G*plus* Adapter 7.5

for SAP ERP

Deployment Guide

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Table of Contents

Preface

Welcome to the *G*plus *Adapter 7.5 for SAP ERP Deployment Guide*. This guide introduces you to the concepts and terminology relevant to the G*plus* Adapter 7.5 for SAP ERP (the Adapter) and how it enables telephony functionality in SAP through the SAPphone interface. It lists the system requirements for, and describes how to install and configure, the Adapter.

This document provides a high-level overview of ERP 7.5 features and functions, together with software-architecture information and deployment-planning materials.

This document is valid for all 7.5 release of this product.

Note: For versions of this document created for other releases of this product, please visit the Genesys Technical Support website, or request the Documentation Library CD, which you can order by e-mail from Genesys Order Management at orderman@genesyslab.com.

This preface contains these sections:

Note: For a good understanding of SAPphone, please read the SAPphone documentation available from the SAP website.

For T-Gate product customers, refer to the for details on migrating from 6.1 T-Gate to the Adapter. The instructions describe a 6.1 T-Gate to 7.0 Adapter migration, but they apply equally to a 6.1 T-Gate to 7.5 Adapter migration. No special migration is required when upgrading from the 7.1 Adapter to the 7.5 Adapter.

Note: SAP no longer sells R/3 or R/3 Enterprise to new customers, and the current product offered is SAP ERP. Therefore, in this document Genesys uses the latest SAP product name, SAP ERP, with the understanding that it can also be referring to the earlier R/3 and R/3 Enterprise products. The essential requirement is that the SAP basis system and applications running on it support the SAPphone interface.

Intended Audience

This document, primarily intended for system administrators or other individuals who install, configure, and maintain the Adapter, assumes that you have a basic understanding of:

- Computer-telephony integration (CTI) concepts, processes, terminology, and applications.
- Network design and operation.

You should also be familiar with:

- Genesys Framework.
- SAP architecture

Chapter Summaries

In addition to this preface, this document contains the following chapters and an appendix:

- Chapter 1, "About the Adapter," on page 13, introduces concepts and terminology for this product, discusses key features of the Adapter, and describes the architecture of the Adapter and how it works with other Genesys products and SAP ERP.
- Chapter 2, "About the SAPphone," on page 19, introduces basic concepts and terminology pertaining to the SAPphone interface, and describes the architecture of SAPphone as it relates to integration with the Adapter.
- Chapter 3, "System Requirements," on page 25, describes the minimum hardware and software requirements for installing and using this product.
- \Chapter 4, "Creating Application Objects in Genesys Configuration Manager," on page 29, describes how to install the Adapter.
- Chapter 5, "Installing the Adapter," on page 35, provides installation instructions for this product.
- Chapter 6, "Configuring the Adapter," on page 41, describes configuration tasks for the Adapter.

- Chapter 7, "Starting the Adapter," on page 67, describes how to start (launch) the Adapter, set up the agent work center, and test the Adapter-SAPphone connection.
- Chapter 8, "Use-Case Scenarios," on page 73, describes some common use-case scenarios you can apply when using this Adapter.
- Chapter 9, "Agent Workmodes," on page 97, describes the mapping between the SAP and Genesys agent workmodes.
- The Appendix, "Handling Call-Attached Data" on page 99, describes the handling and implementation of call-attached data (CAD) that is needed for both CTI and SAP.

Document Conventions

This document uses some stylistic and typographical conventions with which you might want to familiarize yourself.

Document Version Number

A version number appears at the bottom of the inside front cover of this document. Version numbers change as new information is added to this document. Here is a sample version number:

75gp_dep_sa-ERP_04-2005_v7.5.000.01

You will need this number when you are talking with Genesys Technical Support about this product.

Type Styles

Italic

In this document, italic is used for emphasis, for documents' titles, for definitions of (or first references to) unfamiliar terms, and for mathematical variables.

Examples:

- Please consult the *Genesys 7 Migration Guide* for more information.
- *A customary and usual practice* is one that is widely accepted and used within a particular industry or profession.
- Do *not* use this value for this option.
- The formula, $x + 1 = 7$ where x stands for . . .

Monospace Font

A monospace font, which looks like `teletype or typewriter text`, is used for all programming identifiers and GUI elements.

This convention includes the *names* of directories, files, folders, configuration objects, paths, scripts, dialog boxes, options, fields, text and list boxes, operational modes, all buttons (including radio buttons), check boxes, commands, tabs, CTI events, and error messages; the values of options; logical arguments and command syntax; and code samples.

Examples:

- Select the `Show variables on screen` check box.
- Click the `Summation` button.
- In the `Properties` dialog box, enter the value for the host server in your environment.
- In the `Operand` text box, enter your formula.

Screen Captures Used in This Document

Screen captures from the product GUI (graphical user interface), as used in this document, may sometimes contain a minor spelling, capitalization, or grammatical error. The text accompanying and explaining the screen captures corrects such errors *except* when such a correction would prevent you from installing, configuring, or successfully using the product. For example, if the name of an option contains a usage error, the name would be presented exactly as it appears in the product GUI; the error would not be corrected in any accompanying text.

Square Brackets

Square brackets indicate that a particular parameter or value is optional within a logical argument, a command, or some programming syntax. That is, the parameter's or value's presence is not required to resolve the argument, command, or block of code. The user decides whether to include this optional information. Here is a sample:

```
smcp_server -host [/flags]
```

Angle Brackets

Angle brackets indicate a placeholder for a value that the user must specify. This might be a DN or port number specific to your enterprise. Here is a sample:

```
smcp_server -host <confighost>
```

Related Resources

Genesys Resources

Consult these additional Genesys resources as necessary:

- The *Genesys 7 Migration Guide,* which contains information important for migration from the 6.1 T-Gate release to the Adapter for.
- The *Genesys Technical Publications Glossary,* which ships on the Genesys Documentation Library CD and which provides a comprehensive list of the Genesys and CTI terminology and acronyms used in this document.
- The Release Notes and Product Advisories for this product, which are available on the Genesys Technical Support website at http://genesyslab.com/support.

Information on supported hardware and third-party software is available on the Genesys Technical Support website in the following documents:

- *Genesys Supported Operating Systems and Databases*
- *Genesys Supported Media Interfaces*

Genesys product documentation is available on the:

- Genesys Technical Support website at http://genesyslab.com/support.
- Genesys Documentation Library CD, which you can order by e-mail from Genesys Order Management at orderman@genesyslab.com.

SAP Resources

To access additional SAP documentation, such as SAPphone RFC interface specification or SAP Notes, visit:

- The SAP Help Portal at http://help.sap.com.
- The SAP Service Marketplace at http://service.sap.com.

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Chapter

1 About the Adapter

The G*plus* Adapter 7.5 for SAP ERP (the Adapter) enables telephony and contact center functionality for the SAP platform and provides functional continuity for 6.1 T-Gate and 7.1 G*plus* Adapter products customers.

The Adapter is a Genesys server integration component between the SAP platform and Genesys Framework. It is intended for customers who want to enable voice-only telephony in their SAP systems via the SAPphone interface.

Note: If you wish to add Multi-Channel interaction management (voice, e-mail, and so on) to the SAP CRM product, you need an Adapter for SAP CRM.

The information in this chapter is divided among the following topics:

Overview

The Adapter enables telephony functionality for enterprise knowledge workers or agents needing to conduct voice interactions with customers, employees, partners, or suppliers.

SAPphone integrates telephony functions in SAP applications. This allows data exchange between computer and telephone processes. Agents can use the telephone functions from the graphical user interface of the SAP applications and are supplied with data from the SAP system.

Users can select a person directly in an SAP application and establish the telephone connection. When an inbound call is received, the system either displays the caller data or launches a predefined SAP application. During a call, users can enter notes or edit tasks in an SAP Application.

Key Features

This Adapter enables the following key features:

- Adapter configuration and administration through the Genesys Management Framework
- High- availability configuration (backup and primary servers)
- Automatic monitoring options
- Call number translation options
- Switch-specific options and support for a wide range of switches
- Support for different versions of the SAPphone interface

Genesys Management Framework

The Adapter enables configuration and administration through Genesys Management Framework components, for example:

- In Genesys Configuration Manager, you can set or adjust the Adapter's configuration options.
- In Genesys Solution Control Interface, you can start and stop the Adapter remotely, and view its log data.

You can set or adjust the Adapter configuration options in Genesys Configuration Manager, start and stop the Adapter remotely and view its log data in Genesys Solution Control Interface.

Specialized Configuration Options

Automatic Monitoring

The Adapter can determine from SAP which telephony numbers are configured at the specific SAP telephony server (transaction `SPHB`). Depending on the options used, the Adapter can automatically register/deregister either all or just the active (logged on) work centers configured on this telephony server.

Call Number Translation Options

The Adapter provides options both for modifying ANI numbers (removing or adding base numbers, local area codes, and so on), and for dialed numbers coming to the T-Server.

Switch-Specific Options

The Adapter provides switch-specific options which are located in the `genmodel` section of the Adapter's configuration options.

In most cases, the Adapter relies on the switch-specific options that are defined within the `T-Server Application` object and the proper switch configuration in the Configuration Manager.

SAPphone Support

SAPphone Interface

The Adapter supports different versions of SAPphone interface. For more information on this interface, see "The SAPphone Interface" on page 21 and SAPphone documentation available from the SAP website.

SAPphone Architecture

The Adapter is implemented as a SAPphone server component. A Genesys environment can support several instances of the Adapter. Each instance of the Adapter can connect to one SAP system and one Genesys environment. Two different instances of the Adapter can connect to the same or different SAP systems. For more information on the SAPphone architecture, see "The SAPphone Central Architecture" on page 23.

Registration

The Adapter needs information from the SAP system regarding which extensions it has to support and establish. It uses this information to register the extensions at the CTI system.

Before starting a telephony activity, make sure that the SAP extension is registered by the Adapter on CTI.

The Adapter supports the SAP *manual* registration mode (`explicit` via `SPS_REGISTER`, or `on demand` via any telephony request).

The Adapter also supports the SAP *automatic* registration mode. In this case, the Adapter periodically calls the function `SPS_GET_LINES_PER_SERVER` to receive a list of extensions that require telephony support.

Refer to the `auto-registration` section of the Adapter configuration options as described in the "automatic-registration Section" on page 54.

SAPphone Incoming Call Modes

SAPphone supports three methods by which incoming call information is reported to the SAP system:

- The SAP application waits for an incoming call.

  In this mode, the SAP GUI is dormant until an incoming call arrives.
- The SAP application actively requests information on incoming calls.

In this mode, the SAP user should periodically check for incoming calls, usually by clicking `Refresh`.

- The telephony gateway actively reports incoming call information to the SAP application.

  In this mode, the SAP GUI displays an `express` message with incoming call information each time a call arrives. In the case of a missed call, the SAP mailbox holds the message with the missed call information (transaction `SO01`). From an architectural standpoint, this means that the Adapter actively notifies the SAP system every time a new call arrives or every time an agent ends a call.

The Adapter supports all three modes. To activate the third mode described above, adjust the appropriate Adapter configuration option and SAP user settings.

High Availability

All the Adapter's connections are *active*. This means that if the Adapter detects a lost connection with the other server components (Genesys or SAP), it actively tries to reconnect to them.

In addition, the Adapter is able to work with both the primary and backup instances of Genesys components. As a result, if the primary instance of the Genesys server fails or goes out of service, the Adapter starts working with the backup instance. In most cases, agents will be able to resume their operations quickly, with little or no loss of state.

Finally, the Adapter supports Advanced Disconnect Detection Protocol (ADDP) connection to both the Configuration Server and the T-Server. Adjusting ADDP improves the ability to detect the network disconnection, but it increases the local network loading.

Note: For more information about high availability configuration and ADDP, see your Genesys Framework documentation.

Phone Interface

An agent can use the phone interface to:

- Receive incoming and make outgoing calls.
- Transfer a phone interaction to another agent.
- Initiate and participate in conference sessions.
- Receive calls from a queue and make calls to a queue and routing point.
- Attach data to the call. From SAP, this functionality can be used implicitly.

Intergration with the Adapter for SAP Analytics

If the `call-attached-data:analytics-support` option is set to a certain value, the Adapter provides voice-interactions with a unique ID that is based on the T-Server connection ID. This identifier is attached to the interaction as a key-value pair, and the G*plus* Adapter for SAP Analytics uses it when transferring statistical information to SAP.

Architectural Overview

The Adapter uses a SAPphone-centralized architecture, as described in SAPphone Interface Specification 2.3. The Adapter communicates with SAP applications through the SAPphone `Remote Function Call` (RFC) interface. The Adapter interacts with Genesys T-Server through the `GenModel` component, which provides a Switch-Abstraction Layer. It also interacts with the components of the Genesys Management Framework (the Configuration layer and Management Layer) by using corresponding Genesys libraries and application programming interfaces (APIs). Figure 1 illustrates this system overview

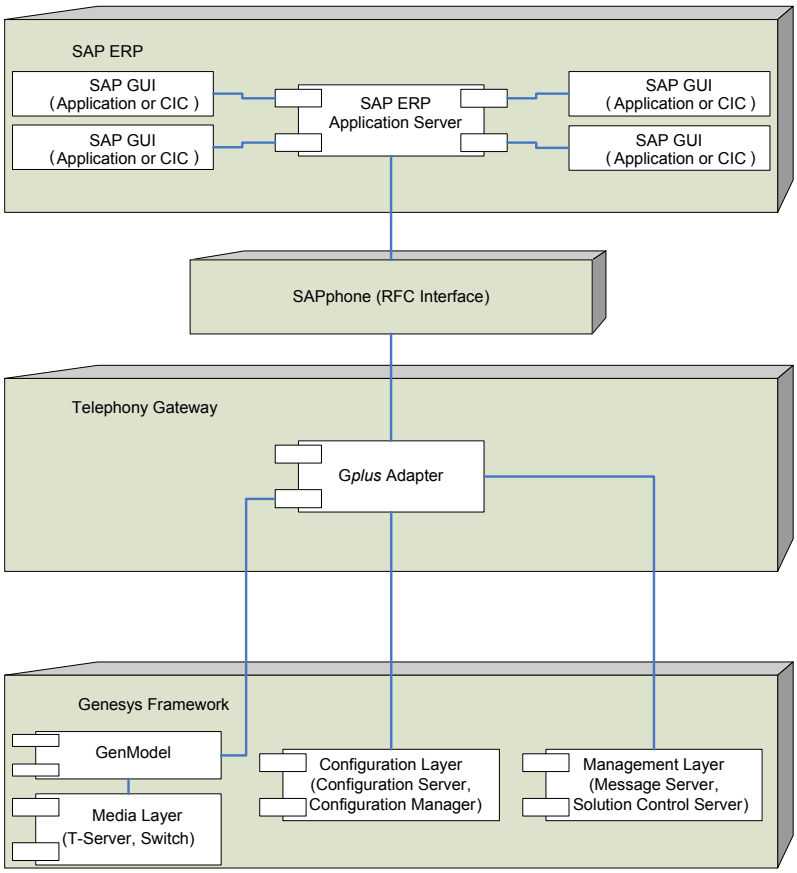


Figure 1: System Overview

Adapter implementation is based on these libraries:

1. `Remote Function Call (RFC) Library` – provided by the SAP library for SAP connectivity
2. `GenModel`, (also known as CTI Driver) – provides the Switch-Abstraction Layer

The Adapter is a client of the Genesys T-Server and can act as a server to either a single SAP agent or multiple SAP agents. Every time the Adapter starts, it opens a TCP/IP socket connection to the T-Server and registers to receive telephony events. As messages pass from T-Server to the Adapter, this information is provided to all requesting SAP applications via the SAPphone interface.

New in Version 7.5

This section lists topics that are new in the current release of this document.

- Intergration with the ERP Adapter for SAP Analytics:

  The Adapter can now provide the information necessary for SAP Analytics Adapter to transfer statistical information to SAP.

- Support for T-Server's consult-user-data mode:

  The new Adapter's option telephony: consult-user-data enables either SAPphone or T-Server modes to handle the user data for consult calls.

Chapter

2 About the SAPphone

This chapter introduces the SAPphone interface.

The information in this chapter is divided among the following topics:

The SAPphone Overview

The objective of the SAPphone is to merge telephone and onscreen work, thereby integrating telephony more closely in day-to-day activities.

Applications and Transactions That Use The SAPphone

The following is a partial list of SAP applications that use the SAPphone:

- `IC`
- SAP Workplace
- Service Management (Service Notification)
- Employee Self Service (ESS)
- Customer-specific applications

The following are examples of SAP transactions that use the SAPphone:

- `SPHT`: SAPphone test environment
- `SPHA`: SAPphone administration
- `SPHB`: SAPphone system administration
- `SPRO`: IMG configuration
- `CICO`: Interaction Center WinClient

Each specific application or transaction contains screens with information and devices to assist the agent with an interaction.

Integration

As a Basis component on SAP platform, the SAPphone is designed as a cross-application module. The SAPphone functions are part of generic object services, which means that they can be called in all applications that support these services.

You can further integrate telephony into transactions, reports and workflow processes of applications so that data can be transferred automatically between the applications and the SAPphone functions. The following areas directly support outbound calls:

- Controlling (head of cost center)
- Application management (applicants and employees)
- Sales and Distribution (contacts and visitors)
- Foreign trade (export licensors)
- SAP Retail (suppliers)
- Money market and foreign exchange (parties to contracts)
- Real estate management (business partners)
- SAP Business Workflow (enhanced user decision and integration of the `Initiate Call` step as a work item in the workflow)
- Business Workplace (sender and creator of message)
- EDI (persons responsible for and parties to IDocs)

The following areas directly support outbound *and* inbound calls:

- Service Management (parties to service messages)
- Inventory Management (parties to Inventory Management messages)
- Quality Management (parties to quality messages)
- Treasury Management (business partners)

Sales and Distribution also supports *Predictive Dialing* for telephone campaigns.

Basic Functions

The SAPphone allows users to perform telephone functions via the mouse. The SAPphone supports the following telephone functions:

- Initiate call
- Receive call
- Terminate call
- Transfer

- Put call on hold
- Conference call

The following functions illustrate the importance of integration between the SAP applications and telephone processes:

- Caller identification for inbound calls
- Automatic launch of an application when receiving an inbound call
- Display of caller data
- Linking of notes to calls
- Provision of caller information stored in the SAP System
- Storage of data on unanswered calls with callback function
- Attachment of calls to documents, work items, and business objects
- Integration of calls in SAP Business Workflow
- Use of telephone calls to start workflows

The SAPphone Interface

The SAPphone is a `Remote Function Call` (RFC) interface, which makes computer telephony available for SAP basis software.

All communication between SAP applications or the IC on the one hand, and external CTI systems, contact centers, or PBX drivers on the other hand, is through the SAPphone telephony interface.

The component that communicates with the SAP system through the SAPphone interface and the CTI system is usually known as a *telephony gateway.* CTI systems may range from a CTI-enabled switch to a globally distributed contact center solution.

See Figure 2 for a graphical representation of this architecture.

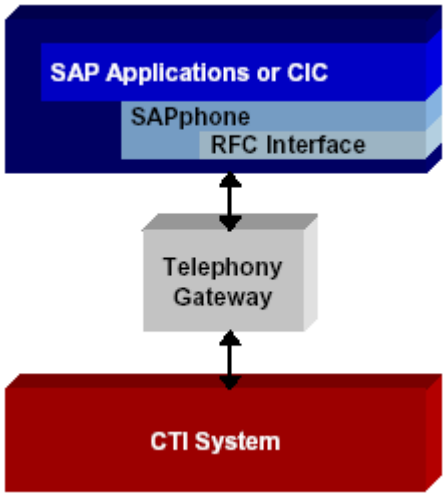


Figure 2: SAPphone Interface to Telephony Gateway and CTI System

The SAPphone is designed to make the telephone an integral part of business processes, either in connection with individual SAP applications, SAP Business Workflow, or the IC in a contact center environment.

