserCtrlType

  On Error Resume Next
  Set SapGuiAuto = GetObject("SAPGUI")
  On Error GoTo 0
  If Not IsObject(SapGuiAuto) Then
    MsgBox "Can not get SapGuiAuto", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set app = SapGuiAuto.GetScriptingEngine
  On Error GoTo 0
  If Not IsObject(app) Then
    MsgBox "Can not get application", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set connection = app.Children(0)
  On Error GoTo 0
  If Not IsObject(connection) Then
    MsgBox "Can not get connection", vbOkOnly, "Hint"
    Exit Sub
  End If

  If connection.DisabledByServer = True Then
    MsgBox "Scripting is disabled by server", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set session = connection.Children(0)
  On Error GoTo 0
  If Not IsObject(session) Then
    MsgBox "Can not get session", vbOkOnly, "Hint"
    Exit Sub
  End If

  If session.Info.IsLowSpeedConnection = True Then
    MsgBox "Connection is low speed", vbOkOnly, "Hint"
    Exit Sub
  End If

  ' Call TAC SE38
  session.findById("wnd[0]/tbar[0]/okcd").text = "/nse38"
  session.findById("wnd[0]").sendVKey 0

  ' Execute report SAPHTML_DEMO1
  session.findById("wnd[0]/usr/ctxtRS38M-PROGRAMM").text = "SAPHTML_DEMO1"
  session.findById("wnd[0]/tbar[1]/btn[8]").press
```

```
  ' Get the handle of the InternetExplorer.Application object ----------
  '
  ' This object controls an instance of Windows Internet Explorer
  ' through automation
  '
  ' Important hint:
  ' The Internet Explorer (IE) 11 desktop application will end support
  ' June 15, 2022, customers are encouraged to move to Microsoft Edge
  ' with IE mode, it enables backward compatibility and will be
  ' supported through at least 2029
  '
  ' ------------------------------------------------------------------
  Set oBrowser =
session.findById("wnd[0]/usr/cntlHTML/shellcont/shell").BrowserHandle

  ' Detect browser control type ----------------------------------------
  '
  ' 0 = Internet Explorer, 1 = Edge (based on Chromium)
  '
  ' Access to the Document Object Model (DOM) works only with
  ' IE control
  '
  ' ------------------------------------------------------------------
  BrowserCtrlType =
session.findById("wnd[0]/usr/cntlHTML/shellcont/shell").GetBrowserControlType(
)

  If BrowserCtrlType = 0 Then

    ' Get the innerText of the body tag of the HTML site
    MsgBox oBrowser.document.body.innerText

    ' Add an additional tag with a text to the HTML site
    oBrowser.document.body.innerHTML = oBrowser.document.body.innerHTML + _
      "<div>Hello World!</div>"

  End If

End Sub

' Main ---------------------------------------------------------------
Main

' End ----------------------------------------------------------------
```

```
' Begin ----------------------------------------------------------------
'
' Get the body text of an HTML control from a dialog
'
' ----------------------------------------------------------------------

Sub Main()

  Dim SapGuiAuto, app, connection, session
  Dim ID, oBrowser, InnerText

  On Error Resume Next
  Set SapGuiAuto = GetObject("SAPGUI")
  On Error GoTo 0
  If Not IsObject(SapGuiAuto) Then
    MsgBox "Can not get SapGuiAuto", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set app = SapGuiAuto.GetScriptingEngine
  On Error GoTo 0
  If Not IsObject(app) Then
    MsgBox "Can not get application", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set connection = app.Children(0)
  On Error GoTo 0
  If Not IsObject(connection) Then
    MsgBox "Can not get connection", vbOkOnly, "Hint"
    Exit Sub
  End If

  If connection.DisabledByServer = True Then
    MsgBox "Scripting is disabled by server", vbOkOnly, "Hint"
    Exit Sub
  End If

  On Error Resume Next
  Set session = connection.Children(0)
  On Error GoTo 0
  If Not IsObject(session) Then
    MsgBox "Can not get session", vbOkOnly, "Hint"
    Exit Sub
  End If

