Table of Contents

Chapter 1 - Introduction

About this document

This document covers the installation of the SAS/ACCESS® Interface to R/3 System for the SAS® System, Release 8.2.

How to use this book

In Chapter 1, you will find an overview of the architecture of the SAS/ACCESS Interface to R/3. Read this chapter and decide which configuration you want to use for your installation.

Chapter 2 lists system requirements and pre-requisites. You will find tips about how to set up and test pre-requisites before you proceed with the installation.

To simplify and document the installation, two lists are provided:

- pre-installation checklist (Appendix G)

  The pre-installation checklist must be completed prior to installation. Do not proceed with installation until all the items on the checklist are correctly completed.

- installation checklist (Appendix H)

  During installation, complete the installation checklist. This information is important as it documents the installation and facilitates upgrades, etc.

These checklists are an important aid to successfully install the SAS/ACCESS Interface to R/3.

Chapter 3 explains the installation of the SAS/ACCESS Interface to R/3 step by step.

Chapter 4 explains how to start the interface and how to verify the installation.

Read appendices A and B if you have been using an earlier release of the SAS/ACCESS Interface to R/3.

For a list of R/3 transaction codes that are useful during installation and verification, see Appendix C.

If you encounter problems during the installation, check if the symptoms are described in Appendix D. You might find a solution there.

What's new in the SAS/ACCESS Interface to R/3

In previous versions of the SAS/ACCESS Interface to R/3, the RFC Server has been linked at installation time. It is no longer necessary to link the RFC server during the installation. The RFC SDK from SAP R/3 is no longer a requirement.

A new batch RFC server is provided as a feature of the SAS/ACCESS Interface to R/3. See Appendix I Batch RFC Installation (on page 57) for information about how to set up the batch RFC server.

The SAS/ACCESS Interface to R/3 now has a general interface to call ABAP/4 RFC functions. On Windows NT® this new feature requires Version 4 (or above) of the DLL librfc32.dll. Check the version in the properties of your librfc32.dll.

The functionality to read hierarchies/sets from the SAP R/3 system has been added to the SAS/ACCESS Interface to R/3. Two new function modules must be installed in the R/3 System to implement this functionality. See "Step 3, Install the ABAP/4 function module 'Z_SAS_G_SET_LIST_SELECT' " (on page 16) and "Step 4, Install the ABAP/4 function module 'Z_SAS_G_SET_TREE_IMPORT' " (on page 17). Version 4 of the librfc32.dll is required.

The authorizations have been updated to include the required authorization objects for R/3 Release 4.

In previous versions of SAS/ACCESS, manual installation of ABAP function modules and program is needed. To simplify the installation procedure and reduce the human error during manual installation, a transport containing all the function modules and program is also shipped with the product. User can now use the SAP transport system to import and activate these function modules and program. Refer to Appendix J - Using transport to install SAP objects (on page 69) for details.

Configurations of the SAS/ACCESS Interface to R/3 System

The SAS/ACCESS Interface to R/3 System can be configured in many different ways. This section describes the components of the SAS/ACCESS Interface to R/3 and basic configurations.

The Components of the SAS/ACCESS Interface to R/3

The components that make up the SAS/ACCESS Interface to R/3 System are

1. SAS/ACCESS Interface to R/3 Application
2. Data Dictionary Extract
3. SAS Views of the R/3 data
4. SAS RFC Server

The SAS RFC Server connects to the R/3 System via the R/3 System Application Server.

SAS/ACCESS to R/3 Application
This is the user interface to navigate the metadata, store selections, and generate the SAS Views to access the R/3 data.

Data Dictionary Extract
This is a copy of metadata from the R/3 Data Dictionary. The metadata is stored in SAS data sets that provide information about tables, fields, data models, and entity types in the R/3 System. For example, one table lists all the tables defined to the R/3 System (typically 20 to 50 thousand logical tables); another lists all the fields for each table (typically 400 to 800 thousand fields).

The Data Dictionary Extract is usually installed on the same box as the user interface of the SAS/ACCESS Interface to R/3 or on a fileserver.

The Data Dictionary Extract can be on a separate machine provided that machine has

- SAS System
- SAS/SHARE® or SAS/CONNECT®

SAS Views of the R/3 Data
These are generated by the SAS/ACCESS to R/3 Application.

To use the SAS Views on a particular machine, the SAS/ACCESS Interface to R/3 must be installed.

SAS Views can be used in batch mode.

SAS RFC Server
Normally the SAS RFC Server is installed either on the same machine as the SAS/ACCESS to R/3 Application or the R/3 System (Application Server).

The SAS RFC Server must be installed under Windows NT® or UNIX®. It cannot be installed under Windows95 or Windows 3.1. However, the SAS RFC Server can be installed on a machine without the SAS System.

R/3 System (Application Server)
The SAS RFC Server communicates with the R/3 System Application Server. The installation of the SAS/ACCESS Interface to R/3 includes a number of ABAP/4 objects and appropriate connection parameters.

Basic Configurations

Figures 1 and 2 show basic configurations for the SAS/ACCESS Interface to R/3. In the first configuration the four SAS components of the Interface are all on the same machine:

- SAS/ACCESS to R/3 Application
- Data Dictionary Extract
- SAS Views of the R/3 data
- SAS RFC Server

In Figure 1, the RFC Server is installed on the same host as the SAS System; in Figure 2 it is on the same host as the R/3 System Application Server.

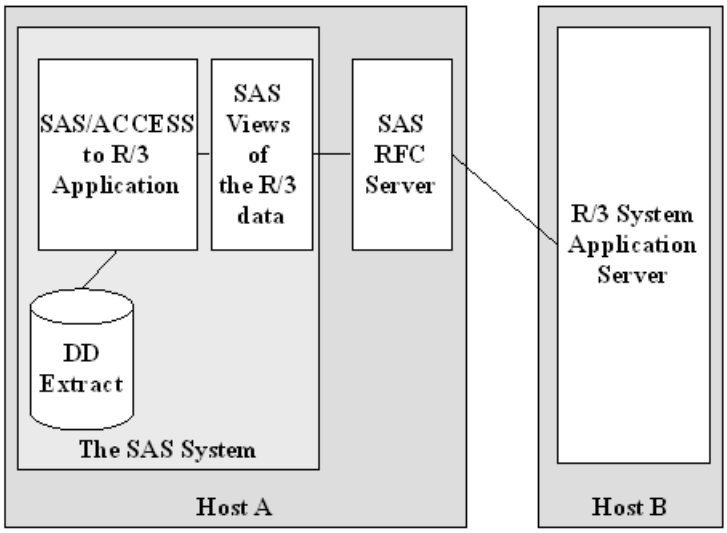

Figure 1 - Basic Configuration (1) of the SAS/ACCESS Interface to R/3 System

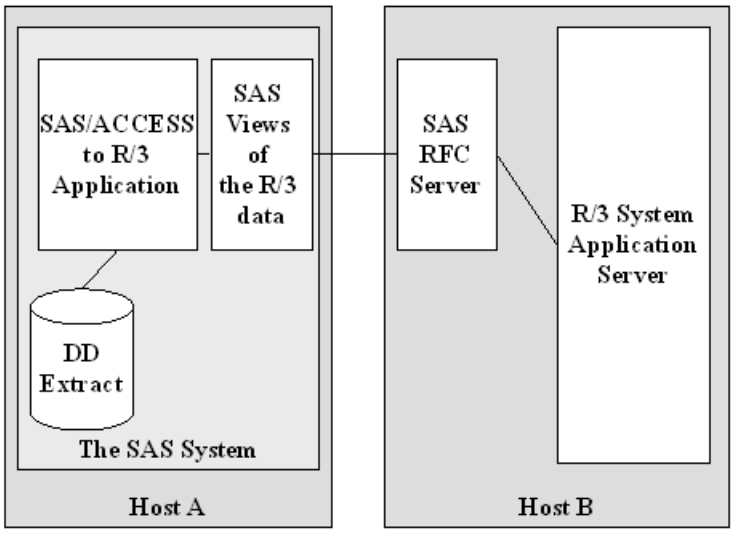

Figure 2 - Basic Configuration (2) of the SAS/ACCESS Interface to R/3 System

Other Configurations

If a basic configuration cannot be used, other configurations are available. In general, the recommendation is to use as few machines as possible to minimize network traffic and offer better system performance.

Figure 3 shows other configurations for the SAS building blocks representing the SAS/ACCESS Interface to R/3 System.

- **Separate SAS RFC Server**

  The SAS RFC Server can run on the SAS System host or on the R/3 System Application Server. It can also run on another server. However, we recommend you use either the SAS System host or the R/3 System Application Server to minimize network traffic.

- **SAS Views on a server**

  The SAS Views of the R/3 data can run on a machine separate from the SAS/ACCESS Interface to R/3 Application. For instance, the user interface of the SAS/ACCESS Interface to R/3 is used on Windows and the views are created on a UNIX host. This configuration requires the installation of the SAS/ACCESS Interface to R/3 Application on both machines: the local client and the remote server. It also requires a SETINIT license on both machines.

- **Separate Data Dictionary Extract**

  The Data Dictionary Extract is on a different machine than the SAS/ACCESS to R/3 Application.

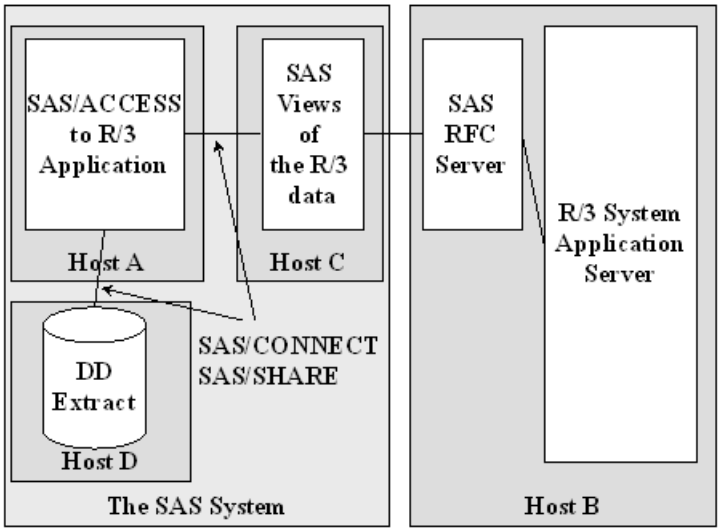

Figure 3 - Other Configurations of the SAS/ACCESS Interface to R/3

Communications

This section describes the communication protocols used between the building blocks of the SAS/ACCESS Interface to R/3. Understanding this is important for determining the parameters used to connect to the R/3 System from the SAS System.