The SAPphone supports the following functions:

- Various telephony functions, such as initiate call, transfer call, and so on. Refer to the SAP document *SAPphone Telephony in SAP Systems* for more information.
- Display of incoming call information.
- Support for contact center functions, such as agent login.
- Support for campaigns (Predictive Dialing, Power Dialing).
- Branch to applications with caller data.
- Support for entering memos for calls.

The Adapter enables all of the above SAPphone functionality with the exception of support for campaigns.

SAP provides three different system architectures for SAPphone:

- Local Connection
- The Client/Server Architecture
- The Central Architecture (which uses a central Adapter Server Component)

The Adapter supports only the Central Architecture.

The SAPphone Central Architecture

In a centralized architecture, the individual work center PCs do not require any additional hardware or software.

The switch is connected to a central telephony server. This server communicates directly with the SAP application server via the local network, without routing via the work center PC. To perform this task, the telephony server must be equipped with the following software components:

- Central RFC component for communicating with the SAP application server
- Interface for adapting the telephony software to the SAPphone RFC interface (either SAPphone Server or program from a third-party vendor)
- Central telephony software

Figure 3 illustrates a centralized architecture (also called centralized connection).

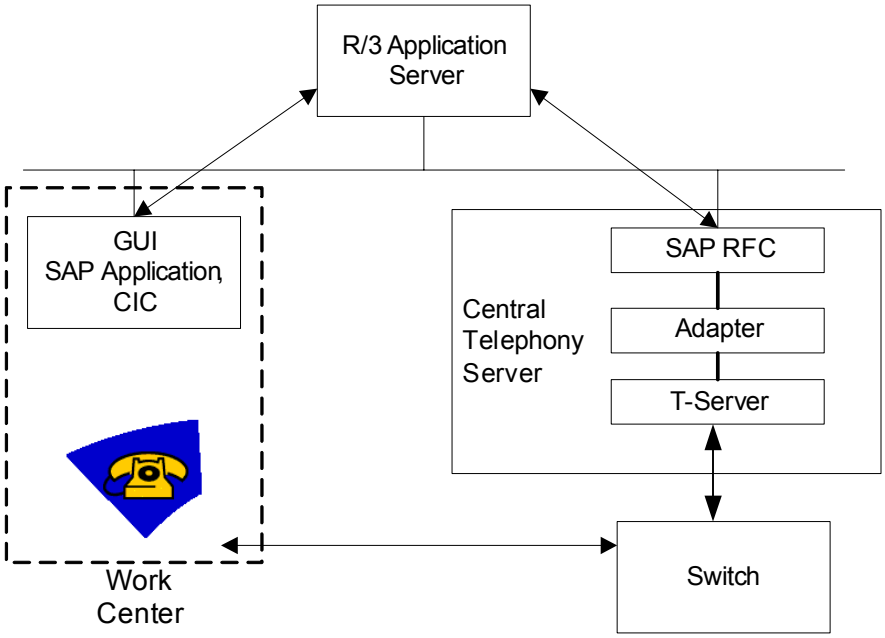


Figure 3: Centralized Connection

Chapter

3 System Requirements

This chapter outlines the minimum software and hardware requirements for the Genesys G*plus* Adapter 7.5 for SAP ERP (the Adapter).

The information in this chapter is divided among the following topics:

Compatibility Overview

The Adapter's functioning depends upon the following items:

- Switch type/T-Server
- Operating system
- Genesys Framework
- SAP System that supports Remote Function Calls (RFC) protocol and SAPphone interface. This includes (but is not limited to):
  - SAP Enterprise Resource Planning (ERP) platform
  - SAP Customer Relationship Management (CRM) platform
  - SAP R/3 System

Information on supported hardware and third-party software is available on the Genesys Technical Support website in the following documents:

- *Genesys Supported Operating Systems and Databases*
- *Genesys Supported Media Interfaces*

Software Requirements

You will need the following software to deploy and use the Adapter:

- Microsoft Windows 2000 or 2003
- Genesys Framework
- SAP Application Server and SAP graphical user interface (GUI) client
- A web browser (such as Microsoft Internet Explorer 5.5 or higher) and a PDF viewer (such as Adobe Acrobat Reader 5.0 or higher), for reading and viewing support documentation

SAP Applications

The Adapter requires an installed and configured SAP Application Server release 4.5B or higher. To ensure that you have access to the latest SAP System features, install the latest SAP System support package, and then apply the relevant SAP Notes. You can determine the SAP System release and the latest applied support package by selecting the menu path `System > Status`.

SAPphone

The Adapter communicates with the SAP system by means of the SAPphone interface. See the SAPphone documentation for SAPphone requirements. This Adapter supports the versions of SAPphone listed in Table 1.

Table 1: Supported Versions of SAPphone Interface

SAP Basis Release	SAPphone Interface Number
4.5B	5.00A
4.6A/B	5.01ASP
4.6C	5.02ASP
4.6D	5.03ASP 5.04ASP 5.05ASP
6.10	5.10ASP
6.20	5.10ASP
6.40	5.11ASP

Genesys Applications

You will need the following applications to deploy the Adapter:

- Genesys Framework 7.2 or 7.5 or higher, including:
  - Components of the Genesys Management Framework (the Configuration Layer and Management Layer) for example: Configuration Server, Configuration Manager, Local Control Agent (LCA), Message Server, Solution Control Server, Solution Control Interface.
  - Media Framework (T-Server).

Hardware Requirements

You will need the following hardware to deploy the Adapter:

- 1 GHz CPU or faster
- 1 GB or more of RAM
- 25 MB of free disk space (additionally, disk space for the Adapter's log files should be reserved)
- CD-ROM drive
- 800x600 256-color monitor or higher
- Network adapter and network connection

Note: The specified hardware requirements are requirements for small to medium deployment (less than 100 agents). For larger deployments, especially those with a high volume of calls, it may be necessary to increase the available hardware resources.

Switches

The Adapter works with numerous switches. Information on supported switches is available on the Genesys Technical Support website in the *Genesys Supported Media Interfaces* document.

Note: For the Adapter to work properly with the Alcatel A4400 and Tenovis Integral 33 switches, the value of the `agent-substitute` option for the Adapter must be set properly as indicated in the `agent-substitute` configuration option description in "Configuring the Adapter" on page 41.

\Chapter

4 Creating Application Objects in Genesys Configuration Manager

This chapter describes how to install the G*plus* Adapter 7.5 for SAP ERP (the Adapter).

The information in this chapter is divided among the following topics:

Importing the Application Template

To facilitate installation, Genesys recommends that you import the Application Template into Genesys Configuration Manager and create and configure an Application object based on this template *before* you install the Adapter.

Import the Application Template as follows:

1. Open Configuration Manager, log in, then select `Environment` > `Application Templates`.
2. Right-click `Application Templates`. From the popup menu that opens, select `Import Application Template`.
3. In the `Open` dialog box, navigate to the file for the Adapter's Application Template. (Its location on your hard drive or installation CD may vary.) The file name is `Gplus_Adapter_for_SAP_ERP_750.apd`.
4. Select this file and click `Open`.
5. In the `Properties` dialog box, click `OK`.

Creating and Configuring the Application

After you have imported the template as described in the previous section, create and configure the new Application object. This involves the following tasks:

- Creating the Application object
- Configuring the `General` tab
- Configuring the `Server Info` tab
- Configuring the `Start Info` tab
- Completing initial setup of the Application object

Creating the Application Object

Creating the application object involves the following tasks:

1. In Configuration Manager, select `Environment` > `Applications`.
2. Right-click either the `Applications` folder or the subfolder where you want to create your application.
3. From the popup menu that opens, select `New` > `Application`.
4. In the `Open` dialog box, locate the template you just imported, then double-click it.

Configuration Manager opens the `Properties` dialog box for the new Application object as shown in Figure 4.

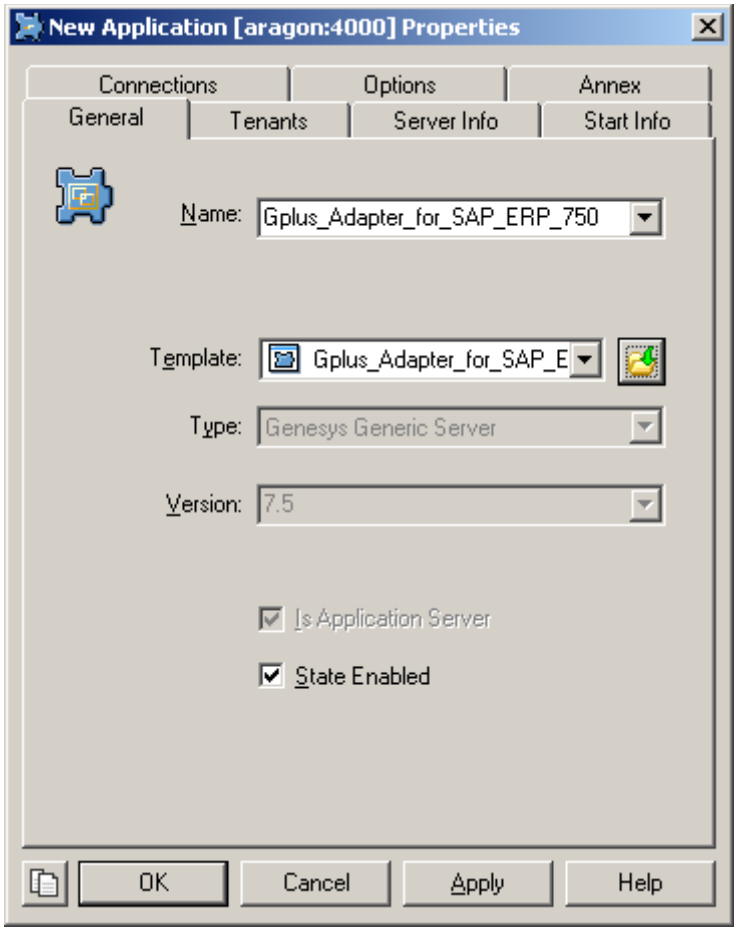


Figure 4: Configuration Manager's Properties Dialog Box

Configuring the General Tab

- On the `General` tab of the `Properties` dialog box, change the default Application object's name (if desired).

Figure 5 shows the contents of the `General` tab with the application name changed to `GPlusAforSAPR3`.

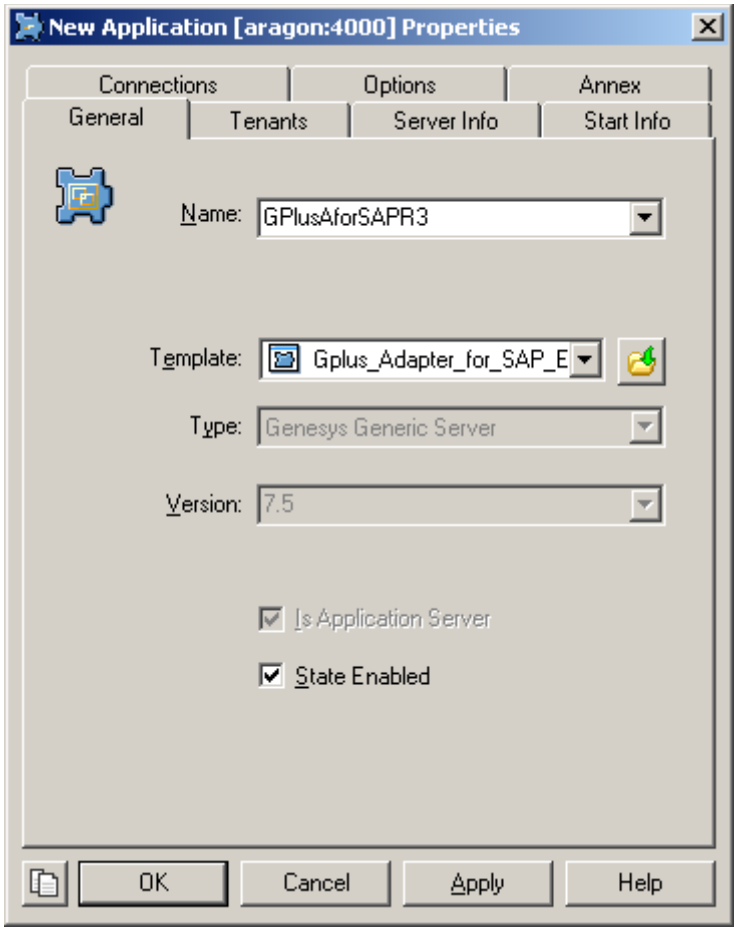


Figure 5: Configuration Manager's General Tab

Configuring the Server Info Tab

Configuring the Server Info tab involves the following tasks:

1. Select the `Server Info` tab in the `Properties` dialog box, then select the host from among those defined in the `Host` section of the Configuration Manager `Environment`.
2. Set the `Communication Port` field to any unused port.

An example of `Server Info` tab settings is shown in Figure 6.

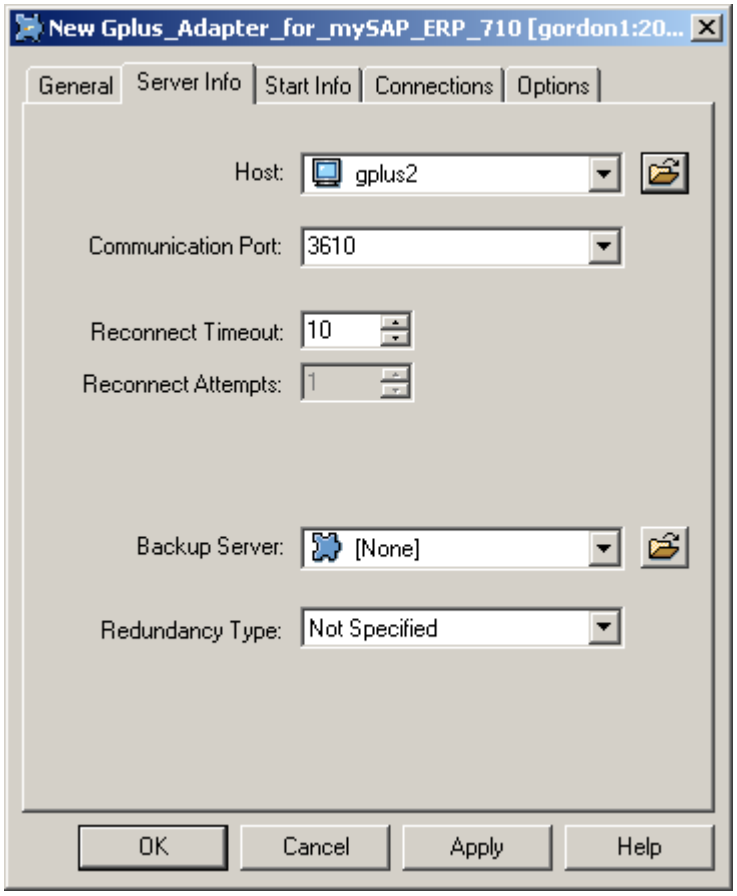


Figure 6: Configuration Manager's Server Info Tab

Configuring the Start Info Tab

Configuring the Start Info tab involves the following:

1. Select the `Start Info` tab in the `Properties` dialog box,.
2. In the `Working Directory` field, enter a period (.) to allow Setup to populate this field during installation.
3. In the `Command Line` field, enter a period (.) to allow Setup to populate this field during installation.
4. Do not enter a value in the `Command Line Argument` field. The installation program will provide the correct data for this field.

An example of `Start Info` tab settings is shown in Figure 7.

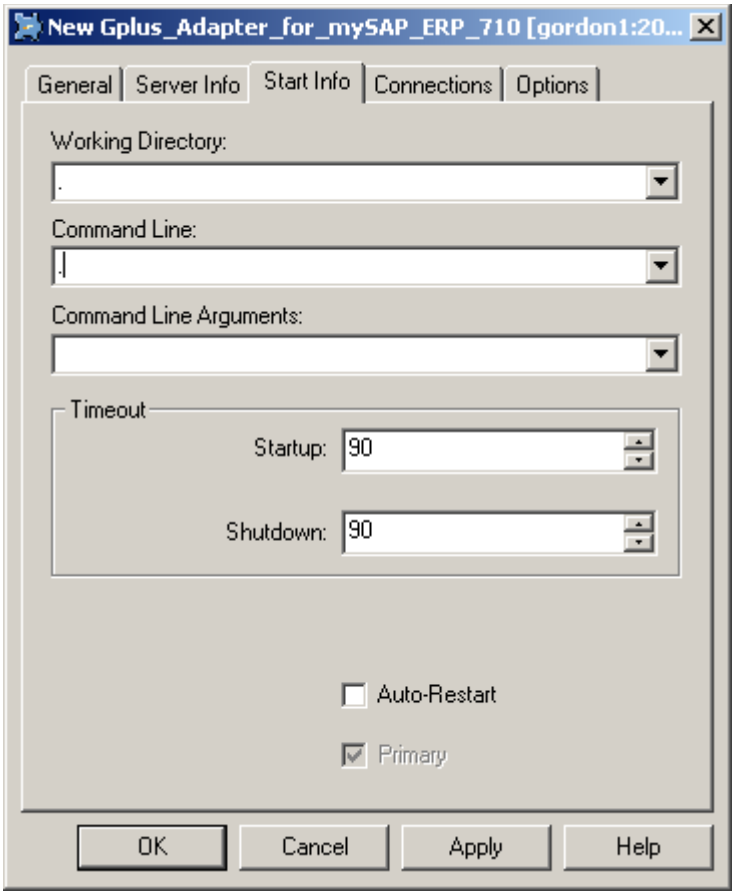


Figure 7: Configuration Manager's Start Info Tab

Completing Initial Application Setup

- Once the values in the previous subsections have been entered, click `Apply` and `OK` to complete the application setup.

To start working with the Adapter, you must first install it, as described in "Installing Gplus Adapter" on page 37. Then configure the Adapter's options in Configuration Manager, as described in "Configuring the Gplus Adapter" on page 43.

Chapter

5 Installing the Adapter

This chapter describes how to install the G*plus* Adapter 7.5 for SAP ERP (the Adapter) on the target computer by using an InstallShield program that takes you step-by-step through the installation.

The information in this chapter is divided among the following topics:

Running the Setup Program

To install the Adapter on the target machine using the Setup program:

1. Locate the `setup.exe` file in the CD path `\gplus_components\gplus_erp\windows\` or find the setup file in your installation package.
2. Double-click `setup.exe` to run the InstallShield Wizard.
   - The `Welcome` window opens. Read the text, and click `Next` to proceed.
   - The `Connection Parameters to the Genesys Configuration Server` dialog box opens. Enter required information, and click `Next` to continue.
   - The `Select Application` dialog box opens. It contains a list of Application objects from the Configuration Server database which have a template of type `Third Party Server and Server Info` corresponding to the host on which the installation is running. Select the application, and click `Next` to continue.
   - The `Choose Destination Location` dialog box opens. Keep or change the default destination and click `Next` to continue.
3. The `Ready to Install` dialog box opens. Click `Install` to begin copying files.

4. Wait for Setup to finish copying files.
5. When the `Installation Complete` window opens, click `Finish` to complete the installation.

Obtaining SAP RFC SDK Binaries

In order to function properly, the Adapter requires SAP RFC SDK binary files. Due to SAP policy, these files are not part of the Adapter's Installation CD. For more information on how to obtain the required binaries, go to the SAP Service Marketplace website at: http://service.sap.com, and search for `SAP Note 413708`. Read this note and its related notes.