  If session.Info.IsLowSpeedConnection = True Then
    MsgBox "Connection is low speed", vbOkOnly, "Hint"
    Exit Sub
  End If

  ' Call TAC SE37
  session.findById("wnd[0]/tbar[0]/okcd").text = "/nSE37"
  session.findById("wnd[0]").sendVKey 0

  ' Call FM POPUP_TO_CONFIRM
  session.findById("wnd[0]/usr/ctxtRS38L-NAME").text = "POPUP_TO_CONFIRM"
  session.findById("wnd[0]").sendVKey 8

  ' Fill the arguments
  session.findById("wnd[0]/usr/txt[34,7]").text = "Information"
```

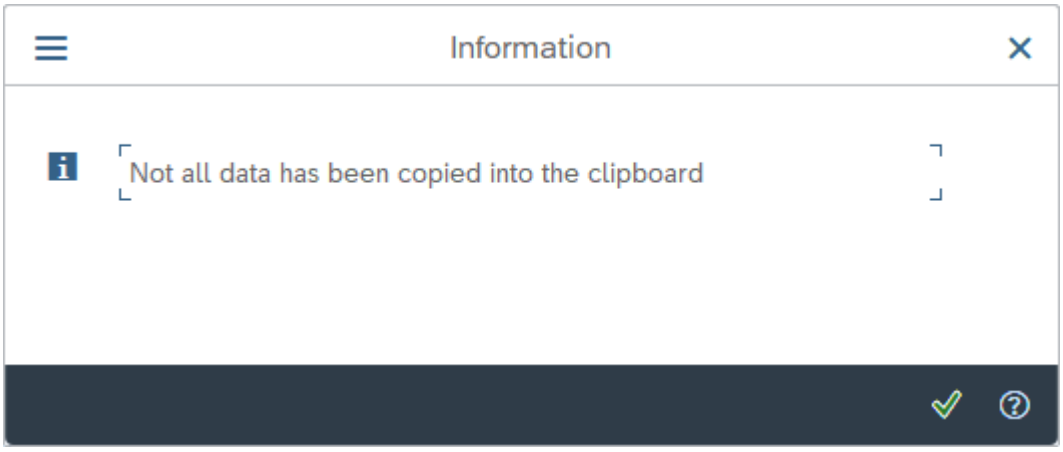
```
  session.findById("wnd[0]/usr/txt[34,9]").text = "This is a test"
  session.findById("wnd[0]/usr/txt[34,10]").text = "Yes"
  session.findById("wnd[0]/usr/txt[34,12]").text = "No"
  session.findById("wnd[0]/usr/txt[34,15]").text = ""
  session.findById("wnd[0]").sendVKey 8

  WScript.Sleep(2500)

  ' Get the handle of the InternetExplorer.Application object
  ID =
"wnd[1]/usr/subSUBSCREEN:SAPLSPO1:0502/cntlHTML_CONTROL_CON/shellcont/shell"
  Set oBrowser = session.findById(ID).BrowserHandle

  ' Get the innerText of the body tag of the HTML site
  MsgBox oBrowser.document.body.innerText

  ' Get the innerText
  InnerText = session.findbyid(ID).BrowserHandle.document.all(0).innertext
  MsgBox InnerText

End Sub

' Main ------------------------------------------------------------------
Main

' End -------------------------------------------------------------------
```

Examples - WSH - Copy Table Data to Clipboard with AutoItX

Hint: In this example AutoItX is used, because WSH does not offer any functions to use the clipboard.