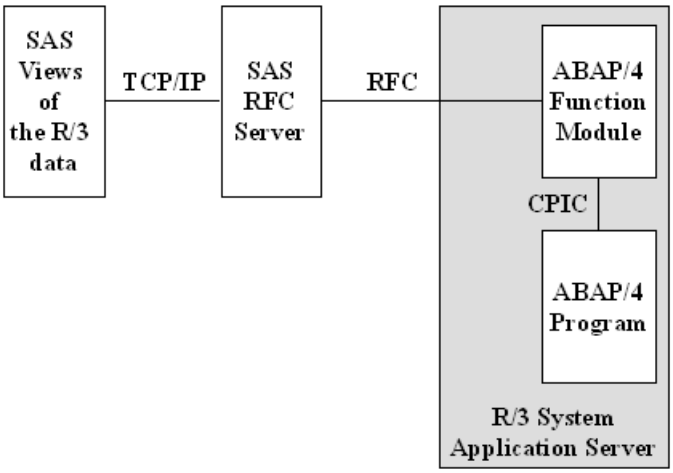

Figure 4 -Communication within the SAS/ACCESS Interface to R/3 System

1. Between the SAS Views and the SAS RFC Server, TCP/IP is used.

   (The default TCP/IP port number is 6991).

2. Between the SAS RFC Server and the R/3 System (Application Server), usually TCP/IP is used. (Other communication protocols can be used. For more information, refer to the RFC documentation from SAP AG).

   Parameters for this link are referred to as RFC parameters and are sometimes stored in a “sideinfo” file.

3. Between the ABAP/4 function module and program CPI-C is used.

   The parameters for this communication link are defined in the R/3 table “TXCOM”.

   The default destination used by the SAS/ACCESS Interface to R/3 is “SELF”.

Related Publications

- *SAS/ACCESS® Interface to R/3 System: User's Guide, Release 3.0, First Edition*
- *SAS® Companion for UNIX Environments, Version 8*
- *SAS® Companion for Microsoft Windows Environment, Version 8*

In addition, the *SAS Installation Instructions* and *System Requirements* for the respective platform may be useful.

Chapter 2 - Pre-Installation

Overview

This chapter outlines the pre-requisites to install and run the SAS/ACCESS Interface to R/3. Some of these pre-requisites require the involvement of other staff, such as the R/3 System administrator.

System Requirements

The installer requires valid operating system user IDs and passwords. For a multi-machine installation, appropriate access to the network and all machines must be included. For Windows NT, administrator privilege is required.

Operating System

SAS/ACCESS Interface to R/3, RFC Server

The RFC Server that is part of the SAS/ACCESS Interface to R/3 requires Windows NT, AIX®, Compaq Tru64™ UNIX® (formerly Compaq's Digital UNIX), HP-UX®, or Solaris®. To install and run the RFC Server as a Windows NT service, NT 4.0 or higher and Windows NT administrator privilege are required.

SAS/ACCESS Interface to R/3, Application

For a list of operating system requirements for the SAS/ACCESS Interface to R/3 user interface, see the system requirements for Version 8 of the SAS System.

The SAS System

SAS/ACCESS Interface to R/3, RFC Server

The RFC Server can run on a machine without the SAS System being installed.

SAS/ACCESS Interface to R/3, Application

The SAS System Version 8 is required.

Required SAS Products

- Base SAS
- SAS/ACCESS Interface to R/3 Software

In addition:

- to use the “Export metadata to Warehouse Administrator” feature, you will need SAS/Warehouse Administrator® Software
- to use the SAS client/server support, you will need SAS/CONNECT or SAS/SHARE

R/3 System

Release

R/3, Release 3.0A or above.

For Windows NT, the librfc32.dll must be available at run time. To use the new functionality to call R/3 function modules the DLL must be Version 4 or higher. Check the version in the property page of the librfc32.dll.

SAPGUI

During the installation of the SAS/ACCESS Interface to R/3 software a SAPGUI is required.

User IDs

R/3 user identifications and passwords are required. The user IDs must have appropriate authorizations to access data and use communication methods. See Authorization Profiles (on page 9) for more information about customizing the authorization.

To install and run the SAS/ACCESS Interface to R/3, the following R/3 user IDs are required:

1. RFC user

   This is an R/3 user ID that is used for the communication link between the SAS RFC Server and the R/3 Application Server. The user type of this ID can be dialog or CPIC.

   Typically, there are several RFC user IDs (one per person). However, to fit varying customer requirements, the RFC and CPIC user IDs can be using one ID which is defined as a CPIC user type.

2. CPIC user

   This is an R/3 user ID that is used "internally" for the communication between the ABAP/4 function module and the ABAP/4 program. The user ID must be defined as a CPIC user type.

3. ABAP/4 Developer user (for installation only)

   For the installation of components, (e.g., function module and ABAP/4 program) in the R/3 system, an ABAP/4 developer user ID is required. For R/3 Release 3.0 and above, a developer user must be registered in the OSS system. The first time a developer user creates a new object, the OSS Access key is entered. Since this user ID is only used for the installation, a suitable existing developer user ID can be used.

Disk Space

Refer to the *System Requirements* documents for the amount of space needed for the SAS/ACCESS Interface to R/3 on the various UNIX and Windows platforms.

Additionally disk space for the data dictionary extract is required. The space requirement varies, but is typically up to 300Mb.

The SAS RFC Server space requirement is 1.5MB.

Connectivity

The SAS RFC Server and the SAS Data Step use TCP/IP socket programming. The TCP/IP network protocol must be installed to use the SAS/ACCESS Interface to R/3. The default port used by the interface is 6991.

The SAS RFC Server and the R/3 Application Server usually use TCP/IP communication. Refer to the RFC documentation from SAP AG. The host of the R/3 Application Server must be known to the host of the RFC Server.

Alternatively, you can use the IP address to identify the R/3 Application Server. The TCP/IP services file must contain entries for the services, ports, and protocols used for the communication. The following is an example for entries in the services file:

```
sapdp00 3200/tcp
sapdp01 3201/tcp
...
sapdp99 3299/tcp
sapgw00 3300/tcp
sapgw01 3301/tcp
...
sapgw99 3399/tcp
sapsp00 3400/tcp
sapsp01 3401/tcp
...
sapsp99 3499/tcp
```

Note: If the SAPGUI is installed on the machine, the TCP/IP Services file already contains these entries.

Authorization Profiles

To install and use the SAS/ACCESS Interface to R/3, a user ID with certain authorizations is required. An authorization has an authorization object. Several authorizations can be bundled together into an authorization profile.

The ABAP/4 developer user ID requires the standard R/3 developer authorizations.

The RFC and CPIC user IDs require authorizations for the following authorization objects:

Object	Minimum Requirement for Values	Example for predefined Authorization	Notes
S_RFC (Auth. check for RFC access)	ACTVT: * RFC_NAME: * RFC_TYPE: *	S_RFC_ALL	starting with R/3 Release 3.1G
S_CPIC (CPIC calls from ABAP/4 programs)	ABAPFORM: * ACTVT: 37, 51 CPICDEST: SELF PROGRAM: SAPLZSAS, ZSASRDTB	S_CPIC_ALL	
S_TABU_DIS (Table Maintenance via standard tools such as SM31)	ACTVT: 03 DICBERCLS: *	S_TABU_SHOW	

The existing authorizations, such as S_CPIC_ALL and S_TABU_SHOW, can be used as standard. Both these authorizations are in authorization profile A_ANZEIGE.

Alternatively, you can set up new authorizations and a new profile. To do this:

1. Ask the R/3 System administrator to set up a new authorization called (for example) SASCPIC. This authorization should be created from the object class ‘Basis: Administration’ and the object ‘CPIC calls from ABAP/4 programs’. The values should be:
   ABAP/4 program name:
   ZSASRDTB and
   SAPLZSAS (or SAPLXXXX, where XXXX is the name of the Function Group chosen for the SAS-supplied Function Module).
   Activity:
   37 and
   51.
   Name of the ABAP/4 FORM routine:
   FLDDESC
   FLDDESC2
   GETDATA and
   TABDESC
   (or simply: *)
   Symbolic destination:
   SELF (or the name chosen for the TXCOM entry).
2. Now, create a new single profile called (for example) SASCPIC. Insert the previously created authorization (SASCPIC) into the profile. Select this authorization from the object class “Basis: Administration” and select SASCPIC from the list.

   Also consider adding other authorities to the new profile, such as
   S_TABU_SHOW (Table Maintenance via standard tools such as SM31).

3. The RFC user(s) and CPIC user(s) should be assigned the authorization profile SASCPIC.

To see the R/3 transaction codes for those tasks, refer to Appendix C.

Chapter 3 - Installing the SAS/ACCESS Interface to R/3

Overview

During the installation of the SAS System Version 8 select to install the SAS/ACCESS Interface to R/3 along with the other products you want to install. Refer to the installation instructions for the SAS System Version 8.2 for your operating system.

Post-Installation Set-up for the SAS RFC Server

Overview

This section describes the setup for the SAS RFC Server after the software has been loaded from the SAS installation CD.

Select one of the following scenarios according to the decisions you made about the configuration of your SAS/ACCESS Interface to R/3. The SAS RFC Server is either installed on the same host as the SAS System or on a remote server. Remote server, in this case, means remote to the SAS System, which also includes the case where the SAS RFC Server is installed on the same host as the R/3 Application Server.

- Windows NT, SAS System host (see below)
- Windows NT, remote server (see page 12)
- UNIX, SAS System host (see page 12)
- UNIX, remote server (see page 13)

Proceed with the section appropriate to your configuration.

Windows NT, SAS System host

The SAS RFC Server is installed as an NT service during the installation of the SAS/ACCESS Interface to R/3 Software.

1. If the DLL `librfc32.dll` is not installed in your Windows system directory, make it available to the SAS RFC Server. Typically the file is in:
   `c:\sappc\sapgui\rfcsdk\bin`

   To make it available:

   - copy it to the install directory (e.g., `!SASROOT\access\sasexe`) or
   - add its directory to PATH or
   - copy it to one of the PATH directories.

2. You have several options to start the SAS RFC Server. You can either start the SAS RFC Server manually or change its properties to start the service automatically when the PC is rebooted.

   - Starting as an NT Service

     1. Display the Services, (on NT 4.0: Start | Settings | Control Panel | Services).
     2. Click the **sasrfc Service**.
     3. Click the **Start** button.

     The optional parameter for the TCP/IP port may be used.

- Automatic Startup as an NT Service

    1. Display the Services, (on NT 4.0: Start | Settings | Control Panel | Services).
    2. Select the **sasrfc Service**.
    3. Click the **Startup** button.
    4. Change the Startup Type to **Automatic** and click **OK**.
    5. Reboot the PC.

Windows NT, remote server

1. Create a directory for the SAS RFC Server (for example, `c:\SAS\SASRFC`).

2. Download the file `ntsasrfc.exe` from the box where the SAS/ACCESS Interface to R/3 is installed to the installation directory on the Windows NT box. If you download the file from a UNIX box, the file is located in `!SASROOT/misc/dbi`; on Windows, the file is in `!SASROOT\access\sasmisc`.