Installation Results

After the Setup is successfully completed, and you obtain the necessary SAP binary libraries, you will see:

- The Adapter's executable and auxiliary files in the destination folder. See Figure 8.

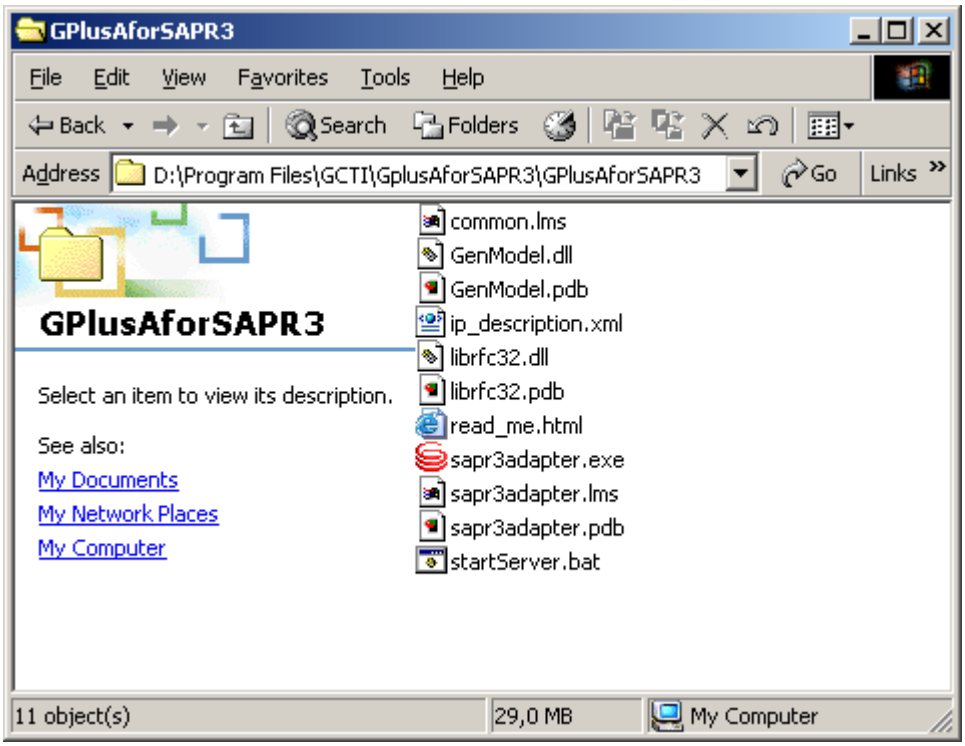


Figure 8: Destination Folder

- The `Adapter for SAP ERP` group in the `Start > Programs> Genesys Solutions` menu. See Figure 9.

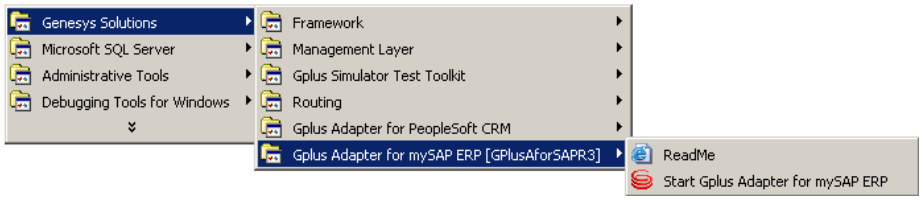


Figure 9: Start Menu

- The `Genesys G*plus* Adapter for SAP ERP` item in the `Windows Services` list. See Figure 10.

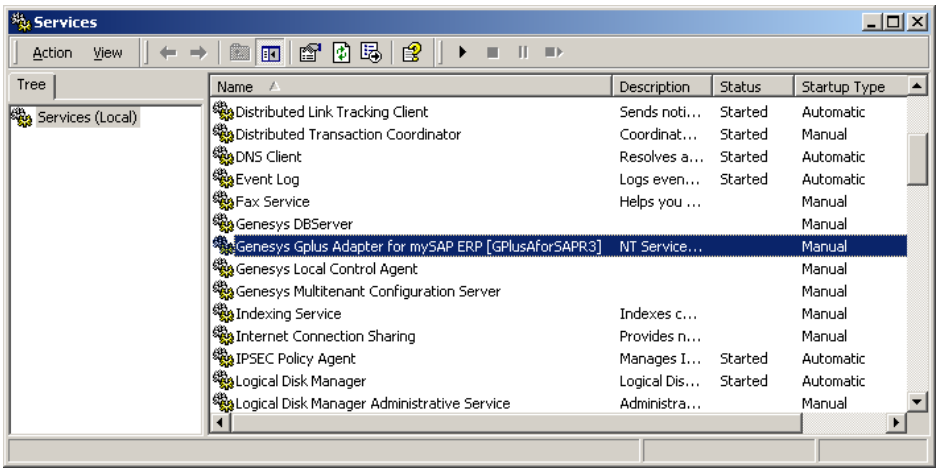


Figure 10: Windows Services List

- Startup parameters populated in the `Start Info` tab of the Adapter Application object in Configuration Manager. See Figure 11.

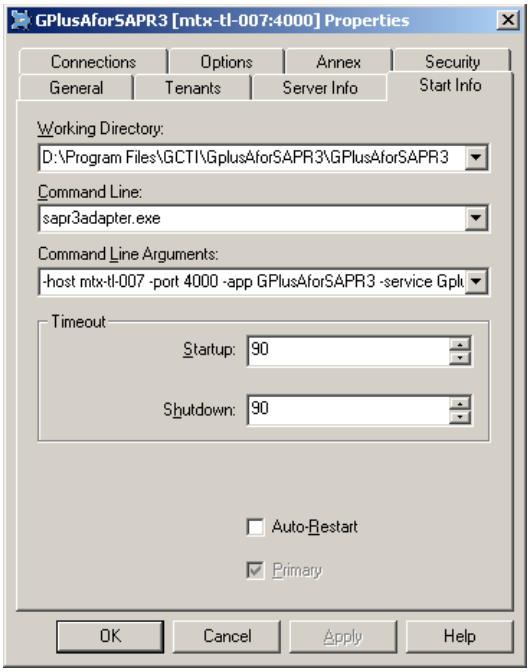


Figure 11: Start Info Tab

Note: If you plan to run the Adapter as a Windows NT Service, you should become familiar with the common recommendations about deploying Genesys components as Windows NT Services. These recommendations are available in the *Genesys Framework Deployment Guide*.

Uninstalling the Adapter

You can uninstall the Adapter using the Microsoft Windows `Add/Remove Programs` feature.

To completely uninstall the Adapter components:

1. From the Windows main taskbar, select `Start` > `Settings` > `Control Panel` > `Add/Remove Programs`.
2. Select `Genesys Adapter for SAP ERP` as the component to remove.
3. Follow the instructions on screen, and confirm that you want to remove the Adapter components.

   `Add/Remove Programs` removes the Adapter components.
4. After you see the message which says that the uninstall has been completed, follow the instructions on screen to conclude the uninstall.

Note: If the Adapter's application folder contains files that were not initially installed, these files will not be deleted by the uninstall process. You must remove these files manually.

Chapter

6 Configuring the Adapter

This chapter describes how to configure the G*plus* Adapter 7.5 for SAP ERP (the Adapter) in Genesys Configuration Manager. It includes the following sections:

Importing the Application Template

Before configuring the Adapter, you must import the Application Template into Genesys Configuration Manager and create and configure an application.

If you followed the recommendation to complete these tasks prior to installation of the Adapter, you may proceed to the next section and configure the Adapter.

If you have not yet completed these tasks, do so now. Refer to the procedures called "Running the Setup Program" on page 35 and "Creating and Configuring the Application" on page 30 of the previous chapter.

Configuring the Adapter

This section describes configuration options available for the Adapter. To view or change these options, first use Genesys Configuration Manager to open the `Properties` dialog box for the Application object that you created.

Note: All configuration information shared between SAPphone and Genesys must be in UPPERCASE. Do not use lowercase letters. SAPphone translates all configuration values into uppercase.

The following subsections describe individual tabs in the Application object's `Properties` dialog box.

Configuring the Connections Tab

On Configuration Manager's `Connections` tab:

1. Add connections to the following servers:

- T-Server
- Message Server (optional, for logging messages to the network)
- Configuration Server (optional)

2. Adjust ADDP between Adapter and Genesys servers components (optional).

Configuring the Options Tab

The options listed Table 2 are located on the `Options` tab of the `Properties` dialog box. The table lists and describes the options by section of that tab. Also see "Configuration Options That You Must Set" on page 61 for options that you must configure for the Adapter to function properly.

Note: All option names and values are case sensitive, so be sure that you use the correct case as shown in Table 2.

Table 2: Adapter Configuration Options

Option Name	Values	Description	Must Restart?
`log` Section Specifies the common Genesys log options. Additional options are described in the *Genesys Framework 7.5 Configuration Options Reference Manual.*			
`verbose`	Default Value: `all` Valid Values: `all`, `debug`, `trace`, `interaction`, `standard`, `none`	Specifies the log event levels that are generated. `all` = all log events at all levels are generated. `debug` = functions the same as the value `all` `trace` = log events at the trace, standard, and interaction levels are generated. `interaction` = log events at the standard and interaction levels only are generated. `standard` = log events at the standard level only are generated. `none` = no log events are generated. Changes take effect immediately **Note:** For definitions of standard, interaction, trace, and debug log levels, refer to the *Genesys Framework 7.5 Deployment Guide* or to the *Genesys Framework 7.5 Solution Control Interface Help*.	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`segment`	Default Value: `false` Valid Values: `false`, `<number> [KB]`	Sets the maximum segment size in kilobytes. The minimum segment size is 100 KB. `false` = no segmentation allowed `<number>` = the maximum segment size in kilobytes	No
`expire`	Default Value: `false` Valid Values: `false, <1 to 100>`	This option determines if log files expire. Use this option to set the number of log files to store. `false` = no expiration; all generated segments are stored. `<1 to 100>` = the maximum number of log files to store.	No
`buffering`	Default Value: `true` Valid Values: `true, false`	This option turns operating system file buffering on or off. It is only applicable to the file output. `true` = enables buffering and increases file output performance. `false` = disables buffering.	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`all`	Default Value: `stdout` Valid Values: `stdout, stderr, network, memory, [pathname]`	Specifies to which outputs an application sends all log events. `stdout` = log events are sent to the standard output device. `stderr` = log events are sent to the standard error output. `network` = log events are sent to the Message Server, which can reside anywhere on the network. The Message Server stores the log events in the `Log Database`. `memory` = log events are sent to the memory output on the local disk. This is the safest choice in terms of application performance. `[pathname]` = log events are stored in a file with a specified file and path name. If a path is not specified, the file is created in the application's working directory. **Note:** To ease troubleshooting, consider using unique names for log files that different applications generate. **Note:** The log output types must be separated by a comma when more than one output is configured. For example: `all = stdout, logfile`	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`print-attributes`	Default Value: `true` Valid Values: `true, false`	Specifies whether the application attaches extended attributes, if any exist, to a log event it sends to log output. Typically, log events of the Interaction log level and audit-related log events contain extended attributes. Setting this option to `true` enables audit capabilities, but negatively affects performance	No
`call number translator` Section Controls the settings for the phone number dialing codes.			
Note: SAP has its own method for number replacement and optimization. Usually you will not want to use both the SAP and Adapter number-optimization implementations in conjunction, but you may do so if the need arises. The Adapter and SAP use similar settings for number translation (such as country-code, extension length, and so on). Genesys recommends keeping consistency between such settings in both SAP and the Adapter.			
`inbound-prefix`	Default Value: `<empty>` Valid Values: `<any string>`	Represents the prefix to be removed by the Adapter on ANI numbers provided by T-Server before sending the information to the SAP system. This may be used when there is a discrepancy between the number saved and used for search in the SAP system and the number given by the telephony system. (For example: `00331234567890 <-> 1234567890`) If no value is present or set, no action is taken on the incoming number.	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`outbound-prefix`	Default Value: `<empty>` Valid Values: `<any string>`	Represents the prefix to be added by the Adapter on numbers provided by SAPphone for outbound dialing, before sending the information to the T-Server. This may be used when there is a discrepancy between the number saved and used in the SAP system and the number the telephony system requires. (For example: `1234567890 <-> 00331234567890`). If no value is present or set, no action is taken on the number to dial.	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`inbound-optimization`	Default Value: `disabled` Valid Values: `disabled`, `extension`, `national`, `canonical`	The type of Inbound call number optimization performed by the Adapter. `disabled` = no optimization performed. `extension` = only the extension number is passed to the SAP system (according to the value of `extension-length`. `national` = ANI passed to the SAP system will not contain international prefix and country-code if they are the same as those defined in the Adapter options. `canonical` = ANI will be presented as `+{country-code}{area-code}{base-number}XYZ`, where `XYZ` is the extension number. **Note:** The Optimization is processed before Outbound/Inbound prefix treatment. Usually, Inbound prefix treatment should not be set if Incoming call optimization is on.	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`outbound-optimization`	Default Value: `disabled` Valid Values: `disabled`, `enabled`	The type of Outbound call number optimization performed by the Adapter. `disabled` = no optimization performed. `enabled` = country code and/or local area code will be removed from the number to dial if they are the same as those defined in the Adapter's options. Dialing number will be optimized according to the following rules: 1. For `idd country-code area-code base-number xyz` numbers, `ndd area-code base-number xyz` will be dialed (if the number's area code is not the same as the Adapter's area code). 2. For `idd country-code area-code base-number xyz` numbers, `base-number xyz` will be dialed (if the number's area code is the same as the Adapter's area code). 3. For `ndd area-code base-number xyz` numbers, `base-number xyz` will be dialed. 4. For `area-code base-number xyz` numbers, `base-number xyz` will be dialed. The length of extension (xyz) in the dialing number should be the same as defined in the `extension-length` Adapter option in order for optimization to occur.	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
country-code	Default Value: 1 Valid Values: <any string of digits>, <empty>	Corresponds to the Country attribute of the SAP site definition (transaction SPHB)	No
outbound-remove	Default Value: ( )- Valid Values: <any character string>, <empty>	Characters to be removed from dialed string before other processing activity.	No
outbound-idd-substitute	Default Value: true Valid Values: true, false	true = Adapter replaces the leading + sign with the value of idd (defined below).	No
idd	Default Value: 011 Valid Values: <any string of digits>, <empty>	International direct dialing prefix for this country (011 for USA, 8-10 for Russia, and so on.)	No
area-code	Default Value: 415 Valid Values: <any string of digits>, <empty>	The area code	No
ndd	Default Value: 1 Valid Values: <any string of digits>, <empty>	National direct dialing prefix. For example 1 for USA, 8 for Russia, and so on.	No
base-number	Default Value: 913 Valid Values: <any string of digits>, <empty>	The common number before an extension number.	No
extension-length	Default Value: 4 Valid Values: <any positive integer>	Number of digits in extension number. Corresponds to extension length in SAP site definition (transaction SPHB).	No
rfc-client Section Contains options that affect the RFC client. The SAP R/3 or SAP ERP system administrator should provide all SAP-related settings.			
notify	Default Value: false Valid Values: true, false	Enables or disables SAP SPS_NEW_CALL and SPS_CALL_ENDED notifications.	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
retry-count	Default Value: 1 Valid Values: <any positive integer>	Number of additional attempts to invoke client method SPS_NEW_CALL, SPS_CALL_ENDED, or SPS_GET_LINE_PER_SERVER if first attempt failed.	No
type	Default Value: 3 Valid Values: 2, 3, E	RFC server type: 2 = R/2 3 = SAP ERP E = external system	No
client	Default Value: 000 Valid Values: <SAP logon client>	Client number of your SAP system, which can be found on the logon screen above the user/password section	No
user	Default Value: <empty> Valid Values: <valid user logon name>	SAP logon user	No
password	Default Value: <empty> Valid Values: <valid user password>	SAP logon password	No
trace	Default Value: false Valid Values: true, false	RFC trace	No
language	Default Value: EN Valid Values: <SAP logon language>	SAP logon language For example: EN = English DE = German	No
codepage	Default Value: <empty> Note: For a value of <empty>, SAP assumes a codepage value of 1100. Valid Values: <valid codepage string>	The codepage to be used for this connection	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
ashost	Default Value: <empty> Valid Values: <valid host name or address of SAP ERP server>	Host name of a specific application server (SAP ERP, No Load Balancing) (e.g. /H/192.168.3.215/H/204.79.180.5/S/3298/H/cpce601)	No
sysnr	Default Value: -1 Valid Values: <valid SAP ERP system number>	SAP ERP system number (SAP ERP, No Load Balancing). This value should be consistent with the system number in SAP ERP Server Properties.	No
mshost	Default Value: <empty> Valid Values: <host name or address of SAP Message Server>	Host name of the Message Server (if using Load Balancing)	No
msserv	Default Value: <empty> Valid Values: <service name of SAP Message Server>	Service of the Message Server (if using Load Balancing) Default value is sapms<R/3 system name>, but this information is usually optional.	No
r3name	Default Value: <empty> Valid Values: <name of SAP ERP system>	Name of the SAP ERP system (if using Load Balancing)	No
group	Default Value: <empty> Valid Values: <name of application server group>	Name of the group of application servers (if using Load Balancing)	No
gateway-id	Default Value: <empty> Valid Values: <existing SAPphone server name>	Server name as defined in SAPphone site configuration. The limit for the SAPphone server name is six characters.	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`rfc-server` Section Contains options affecting the RFC server. The SAP R/3 or SAP ERP system administrator should provide all SAP-related settings.			
`gateway-host`	Default Value: `localhost` Valid Values: `<valid host name>`	Host name or host string of the SAP Gateway (For example: `/H/192.168.3.215/H/204.79.180.5/S/3298/H/cpce601`)	No
`gateway-service`	Default Value: `sapgw00` Valid Values: `<valid service>`	Service of the SAP gateway (For example: `sapgw13`)	No
`program-id`	Default Value: `GPLUS.ERP` Valid Values: `<Program ID in RFC destination that is used in SAPphone server>`	`Program ID` of the Adapter (RFC destination)	No
`listen-timeout`	Default Value: 1 Valid Values: `<1 through 120>`	Timeout value (in seconds)	No
`recv-thread`	Default Value: 1 Valid Values: `<1 through 512>`	The minimum number of threads awaiting incoming requests. If the number of threads becomes less than specified because some thread is busy handling requests, the Adapter will create additional threads.	No
`send-thread`	Default Value: Valid Values:	Reserved for future use.	
`reconnect-timeout`	Default Value: `4` Valid Values: `<any positive integer>`	Defines (in seconds) how long the Adapter waits before trying to connect to the SAP gateway if the connection was broken	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
connection-pool	Default Value: 1 Valid Values: <1 through 128>	The maximum number of open (but not necessarily listening) connections	No
automatic-registration Section Specifies options for registration of DNs			
auto-registration	Default Value: none Valid Values: none, all, active	DN monitoring options. none = Adapter does not set monitoring points for extensions. active = Adapter tries to register all extensions that are configured and active (agent is logged on to SAP) at the specific SAPphone telephony server using the SPS_GET_LINES_PER_SERVER function. all = Adapter will try to register all extensions which are configured at the specific SAPphone telephony server using SPS_GET_LINES_PER_SERVER function.	No
register-timer	Default Value: 120 Valid Values: <any positive integer>	Time (in seconds) specifying how often the Adapter initiates the SPS_GET_LINES_PER_SERVER request to check with the SAP system regarding the need to monitor additional DNs. This option works only when auto-registration is enabled (auto-registration is set to active or all).	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`deregister-timer`	Default Value: `240` Valid Values: `<any positive integer>`	Time (in seconds) specifying how often the Adapter initiates the `SPS_GET_LINES_PER_SERVER` request to check with the SAP system regarding the need to deregister some of the currently monitored DNs. This option works only when `auto-registration` is enabled (`auto-registration` is set to `active` or `all`).	No
`register-on-demand`	Default Value: `false` Valid Values: `true, false`	`false` = The Adapter will register the SAP agent only when receiving an `SPS_REGISTER` request unless the agent is already registered automatically (`auto-registration` is enabled). `true` = The Adapter will register the SAP agent when receiving any telephony request from SAP, without an explicit `SPS_REGISTER` request, unless the agent is already registered.	No
`telephony` Section Specifies telephony options			
`blind-transfer`	Default Value: `single_step` Valid Values: `single_step, mute`	The type of transfer to use for `SPS_BTRANSFER`. This option applies only to switches that support both `One-Step` and `Mute` transfer and allow you to choose between them (such as the Philips Sopho).	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`sps-agentlogin-tout`	Default Value: `3000` Valid Values: `<any positive integer>`	Time (in milliseconds) that the Adapter waits for completion of an agent `login` request	No
`sps-agentlogout-tout`	Default Value: `3000` Valid Values: `<any positive integer>`	Time (in milliseconds) that the Adapter waits for completion of an agent logout request	No
`sps-setworkmode-tout`	Default Value: `3000` Valid Values: `<any positive integer>`	Time (in milliseconds) that the Adapter waits for completion of a `Set Work Mode` request	No
`sps-default-tout`	Default Value: `3000` Valid Values: `<any positive integer>`	Time (in milliseconds) that the Adapter waits for completion of any request that does not have a specific timeout defined	No
`sps-register-tout`	Default Value: `80` Valid Values: `<any positive integer>`	Time (in milliseconds) that the Adapter waits for completion of DN registration	No

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
workready-mapping	Default Value: AutoIn Valid Values: <any string>, <empty>	Defines the control to which CTI mode WM_WORKREADY is mapped. AutoIn = WM_WORKREADY is mapped to ready auto-in and WM_READY is mapped to ready manual-in (if the switch does not support this, the Adapter tries to simulate by sending not-ready when a call arrives). <empty> = WM_WORKREADY is not supported. All ready submodes are WM_READY. <any other string> = WM_WORKREADY is represented by ready with reason code other-string. All other ready submodes are WM_READY.	No
cti-log	Default Value: true Valid Values: true, false	true = enables CTI driver trace false = disables CTI driver trace	No
consult-user-data	Default value: sapphone Valid values: sapphone, default	sapphone = the user data for consult calls is handled according to the SAPphone specification. default = the user data for consult calls is handled according to the value of the T-Server's consult-user-data configuration option. See the documentation for your T-Server to learn more about this option.	