```
' Open SE16 with table TADIR
session.findById("wnd[0]/tbar[0]/okcd").text = "/nse16"
session.findById("wnd[0]").sendVKey 0
session.findById("wnd[0]/usr/ctxtDATABROWSE-TABLENAME").text = "TADIR"
session.findById("wnd[0]/tbar[1]/btn[7]").press
session.findById("wnd[0]").sendVKey 8

' Select two columnes
session.findById("wnd[0]/usr/cntlGRID1/shellcont/shell").selectColumn("OBJ_NAM
E")
session.findById("wnd[0]/usr/cntlGRID1/shellcont/shell").selectColumn("SRCSYST
EM")

' Bring SAP window to front
Set oAutoIt = WScript.CreateObject("AutoItX3.Control")
oAutoIt.WinActivate session.findById("wnd[0]").Text

' Set the focus to the table
session.findById("wnd[0]/usr/cntlGRID1/shellcont/shell").setFocus

oAutoIt.Sleep 250

' Send keys Ctrl + C to copy the content to the clipboard
oAutoIt.Send "{CTRLDOWN}c{CTRLUP}"
```

If too much data is to be copied, a message is displayed.



Hint: With VBScript SendKeys command is it not possible to send the keystrokes Ctrl + C to the SAP control.

Testing

03/2022 with release 5.18

Operating System	SAP GUI	Programming Language	Version	Available in Standard	Additional Library Necessary	Architecture	Recording	Playback
Windows 10 21H2 19044.1566 x64	SAP GUI for Windows 7.70 Compilation 1 Patch 5 x86	PowerShell Windows	5.1.19041.1320	✓	none	x64	✓	✓
						x86		✓
		PowerShell Core	7.2.1	×	none	x64	✓	✓
			7.2.2				✓	✓
		C# 10 dotNET SDK	6.0.2	×	none	x64	✓	✓
		C# 5 dotNET Framework	4.8.4084	✓	none	x64	✓	✓
						x86		✓
		Visual Basic 2012 dotNET Framework	14.8.4084	✓	none	x64	✓	✓
						x86		✓
		Python	3.9.10	×	PyWin	x86	✓	✓
		Java Shell OpenJDK	17.0.2	×	JaCoB	x64	✓	✓
			18.0.0				✓	✓
		AutoIt	3.3.14.5	×	none	x64	✓	✓
						x86		✓
		Windows Script Host VBScript	5.812	✓	none	x64	✓	✓
						x86		✓

06/2022 with release 5.20

Operating System	SAP GUI	Programming Language	Version	Available in Standard	Additional Library Necessary	Architecture	Recording	Playback
Windows 11 21H2 22000.795 x64	SAP GUI for Windows 7.70 Compilation 1 Patch 7 x86	PowerShell Windows	5.1.22000.653	✓	none	x64	✓	✓
						x86		✓
		PowerShell Core	7.2.5	×	none	x64	✓	✓
		C# 10 dotNET SDK	6.0.302	×	none	x64	✓	✓
		C# 5 dotNET Framework	4.8.4161	✓	none	x64	✓	✓
						x86		✓
		Visual Basic 2012 dotNET Framework	14.8.4161	✓	none	x64	✓	✓
						x86		✓
		Python	3.9.10	×	PyWin	x86	✓	✓
		Java Shell OpenJDK	18.0.1.1	×	JaCoB	x64	✓	✓
			18.0.2				✓	✓
		AutoIt	3.3.16.0	×	none	x64	✓	✓
						x86		✓
		Windows Script Host VBScript	5.812	✓	none	x64	✓	✓
						x86		✓

04/2023 with release 6.00

Operating System	SAP GUI	Programming Language	Version	Available in Standard	Additional Library Necessary	Architecture	Recording	Playback
Windows 11 22H2 22691.1194 x64	SAP GUI for Windows 8.00 Compilation 0 Patch 1 x86 and x64	PowerShell Windows	5.1.22621.963	✓	none	x64	✓	✓
						x86		✓
		PowerShell Core	7.3.2	×	none	x64	✓	✓
		C# 5 dotNET Framework	4.8.9032	✓	none	x64	✓	✓
						x86		✓
		C# 10 dotNET SDK	6.0.405	×	none	x64	✓	✓
		Visual Basic 2012 dotNET Framework	14.8.9032	✓	none	x64	✓	✓
						x86		✓