3. Double-click on the self-extracting `ntsasrfc.exe` file to extract the files into the installation directory.

4. To install the SAS RFC Service, start a MS-DOS command prompt and enter the following commands:

    ```
    cd \SAS\SASRFC
    sasrfc -install
    ```

5. If the DLL `librfc32.dll` is not installed in your Windows system directory, make it available to the SAS RFC Server. Typically the file is in `c:\sappc\sapgui\rfcsdk\bin`.

    To make it available:

    - copy it to the install directory (e.g., `c:\SAS\SASRFC`) or
    - add its directory to PATH or
    - copy it to one of the PATH directories

6. You have several options to start the SAS RFC Server. You can either start the SAS RFC Server manually or change its properties to start the service automatically when the PC is rebooted.

    - Starting as an NT Service

        1. Display the Services, (on NT 4.0: Start | Settings | Control Panel | Services).
        2. Click the **sasrfc Service**.
        3. Click the **Start** button.

        The optional parameter for the TCP/IP port may be used.

    - Automatic Startup as an NT Service

        1. Display the Services, (on NT 4.0: Start | Settings | Control Panel | Services).
        2. Select the **sasrfc Service.**
        3. Click the **Startup** button.
        4. Change the Startup Type to **Automatic** and click **OK.**
        5. Reboot the PC.

UNIX, SAS System host

No further actions required.

UNIX, remote server

1. Create a directory for the SAS RFC Server (for example, `/usr/local/sas/sasrfc`).

2. Download the tar file from the box where the SAS/ACCESS Interface to R/3 is installed to the installation directory on the UNIX box. Select the appropriate file for your UNIX system. If you download the file from another UNIX box, the files are located in `!SASROOT/misc/dbi`, on Windows in `!SASROOT\access\sasmisc`. Select

   - `aixrrfc.tar` for AIX
   - `aosfrfc.tar` for Compaq Tru64 UNIX (formerly Compaq's Digital UNIX)
   - `hpuxrfc.tar` for HP-UX
   - `sol2rfc.tar` for Solaris

3. Change to the target installation directory. For the example created in step 1, the command is `cd /usr/local/sas/sasrfc`.

4. To extract the files, run the following command. Replace `hpuxrfc.tar` with the correct filename.

   ```
   tar xvf hpuxrfc.tar
   ```

Installing the R/3 Components

Prerequisites

1. **SAPGUI**

   The installation of the components in the R/3 system requires the SAPGUI software to be installed on your PC or workstation.

   Note: It is not necessary to have the SAPGUI installed on the same PC or workstation where the SAS/ACCESS Interface to R/3 is going to be installed, but you need access to a SAPGUI during the installation.

2. **ABAP/4 Developer User ID**

   A valid R/3 user ID and password is required. The user ID must be registered with the OSS system because new ABAP/4 objects (e.g., a function group, function module, and report) are created in the R/3 system. The first time a developer creates or modifies an object, they must enter the registration key obtained from the OSS system.

Assistance

If your experience with the R/3 ABAP/4 workbench is limited, it is strongly recommended to get assistance from your R/3 System administrator to perform these tasks.

Overview

This section describes the steps to install components of the SAS/ACCESS Interface to R/3 in your R/3 system. It describes how to configure your R/3 System for the SAS interface.

This section describes the basic steps to install a function group, function modules, and ABAP/4 programs. The description is based on R/3 Release 3.0E system. Other releases might be slightly different. For instructions for Release 2.2 of the R/3 System, refer to Appendix E. Differences for R/3 Release 4.0 and above are marked with "Note for Rel.4.0 and above". Skip this part if you are familiar with the ABAP/4 workbench.

Then the specific attributes and parameters to set up the SAP R/3 components are described. Follow these instructions to install the components.

Usually, the components should be installed in your R/3 development system. After the interface has been tested, the R/3 Transport System is used to deliver the objects into your QA or production system.

> **Note:** If you plan to deliver the objects to another instance of the R/3 System, do not select "Local Object" when saving the ABAP/4 function module and program in the development system since "Local Object" cannot be transported to other systems.

> **Note:** Release 8.2 is also shipped with a SAP transport that contains all SAP objects. You can use SAP Transport system to input all the objects into SAP. Refer to Appendix K for more information.

Log on to the R/3 System with the developer user ID using the SAPGUI.

How to create function modules

1. Go to the ABAP/4 Function Library: Initial Screen window by selecting **Function Library** from the ABAP/4 workbench or by entering the transaction code: /nse37

2. Enter the name of the function module in the **Function module** field.

3. Click the **Create** button. This displays the Function Module Create: Administration window. If the function module already exists, check the component **Source code** in the Object components box and click the **Change** button. The Function Module: Edit window then appears.

4. Enter the function group in the Classification box (e.g., ZSAS).

   > **Note for Rel. 4.0 and above:** In the Enter function group dialog box, enter the name of the function group (e.g., ZSAS). This displays the Create Function Module window. Initially the Administration page is selected.

5. Enter the attributes for the function module by selecting the application, entering a short text, and selecting the processing type. For all functions installed for the SAS/ACCESS Interface to R/3, the processing type "Remote Function Call supported" must be selected.

6. Save the new function module by clicking the **Save** button or selecting **Function module→Save** from the pulldown menu.

7. To define the import and export parameters, go back to the ABAP/4 Function Library: Initial Screen, select the import/export parameters interface, and select the Change button. The Function Module Change: Import/Export parameters window appears. Enter the import and export parameters with their reference types.

   > **Note for Rel. 4.0 and above:** Select the import or export page of the Create Function Module window to define the import and export parameters.

8. To define the table parameters of the Remote Function Call program go back to the ABAP/4 Function Library: Initial Screen, select the component Table parameters/exceptions interface, and click the Change button. The Function Module Change: Table Parameters/Exceptions window appears. Enter the table parameters and reference structures and the exceptions in the appropriate fields.

   > **Note for Rel. 4.0 and above:** Select the Tables page of the Create Function Module window to define these table parameters.

9. Save the function module and go back to the ABAP/4 Function Library: Initial Screen.

10. If the SAPGUI is on a different machine than the SAS/ACCESS Interface to R/3 System, download the ABAP/4 source files from the SAS directory to the SAPGUI machine. On Windows NT, the source files are located in directory `!SASROOT\access\sasmisc`; on UNIX, in `!SASROOT/misc/dbi`.

11. To upload the source code, select the component **Source code** and click the **Change** button. The Function Module: Edit window appears. Select **Utilities →Upload** from the pulldown menu. In the Import from a Local File dialog window, enter the name of the external file and click **OK**.

12. Save the function module.

13. To activate the function module, select **Function module → Activate** from the pulldown menu.

Step 1, Create the function group "ZSAS"

Create a new function group for the function modules of the SAS/ACCESS Interface to R/3. The name of the function group must start with "Z" or "Y", such as "**ZSAS**".

1. Go to the ABAP/4 Function Library: Initial Screen window by selecting **Function Library** from the ABAP/4 workbench or by entering the transaction code: /nse37

2. Go to the Create Function Group window by selecting **Goto → Function groups → Create group** from the pulldown menu.

3. Enter the name of the new function group in the Function group field (e.g., **ZSAS**).

4. In the Short text field enter a description of the function group (e.g., **SAS/ACCESS Interface to R/3 System**).

5. Click the **Save** button. The **Create object catalog entry** window appears. Select the object catalog development class that the R/3 System administrator recommends. To select from the list of classes starting with Z, use the down arrow icon and enter **Z***.

6. Click the **Create Request** button to create a new transport request number. The new number is displayed (e.g., A01K902092). This transport request number is required later to transport these objects to other R/3 Systems like Production.

7. Enter a description (e.g., **SAS/ACCESS Interface to R/3 System transport**).

8. Confirm the entry and close the **Create Object Catalog Entry** window.

Step 2, Install the ABAP/4 function module "Z_SAS_READ_TABLE_CPIC"

For general information, see "How to create function modules" on page 14.

1. Enter the function name: Z_SAS_READ_TABLE_CPIC

2. Enter the function group: ZSAS

3. Enter the attributes:

Application	S (for Basis) or leave blank (for all applications).
Short text	SAS/ACCESS Interface to R/3 System: Read Tables.
Processing type	Choose Remote Function Call supported.

Table 1 - Attributes for Function Z_SAS_READ_TABLE_CPIC

4. Enter the TABLE parameters:

Table parameters	Ref. Structure
Z_SAS_WTAB	ABAPTEXT
Z_SAS_LTAB	LISTZEILE
Z_SAS_PTAB	ABAPTEXT
Z_SAS_DTAB	LISTZEILE

Table 2 - Table Parameters for Function Z_SAS_READ_TABLE_CPIC

5. Upload the source code from `!SASROOT/misc/dbi/fread30.ab4` or `!SASROOT\access\sasmisc\fread30.ab4`.

Step 3, Install the ABAP/4 function module "Z_SAS_G_SET_LIST_SELECT"

Note: The function module is new for SAS Release 8.1. It is used to read hierarchies/sets from the R/3 system. The function module only needs to be installed for R/3 Release 4.0 and above. For general information, see "How to create function modules" on page 14.

1. Enter the function name: Z_SAS_G_SET_LIST_SELECT
2. Enter the function group: ZSAS
3. Enter the attributes:

Application	S (for Basis) or leave blank (for all applications).
Short text	SAS/ACCESS Interface to R/3 System: Sets.
Processing type	Choose Remote Function Call supported.

Table 3 - Attributes for Function Z_SAS_G_SET_LIST_SELECT

4. Enter the IMPORT parameters:

Import parameter	Ref. field/structure	Proposal	Optional
CLIENT	SY-MANDT		Yes
SETCLASS	RGSBS-CLASS		Yes
SHORTNAME	RGSBS-TITLE		Yes
KOKRS	SETHIER-KOKRS	'*'	Yes
KTOPL	SETHIER-KTOPL	'*'	Yes

Table 4 - Import Parameters for Function Z_SAS_G_SET_LIST_SELECT

5. Enter the TABLE parameters:

Table parameter	Ref. Structure
MATCHING_SETS	SETLIST
TEXTS	LISTZEILE

Table 5 - Table Parameters for Function Z_SAS_G_SET_LIST_SELECT

6. Upload the source code from `!SASROOT/misc/dbi/zsasglst.ab4` or `!SASROOT\access\sasmisc\zsasglst.ab4`.

Step 4, Install the ABAP/4 function module "Z_SAS_G_SET_TREE_IMPORT"

Note: The function module is new for SAS Release 8.1. It is used to read hierarchies/sets from the R/3 system. For general information, see "How to create function modules" on page 14.