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
analytics-support	Default Value: false Valid Values: true, false	False = the Adapter does not provide the information that is necessary for integration with the Adapter for SAP Analytics. True = the Adapter attaches the special key-value pair to each interaction. The key name of the key-value pair is predefined, and the Adapter for SAP Analytics uses it when synchronizing data.	Yes
genmodel Section Specifies options that control the Switch Abstraction Layer–CTI driver (genmodel) behavior			
enable-log-user-data	Default Value: false Valid Values: true, false	true = CTI driver writes call-attached data in the log. false = no call-attached data is written in the log.	Yes
answer-call-delay	Default Value: 500 Valid Values: 0, <any positive integer>	The time (in milliseconds) to wait before sending an Answer Call Feature request to the PBX. Some switches, such as the Nortel DMS, require time before an answer can be invoked.	Yes
agent-substitute	Default Value: auto Valid Values: true, false, auto	auto = the Adapter reads this option's value from the T-Server configuration object. true, false = the selected value should correspond to the value of the T-Server's agent-substitute option (for Alcatel A4400, Tenovis Integral 33).	Yes
agent-logout-control	Default Value: false Valid Values: true, false	Must be set to false. Reserved for future use with Outbound campaign server.	Yes

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`request-timeout`	Default Value: `30` Valid Values: `0, <any positive integer>`	OCS desktop protocol request timeout. Reserved for future use.	Yes
`use-pending-workmode`	Default Value: `true` Valid Values: `true, false`	`true` = allows changing of agent state when an agent is on call. `false` = does not allow changing of agent state when an agent is on call. The option value should correspond to the value of the switch's `use-pending-workmode` option. Currently, only the Avaya Definity ECS switch supports this option.	Yes
`delete-call-timeout`	Default Value: `0` Valid Values: `0, <any positive integer>`	How long to wait for `EventReleased` after `ReleaseCall`	Yes
`call attached data` Section Specifies options for call-attached data			
`cic-clipboard`	Default Value: `TGCLIP_` Valid Values: `<any underscore-terminated string>`	Any top-level key prefixed by this value is treated as an SAP `CIC_CLIPBOARD` object.	Yes
`keyvalue`	Default Value: `SAPKEY_` Valid Values: `<any underscore-terminated string>`	Any top-level key prefixed by this value is treated as an SAP `KEYVALUE` object.	Yes
`custom`	Default Value: `SAPCUST_` Valid Values: `<any underscore-terminated string>`	Any top-level key prefixed by this value is treated as a custom SAP object.	Yes

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
logsys-option	Default Value: null Valid Values: null, unique, percall, keyvalue	The CIC_CLIPBOARD CAD type includes a LOGSYS field that describes the SAP system in which the object resides. This field value is set depending on the value selected for logsys-option. This option does not affect direct calls between SAP agents, but it can apply to CTI-to-SAP calls or routing strategies. See the section "LOGSYS in CIC_CLIPBOARD" on page 102 for a description of option values and examples.	Yes
logsys-value	Default Value: <empty> Valid Values: <any ASCII string>	Defines the value of the LOGSYS key for CIC_CLIPBOARD objects when the logsys-option value is not null or keyvalue.	Yes
instance-key	Default Value: _instance Valid Values: Any string with length <64 and unique through all top level keys in Call Attached data	This key is used by the Adapter to store internal instance-related information associated with SAP CAD. Do not change it until there is conflict with other key name _instance.	Yes
on-transfer-add-connids	Default Value: false Valid Values: true, false	If true, the adapter will store connection identifiers as KEYVALUE objects in SAP CAD.	Yes
origin-connid-key	Default Value: ORIGIN-CONN-ID Valid Values: String	Defines value of KEY property of KEYVALUE object to store original connection id.	Yes

Table 2: Adapter Configuration Options (Continued)

Option Name	Values	Description	Must Restart?
`transferred-connid-key`	Default Value: `TRANSFERRED_CONN_ID` Valid Value: String	Defines value of `KEY` property of `KEYVALUE` object to store connection id after completion of transfer.	Yes
`use-index`	Default Value: `true` Valid Values: `true, false`	If `true`, each instance of SAP object in the internal representation will have name equal to instance number; otherwise, all instances will have same key, but instance number will be added as a sub-key list describing instance.	Yes
`root-key`	Default Value: `SAPCAD`	Reserved	Yes

Configuration Options That You Must Set

You must set or adjust certain configuration options for the Adapter to start and to communicate successfully with the SAP system and T-Server. Table 3 shows required options for various sections described in Table 2 on page 43. Refer to Chapter 8 on page 73 for helpful information about how to set mandatory SAP-related options.

Note: You can accept the default values for all other configuration options or adjust them later according to your needs.

Table 3: Configuration Options Which Must Be Set

Section	Required Option	Description/Values	Must Restart?
rfc-server	gateway-host	Host name of the SAP Gateway (For example: /H/192.168.3.215/H/204.79.180.5/S/3298/H/cpce601) default = localhost values = <any valid host name>	No
	gateway-service	Service of the SAP Gateway (For example: sapgw13) default = sapgw00	No
	program-id	Program ID of the Adapter (RFC destination) default = GPLUS.ERP values = <Program ID in RFC destination that is used in SAPphone server>	No

Table 3: Configuration Options Which Must Be Set (Continued)

Section	Required Option	Description/Values	Must Restart?

`rfc-client`	`ashost`
	OR
	`mshost`
		Define `ashost` for host name of specific application server (*No Load Balancing*) (For example: `/H/192.168.3.215/H/204.79.180.5/S/3298/H/cpce601`)
		default = `<empty>`
		values = `<valid host name or IP address of SAP ERP server>`
		OR,
		Define `mshost` for host name of Message Server (*Load Balancing*)
		default = `<empty>`
		values = `<host name or address of SAP Message Server>`
			No

	`client`	Numeric value of the SAP logon client default = `000` values = `<SAP logon client>`	No

Table 3: Configuration Options Which Must Be Set (Continued)

Section	Required Option	Description/Values	Must Restart?
rfc-client (cont.)	gateway-id	Server name as defined in SAPphone site configuration. The limit for the SAPphone server name is six characters. default = <empty> values = <existing SAPphone server name>	No
	user	Name of SAP logon user default = <empty> values = <valid user logon name>	No
	password	SAP logon password default = <empty> values = <valid user password>	No
	sysnr OR r3name	Define sysnr for SAP ERP system number (*No Load Balancing*). This should be consistent with the system number in SAP ERP server properties. default = -1 values = <valid SAP ERP system number> OR, Define r3name for name of the SAP ERP system (*Load Balancing*). default = <empty> values = <name of SAP ERP system>	No

Table 3: Configuration Options Which Must Be Set (Continued)

Section	Required Option	Description/Values	Must Restart?
genmodel	agent-substitute	If not auto, should correspond to the agent-substitute option value of the T-Server (for Alcatel 4400, Tenovis Integral 33) default = auto values = true, false, auto	Yes

Integrating with the Management Layer

You can easily intergrate the Adapter into the Management Layer for remote control as follows:

1. Make sure the Genesys Framework Management Layer components are installed and configured.
2. Add the Message Server application into the Adapter's Connections list.
3. Adjust the Adapter's log options in order for the Adapter to send log messages to the Message Server.

These steps will enable you to administer the Adapter remotely from the Solution Control Interface. In particular, you will be able to:

- Start or stop the Adapter.
- View the Adapter's generated log messages.
- Receive alarms for various errors

Chapter

7 Starting the Adapter

This chapter describes how to start the G*plus* Adapter 7.5 for SAP ERP (the Adapter), set up the agent work center, and test the Adapter-SAPphone connection. It includes the following sections:

You can start the Adapter in one of the following ways:

- Using a shortcut from the Start Menu
- Using an executable file from Windows Explorer (with Command Line Arguments)
- Using the Application object configured in Configuration Manager from the Solution Control Interface

Note: Before you start the Adapter, make sure that all Genesys components (T-Server, Configuration Server, and so on) on which the Adapter depends are properly configured and running.

Launching the Adapter from the Start Menu

To launch the Adapter from the `Start` menu in Windows:

1. Select `Start` > `Programs` > `Genesys Solutions` > `Gplus for SAP ERP [<application>]` and select `Start Gplus Adapter for SAP ERP`.
2. The Adapter starts. You see the Adapter console window with log information (initialization steps, SAP requests, error info, and so on) as shown in Figure 12. The specific information displayed will vary.

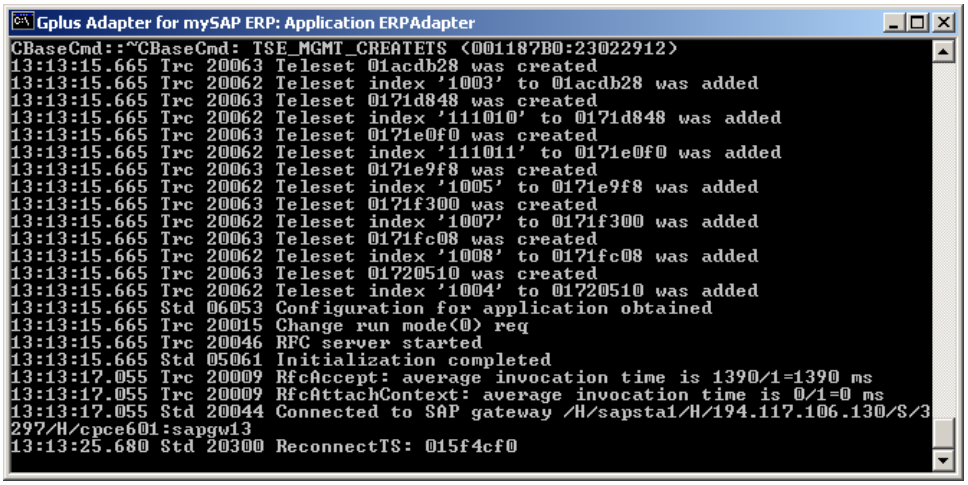


Figure 12: Adapter Started Successfully

Starting the Adapter Using the Solution Control Interface

If you adjust integration with the Management Layer for the Adapter as described in "Integrating with the Management Layer" on page 65, you will also able to start the Adapter and check log information remotely using the Solution Control Interface application.

To do this, follow these steps:

1. Make sure that the Local Control Agent is running on the host where the Adapter is installed.
2. Make sure that `Start Info` tab of Adapter Application object in Configuration Manager has correct startup parameters specified.
3. In the Solution Control Interface, in `Items Tree` view, find the Adapter Application object you created in previous steps.

4. Start the Adapter using the `Start` menu shortcut or the `Start` button on the toolbar.

Adjusting Command Line Arguments

During setup (installation), the installer creates a `.bat` file in the destination folder that you can use to start the Adapter. This `.bat` file contains settings and options necessary for the Adapter to start successfully; in particular, it includes command line arguments necessary for the Adapter to connect to the Configuration Server and to read the settings. You will need to modify these arguments if your Configuration Server settings are changed.

The following are required parameters:

```
-host <name1> -port <value> -app <name2>
```

where:

`<name1>` is the name of the host running the Configuration Server

`<port1>` is the port number of the Configuration Server

`<name2>` is the application name defined in the `General` tab. The application name should appear in quotation marks in the command line if it contains spaces.

If you use Adapter not as standalone application but as Windows Service, you can change startup parameters in the Registry Editor. Locate the Adapter's Registry key:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\GplusAforSAPR3\ImagePath
```

Then adjust its value. The value must have format:

```
"<full path>\sapr3adapter.exe" -host <name1> -port <value> -app <name2> -service <name3>
```

where

`<name3>` is the Service name. It should be the same as the name of the corresponding registry key in "`Services`" registry folder (`GplusAforSAPR3` in our example)

Note: It is recommended to keep consistency between startup parameters in: Startup `BAT` file, Service entry for Adapter in Windows Registry, and `Start Info` tab of the corresponding Application object in Configuration Manager.

Setting Up the Agent Work Center

Note: All configuration information shared between SAPphone and Genesys must be in UPPERCASE. Do not use lowercase letters. SAPphone translates all configuration values into uppercase.

To enable SAP work center functionality, you should adjust switch settings in Genesys Configuration Manager, and adjust SAPphone settings in the SAP GUI.

1. Make sure that your switch is properly configured and its settings are appropriately reflected in Genesys Configuration Manager.

   In particular:

   - *agent logins* are defined and configured in the `Switches/<your switch>/Agent Login` folder.
   - *extensions and/or positions* are defined and configured in the `Switches/<your switch>/DNs` folder. In most cases, positions (or both positions and extensions) should be configured in `Places` as well.
   - *queue and routing DNs* are configured in the `Switches/<your switch>/DNs` folder.
   - *agent groups and persons* are configured in the appropriate locations in Configuration Manager (optional).

2. Make sure that the SAP agent is provided with:
   - the correct agent login (user ID) and password.
   - valid telephony number (extension) which is configured in Genesys Configuration Manager.
   - valid telephony server ID which matches the `gateway-id` Adapter option.

   This information should be entered in the `SPHA` transaction in `Work Center` and `User` settings screens.

Note: Some switches, such as Nortel Symposium and Aspect ACD, require DNs to be in a logged state before starting any call activity. So after you configured the SAP work center and passed a connection test, you can log `ON` the SAP agent, if necessary.

Testing the Adapter-SAPphone Connection

After you have started the Adapter and set up the agent work center on SAP, Genesys recommends that you perform a connection test. In this way, you will be able to check the connection and compatibility between the Adapter and SAP.

There are two kinds of connection tests that you can perform:

- TCP / IP connection test, which you can perform from SAP transaction `SM59`
- SAPphone connection test, which you can perform from SAP transaction `SPHB`.

Refer to Chapter 8 on page 73 for details about how to perform the connection test.

Chapter

8 Use-Case Scenarios

This chapter describes some common use-case scenarios for this Adapter.

These scenarios reveal some useful functions of the Adapter at work. This chapter includes the following sections:

What to Do First

Before executing the use-case scenarios described in this chapter:

- Make sure that the Adapter is installed and configured.
- Make sure that all Genesys components on which the Adapter depends are properly configured and running.

Configuring a Connection Between a SAP Application Server and an Adapter

In order to adjust the connection between the SAP Application Server and the Adapter, you must first configure the SAP and the Adapter. If everything is configured correctly, you should have all the information that you need in order to set the mandatory options as described in Chapter 7 on page 67. Most of these options are common to the general SAP environment settings and should be provided by the SAP administrator: however, two of the Adapter's

options, `rfc-server:program-id` (see page 53) and `rfc-client:gateway-id` (see page 50), depend on the specific SAPphone server configuration.

The following procedure describes how to configure the SAPphone server on the SAP, and how the SAPphone server settings should be reflected in the Adapter's `rfc-server:program-id` and `rfc-client:gateway-id` options. Make sure that all the Adapter's other mandatory options are set to their correct values.

To create a SAPphone server on SAP:

1. In the SAP `SM59` transaction, create a new TCP/IP connection RFC destination. Set the `RFC` destination name and Program ID to the values shown in Figure 13.

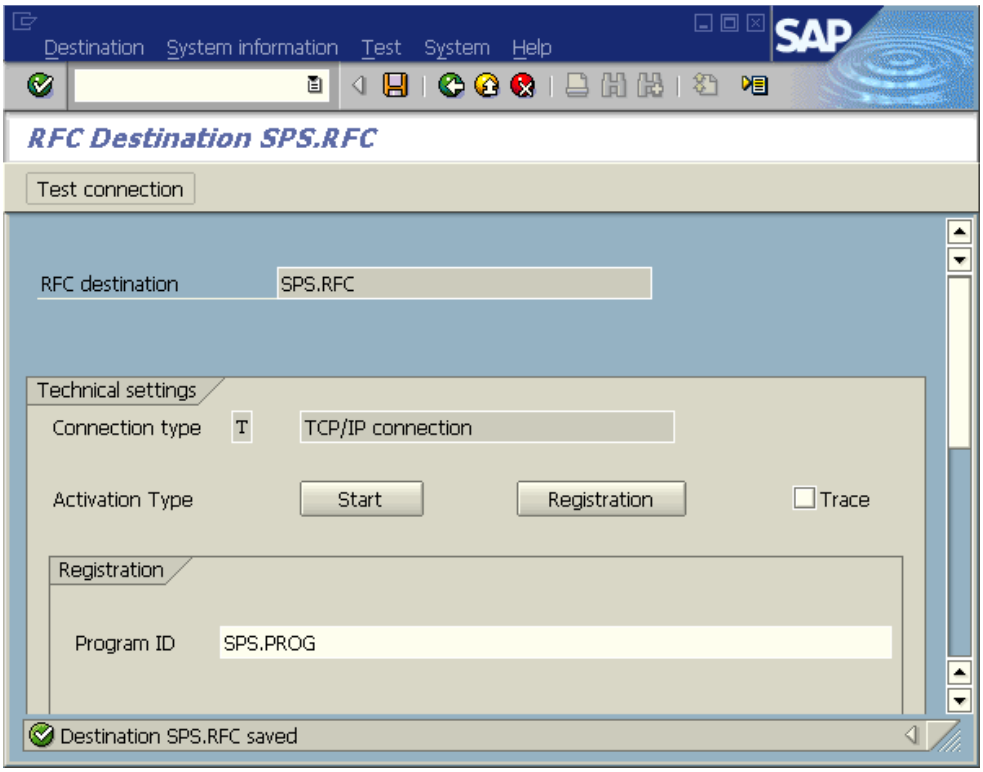


Figure 13: SAP: RFC Destination Screen

2. Save your settings.
3. In Genesys Configuration Manager, set the Adapter's `rfc-server:program-id` option to the value that you set for the Program ID in SAP in Step 1.
4. Apply the changes.
5. Make sure that the Adapter is running.
6. From the `SAP RFC Destination` screen, initiate a connection test. If everything is correct, the SAP displays the RFC connection test results (see Figure 14).

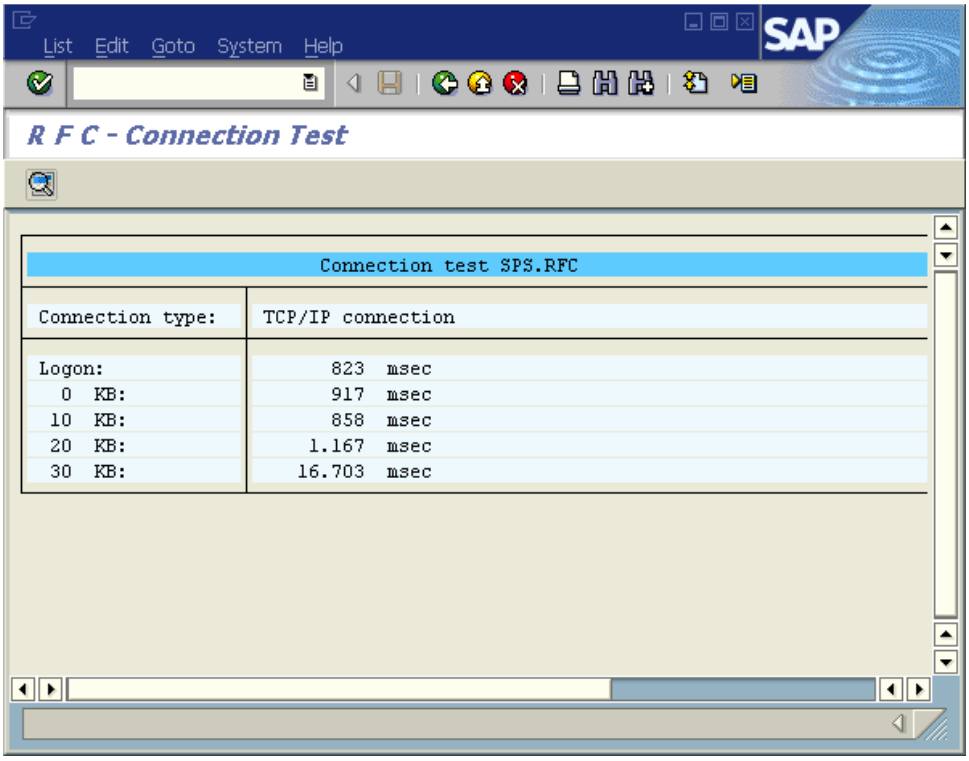


Figure 14: SAP: RFC Connection Test Results

7. From the SAP `SPHB` transaction, create a new SAPphone server based on the RFC destination that you defined in Step 1. You will see that the `Server` box, which holds the server name, is disabled; this means that the server is inactive (see Figure 15).

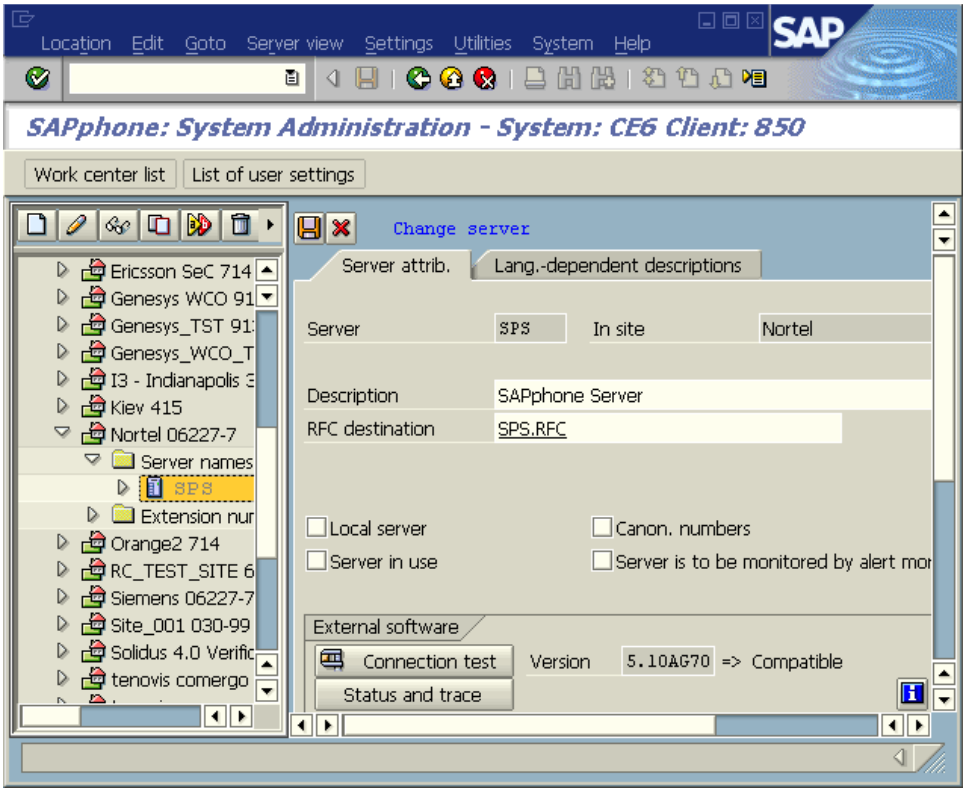


Figure 15: SAP: The Newly Created SAPphone Server

8. In Genesys Configuration Manager, set the Adapter's `rfc-client:gateway-id` option to the value that you set for the SAPphone server name in Step 7.
9. Apply the changes.
10. From the SAPphone server screen, initiate another connection test. This test enables the SAP and the Adapter to do the following:
    - Exchange the parameters that must be maintained in both the SAP system and the telephony gateway (`XCHGPARAMS` request).
    - Exchange the version number of both the SAPphone and the telephony gateway (`XCHGVERSION` request).

    If this connection test is successful, the SAP displays the compatibility information about the SAPphone interface that the SAP and the Adapter support (see Figure 16).

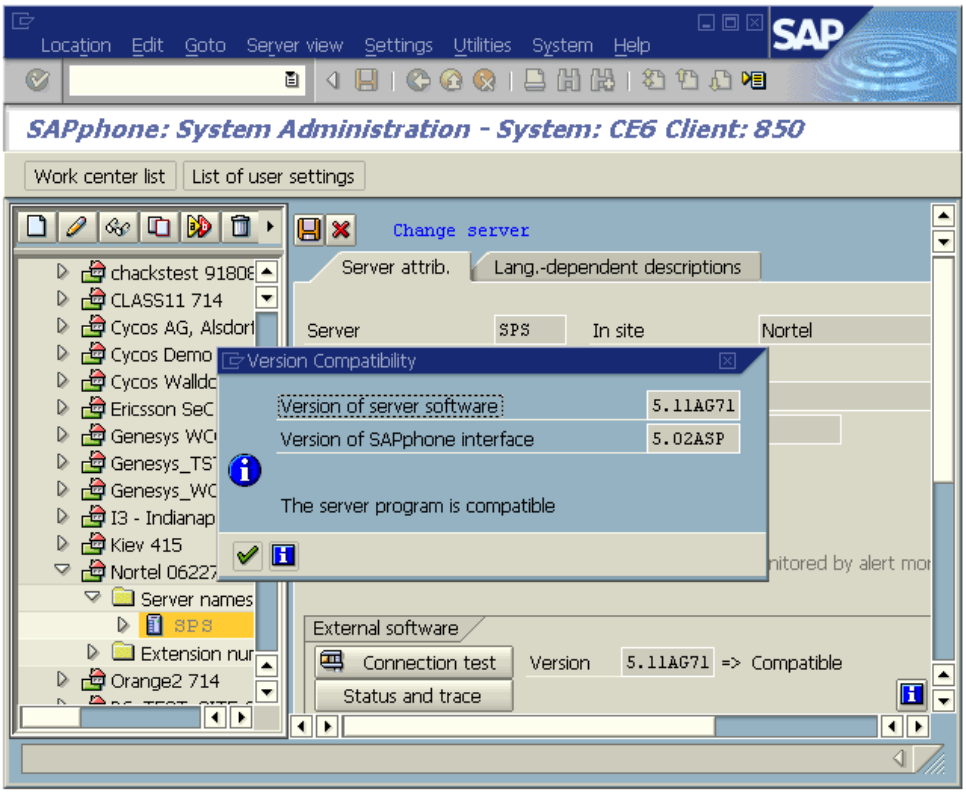


Figure 16: SAP: Connection Test is Passed

11. From the SAPphone server screen, select the `Server in use` check box to activate the SAPphone server and save the changes.

    You can now use the Adapter and the SAP together.

Scenario 1: Conferencing

A `conference call` is a telephone call in which the calling party wants to have more than one called party listen to the audio portion of the call.

This scenario includes the parameters shown in Table 4.

Table 4: Conferencing Scenario Parameters

Item	Parameter
Activity:	Making a third-party conference call
SAP Transactions:	`SPHA SPHT`
Switch:	Nortel Succession

Table 4: Conferencing Scenario Parameters

Item	Parameter
Adapter Options:	`auto-registration = active, notify = true`
SAPphone Options:	`"Display inbound call"` active, `"Message if absent for call"` active

The Nortel Succession switch, that is used in this scenario, has two specific features:

- You must log on before you can perform any telephony activity.
- The switch has a teleset (Extension/Position) DN system, because calls from the ACD Queue go to the `Position`, but not the `Extension`.

To check the accuracy of the CTI configuration in Configuration Manager:

- In Configuration Manager, review `Places` and `Queues` to check the accuracy of the CTI configuration.

  `Place` and `Switch` information should match the hardware configuration. Figures 17, 18 and 19 provide examples of this configuration.

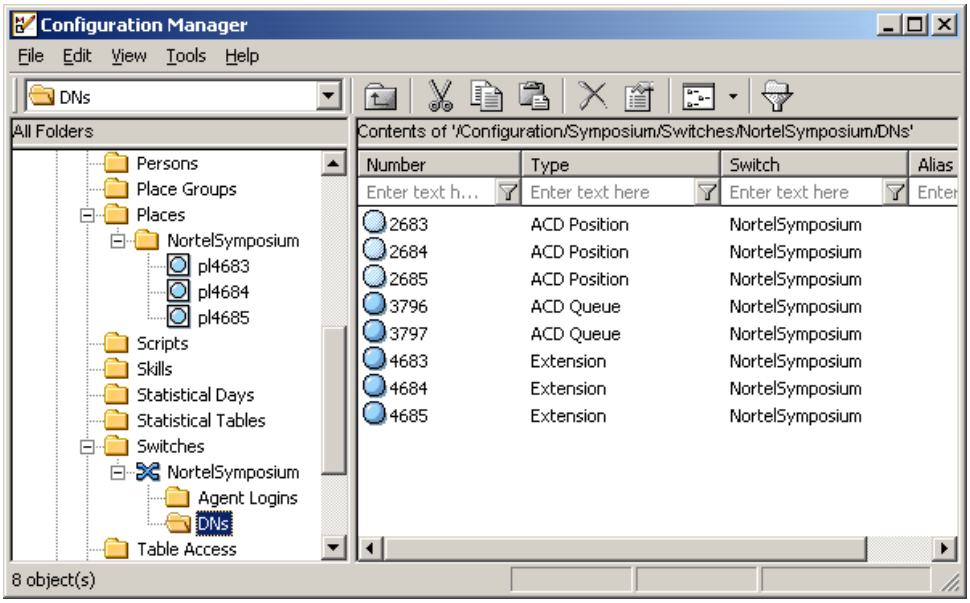


Figure 17: Configuration Manager: DNs Configuration

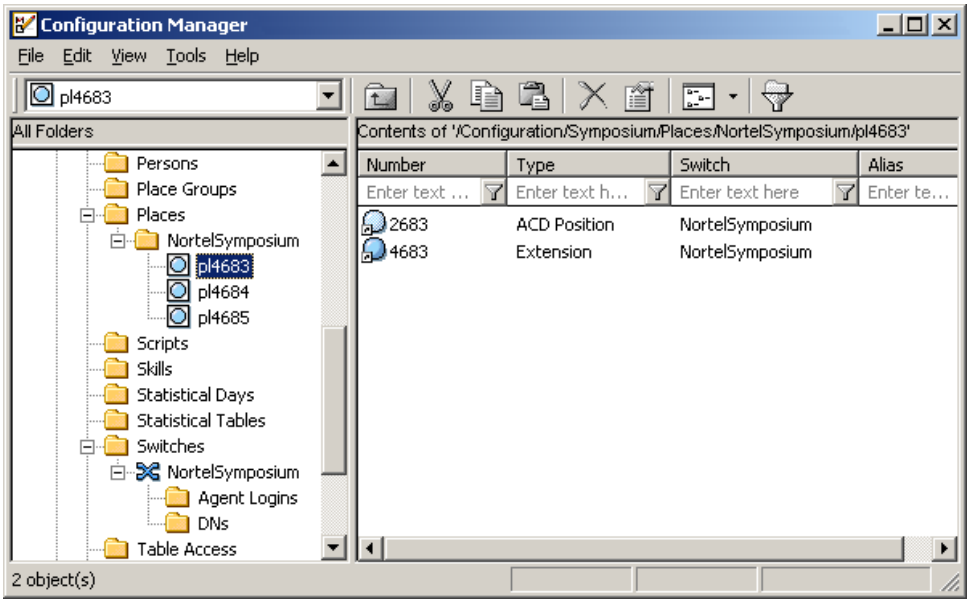


Figure 18: Configuration Manager: Places Configuration

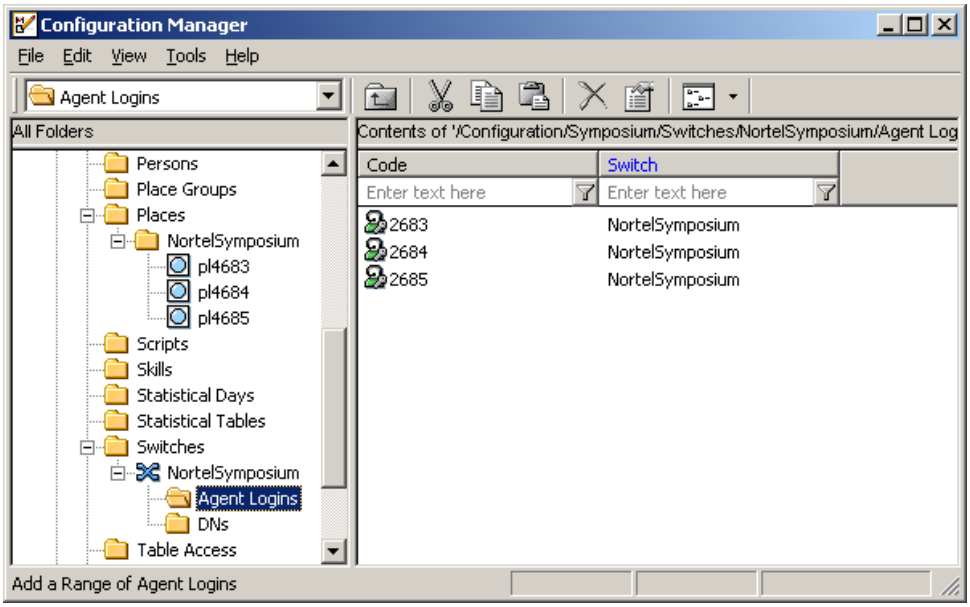


Figure 19: Configuration Manager: Agent Logins Configuration

To configure the Agent WorkCenter (`SPHA` transaction) on SAP:

1. On the `Work Center-Specific Settings` screen, define the `Telephone number` and the `Telephone server` boxes. Figure 20 shows an example of this screen.

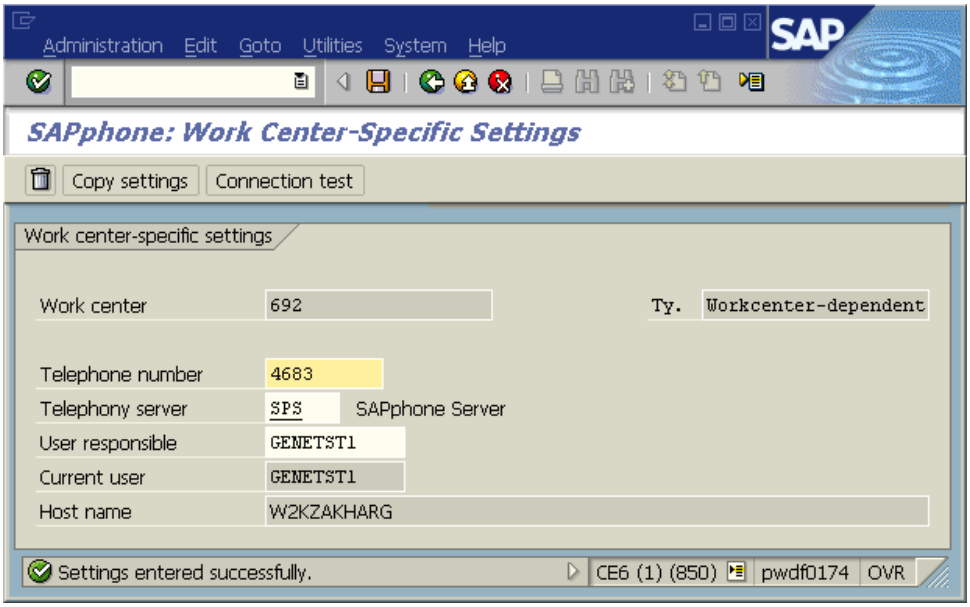


Figure 20: SAP: SPHA - Work Center-Specific Settings Screen

2. On the `SAPphone: User-Specific Settings` screen, under `Display inbound calls`, click `Display inbound calls`.
3. Under `Notification of call if absent`, click `Message if absent for call`.