		Python	3.9.13	×	PyWin 3.05	x86	✓	✓
		Java Shell OpenJDK	19.0.2	×	JaCoB 1.20	x64	✓	✓
		AutoIt	3.3.16.1	×	none	x64	✓	✓
						x86		✓
		Windows Script Host VBScript	5.812	✓	none	x64	✓	✓
						x86		✓

02/2024 with release 6.04

Operating System	SAP GUI	Programming Language	Version	Available in Standard	Additional Library Necessary	Architecture	Recording	Playback
Windows 11 23H2 22631.3155 x64	SAP GUI for Windows 8.00 Compilation 1 Patch 6 x86 and x64	PowerShell Windows	5.1.22621.2506	✓	none	x64	✓	✓
						x86		✓
		PowerShell Core	7.4.1	×	none	x64	✓	✓
		C# 5 dotNET Framework	4.8.9032	✓	none	x64	✓	✓
						x86		✓
		C# 12 dotNET SDK	8.0.201	×	none	x64	✓	✓
		Visual Basic 2012 dotNET Framework	14.8.9032	✓	none	x64	✓	✓
						x86		✓
		Python	3.9.13	×	PyWin 3.06	x86	✓	✓
		Java Shell OpenJDK	21.0.2	×	JaCoB 1.20	x64	✓	✓
		AutoIt	3.3.16.1	×	none	x64	✓	✓
						x86		✓
		Windows Script Host VBScript	5.812	✓	none	x64	✓	✓
						x86		✓

Operating System	SAP GUI	Programming Language	Version	Available in Standard	Additional Library Necessary	Architecture	Recording	Playback
Windows 11 23H2 22631.3958 x64	SAP GUI for Windows 8.00 Compilation 1 Patch 8 x64	PowerShell Windows	5.1.22621.3958	✓	none	x64	✓	✓
						x86		✓
		PowerShell Core	7.4.4	×	none	x64	✓	✓
		C# 5 dotNET Framework	4.8.9232	✓	none	x64	✓	✓
						x86		✓
		C# 12 dotNET SDK	8.0.303	×	none	x64	✓	✓
		Visual Basic 2012 dotNET Framework	14.8.9256	✓	none	x64	✓	✓
						x86		✓
		Python		×	none		✓	—
		Java Shell OpenJDK	22.0.2	×	JaCoB 1.21	x64	✓	✓
		AutoIt	3.3.16.1	×	none	x64	✓	✓
						x86		✓
		Windows Script Host VBScript	5.812	✓	none	x64	✓	✓
		Windows Script Host JScript	5.812	✓	none	x64	✓	✓

Tracker.ini

Programming Language	Architecture	Section	Keyword	Comment
PowerShell Windows	x64	ProgramConfiguration	EditorExternaIPS1	`%WINDIR%\System32\WindowsPowerShell\v1.0\powershell_ise.exe`
		ScriptingEngines	PowerShell	`%WINDIR%\System32\WindowsPowerShell\v1.0\powershell.exe`
	x86	ProgramConfiguration	EditorExternaIPS1	`%WINDIR%\SysWOW64\WindowsPowerShell\v1.0\powershell_ise.exe`
		ScriptingEngines	PowerShell	`%WINDIR%\SysWOW64\WindowsPowerShell\v1.0\powershell.exe`
PowerShell Core	x64	ScriptingEngines	PowerShellCore	Set path to `pwsh.exe`
AutoIt	x64	ScriptingEngines	AutoIt	Set path to `AutoIt3_x64.exe`
	x86	ScriptingEngines	AutoIt	Set path to `AutoIt3.exe`
Python		ScriptingEngines	Python	Set path to `python.exe`
Java Shell	x64	ScriptingEngines	JShell	Set path to `JShell.exe` and add path to `JaCoB-*-x64.dll` to `PATH` environment variable.

Hint: Python needs the Win32COM client, from Python for Win32 (pywin32) extensions, to use SAP GUI Scripting. A stability of this integration could not be achieved. For this reason the playback tests were discontinued. Only the recording continues to be checked.

Tracker.*2exe.cmd (dotNET)

C# dotNET Framework	x64	`%WINDIR%\Microsoft.NET\Framework64\v4.0.30319\csc.exe /target:winexe /platform:x64 /out:Tracker_RunScript.cs.exe /reference:"C:\Windows\Microsoft.NET\Framework64\v4.0.30319\Microsoft.VisualBasic.dll" Tracker_RunScript.cs`