1. Enter the function name: Z_SAS_G_SET_TREE_IMPORT
2. Enter the function group: ZSAS
3. Enter the attributes:

Application	S (for Basis) or leave blank (for all applications).
Short text	SAS/ACCESS Interface to R/3 System: Sets.
Processing type	Choose Remote Function Call supported.

Table 6 - Attributes for Function Z_SAS_G_SET_TREE_IMPORT

4. Enter the IMPORT parameters:

Import parameter	Ref. field/structure	Proposal	Optional
CLIENT	SY-MANDT	SY-MANDT	Yes
FIELDNAME	RGSMH-FIELD	SPACE	Yes
LANGU	SY-LANGU	SY-LANGU	Yes
NO_DESCRIPTIONS	SY-DATAR	SPACE	Yes
NO_RW_INFO	SY-DATAR	SPACE	Yes
SETID	SETHIER-SETID		
TABNAME	RGSMH-TABLE	SPACE	Yes
NO_VARIABLE_REPLACEMENT	SY-DATAR	SPACE	Yes
ROOT_HEADER_ONLY	SY-DATAR	SPACE	Yes
NO_TABLE_BUFFERING	SY-DATAR	SPACE	Yes

Table 7 - Import Parameters for Function Z_SAS_G_SET_TREE_IMPORT

5. Enter the EXPORT parameters:

Export parameter	Ref. field/structure
SET_NOT_TRANSPARENT	SY-DATAR

Table 8 - Export Parameters for Function Z_SAS_G_SET_TREE_IMPORT

6. Enter the TABLE parameters:

Table parameter	Ref. Structure	Optional
SET_HIERARCHY	SETHIER	Yes
SET_VALUES	SETVALUES	Yes

Table 9 - Table Parameters for Function Z_SAS_G_SET_TREE_IMPORT

7. Enter the Exceptions:

Exception
SET_NOT_FOUND
ILLEGAL_FIELD_REPLACEMENT
ILLEGAL_TABLE_REPLACEMENT

Table 10 - Exceptions for Function Z_SAS_G_SET_TREE_IMPORT

8. Upload the source code from `!SASROOT/misc/dbi/zsastree.ab4` or `!SASROOT\access\sasmisc\zsastree.ab4`.

Step 5, Install the ABAP/4 program "ZSASRDTB"

1. Create a new program.

Go to the ABAP/4 Editor: Initial Screen window by selecting ABAP/4 program from the ABAP/4 workbench or by entering the transaction code: /nse38.

In the **Program** field, enter the name of the ABAP/4 report i.e. **ZSASRDTB**.

Click the **Create** button. The ABAP/4: Program Attributes window appears.

2. **Define the program attributes.**

   Select the following parameters:

Title	SAS/ACCESS Interface to R/3 System: Read Tables.
Type	1 (Online program; Executable program)
Status	K (Customer production program)
Application	S (Basis)
Authorization group	leave blank or fill in program group provided by R/3 System Administrator. This allows to group programs for authorization checks.
Development class	select the development class assigned by the R/3 System Administrator. The development class is important for the transport to other systems.
Logical database	leave blank or D$ (Processing without database)
From Application	leave blank or S (Basis System)
Selection screen	leave blank

Table 11 - Attributes for Program ZSASRDTB.

   Save the new ABAP/4 program by clicking the **Save** button or selecting **Program →Save** from the pulldown menu

   The Create Object Catalog Entry window appears. Tab into the transport request field and use the down arrow icon to select the previously assigned transport request number. For example, **A01K90202 SAS/ACCESS Interface to R/3, Release 3.**

   Close the Create Object Catalog Entry window. Go back to the ABAP/4 Editor: Initial Screen window.

3. **Upload the ABAP/4 source code.**

   If the SAPGUI is on a different machine than the SAS/ACCESS Interface to R/3 System, download the file `zsasrdtb.ab4` to the SAPGUI machine. On Windows NT, the file is located in directory `!SASROOT\access\sasmisc`; on UNIX, in `!SASROOT/misc/dbi`.

   To upload the source code select the component **Source code** and click the **Change** button. The ABAP/4 Editor: Edit Program window appears.

   Select **Utilities → Upload** from the pulldown menu.

   In the Import from a Local File dialog window enter the name of the external file (e.g., on UNIX `!SASROOT/misc/dbi/zsasrdtb4`; on Windows, **`!SASROOT\sasmisc\zsasrdtb.ab4`** and click **OK**.

4. **Check the syntax.**

   To check the syntax of the ABAP/4 program click the **Check** button or select **Program → Check → Current Program** from the pulldown menu.

5. **Save the ABAP/4 program.**

Step 6, Maintain the communication parameters in R/3 table "TXCOM"

As shown in Figure 4 (on page 5), the ABAP/4 function module and program used by the SAS/ACCESS Interface to R/3 communicate via CPI-C. The parameters for this communication link are defined in the R/3 table "TXCOM". The default destination used by the SAS/ACCESS Interface to R/3 is "SELF".

To define this destination and its parameters in the R/3 System:

1. Go to the Table Maintenance window by entering the transaction code: /nsm31.
2. In the table field enter the table name **TXCOM** and then click the **Maintain** button. The Maintain Table window appears.
3. To add a new entry to the table TXCOM select **XCOM entry → Create** from the pulldown menu.
4. In the fields in the Create XCOM Entry window enter the parameters for the connection. An example follows.

   Note: The values in the following table are just examples. Enter the correct values for the local R/3 System. The values in *italic* are likely to be different.

Field	Example	Comment
Dest.	SELF	the symbolic destination
LU	*host1*	the logical unit. If the partner program is an R/3 System the logical unit is the R/3 hostname
TP	*sapdp00*	the transaction program, of the form sapdp*nn* where *nn* is the value of the system number (SYS).
Log	I	the communication type. **I** for internal connection from one R/3 System to another R/3 System.
Gateway host	*host1*	name of the machine where the gateway is installed and running
Gateway service	*sapgw00*	the TCP/IP service of the gateway, of the form sapgw*nn* where *nn* is the value of the system number (SYS).

Table 12 - TXCOM Parameters

5. Save the entry by clicking the **Save** button.

Notes:

1. TXCOM entries are case-sensitive. When creating TXCOM entries, the case entered needs to correspond **exactly** as it appears in the install instructions.

2. If the name of the gateway host exceeds the length of the input field, define a key for this host in table THOST.

3. If you have problems finding the correct entries for the gateway host and gateway service, check:

   - the active gateway via ABAP/4 report RSPFPAR using transaction SE38. Check the entries:

     ```
     rdisp/gateway
     rdisp/gwservice
     ```

   - the gateway and the services entry in the profile DEFAULT.PFL by:

     ```
     rdisp/gateway = <GW host name>
     rdisp/gwservice = <sapgwnn>
     ```

     where the GW host name is the host where the R/3 gateway process runs. It must be defined unambiguously in /etc/hosts.

Step 7, Transport the ABAP/4 Function Module and Program

Once the function module and program are installed, they must be released from the R/3 Development system and then transported. This allows SAS Views to read data from different R/3 Systems such as Development and Production.

To do this:

1. From the R/3 System Main menu, go to the ABAP/4 Development Workbench: **Tools → ABAP/4 Workbench**
2. From the pulldown menu, select **Overview → Workbench Organiser**.
3. Click the **Display** button on the bottom left of the screen.
4. A tree appears that displays the transportable items. Select the previously assigned transport request number (e.g., A01K902092 SAS/ACCESS Interface to R/3, Release 2).
5. Click the - sign and then click on the new sublevel that appears. Continue doing this until no further sublevel appears. (It is important to reach the lowest sublevel since a parent can only be released after all its children have been released).
6. Select the lowest item by clicking on it and then release it by clicking the **Release** button. (When released, an item changes its background color). Release the next lowest item in the same way. Ensure all levels of the request are released.
7. When the top level is released (after all its children have been released) the export is automatically started. The SAPGUI displays a message.
8. When complete, check that no errors occurred by returning to the main workbench screen. Select **Goto → Transport log** from the pulldown menu.
9. If no errors occurred, inform the R/3 System administrator of the transport request number for the import to other R/3 Systems. If necessary, this transfer can be performed later when the application goes into production.

The Data Dictionary Extract

The SAS/ACCESS Interface to R/3 uses a copy of metadata from the R/3 System for navigation and to generate the program to read R/3 data. Extracting the necessary metadata from the R/3 data dictionary is part of the installation process. Before starting the dictionary extract process the RFC Server must be installed and the R/3 System must be configured for the SAS/ACCESS Interface to R/3.

If the R/3 Systems such as Development and Production are at the same level/version/release, then extract only the data dictionary from the R/3 Development system. However, if the level/version/release of other system(s) are different from that of Development, extract the data dictionary for each different system. This is necessary since the metadata is different for each level/version/release of the R/3 System.

If new R/3 System structures are added or existing ones changed, re-extract the metadata to reflect those changes.

Step 1, Start the RFC server

Note: For complete instructions regarding how to start and stop the RFC server, refer to *SAS/ACCESS- Interface to R/3 System: User's Guide, Release 3.0, First Edition.*

For UNIX

When the RFC server is successfully linked to the RFC SDK library, it is located in

```
!SASROOT/saspgm/bin/sasrfc
```

Enter the command:

```
sasrfc [-p portno] [-d 0|1|2]
(e.g. sasrfc -p 6992 -d 1)
```

where

- portno is the port number, default 6991
- d is the diagnostic level, default 0
- [...] indicates optional
- | indicates a choice of values.

When using diagnostic level 0, the server runs as a daemon process. After successful initialization, all messages are routed to syslog.

When using diagnostic level 1, the server runs as a normal process. Messages are routed to file `sasrfc.log`.

Diagnostic level 2 is the same as diagnostic level 1 with the addition of extra diagnostic messages.

For Windows NT

Use either of the following methods to start the SAS RFC Server on Windows NT:

- **Starting as a Console Application**

  In a DOS window, change to the install directory and start the server with the debug parameter. For example,

  ```
  cd \sas\access\sasexe
  sasrfc -debug
  ```

  The default TCP/IP port is 6991. Use an optional parameter to specify an alternative e.g.

  ```
  sasrfc -debug -p 6991
  ```

  To stop the server, use **CTRL+C**.

- **Starting as an NT Service**

  1. Display the Services using Start | Settings | Control Panel | Services.
  2. Click the sasrfc Service.
  3. Click the **Start** button.

  The optional parameter for the TCP/IP port may be used.

Step 2, Logon to the R/3 System

Use the GUI of the SAS/ACCESS Interface to R/3 to connect to the R/3 System. To start the GUI, enter `%r3access` in the command line of the SAS session. Double-click the **Logon** icon. In the Logon to R/3 window and the Advanced Parameters window, enter the connection parameters. Table 13 lists the connection parameters and a description.

(To review the communication requirements, refer to Figure 4 on page 5).