4. Under `Call center login data`, define the `User` and `Password` boxes as they are defined in the `Agent Logins` folder under the `Switch` configuration. Figure 21 shows an example of this screen.

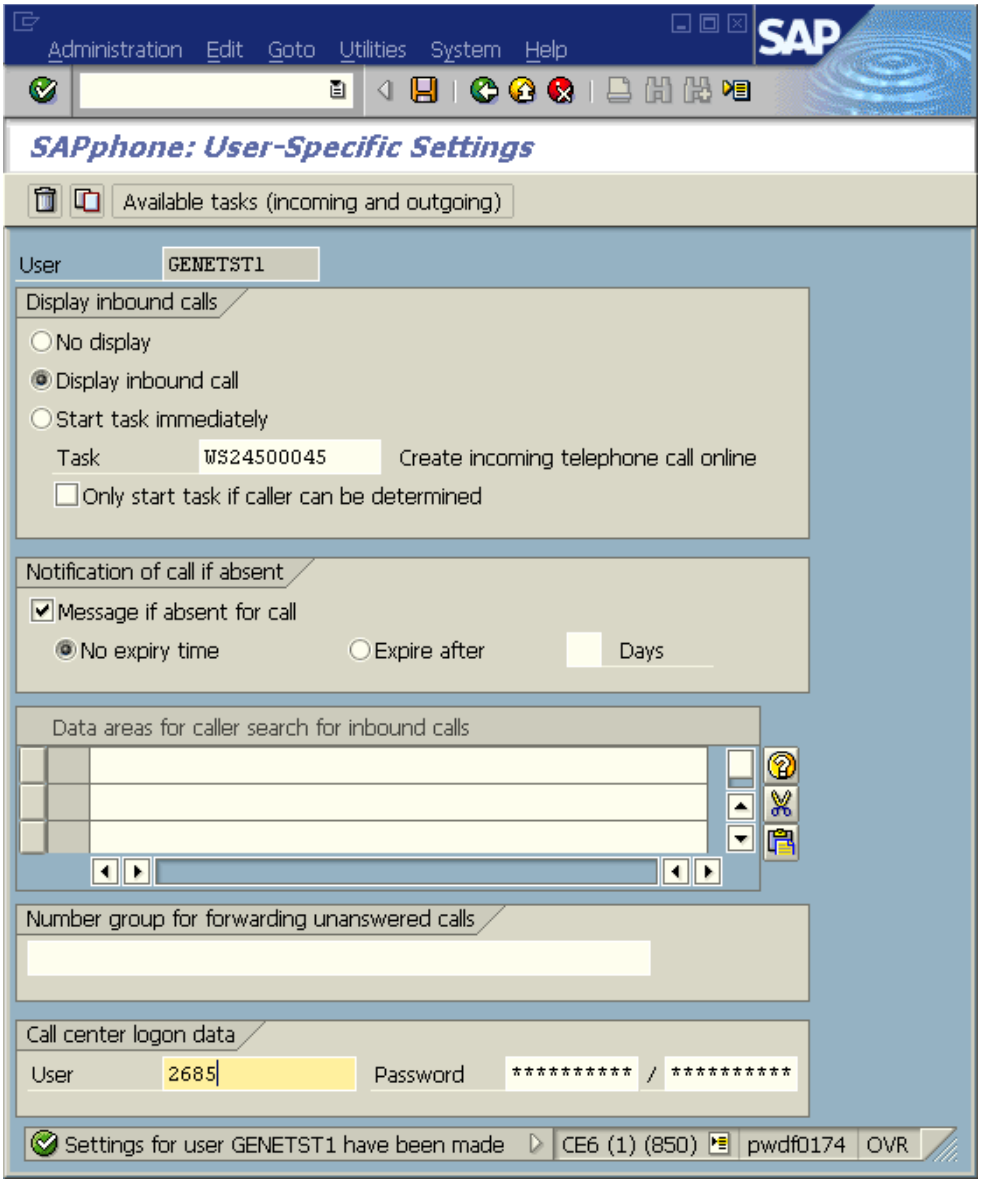


Figure 21: SAP: SPHA - User-Specific Settings Screen

To configure and start the Adapter:

1. In Configuration Manager, under the `Adapter` application, configure the required Adapter options.
2. Set the following additional options:
   - `automatic-registration:auto-registration = active` (see page 54 for a description).
   - `rfc-client:notify=true` (see page 50 for a description).
3. Start the Adapter.
4. Initiate a connection test.

If the test is successful, proceed with the steps that follow.

To make a conference call:

1. In SAP, open the `SAPphone Test Environment (SPHT)` screen. (See Figure 22.)

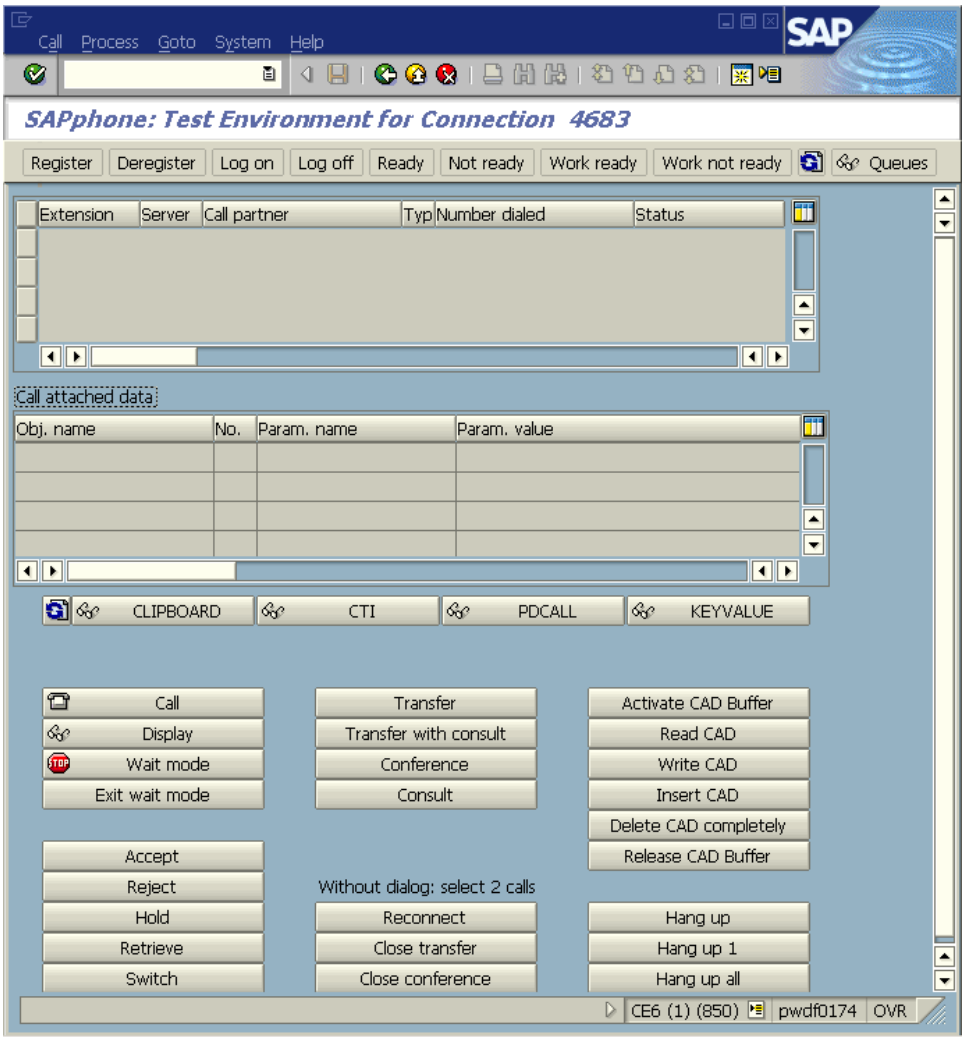


Figure 22: SAP: SAPphone Test Environment Screen

> **Note:** As the Adapter's `auto-registration` option is set to `active`, the Adapter has already registered the telephony number on CTI; therefore there is no need to make an explicit (manual) registration request.

2. On the `SPHT` screen, click `Log on` to log on to the `Position` that the switch requires. See Figure 22 for further reference.

Note: Because the SAPphone does not have any settings for `ACD Position`, it sends only the extension number to the Adapter. The Adapter, in turn, finds the information about the position number in the `Place` object in the Genesys Configuration Layer, as shown in Figure 15 on page 76.

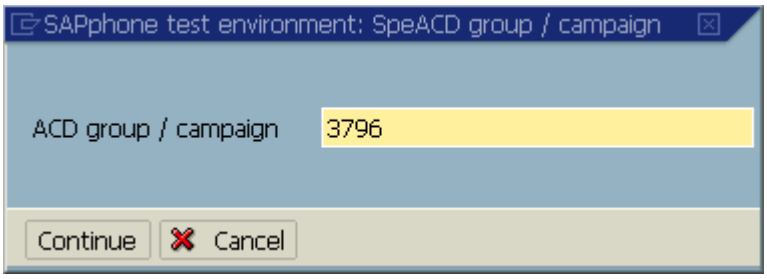


Figure 23: SAP: Log-On to Queue Dialog Box

3. On the `SPHT` screen, click `Ready` to enable the agent to receive calls from the queues.
4. Make a call from an external source (either another configured SAP agent or a physical phoneset) to the queue to which you have the SAP agent logged on. Figure 24 shows the state of the current calls.

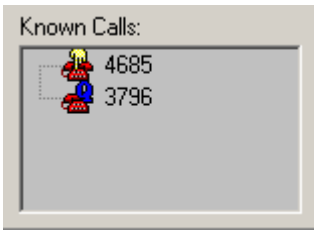


Figure 24: CTI: Extension 4685 Sending Call to Queue 3796

5. Wait until CTI redirects the call from the `Queue` to the `Logged` and `Ready Position` number. See Figure 25 for an example.

Figure 25: CTI: The Call Comes from Position 2686

Although the call comes from the `Position`, the Adapter knows about the related extension from the `Place` settings in Genesys Configuration; therefore it uses the extension number to redirect the call to the SAP agent. Furthermore, because of the `notify` option is set to `true`, the Adapter sends an `SPS_NEW_CALL`

message to inform the SAP agent about the new call that arrived. As a result, the SAP graphical user interface (GUI) displays a dialog box with the customer's information. The appearance of this dialog box depends on the SAP environment that you use. See Figure 26 for an example.

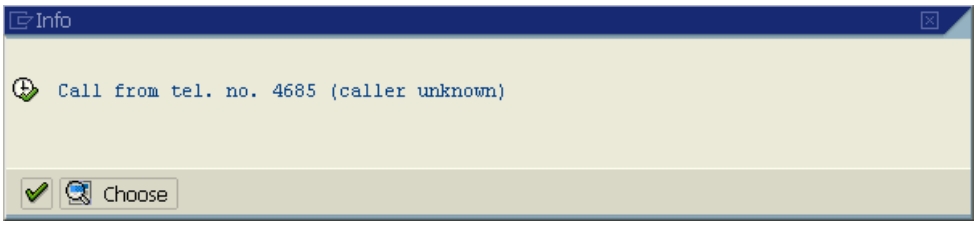


Figure 26: SAP: Incoming Call Dialog Box

6. Accept the call and refresh the `SPHT` screen. The `SPHT` screen now displays the connected call, as shown in Figure 27.

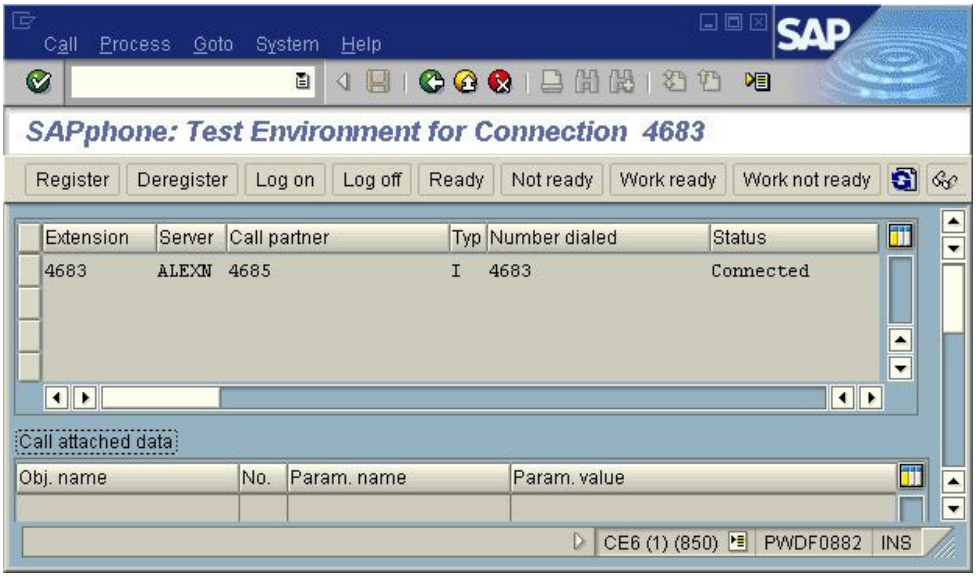


Figure 27: SAP: Connected Call

7. In the `Conference` dialog box, click `Initiate` to start a conference call to another extension (either another configured SAP agent or a physical phoneset). Figure 28 shows an example of the `Conference` dialog box.

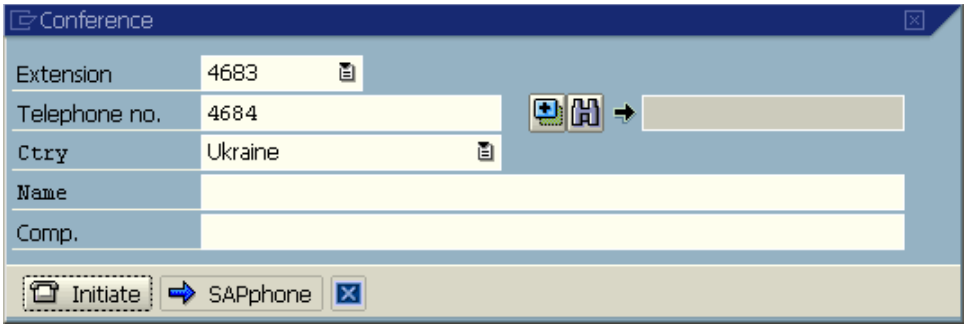


Figure 28: SAP: Conference Dialog Box

Figure 29: CTI: Consult Call Is Initiated

8. Answer the incoming call from the SAP GUI or the physical phoneset. As a result of answering the call, the SAP agent has two current calls - one of which is on hold, and the other one of which is connected. Figure 30 displays the state of the two current calls.

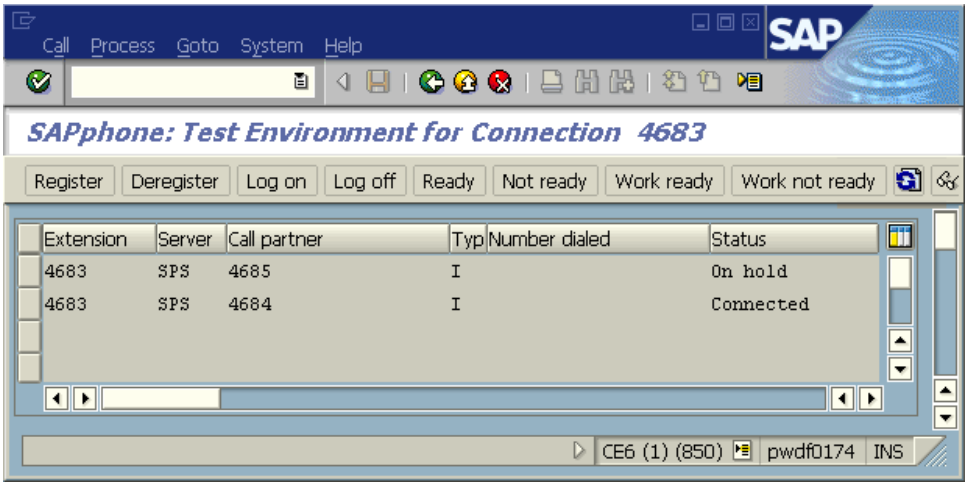


Figure 30: SAP: Initial and Consult Calls

9. Select both calls and then close the conference. This establishes the conference, and then you can see all the conference parties in the SAP call list as shown in Figure 31.

Figure 31: CTI: Conference Is Established

Figure 32 shows the established conference calls.

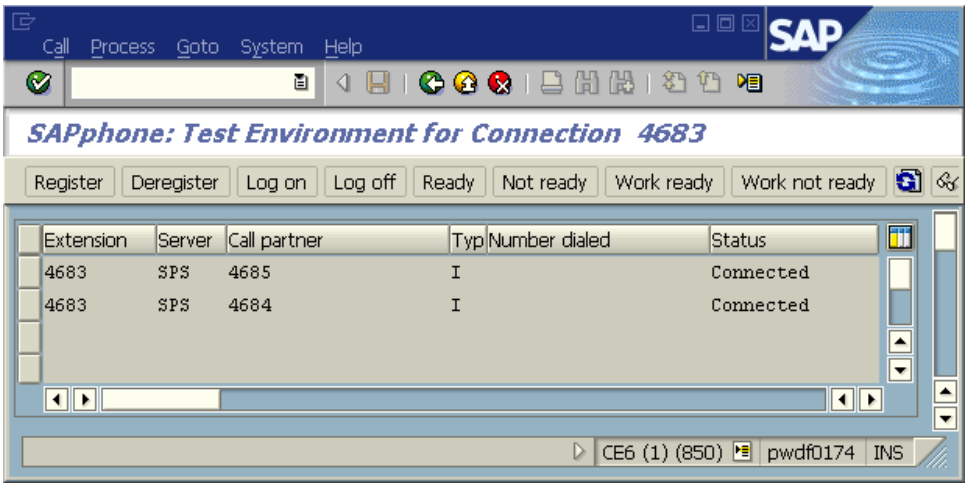


Figure 32: SAP: Conference Is Established

Scenario 2: Blind Transfer

A *`blind transfer`*, also known as a *one-step transfer*, is one in which the agent who initiates the transfer does not first consult with the agent to whom he or she is transferring the call; instead he or she transfers the call directly to that agent.

This scenario includes the parameters shown in Table 5.

Table 5: Blind Transfer Scenario Parameters

Item	Parameter
Activity	Making a blind (`One-Step`) transfer call
SAP transactions	`SPHA CIC0`
Switch	Siemens Hicom 300E

Table 5: Blind Transfer Scenario Parameters

Item	Parameter
Adapter Options	`outbound-optimization = enabled`
SAPphone options	`Canonical numbers` active

To check the accuracy of the CTI configuration in Configuration Manager:

- In Configuration manager, review `Places` and `Queues` to check the accuracy of the CTI configuration.

  `Place` and `Switch` information should match the hardware configuration. Figure 33 provides an example.

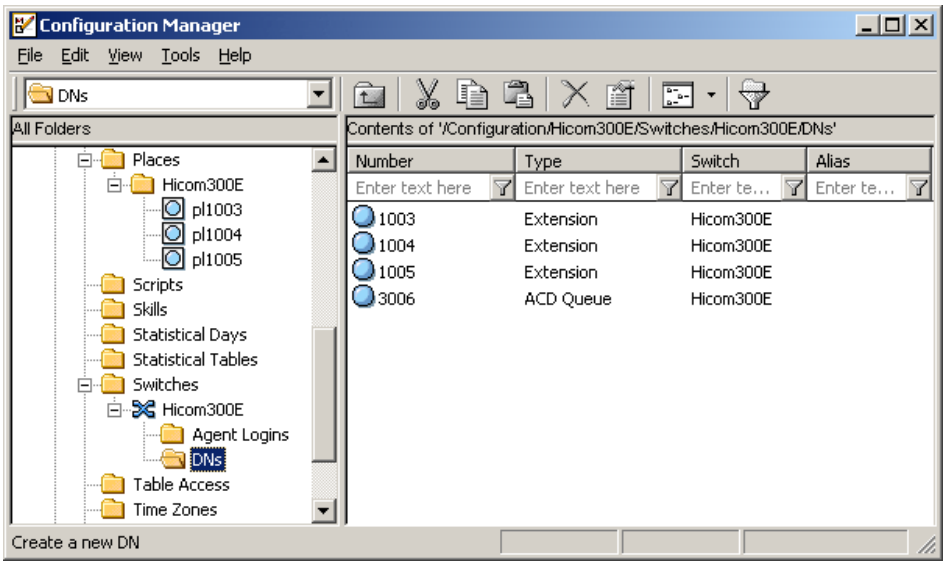


Figure 33: Configuration Manager: DNs Configuration

To configure an `Agent Work Center` (`SPHA` transaction) on the SAP:

- On the `Work Center-Specific Settings` screen, define the `Telephone number` and `Telephone server` boxes. Figure 20 shows an example of this screen.

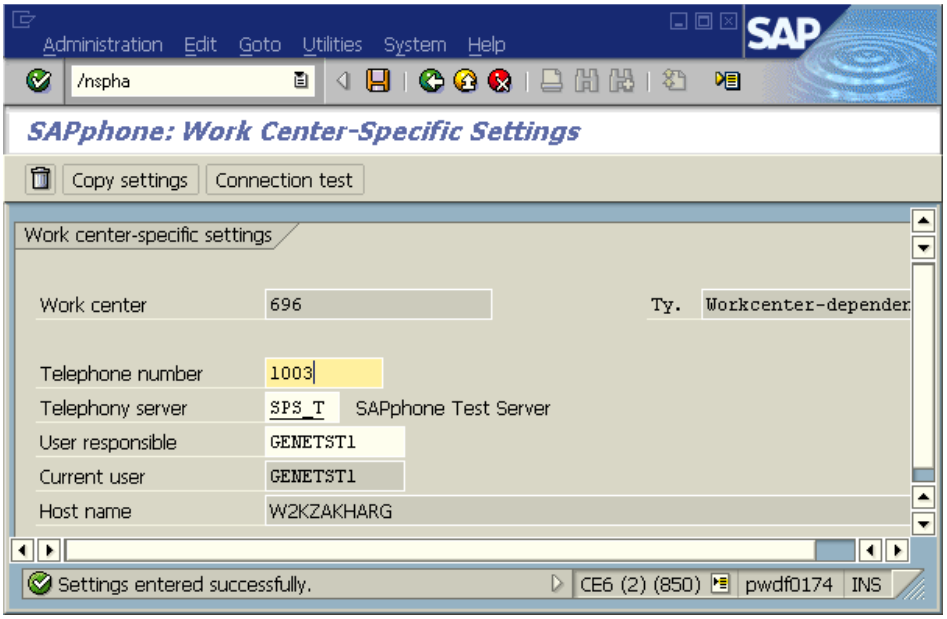


Figure 34: SAP: SPHA - Work Center-Specific Settings Screen

To configure the canonical numbers:

- On the SAP SPHB, select the Canon. numbers check box to activate the generation of canonical numbers for the SAPphone server that you are using.

Note: Selecting Canon. numbers forces SAP to dial the number in the format: +<country_code><area_code> <extension>, based on your SAPphone site settings.

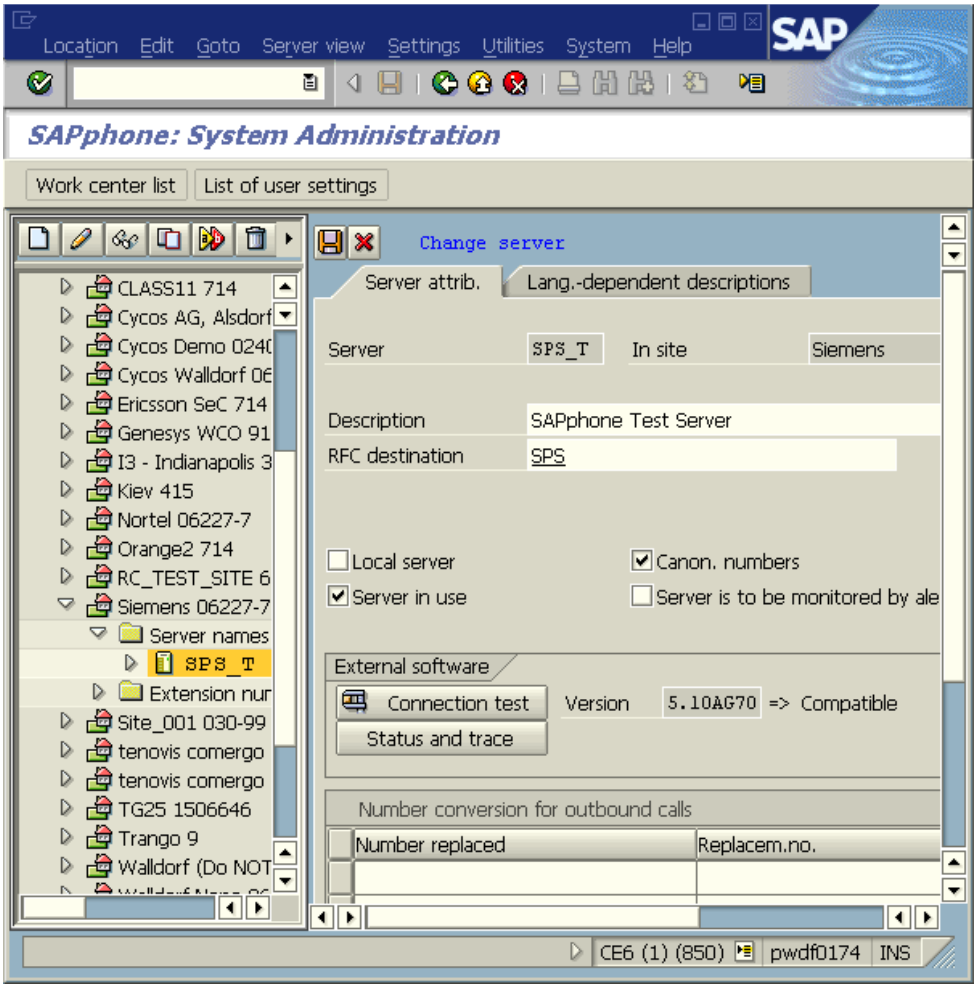


Figure 35: SAP: SPHB - Canonical Number Is Activated

To configure and start the Adapter:

1. In Configuration Manager, under the `Adapter` application, configure the required Adapter options.
2. Set the following additional options:
   - `call-number-translator:outbound-optimization = enabled` (see page 46 for a description)
   - `call-number-translator:country-code = 1` (see page 46 for a description)

Note: The value that you set for `call-number-translator:country-code` should match the value for the SAPphone site definition. In this example, `1` matches the `US` country-code on SAP.

Figure 36 shows an example of the configured options.

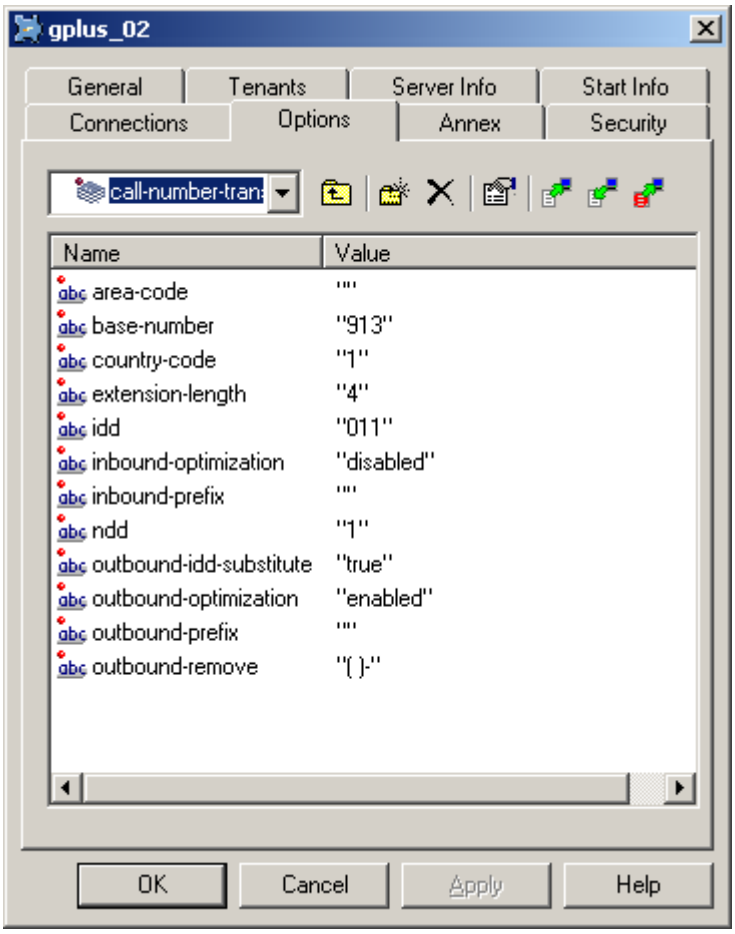


Figure 36: Configuration Manager: Adapter Settings

3. Start the Adapter.
4. From the SAP `SPHA` or `SPHB` transaction, initiate a connection test to check the connectivity between the SAP and the Adapter.

If the test is successful, proceed with the steps that follow.

To make a blind transfer:

1. In SAP, go to the `CIC0` (`Customer Interaction Center #0`) transaction, (see Figure 37).

Note: Notice that the Adapter receives several SAPphone requests, and that `SPS_REGISTER` is among them. This means that the Adapter has already registered this extension.

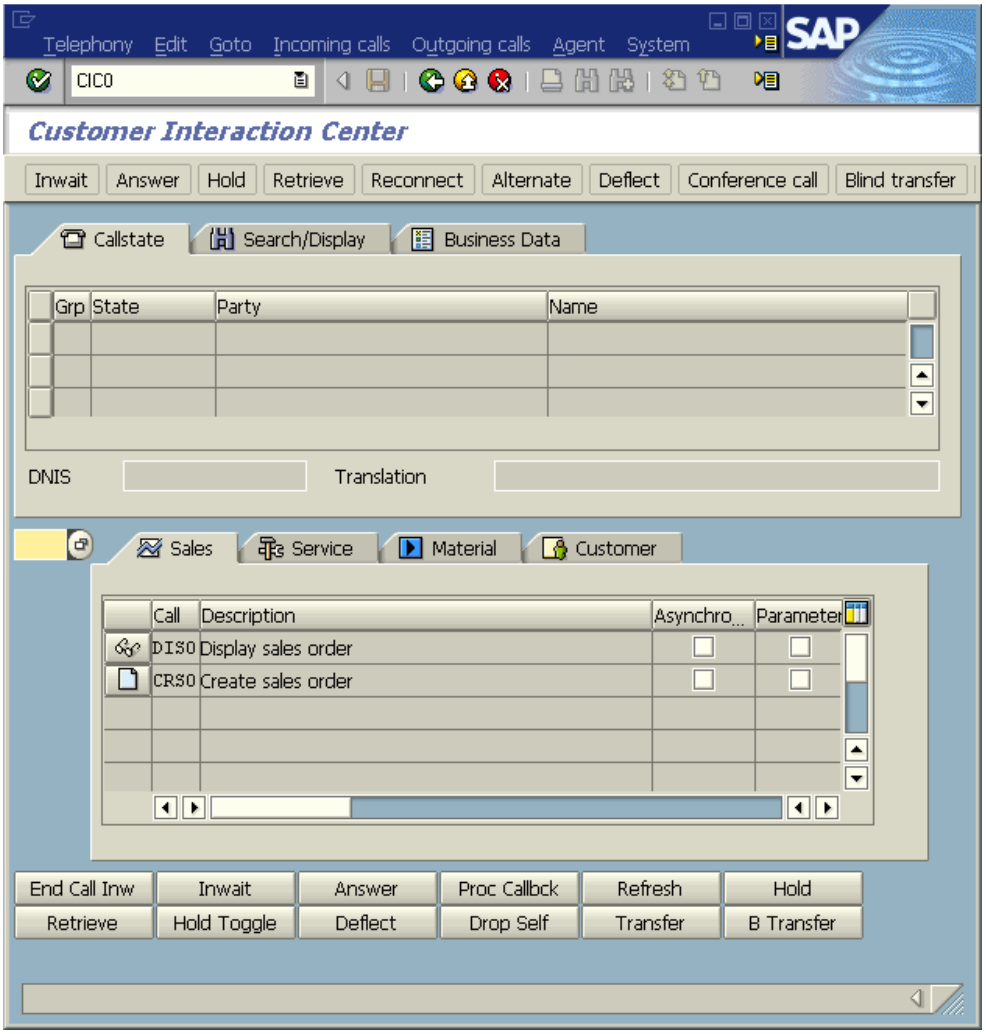


Figure 37: SAP: Customer Interaction Center

2. Click `Inwait` to activate the `Wait` mode (see Figure 37).
3. Make a call from an external source (either another configured SAP agent or a physical phoneset) to the queue in the `CIC0` transaction that you have the SAP agent logged on to. Figure 38 shows the state of the current calls.

Figure 38: CTI: Extension 1005 Sending Calls to SAP Agent 1003

4. On the `Customer Interaction Center` screen, click `Answer` to accept the call. See Figure 39 for an example of an accepted call.

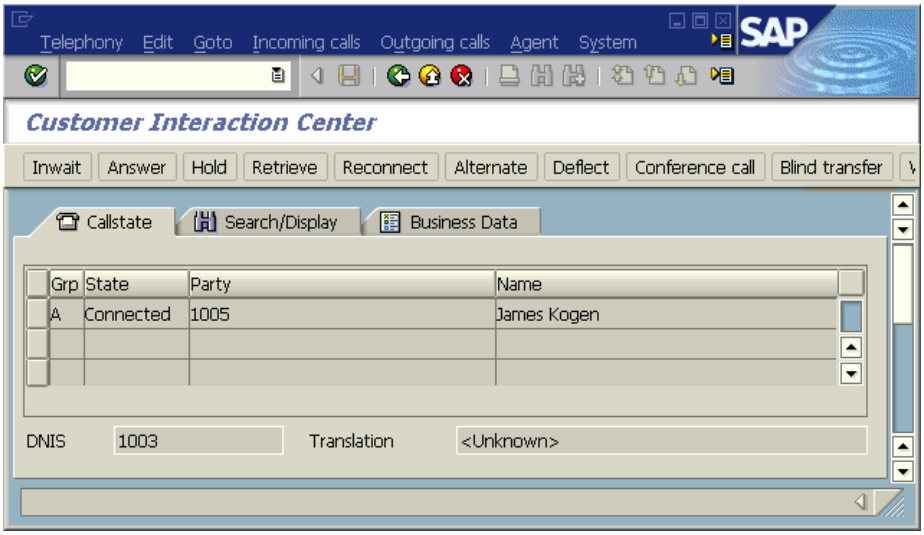


Figure 39: SAP: Agent Accepted the Call

5. On the `Customer Interaction Center` screen, click `Blind Transfer` to transfer this call to Agent 1004. See Figure 40 for an example of the `Transfer Without Consult` screen.

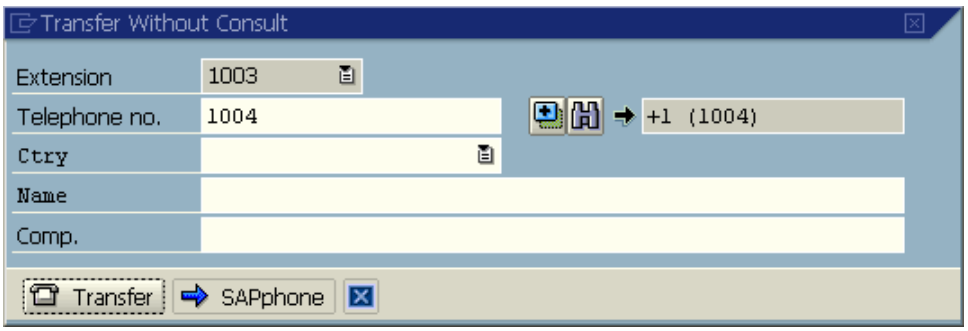


Figure 40: SAP: Initiate Transfer Without Consult Window

Destination Number Optimization

Because of the canonical number option that you set on page 88, the actual number that is called is `+1 (1004)`. In particular, if you look at the Adapter log output, you will notice that the SAPphone transfer request has the following format for this case:

```
Int 04543 Interaction message "SPS_BTRANSFER" received from 3
("RfcGetData")
 OPER       :RfcGetData
 NAME       :SPS_BTRANSFER
 EXT        :1003
 HANDLE     :0071011ba08a101d_1003
 DESTINATION:+1 (1004)
```

```
EXTCALLS  :SPH_CSTATE
```

The Adapter optimizes this destination number as follows according to the settings that you configured in Step 1 on page 86:

- Spaces and brackets are removed due to the `outbound-remove` option.

  As a result of this step, `+1 (1004)` will be optimized to `+11004`.

- The plus sign is replaced with the `idd` value `011` due to the `outbound-idd-substitute` value.

  As a result of this step, `+11004` will be optimized to `01111004`.

- The `outbound-optimization` engine applies the N2 template, which you can see in the description of the `outbound-optimization` option on pages 57.

  As a result, the number `01111004` will be optimized to `1004`.

  As a result of this optimization, the Adapter sends CTI a request to transfer the call to extension `1004` as shown in Figure 41.

Figure 41: CTI: The Call Is Transferred from 1003 to 1004

Scenario 3: Gathering Log Information

To facilitate troubleshooting, all Genesys components store an internal representation of execution steps. This information is helpful if you are trying to resolve issues on your own. Genesys Technical Support will also require this information along with the problem description, to help you resolve the problem.

If you encounter any telephony-related problems and feel that you need help from Genesys Technical Support, you should collect: the following

- A full T-Server log saved to a file.
- A full Adapter log saved to a file.
- All SAP `RFC SDK` trace files. See your SAP `RFC SDK` documentation for details about RFC tracing.

T-Server Log

To collect the full T-Server log data, refer to the appropriate *T-Server Deployment Guide* and set the option values as shown in Table 6.

Table 6: Option Values for T-Server Log

Section	Option	Value
log	verbose	all
	all	[pathname] = log events are stored in a file with a specified file and path name. If a path is not specified, the file is created in the application's working directory.

Figure 42 shows Genesys Configuration Manager with the options set as described in Table 6.

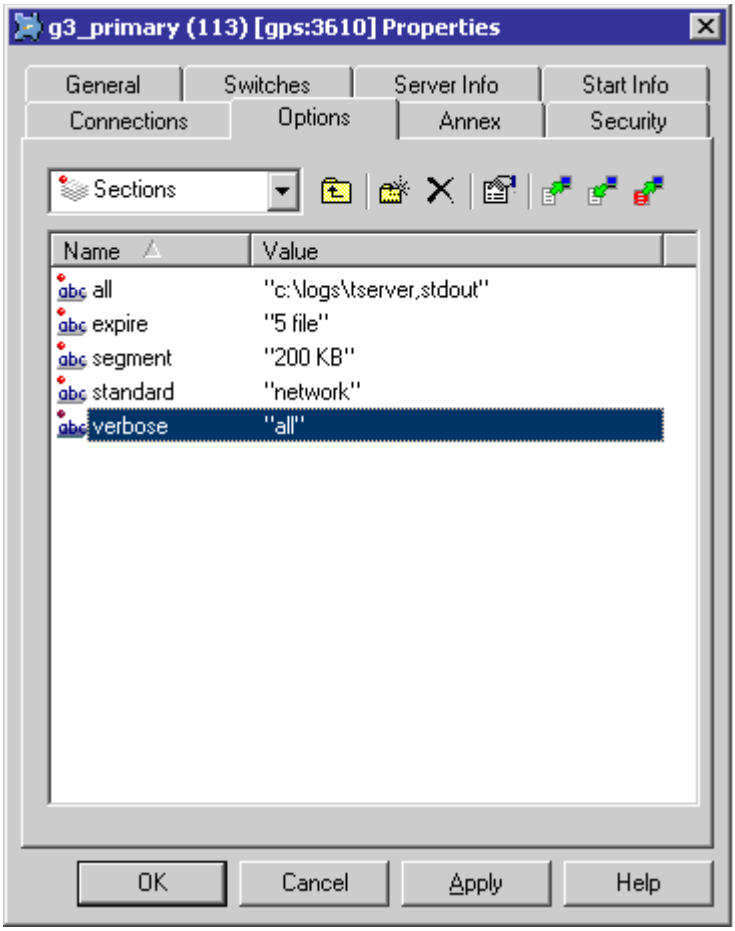


Figure 42: Configuration Options for T-Server Log

Adapter Log

To collect the full Adapter log data, set the option values as shown in Table 7.

Table 7: Option Values for Adapter Log

Section	Option	Value
log	verbose	`all =` enables all log events on all log levels to be produced
	all	`stdout, AdapterLog =` enables log output both to adapter application screen and to a log file prefixed with "AdapterLog", which will be placed into the application folder.
	print-attributes	`true` = provides more details about input and output parameters for the Adapter's interaction functions
telephony	cti-log	`true` = enables log output related to CTI components
genmodel	enable-log-user-data	`true` = enables log output for call-attached data that you use
rfc-client	trace	`true` = enables RFC tracing on the Adapter's side

After you set all the option values as shown in Table 6 and Table 7, complete the following steps:

1. Start the T-Server and the Adapter.
2. Collect the log files for the T-Server, the Adapter, and the SAP `RFC SDK`.
3. Send the log files to Genesys Technical Support, along with a description of the problem.

Note: Setting the options in Table 6 and Table 7 to their recommended values forces the Adapter to produce the most complete log information, but it can negatively affect performance. Therefore, after you gather the log data, reset the specified options in order to decrease the level of log detail.

Chapter

9 Agent Workmodes

The SAPphone Interface RFC specification defines four agent states (workmodes) for the `SPS_SETWORKMODE` request: `Ready`, `NotReady`, `WorkReady` and `WorkNotReady`.

The Adapter maps these SAPphone states to the `Workmode` field of the T-Server's `Ready` and `NotReady` requests. If the `telephony:workready-mapping` option (see page 55) is set to the default value, `AutoIn`, the Adapter uses the mapping shown in Table 8 for workmodes on the SAPphone and the Genesys T-Server.

Table 8: Agent Workmodes

SAPphone Workmodes	T-Server Workmodes
`Ready (01)`	`Ready` with workmode `ManualIn`
`NotReady (02)`	`NotReady` with workmode `AuxWork`
`WorkReady (03)`	`Ready` with workmode `AutoIn`
`WorkNotReady (04)`	`NotReady` with workmode `AfterCallWork`

Appendix

Handling Call-Attached Data

This appendix describes how to handle issues relating to call-attached data (CAD) between SAP and Genesys applications.

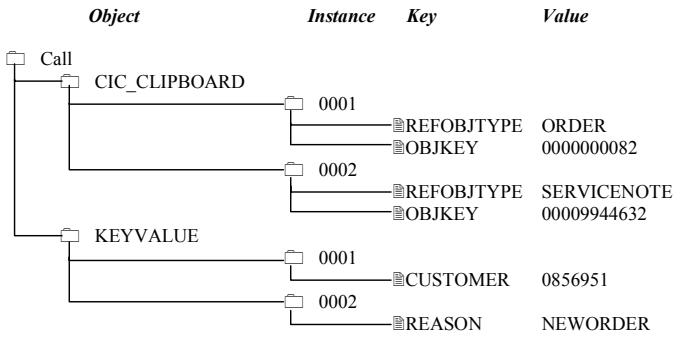
This appendix contains the following sections:

Data Structure

It is important to note the differences in call-attached data structure between SAP applications and Genesys applications.

SAP Data Structure

In SAP applications, call-attached data is transported as a table, but the data is organized in a tree-like structure. The information itself is contained in *key-value objects*. Multiple key-value objects, preferably those that are needed to identify one business object, can be put together in an object instance (for example, if there is more then one key field). Multiple object instances may belong to one object. The object is used to categorize information.



....and its representation in the table:

Object name	Object instance	Key name	Value
CIC_CLIPBOARD	0001	REFOBJTYPE	ORDER
CIC_CLIPBOARD	0001	OBJKEY	0000000082
CIC_CLIPBOARD	0002	REFOBJTYPE	SERVICENOTE
CIC_CLIPBOARD	0002	OBJKEY	00009944632
KEYVALUE	0001	CUSTOMER	0856951
KEYVALUE	0002	REASON	NEWORDER

Figure 43: Example of SAP Call-Attached Data Structure

Genesys Data Structure

In Genesys, call-attached data is represented by a list of key-value objects. There are no restrictions on uniqueness of keys; the value can be simple (string, integer, binary data) or a nested list of key-value objects.

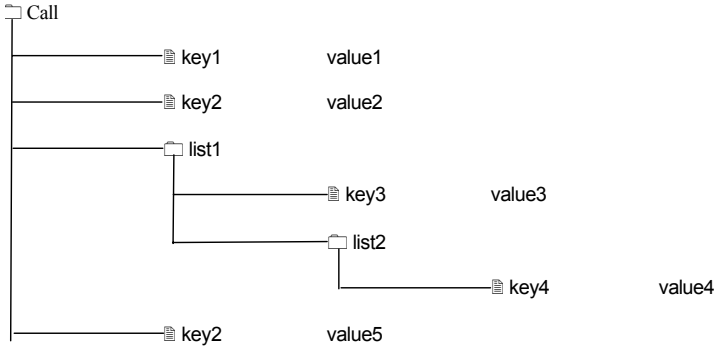


Figure 44: Example of Genesys Call-Attached Data Structure

Translating Genesys CAD to SAP CAD

The most straightforward way to translate between SAP CAD and Genesys CAD is to represent SAP data using nested lists of key-value objects. Because

Genesys Router 6.5 and earlier does not work with tree-like structures of CAD, the Adapter uses a combination method:

- The Adapter parses top-level data and uses a tree structure to store parsed data (internal representation) in call-attached data.

This approach has drawbacks:

- Not all data can be represented (for example, objects with names beginning with the underscore [_] character)
- The top level contains a lot of miscellaneous internal data that becomes visible to user.

CIC_CLIPBOARD

By default, the Adapter scans all simple top-level pairs for keys matching the `TGCLIP_<refobjecttype>` pattern. If a key matches this pattern, the Adapter assigns an instance number and exports to the SAP `CIC_CLIPBOARD` object.

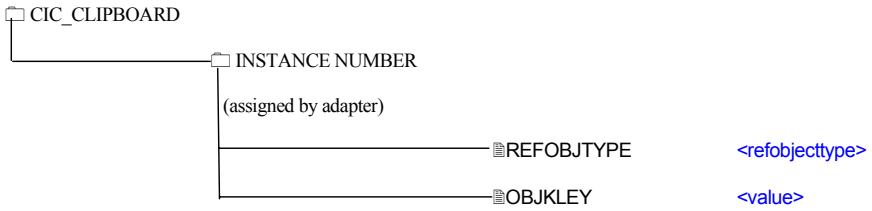


Figure 45: CIC_CLIPBOARD

For example, if the Genesys CAD is as shown in Table 9, the result will be as shown in Table 10.

Table 9: Genesys CAD - CIC_CLIPBOARD

Key	Value
TGCLIP_**ORDER**	**0082**
TGCLIP_**SERVICENOTE**	**5120**

Table 10: Resulting Export to SAP CIC_CLIPBOARD Object

Object Name	Instance	Key	Value
CIC_CLIPBOARD	0001	REFOBJTYPE	**ORDER**
CIC_CLIPBOARD	0001	OBJKEY	**0082**
CIC_CLIPBOARD	0002	REFOBJTYPE	**SERVICENOTE**
CIC_CLIPBOARD	0002	OBJKEY	**5120**

The TGCLIP_ prefix can be configured in Adapter options as follows:
call-attached-data: cic-clipboard=TGCLIP_ (default value).

LOGSYS in CIC_CLIPBOARD

LOGSYS is a CIC_CLIPBOARD SAP object field. When making calls to SAP or creating routing strategies, you may need to define this field as well.

The LOGSYS field should be defined as an additional keyvalue pair with the TGCLIP_ prefix (or other as defined in the cic-clipboard Adapter configuration option). The value of this field depends on two Adapter options:

- logsys_option
- logsys_value

Below you can find how these options impact the LOGSYS value of an attached CIC_CLIPBOARD object.

logsys-option = null

LOGSYS value for the CIC_CLIPBOARD object will be blank

For example:

Table 11: logsys-option = null

Mode	Key	Value
CTI	TGCLIP_**ORDER**	**0082**
	TGCLIP_**LOGSYS**	**YY_456**
SAP	REFOBJTYPE	**ORDER**
	OBJKEY	**0082**
	LOGSYS	

logsys-option = unique

LOGSYS key value in CIC_CLIPBOARD object will be replaced with the value defined for the logsys-value Adapter configuration option.

For example:

Table 12: logsys-option = unique.

Mode	Key	Value
Adapter	logsys-value	XX_123
CTI	TGCLIP_ORDER	0082
	TGCLIP_LOGSYS	YY_456
SAP	REFOBJTYPE	ORDER
	OBJKEY	0082
	LOGSYS	XX_123

logsys-option = percall

If each CIC_CLIPBOARD object on the CTI side is provided with its own LOGSYS key, then the LOGSYS value for these objects will be replaced with the value defined for the logsys-value Adapter configuration option.

For example:

Table 13: logsys-option = percall (different LOGSYS)

Mode	Key	Value
Adapter	logsys-value	XX_123
CTI	TGCLIP_ORDER	0082
	TGCLIP_ORDER_LOGSYS	YY_456
	TGCLIP_SERVICE	0099
	TGCLIP_SERVICE_LOGSYS	ZZ_789
SAP	REFOBJTYPE	ORDER
	OBJKEY	0082
	LOGSYS	XX_123
	REFOBJTYPE	SERVICE
	OBJKEY	0099
	LOGSYS	XX_123

If several CIC_CLIPBOARD objects on the CTI side share the same LOGSYS value, this shared value will be used for all these objects on the SAP side, no matter which value has the logsys-value Adapter configuration option.

For example:

Table 14: logsys-option = percall (shared LOGSYS)

Mode	Key	Value
CTI	TGCLIP_**ORDER**	**0082**
	TGCLIP_**SERVICE**	**0099**
	TGCLIP_**LOGSYS**	**YY_456**
SAP	REFOBJTYPE	**ORDER**
	OBJKEY	**0082**
	LOGSYS	**YY_456**
	REFOBJTYPE	**SERVICE**
	OBJKEY	**0099**
	LOGSYS	**YY_456**

logsys-option = keyvalue

The `LOGSYS` value defined in the `CIC_CLIPBOARD` object will be used for the obejct on SAP, no matter which value has the `logsys-value` Adapter configuration option.

For example:

Table 15: logsys-option = keyvalue

Mode	Key	Value
CTI	TGCLIP_**ORDER**	**0082**
	TGCLIP_**LOGSYS**	**YY_456**
SAP	REFOBJTYPE	**ORDER**
	OBJKEY	**0082**
	LOGSYS	**YY_456**

KEYVALUE

The Adapter matches the top level keys for `SAPKEY_<key>`. For any matched key, an instance number is assigned, and the `KEYVALUE` object is exported to SAP.

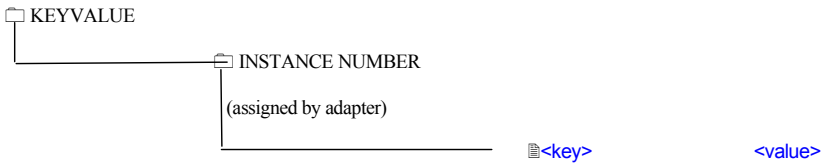


Figure 46: KEYVALUE

For example, if the Genesys CAD is as shown in Table 16, the result will be as shown in Table 17.

Table 16: Genesys CAD - KEYVALUE

Key	Value
SAPKEY_**CUSTOMER**	**1234**
SAPKEY_**REASON**	**NEWORDER**

Table 17: Resulting Export to SAP KEYVALUE Object

Object Name	Instance	Key	Value
KEYVALUE	0001	**CUSTOMER**	**1234**
KEYVALUE	0002	**REASON**	**NEWORDER**

The `SAPKEY_` prefix can be configured in Adapter options as follows:

```
call-attached-data: keyvalue =SAPKEY_ (default value).
```

Other SAP Objects

The matching pattern is `SAPCUST_<object>__<object-key>`. If the pattern matches, then the object is exported to SAP.

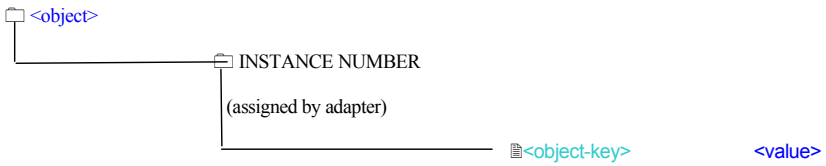


Figure 47: Generic <object> Pattern

The following is an example of the above using the object `CIC_CTI`.

For example, if the Genesys CAD is as shown in Table 18, the result will be as shown in Table 19.

Table 18: Genesys CAD - SAPCUST

Key	Value
SAPCUST_**CIC_CTI**__*CUSTANI*	**1234567**

Table 19: Resulting Export to SAP CIC_CTI Object

Object Name	Instance	Key	Value
CIC_CTI	0001	*CUSTANI*	**1234567**

The `SAPCUST_` prefix can be configured in Adapter options as follows: `call-attached-data: custom=SAPCUST_ (default value).`

Handling Call-Attached Data for Consult Calls

Call-attached data (CAD) is not stored within SAP systems, but in the external telephony software that is connected to SAPphone. The Adapter is responsible for handling call-attached data and, in particular, for moving data between the original call and the consult call.

Agenda

Below you can see a use-case scenario which shows how the Adapter implements CAD handling for consult calls with the Adapter's option `telephony: consult-user-data` set to the `sapphone` value.

- `A`, `B`, and `C` are SAP agents who perform telephony operations.
- CAD can be added to the call from both the SAP and CTI side, so in the steps below you can operate both with SAP CAD and CTI CAD.

Steps

Step 1

Assume there is an active call between two parties, `A` and `B`, with data attached to the call (`CAD1`) as shown in Figure 48.

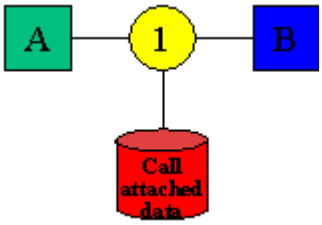


Figure 48: CAD Scenario, Step 1

Step 2

Assume that B initiates a consult call to C. The first call is placed *on hold.* Call-attached data is copied automatically from the first to the second call as shown in Figure 49.

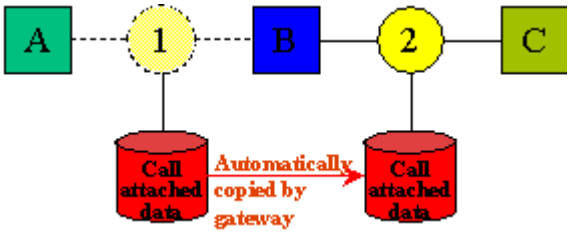


Figure 49: CAD Scenario, Step 2

Now, both the A—B *held* call and the B—C *connected* consult call have the same set of data (CAD1).

Step 3

C adds CAD2 to the B—C call, as shown in Figure 50.

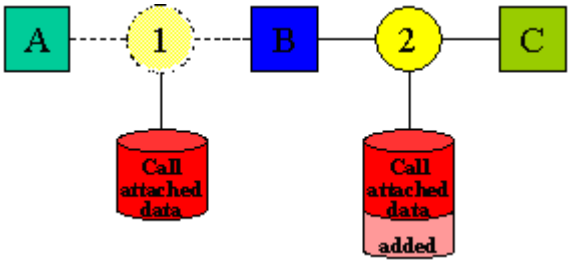


Figure 50: CAD Scenario, Step 3

Now, both calls have a different set of data.

Step 4

When the call is finally transferred, the consult call is ended and the first call is retrieved. The added (modified) call-attached data is copied back to the first call (replaces the CAD from the first call), as shown in Figure 51.

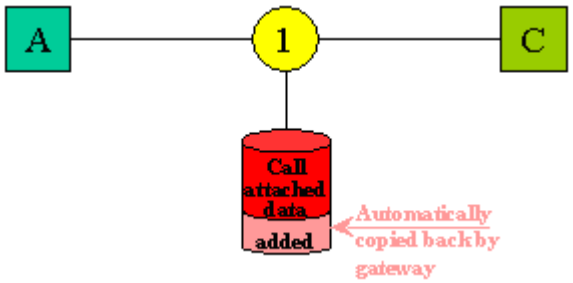


Figure 51: CAD Scenario, Step 4

The result will be the same if you do a close conference (`SPS_CONFERENCE`) or reconnect (`SPS_RECONNECT`) at this step. The CAD of the currently connected call replaces the CAD of the other calls.

Call Attached Data for Original and Transferred Connection ID

For improving call traceability and gathering statistical information, it may be necessary to know about the call connection ID if it is changed several times due to conference or transfer scenarios. With the `on-transfer-add-connids` option set to `true`, the Adapter attaches connection ID of the original call and connection ID of the call after transfer (or after conference) as SAP key-value objects. Below is the use-case scenario which reveals this feature in detail. See Table 20.

Table 20: Agenda: dnA, dnB, dnC, dnD are SAP Agent Who Perform Telephony Operations

	Step	Call	ConnID	CAD for the Call
1	dnA: Make call to dnB	dnA-dnB	`conn_id_1`	no
2	dnC: Initiate two-step transfer (transfer with consult) to dnC. dnC answers the call.	dnA-dnC	`conn_id_2`	no
3	dnA: Close transfer	dnB-dnC	`conn_id_1`	The Adapter adds two SAP key-value objects to the dnB-dnC call : OriginConnID: `conn_id_1` TransferConnID: `conn_id_2`

Table 20: Agenda: dnA, dnB, dnC, dnD are SAP Agent Who Perform Telephony Operations (Continued)

	Step	Call	ConnID	CAD for the Call
4	dnC: Initiate two-step transfer (transfer with consult) to dnD. dnD answers the call.	dnC-dnD	`conn_id_3`	Since it is a consult call, the data attached to the dnB-dnC call (step3) are copied to the dnC-dnD call. So there are two SAP key-value objects available for the call: OriginConnID: `conn_id_1` TransferConnID: `conn_id_2`
5	dnC: Close transfer	dnB-dnD	`conn_id_1`	In addition to already existing CAD (step4), the Adapter adds two SAP key-value objects to the dnB-dnD call : OriginConnID: `conn_id_1` TransferConnID: `conn_id_3` In summary, CAD attached to the dnB-dnD call are: OriginConnID: `conn_id_1` TransferConnID: `conn_id_2` OriginConnID: `conn_id_1` TransferConnID: `conn_id_3` Thus the dnB-dnD call will have four SAP key-value objects which reflect the full history (ConnIDs) of call transferring.

Questions and Answers

The following are common questions and answers relating to call-attached data handling.

Why does the Delete CAD method set the value of CAD files to "*" but does not delete them?

In Genesys, there are two methods for deleting CAD:

- Delete all the data
- Delete a particular key

The first method can not be used here because it affects all data, even data not exported in SAP (specific routing strategy information, and so on).

The second method deletes only one pair, so we would need to send a request for each pair. This is undesirable, because data can be changed between requests, and the method is slow. Additionally, because keys can be duplicated, there is not way to delete a second instance of the key without deleting the first one.

Therefore, instead of deletion, the Adapter marks all deleted field by '*'. This character can not be used by the SAP `RFC_CHAR` data type, so it is safe, and `Update` updates all specified keys in one request.

What is the purpose of writing data to a CAD sub-folder within "instance?"

Because SAP and Genesys both use a tree-like structure for CAD, this is a more natural way to represent SAP CAD in Genesys. This folder also contains internal information (instance number assigned to objects during initial CAD processing). Having this information attached to the call guarantees that after transfer, the second agent will receive exactly the same CAD representation, including instance numbers, and so on.

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