	x86	`%WINDIR%\Microsoft.NET\Framework\v4.0.30319\csc.exe /target:winexe /platform:x86 /out:Tracker_RunScript.cs.exe /reference:"C:\Windows\Microsoft.NET\Framework\v4.0.30319\Microsoft.VisualBasic.dll" Tracker_RunScript.cs`
C# dotNET	x64	Add `DOTNET_ROOT` environment variable with the path to the dotNET Core SDK and add `%DOTNET_ROOT%` to the `PATH` environment variable.
Visual Basic dotNET Framework	x64	`%WINDIR%\Microsoft.NET\Framework64\v4.0.30319\vbc.exe /target:winexe /platform:x64 /out:Tracker_RunScript.vb.exe Tracker_RunScript.vb`
	x86	`%WINDIR%\Microsoft.NET\Framework\v4.0.30319\vbc.exe /target:winexe /platform:x86 /out:Tracker_RunScript.vb.exe Tracker_RunScript.vb`

Windows Script Host (VBScript)

Hint: It is no longer recommended to use VBScript. It is a deprecated script language that is no longer being developed. For this reason the playback tests were discontinued. Only the recording continues to be checked.

Windows Script Host	x64	Start console w ith `%WINDIR%\System32\cmd.exe`
		Command `echo %PROCESSOR_ARCHITECTURE%` delivers AMD64
		`%WINDIR%\System32\wscript.exe [Path\]Tracker_RunScript.vbs`
	x86	Start console w ith `%WINDIR%\SysWOW64\cmd.exe`
		Command `echo %PROCESSOR_ARCHITECTURE%` delivers x86
		`%WINDIR%\SysWOW64\wscript.exe [Path\]Tracker_RunScript.vbs`

Testing - Transaction Codes

To test different UI elements use transaction code

- *GUIBIBS*, which starts the program SAPMBIBS, or
- *BIBS*, which starts the program SAPLEXAMPLE_ENTRY_SCREEN, or
- *GUIT*, whicht starts the program SAPM_GUITEST_PORTABLE, or
- *DWDM*, to open the Demo Center, or
- SE38 with a selection of programs DEMO_DYNPRO* or
- *ABAPDOCU*, to open ABAP examples, or
- SE80 with the package SABAPDEMOS or
- *BRFACS02*, e.g. SAPLBRF_MAINTENANCE:3006, to experiment with program name and screen number (works in S/4HANA with restrictions), or
-
- SE38 with the report name /SAPDMC/SAPMLSMW, to experiment with program name and screen number, or
- *SAPTEXTEDIT_TEST_2* to test TextEdit Control.

Web Dynpro for ABAP

To test integration scenarios with Web Dynpro for ABAP you can use the Web Dynpro Applications from the following development packages:

- SWDP_DEMO
- SWDP_DEMO_TUTORIALS

Requirements

- Operating system Windows 11 or higher.
  Scripting Tracker should run with Windows 7 or higher, but that was no longer tested.

- Full standard installation of SAP GUI for Windows 8.00 or higher.
  Scripting Tracker should run with full standard installation of SAP GUI for Windows 7.40 or higher, but that was no longer tested .

- Activated SAP GUI Scripting on the presentation and application server.

- Microsoft dotNET Framework 4.8 or higher.
  Scripting Tracker should run with Microsoft dotNET Framework 4.6.2 or higher, but that was no longer tested.

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Jacob is available at GibHub.

Contact

WebSite: tracker.stschnell.de
Support: mail@stschnell.de

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