Enter the connection parameters:

Parameter	**Comment**
Connection ID	SAS internal connection identifier (7 characters, SAS name), default: CONN1
TCP/IP host	name of the RFC server host; default: localhost
TCP/IP port	port number for RFC server; default: 6991
User ID (RFC)	mandatory, R/3 user ID
Password (RFC)	mandatory, R/3 password
Client (RFC)	mandatory, R/3 client. Client is always three characters - include leading zeros e.g. 040.
Language (RFC)	mandatory, R/3 logon language.
Destination (RFC)	name of the RFC destination as defined in a ‘sideinfo’ file. If a ‘sideinfo’ file is used, specify the RFC destination and leave the RFC host field blank. Either the RFC destination or the RFC host must be specified, but not both.
Host (RFC)	host name of the R/3 target system. Specify the host name in this field only if no ‘sideinfo’ file is used. Either the RFC destination or the RFC host must be specified, but not both.
System number	system number of the R/3 target system. The default value is 0.
Gateway service	the gateway service of the intermediate gateway of the form sapgwnn where nn is the system number. The default service is sapgw00.
Gateway host	the hostname of the intermediate gateway
R/3 function module	the R/3 function module used for the SAS/ACCESS Interface to R/3 System. Default: Z_SAS_READ_TABLE_CPIC.
User ID (CPIC)	the R/3 user ID used internally to communicate between the ABAP/4 function module and the ABAP/4 program to read the R/3 data. This user ID must be CPIC enabled. Do not enter the CPIC user ID, if the RFC user ID can be used as a default.
Client (CPIC)	R/3 client, for explanation see User ID (CPIC).
Password (CPIC)	R/3 password, for explanation see User ID (CPIC).
Language (CPIC)	R/3 logon language, for explanation see User ID (CPIC).
Destination (CPIC)	the name of the CPIC destination internally used for communication between the ABAP/4 function module and the ABAP/4 program. The destination must be defined in the R/3 table TXCOM. Default: SELF.

Table 13 - Connection Parameters

Note 1: Two R/3 Systems such as Development and Production can run on one machine. If no "sideinfo" file is available, set the system number (SYS) and gateway service (GWSERV) fields in the connection parameters to access the correct R/3 System.

Note 2: The "sideinfo" file contains side information to communicate between the SAS RFC Server and the R/3 System (Application Server) (ABAP/4 function module). Its contents are similar to the connection parameters in the R/3 table TXCOM. For example,
DEST=mydest
LU=host1
TP=sapdp00
GWHOST=host1
GWSERV=sapgw00
PROTOCOL=I

Using a "sideinfo" file with the SAS RFC Server

For UNIX

1. Edit/create the sideinfo file (named `sideinfo`)
2. Copy the sideinfo file to the desired location, such as `!SASROOT/saspgm/bin`.
3. Set the environment variable SIDE_INFO to the fully qualified path name. For example,

   for csh

   ```
   setenv SIDE_INFO /usr/local/sas/saspgm/bin/sideinfo
   ```

   for ksh

   ```
   export SIDE_INFO=/usr/local/sas/saspgm/bin/sideinfo
   ```

For Windows NT

1. Edit/create the sideinfo file (named `sideinfo`).
2. Copy the sideinfo file to the desired location, such as `!SASROOT\access\sasexe`.
3. Set the environment variable SIDE_INFO to the fully qualified path name. For example,

   ```
   SET SIDE_INFO=c:\sas\sr3\sideinfo
   ```

Step 3, Start the extraction program

A wizard interface guides you through loading the metadata into SAS. To start the wizard, double-click on the **Wizard to Load Metadata** icon.

The Welcome window is displayed. Click on the **Next** button.

In the Metadata Destination window, select the SAS library for the metadata extract. The library R3LIB is the default value used in the SAS/ACCESS Interface to R/3. Click on the **Next** button.

In the Metadata Selection window, select the metadata to be extracted from the R/3 system. You can subset the metadata extract by selecting or deselecting components of the metadata. To subset the table and field extraction, select the **Range** button and enter a range of tables in the Table Subset window. In the Metadata Selection window, click on the **Next** button.

In the Parameter window enter the connection ID, the language for the metadata extract, and the R/3 Release. Select if the new metadata should be merged into the existing extract. Click on the **Next** button.

In the Select File window, you can enter a file name for the SAS extraction program to be saved to. You can use the file to repeat the metadata extract or set up SAS batch jobs for the extract. Click on the **Next** button.

In the Begin Metadata Extract window, review your settings and click on the Finish button to start the metadata extract.

Step 4, Logoff from the R/3 System

Use the GUI to log off.

Installation of the basic configuration is now complete. To ensure it has been successful, start the SAS/ACCESS Interface to R/3 (see page 22) and test the installation.

Data Dictionary Extract in batch

The SAS sample program `sr3bprof.sas` contains an example of how to create a profile entry with the connection parameters and how to log on to R/3 using the profile.

Modify the sample program `sr3bprof.sas` to log on to R/3 in batch. For example:

```
/* Use sr3bprof.sas to create the profile. */


/* Logon to R/3. See program sr3bprof.sas */
%r3connb(profile=&profile, libref=&library, function=OPEN);

/* Assign the libref for the Data Dictionary Extract(s). */
libname r3lib 'the-location-of-the-Extracts';

/* Extract the Data Dictionary Information. */
%extrr3dd(conn=&cconn, language=E, merge=N, outlib=R3LIB);

/* Logoff. */
%r3connb(conn=&conn, function=CLOSE);
```

Separate Data Dictionary Extract(s)

To install, run the Data Dictionary extraction program on the remote machine.

Chapter 4 - Start the Interface

To start the SAS/ACCESS Interface to R/3 System from the SAS System, enter one of the following commands on the SAS command line:

```
%r3access
```

or

```
afa c=sashelp.sr3.primary.scl
```

Test the installation

1. Click the “List of tables” icon on the GUI.
2. Enter the table name “T001”.
3. Click the Properties button.
4. Click the Show Data button.

If the table T001 is displayed correctly, then the installation is working correctly.

Functionality

If no connection to the R/3 System is available, most of the functionality of the SAS/ACCESS Interface to R/3, such as navigating the data model, creating SAS Views to R/3 tables, and exporting metadata, is unaffected.

However, data extraction requires that the SAS RFC Server be running. If the SAS RFC Server is not running, a return code is generated. See "Start the RFC Server" on page 22. For more information, refer to *SAS/ACCESS® Interface to R/3 System: User's Guide, Release 3.0, First Edition*.

Appendix A - Upgrading from Release 1.1 to Release 3.0

General

Release 1.1 was replaced by Release 2.0. If you have been using the SAS/ACCESS Interface to R/3, Release 2.0, see Appendix B.

To install Release 3.0 where Release 1.1 has been previously installed, carry out the installation instructions but note the following conversion issues.

In general, there is upward compatibility between Release 1.1 and Release 3.0. This means that Release 3.0 works with descriptors, connections, and SAS Views created under Release 1.1. However, in some cases, a conversion process is needed; see the below for details.

Release 1.1 does not support descriptors and connections created under Release 2.0 or Release 3.0. If these releases are run at the same time, keep separate libraries for Release 1.1, Release 2.0, and Release 3.0.

Descriptors

A conversion utility is supplied to make the descriptors created under Release 1.1 visible under Release 3.0. To do this:

1. Copy the R11LIB.R3DESC catalog to R30LIB.R3DESC.
2. A) To convert all Release 1.1 descriptors in a SAS catalog submit the conversion macro:

   ```
   %r3descnv(lib=R30LIB)
   ```

   B) To convert a single Release 1.1 descriptor in the copied catalog (for example R20LIB.R3DESC.R11DESC.SLIST) in a SAS catalog, submit the conversion macro:

   ```
   %r3descnv(lib=R30LIB, ent=R11DESC)
   ```
3. Repeat for all Release 1.1 R3DESC catalogs and descriptors needed under Release 3.0.

Connections

A conversion utility is supplied to convert Release 1.1 connection objects into Release 3.0 connection profiles. To do so:

1. A) To convert all Release 1.1 connection objects in SAS catalog R11LIB.R3CONN, submit the conversion macro:

   ```
   %r3concnv(incat=R11LIB.R3CONN, outlib=R30LIB);
   run;
   ```

   B) To convert a single Release 1.1 connection object, such as R11LIB.R3CONN.TESTCONN.SOURCE, submit the conversion macro:

   ```
   %r3concnv(incat=R11LIB.R3CONN, outlib=R30LIB, ent=TESTCONN);
   run;
   ```

SAS Views

There are no conversion issues for the SAS Views created under Release 1.1.

Appendix B - Upgrading from Release 2.0 to Release 3.0

We recommend you re-install the RFC Server and upload the new source code for the ABAP/4 program and function module.

Since Release 2.0 of the SAS/ACCESS Interface to R/3 was based on Release 6.12 of the SAS System, and Release 3.0 is based on Version 8, the following conversion issues occur.

Descriptors

Descriptors written with the SAS/ACCESS Interface to R/3 Release 2.0 can be read using Release 3.0 of the interface.

The descriptors cannot be updated.

To copy the descriptors into a Version 8 library, run the following program. The libref V6LIB is assigned to the Release 6.12 library, and V8LIB is assigned to the new Version 8 library.

```
proc copy out=V8LIB in=V6LIB;
    select r3desc /memtype=CATALOG;
    select _r3desc_ /memtype=DATA;
run;
```

Connections

The old connection profiles can be read. However, we recommend you copy the old profile data sets into a new Version 8 library. The connection profiles are stored in <libref>.R3CONN.

SAS Views

The views created with Release 2.0 of the interface can be read in Release 3.0.

Data Dictionary Extract

Data dictionary extracts for Release 2.0 of the interface can be used with the new release.

Appendix C - Selected R/3 Transaction Codes

This is a list of transaction codes that might be useful during installation.

Enter the transaction code in the SAPGUI command line preceded by /n (i.e., a slash followed by the letter "n"). For example, to call the ABAP/4 Editor, enter

/nse38

Note: Commands are not case-sensitive.

- Authorizations, Profiles, and Users

  SU01
  : Maintain Users

  SU02
  : Maintain Profiles

  SU03
  : Maintain Authorizations

- ABAP/4 Functions and Programs

  SE37
  : Function Library

    Alternatively, from the R/3 System Main menu select:

    Tools → ABAP/4 Workbench

    Click the **Function Library** button to view the ABAP/4 Function Library: Initial Screen window.

  SE38
  : ABAP/4 Editor

    Alternatively, from the R/3 System Main menu, select
    Tools → ABAP/4 Workbench
    Click the ABAP/4 Editor button to view the ABAP/4 Editor: Initial Screen window.

- View tables and table maintenance

  SE16
  : Display a table

  SM31
  : Table maintenance

- System log

  ST22
  : ABAP/4 dump analysis

  SM21
  : System log

- RFC Destinations

  SM59
  : Display and maintain RFC destinations

Appendix D - Error Messages

All Operating Systems

CPIC User Authorization

```
ERROR : RFC operation/code CallReceive
ERROR : info :
ERROR : key : COMMUNICATION_INIT_NO_AUTH
ERROR : status : EXCEPTION SYSTEM_FAILURE RAISED
ERROR : message : No authorization for CPIC destination SELF .
ERROR : internal :
ERROR : getdata
```

The destination SELF is created during the installation of SAS/ACCESS Interface to R/3 System (by updating table TXCOM).

The rules for using CPIC destinations were changed at release 3.1H. Now it is necessary to authorize the RFC user as well as the CPIC user to use CPIC comms.

Set the minimum permissions needed (see page 9) since it is usually undesirable to give all permissions to the RFC user(s).

Gateway Service not found

```
ERROR: Gateway service sapgwnn not found
```

Check that the TCP/IP services file contains the required entries. See also "Connectivity" (page 8) in Chapter 2.

Hostname not found

```
ERROR: Host hostname not found
```

Check that the TCP/IP hosts file contains an entry for the specified host or use the IP address. See "Connectivity" (page 8) in Chapter 2.

No logical assign for filename...

```
ERROR: No logical assign for filename CONN1D.
ERROR: No logical assign for filename CONN1R.
```

This error occurs if a previously created SAS view is read and the connection ID, such as CONN1, used while the view was created, is not connected to the R/3 System. To establish the connection, use the Logon icon of the SAS/ACCESS Interface to R/3.

UNIX

Correct version of RFC SDK

R/3 System error code : CALL_FUNCTION_WRONG_VALUE_LENG
in the dev_rfc trace file and a core dump.

This problem might be resolved by using a later version of the RFC SDK, preferably one in which the file `include/saprfc.h` contains the line
`#define RFC_VERSION 3`

Linking the SAS RFC Server on AIX

At install time, with recent levels of AIX (such as 4.2) and R/3 3.1, **"**unresolved symbol" errors may appear. The error message is

```
ld: 0711-317 ERROR: Undefined symbol: .__set_errno128
```

For symbol errno_128, an extra link parameter **"**-lm" is needed. Follow the instructions in the section "UNIX, remote server" (see page 13) to link the RFC Server on the AIX box. When executing the install script, select the command file **"**ld30_5" from the provided list.

Linking the SAS RFC Server on HP-UX

At install time with HP-UX 11.0, the following error message appears:

```
ld: Unsatisfied symbols:
    ldexp (code)
    frexp (code)
    matherr
```

To solve this problem, follow the instructions in the "UNIX, remote server" (see page 13) to link the RFC Server on the local HP-UX box. When executing the install script, select the command file **"**ld30_3" from the provided list.

Internal data table ended prematurely

On UNIX, an error has been reported when extracting the TABLES and FIELDS information. Th symptom is the message "ERROR Internal data table ended prematurely".

No fix is available, but a workaround is to run the RFC Server with diagnostics enabled. See the *SAS/ACCESS® Interface to R/3 System: User's Guide, Release 3.0,* Chapter 5.

Appendix E - Installation for R/3 Release 2.2

Log on to the R/3 System with the developer user ID using the SAPGUI.

Step 1, Create the function group "ZSAS"

Create a new function group for the function module **“ Z_SAS_READ_TABLE_CPIC**. The name of the function group is, for example, **ZSAS**.

1. Go to the ABAP/4 Function Library: Initial Screen window by selecting **Function Library** from the ABAP/4 workbench or by entering the transaction code: `/nse37`

2. Go to the Create Function Group window by selecting **Goto → Function groups → Create group** from the pulldown menu.

   Enter the name of the new function group in the Function group field, (e.g., **ZSAS)**.

   In the Short text field, enter a description of the function group (e.g., **SAS/ACCESS Interface to R/3 System)**.

   Click the **Save** button. The **Create object catalog entry** window appears. Select the object catalog development class that the R/3 System administrator recommends. To select from the list of classes starting with Z, use the down arrow icon and enter **Z***.

   Click the **Create Request** button to create a new transport request number. The new number is displayed (e.g., A01K902092). This transport request number is required later to transport these objects to other R/3 Systems such as Production.

   Enter a description (e.g., SAS/ACCESS Interface to R/3 System transport).

   Confirm the entry and close the **Create Object Catalog Entry** window.

Step 2, Create the structure "SASLIST"

To install the function module in an R/3 Release 2.2 System, define the structure SASLIST.

1. Go back to the R/3 System Main menu.

   Go to the ABAP/4 Development Workbench by selecting **Tools → ABAP/4 Workbench**.

   Click the **Data Dictionary** button to view the Dictionary: Initial Screen.

2. Enter the name **SASLIST** in the Object name field and click the **Structures** radio box.

   To create the structure, click the **Create** button.

   Enter the following values

   - Field: LINE
   - Data elem.: LISTLINE

   and save the new structure.

Step 3, Install the ABAP/4 function module Z_SAS_READ_TABLE_CPIC

To install the ABAP/4 function module **Z_SAS_READ_TABLE_CPIC**:

1. **Create the function module.**

   Go to the ABAP/4 Function Library: Initial Screen window by entering the transaction code: /nse37

   Enter the name of the function module in the **Function module** field (i.e., **Z_SAS_READ_TABLE_CPIC)**.

   Click the **Create** button. This displays the Function Module Create: Administration window. (Press **Enter** to ignore any warning messages.) If the function module already exists, check the component **Source code** in the Object components box and click the **Change** button. The Function Module: Edit Z_SAS_READ_TABLE_CPIC window then appears.

   Enter the function group in the Classification box.

   Enter the following parameters for the function module:

Application	**S** (for Basis) or leave blank (for all applications).
Short text	**SAS/ACCESS Interface to R/3 System: Read Tables.**
Processing type	Choose **Remote Function Call supported**.

   Table 14 - Parameter for Function Z_SAS_READ_TABLE_CPIC

   Save the new function module by clicking the **Save** button or selecting **Function module → Save** from the pulldown menu.

2. **Define the interface.**

   To define the table parameters of the Remote Function Call program, go back to the ABAP/4 Function Library: Initial Screen, select the component **Table parameters/exceptions interface,** and click the **Change** button. The Function Module Change: Table Parameters/Exceptions window appears.

   Enter the following Table parameters and Reference structures in the appropriate fields:

Table parameters	Ref. Structure
Z_SAS_WTAB	ABAPTEXT
Z_SAS_LTAB	SASLIST
Z_SAS_PTAB	ABAPTEXT
Z_SAS_DTAB	SASLIST

   Table 15 - Table Parameters for Function Z_SAS_READ_TABLE_CPIC for R/3 Release 2.2

   Save the function module and go back to the ABAP/4 Function Library: Initial Screen.

3. **Upload the ABAP/4 source code.**

   If the SAPGUI is on a different machine than the SAS/ACCESS Interface to R/3 System, download the file `fread30.ab4` to the SAPGUI machine. On Windows NT, the file is located in directory `!SASROOT\access\sasmisc`; on UNIX, in `!SASROOT/misc/dbi`.

   To upload the source code, select the component **Source code** and click the **Change** button. The Function Module: Edit window appears.

   Select **Utilities → Upload** from the pulldown menu.

   In the Import from a Local File dialog window, enter the name of the external file (e.g., on UNIX `!SASROOT/misc/dbi/fread30.ab4`; for Windows, `!SASROOT\access\sasmisc\fread30.ab4`) and click **OK**.

   Save the function module.

4. **Activate the function module.**

   To activate the function module select **Function module → Activate** from the pulldown menu.

Step 4, Maintain the communication parameters in R/3 table "TXCOM"

See Step 6, Maintain the communication parameters in R/3 table "TXCOM" in Chapter 3 (page 20).

Step 5, Transport the ABAP/4 Function Module and Program

See Step 7, Transport the ABAP/4 Function module and Program in Chapter 3 (page 21).

Appendix F - Q&A

How do I change an expired password for a CPI-C user ID?

Use the following procedure:

1. Have the R/3 System administrator change the user type to Dialog.
2. Use the SAPGUI to log on using this R/3 user ID and change the password. Log off.
3. Have the R/3 System administrator change the user type back to CPIC.

Appendix G - Pre-installation Checklist

Before installing the SAS/ACCESS Interface to R/3, the following information must be available.

Documenting this information (together with the Installation table that follows) simplifies installation and on-going maintenance considerably

The checklist is broken down into sections A, B, and C. Section A is general information and can be provided by the SAS Account Rep. Section B should be completed by the person maintaining the SAS environment. The person maintaining the R/3 environment should complete section C.

Section B clarifies where SAS/ACCESS Interface to R/3 is to be installed and where the extracted R/3 metadata is to reside. Section C clarifies where SAP AG RFC Software Development Kit resides and which R/3 systems you want to access.

Section A General Information

When:	
Company name:	
Address:	
Name of SAS Account rep: Phone number: E-mail:	
Name of SAS person responsible for the installation: Phone number: E-mail:	
Name of Customer Contact: Phone number: E-mail:	

Section B SAS Environment

SAS/ACCESS Interface to R/3, Application

Name of SAS contact: Phone number: E-mail:	
Name of Network contact: Phone number: E-mail:	
Hostname:	
IP address:	
Operating System/version no:	
OS User ID/Password:	
If Windows: User ID has administrator rights?	☐ Yes
Windows: Screen-saver password (or disabled):	
Path where The SAS System is installed, i.e. c:\Program Files\SAS Institute\SAS\V8, /usr/local/sas	
SAS setinit includes SAS/ACCESS to R/3 (provided by SAS Institute):	☐ Yes
If UNIX: has X-Windows?	☐ Yes
UNIX root password:	

Data Dictionary Extract(s)

If you have multiple versions of R/3 (for example, 3.1H and 4.0B) then the R/3 metadata has to be extracted from each system. Complete one of these tables for each metadata extract.

Hostname: IP address: (Typically this is the box that has SAS/ACCESS to R/3.)	
Drive/Path where Data Dictionary is to be installed:	
R/3 **3.1h or less 250 MB** disk space required. R/3 **4.x or higher 1GB** disk space required.	☐ Yes, disk space is available.

SAS Views on separate machine

Hostname:	
IP address:	
Operating System/version no:	
OS User ID/Password:	
Windows NT: User ID has administrator rights?	☐ Yes
Windows: Screen-saver password (or disabled):	
UNIX root password:	
Path where The SAS System is installed, i.e. c:\Program Files\SAS Institute\SAS\V8, /usr/local/sas	
SAS setinit includes SAS/ACCESS to R/3 (provided by SAS Institute):	☐ Yes

Section C System R/3 Environment

General Information

Name of R/3 administrator available to help with install: Phone number: E-mail:	
Name of R/3 System developer available to help with install: Phone number: E-mail:	
Alternately, ABAP/4 developer user ID. Client: User ID: Password: OSS access key (if user ID not previously used for development):	
If ABAP/4 developer user ID not available, normal dialog user. Client: User ID: Password:	

RFC Server

Complete one of these tables for each RFC server.

Hostname:	
IP address:	
Location of RFC SDK i.e. /usr/sap/TST/exe/run/rfcsdk	
Windows NT: Location of librfc32.dll i.e. c:\sappc\sapgui\rfcsdk\bin	
TCP/IP port no. (default 6991)	
TCP/IP hosts file entry for R/3 System (Application Server) i.e. 1.2.3.4 r3server	
TCP/IP services file entries i.e. sapdp00 3200/tcp	

R/3 System

This is information about the R/3 System that you want to pull data from. Complete one of these tables for each R/3 System instance you want to access.

Application server hostname:	
IP address:	
R/3 System Release/level i.e. 3.1h:	
System ID i.e. A01	
Sideinfo file is used for communication parameters?	☐ Yes ☐ No
If yes, full path and name of sideinfo file:	
RFC User ID – dialog user. Client: User ID: Password:	
CPIC user ID – CPIC enabled. Client: User ID: Password:	
System number (SYS) i.e. 00	
Language i.e. E for English	
Gateway host: (if different)	
Gateway service i.e. sapgw00	
Transaction program i.e. sapdp00	

SAPGUI

SAPGUI is installed on hostname:	
UNIX: has X-Windows?	☐ Yes

Appendix H - Installation Information

During installation, note the following information.

Location of Data Dictionary Extract(s) i.e. `c:\sas\A01\r3lib`	
Name of new function group i.e. ZSAS	
Transport request number: i.e. A01K902092	

Appendix I - Batch RFC Installation

Overview

The batch RFC server software allows for concurrent processing of data transfer requests using SAP batch processing functionality. Using the batch RFC server eliminates the need to use two dialog processes that are currently used with the standard RFC server. The batch RFC server allows for long extracts without the worry of timing out.

The following diagram depicts the basic architecture.

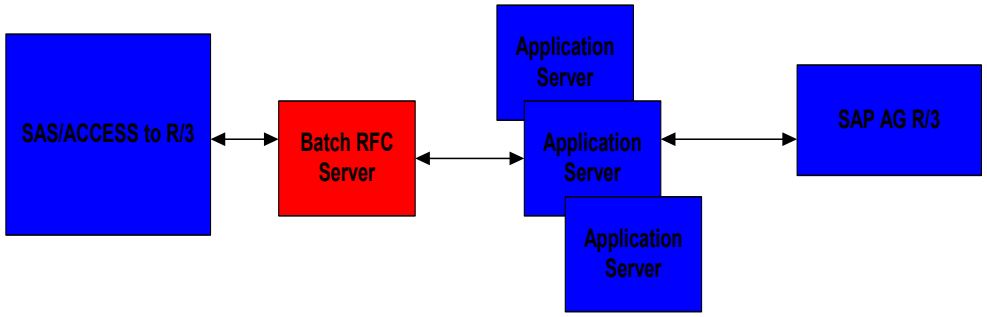

Figure 5 -Batch RFC Server Basic Architecture

Installation

This chapter describes the steps to install components of the SAS/ACCESS Interface to R/3 in your R/3 system. It describes how to configure your R/3 System for the SAS interface. The description is based on a R/3 Release 4.5B system. Other releases might be slightly different. The batch RFC server runs on R/3 Release 3.0 and higher.

The batch RFC server requires an ABAP/4 function module and an ABAP/4 program with a corresponding variant. Also, the user ID that is used within SAS/ACCESS Interface to R/3 needs to have authorization to submit batch jobs "already released".

Usually, the components should be installed in your R/3 development system. After the interface has been tested, the R/3 Transport System is used to deliver the objects into your Quality/Test or production system.

> **Note:** If you plan to deliver the objects to another instance of the R/3 System, do not select "Local Object" when saving the ABAP/4 function module and program in the development system since this restricts use to the R/3 Development System only.

Log on to the R/3 System with the developer user ID using the SAPGUI.

Step 1, Install the ABAP/4 function module "Z_SAS_BATCH_INTERFACE_4"

To install the ABAP/4 function module **Z_SAS_BATCH_INTERFACE_4**, you need to create a function module using the ABAP/4 function library, define the interface for the function module, upload the function module source code included in the SAS/ACCESS Interface to R/3 software package, and then activate the function module.

1. **Create the function module.**

   Go to the ABAP/4 Function Library: Initial Screen window by selecting **Function Builder** from the ABAP/4 workbench or by entering the transaction code: /nse37

   Enter the name of the function module in the **Function module** field (i.e., **Z_SAS_BATCH_INTERFACE_4**).

   Click the **Create** button. This displays the Function Module Create: Administration window. (Press **Enter** to ignore any warning messages.) If the function module already exists, check the component **Source code** in the Object components box and click the **Change** button. The Function Module: Edit Z_SAS_BATCH_INTERFACE_4 window then appears.

   Enter the function group in the Classification box (e.g., **ZSAS**).

   > **Note for Rel. 4.0 and above:** In the Enter function group dialog box, enter the name of the function group (e.g., **ZSAS)**. This displays the Create Function Module window. Initially the Administration page is selected.

   Enter the following parameters for the function module:

Application	**S** (for Basis) or leave blank (for all applications).
Short text	**SAS/ACCESS Interface to R/3 System: Batch Interface**
Processing type	Choose **Remote Function Call supported**.

Table 16 - Parameter for Function Z_SAS_BATCH_INTERFACE_4

   Save the new function module by clicking the **Save** button or selecting **Function module → Save** from the pulldown menu.

2. **Define the interface.**

   To define the import parameters of the Remote Function Call program go back to the ABAP/4 Function Builder: Initial Screen, select the tab Import. The Function Module Change: Import Parameters window appears.

   Enter the following Import parameters and Reference structures in the appropriate fields:

Import parameter	Ref. Field/Structure	Proposal
Z_SAS_JOBNAME	TBTCJOB-JOBNAME	‘ ‘
Z_SAS_REPORT	VARID-REPORT	‘’
Z_SAS_VARIANT	VARID-VARIANT	‘’
Z_SAS_TGTSYSTEM	TBTCJOB-BTCSYSTEM	SY-HOST

Table 17 - Import Parameters for Function Z_SAS_BATCH_INTERFACE_4

To define the export parameters of the Remote Function Call program, select the Export tab. The Function Module Change: Export Parameters window appears.

Enter the following Export parameters and Reference structures in the appropriate fields:

Export parameters	Ref. Structure
Z_SAS_PROGID	LISTZEILE
Z_SAS_JOBNO	TBTCJOB-JOBCOUNT
Z_SAS_SYSINFO	RFCSI
Z_SAS_BIW_ACTIVE	DD03L-KEYFLAG

Table 18 - Export Parameters for Function Z_SAS_BATCH_INTERFACE_4

To define the table parameters of the Remote Function Call program, select the Tables tab. The Function Module Change: Export Parameters window appears.

Enter the following Export parameters and Reference structures in the appropriate fields:

Table parameters	Ref. Structure
Z_SAS_PROGIDS	LISTZEILE
Z_SAS_DESTS	LISTZEILE

Table 19 - Table Parameters for Function Z_SAS_BATCH_INTERFACE_4

To define the exception parameters of the Remote Function Call program, select the Exceptions tab. The Function Module Change: Exception Parameters window appears.

Enter the following Export parameters and Reference structures in the appropriate fields:

Exception
NO_VARIANTS

Table 20 - Exception Parameters for Function Z_SAS_BATCH_INTERFACE_4

Save the function module and go back to the ABAP/4 Function Builder: Initial Screen.

3. Upload the ABAP/4 source code.

If the SAPGUI is on a different machine than the SAS/ACCESS Interface to R/3 System, download the file `sasrfcbf.ab4` to the SAPGUI machine. On Windows NT, the file is located in directory `!SASROOT\access\sasmisc`; on UNIX in `!SASROOT/misc/dbi`.

To upload the source code, select the component **Source code** and click the **Change** button. The Function Module: Edit window appears.

Select **Utilities -> Upload** from the pulldown menu.

In the Import from a Local File dialog window, enter the name of the external file (e.g., on UNIX, `!SASROOT/misc/dbi/sasrfcbf.ab4`; for Windows, `!SASROOT\access\sasmisc\sasrfcbf.ab4`) and click **OK**.

Save the function module.

4. **Activate the function module.**

   To activate the function module select **Function module →Activate** from the pulldown menu.

Step 2, Install the ABAP/4 Program ZSASRDBT

The ABAP/4 program ZSASRDBT is supplied on your SAS/ACCESS Interface to R/3 software package. The following steps will lead you through creating a new program via the ABAP/4 workbench, defining program attributes, creating an object catalog entry, and finally uploading the program source code.

1. **Create a new program.**

   Go to the ABAP Editor: Initial Screen window by selecting **ABAP program** from the ABAP workbench or by entering the transaction code: /nse38.

   In the **Program** field, enter the name of the ABAP/4 report (i.e., **ZSASRDBT**).

   Click the **Create** button. The ABAP/4: Program Attributes window appears.

2. **Define the program attributes.**

   Select the following parameters:

Title	**SAS/ACCESS Interface to R/3 System: Read Tables – Batch**.
Type	1 (Online program; Executable program)
Status	K (Customer production program)
Application	S (Basis)
Authorization group	Leave blank or fill in program group provided by R/3 System Administrator. This allows to group programs for authorization checks.
Development class	Select the development class assigned by the R/3 System Administrator. The development class is important for the transport to other systems.
Logical database	Leave blank or D$ (Processing without database)
From Application	Leave blank or S (Basis System)
Selection screen	Leave blank

Table 21 - Attributes for Program ZSASRDBT.

Save the new ABAP/4 program by clicking the **Save** button or selecting **Program → Save** from the pulldown menu.

The **Create Object Catalog Entry** window appears. Tab into the transport request field and use the down arrow icon to select the previously assigned transport request number (for example, **A01K90202 SAS/ACCESS Interface to R/3 Batch RFC).**

Close the Create Object Catalog Entry window. Go back to the ABAP Editor: Initial Screen window.

3. **Upload the ABAP/4 source code.**

   If the SAPGUI is on a different machine than the SAS/ACCESS Interface to R/3 System, download the file `zsasrdbt.ab4` to the SAPGUI machine. On Windows NT, the file is located in directory `!SASROOT\access\sasmisc`; on UNIX, in `!SASROOT/misc/dbi`.

   To upload the source code, select the component, **Source Code,** and click the **Change** button. The ABAP Editor: Edit Program window appears.

   Select **Utilities → Upload** from the pulldown menu.

   In the Import from a Local File dialog window, enter the name of the external file (e.g., on UNIX `!SASROOT/misc/dbi/zsasrdbt.ab4`; on Windows `!SASROOT\sasmisc\zsasrdbt.ab4`) and click **OK**.

4. **Check the syntax.**

   To check the syntax of the ABAP/4 program click the **Check** button or select **Program → Check → Current Program**.from the pulldown menu.

5. **Save the ABAP/4 program.**

Step 3, Maintain the RFC Destinations

SAP uses RFCs to communicate with other computers and programs on its network. In order for this to take place, there are administrative set-up steps to define these computers and the logical processes that run on the network. The transaction where this set-up takes place is SM59. For the purpose of the batch RFC server, we are only concerned with the TCP/IP connection set-up.

In order to implement the batch RFC functionality, you will need to set up RFC destinations.

Example:

When setting up RFC destinations, the number of background processes should be considered. For example, assuming a SAP system has been configured to have six background processes, the following may be set up.

Three destination groups: 1DESTGRP, 2DESTGRP, 3DESTGRP. These would be set up in SM59.

Under 1DESTGRP there may be two concurrent processes available for that destination group, this would be reflected by adding the following destinations: 1DESTGRP1, 1DESTGRP2 (Following the pattern 'NAMEX', where 'NAME' is the name of your destination group and 'X' is 1, 2, etc. In this case, 'NAME' becomes '1DESTGRP'.).

If we also wanted two concurrent processes available for 2DESTGRP and 3DESTGRP, we would create the following:

2DESTGRP1, 2DESTGRP2, 3DESTGRP1, 3DESTGRP2

As with the current RFC server, a single instance of the RFC server can handle multiple R/3 servers.

Now we would be able to start up to three different batch RFC servers. You could also have three different batch RFC servers set up that access data against the same SAP system by user group (i.e., Financial, Production, IT). In this case, the batch RFC server would be started up to point to a different variant which would then point to a different set of program IDs to send the requested data through.

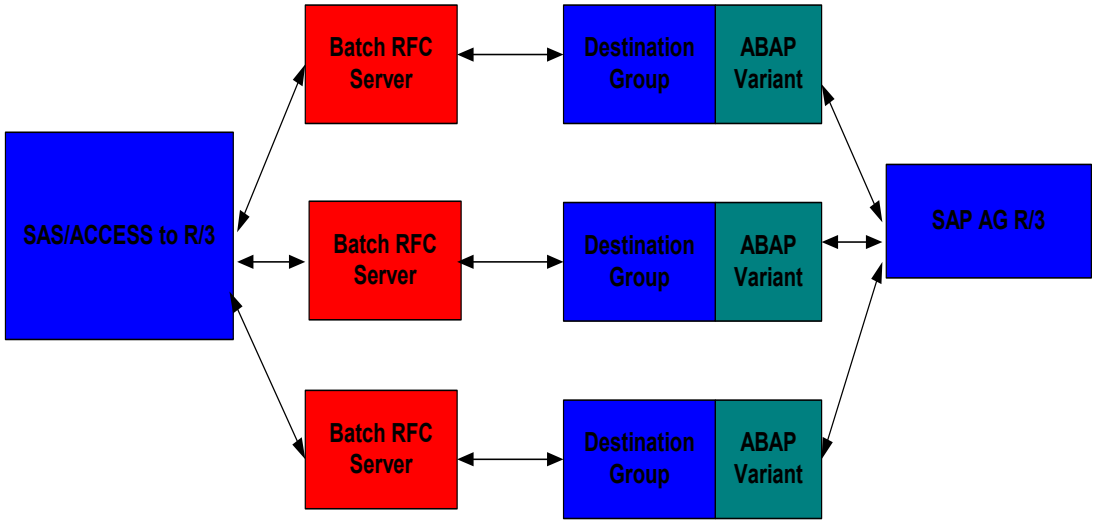

Figure 6 - Start-up Parameters and Data Transfer

The above diagram shows the relationship between the start up parameters for the batch RFC server and the way SAP will handle transferring data from SAP to the Batch RFC server.

The RFC Destination (located under SM59, TCP/IP connections) allows the batch program running in SAP to know where the batch RFC server is running. The batch program uses this destination to send back the requested data. For example, 1DESTGRP could be created to represent the location "test" with the following attributes:

RFC Destination	1DESTGRP
Connection Type	T (TCP/IP Connection)
Activation Type	Registration
Program ID	TEST.1SASRFCEX

Table 22 - Example Destination Parameters

The batch RFC server process allows for concurrency by using a naming convention when setting up RFC Destinations: NAMEX where "NAME" depicts the destination group and "X" is a number (1, 2, 3, etc.). For example, if three users were requesting data from SAP into SAS, an RFC destination would be created with the name 1DESTGRP (destination group). In this example, the batch RFC server software expects a group destination and two destinations to point to this group. The additional destinations would be named 1DESTGRP1 and 1DESTGRP2. The batch RFC server process would utilize these destinations when sending the requested data back to SAS. The attributes of the destination are the same except for the name and the program ID. The program ID must be unique. In this example, a 1 or 2 would be added onto the program ID to make it unique.

A Destination Group should contain at least two destinations to allow the Metadata Extraction to run.

If a "single-threaded" configuration is necessary, set up two destinations in a destination group, run the Metadata Extract, and then delete the second destination.

RFC Destination	1DESTGRP1
Connection Type	T (TCP/IP Connection)
Activation Type	Registration
Program ID	TEST.1SASRFCEX1

RFC Destination	1DESTGRP2
Connection Type	T (TCP/IP Connection)
Activation Type	Registration
Program ID	TEST.1SASRFCEX2

RFC Destination	1DESTGRP3
Connection Type	T (TCP/IP Connection)
Activation Type	Registration
Program ID	TEST.1SASRFCEX3

Table 23 - Example Destination Group Parameters

Note: The case used when defining the program ID should be consistent. This program ID should be globally unique.

Step 4, Create Variants

For each defined destination group, a variant needs to be created that references a destination group. Note: Variants are client-dependent. A variant is a SAP convention that allows parameters to be passed to an ABAP program at runtime. It offers a flexible method of setting ABAP parameters without making a change to the ABAP program. A variant contains the values that are expected by the ABAP program at runtime. By going to transaction SE38 and selecting the variant radio button for a given program, the user can set the runtime values. The ABAP was written using "Select-Options" statements where the input variables are defined.

Using the example used when creating destinations, three variants would be created for Program ZSASRDBT (go to transaction SE38, select radio-button **variant**, select Change, and Create Variant/Sub-Objects Values). The default value for G_BUFMAX is 10000. G_RETRYN and G_RETRYD are parameters that are used for handling communication failures between SAP and the batch RFC server. The G_RETRYN is the number of retries that will be used to send data. The G_RETRYD is the time that the program waits in seconds between trying to send the data. Worthwhile performance gains can be made in fast network configurations by specifying larger values for G_BUFMAX (i.e. 1000000) and small values for G_RETRYN (e.g., 2) and G_RETRYD (e.g., 1).

ZVARIANT1		ZVARIANT2		ZVARIANT3	
G_BUFMAX	10000	G_BUFMAX	10000	G_BUFMAX	10000
G_DEST	1DESTGRP	G_DEST	1DESTGRP	G_DEST	1DESTGRP
G_RETRYN	10	G_RETRYN	10	G_RETRYN	10
G_RETRYD	30	G_RETRYD	30	G_RETRYD	30

Table 24 - Example Variants

The following diagram summarizes the setup necessary for the above example.

RFC Destination	Destination Classification (SAS terminology)	Variant	Variant G_DEST Value
1DESTGRP	Group Destination	ZVARIANT1	1DESTGRP
1DESTGRP1	Data Destination		
1DESTGRP2	Data Destination		
2DESTGRP	Group Destination	ZVARIANT2	2DESTGRP
2DESTGRP1	Data Destination		
2DESTGRP2	Data Destination		
3DESTGRP	Group Destination	ZVARIANT3	3DESTGRP
3DESTGRP1	Data Destination		
3DESTGRP2	Data Destination		

Table 25 - Set-up Summary

In the example below, three batch RFC servers could be started on 3 different servers. If the default value for the Z_SAS_REPORT is made “ZSASRDBT”, then the “-R ZSASRDBT” is optional.

Server1

```
sasrfcb –p 6991 –R ZSASRDBT –V ZVARIANT1 –d 1
```

Server2

```
sasrfcb –p 6991 –R ZSASRDBT –V ZVARIANT2 –d 1
```

Server3

```
sasrfcb –p 6991 –R ZSASRDBT –V ZVARIANT3 –d 1
```

See “Starting the Batch RFC Server” on page 59 for more details.

Step 5, Transport the ABAP/4 Function Module and Program

If it is necessary to deploy this code to other systems such as test and production, transport the function module and **ABAP** objects using the transport system/workbench organizer.

Step 6, Set up User Authorizations

In order to use the batch RFC server, the R/3 user needs to be set up with a profile with access to S_BTCH_JOB authorization group, such as

```
S_BTCH_JOB with operation RELE
```

The following authorization groups also need to be added to the profile for RFC and Table access:

```
S_RFC
```

```
S_TABU_DIS
```

Location of the Batch RFC Server

The batch RFC server is supported on the following platforms: AIX, Solaris, HP-UX 11.x, Alpha Tru 64 Unix, Windows. If you have licensed the SAS/ACCESS Interface to R/3 product on any of these platforms, then you will receive the Batch RFC Server when you install the SAS/ACCESS Interface to R/3 product. If you decide to run the Batch RFC Server on a platform other than the one that you licensed SAS/ACCESS Interface to R/3, then you can install the Batch RFC Server from the CD titled "Batch RFC Server for SAS/ACCESS Interface to R/3". Please see the "readme.txt" file on the CD for instructions on installing the Batch RFC Server on alternate platforms.

Starting the Batch RFC Server

For UNIX

As part of the standard install, the Batch RFC Server is located in `!SASROOT/saspgm/dbi/bin`. If you installed the Batch RFC Server from the CD titled "Batch RFC Server for SAS/ACCESS Interface to R/3" then it will be located where you specified in the install process.

Set up your load library environment variable to point to the ACE and TAO shared libraries. For the following examples, assume that the full path of `!SASROOT/saspgm/dbi/bin` is `/sas/saspgm/dbi/bin`.

Depending on the UNIX system you are working with, the environment variable(s) are different.

For AIX, `set LIBPATH=$LIBPATH:/sas/saspgm/dbi/bin`

For Digital UNIX, `set LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/sas/saspgm/dbi/bin`

For HPUX, `set LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/sas/saspgm/dbi/bin`
`SHLIB_PATH=:/sas/saspgm/dbi/bin`

For SUN, `set LIBPATH=$LIBPATH:/sas/saspgm/dbi/bin`

Go to the directory containing the sasrfcb code, usually `!SASROOT/saspgm/dbi/bin`.

Enter the command:

```
./sasrfcb –p portno -R ZSASRDBT –V Variant –d 0|1|2
```

where

- portno is the port number
- d is the diagnostic level
- […] indicates optional
- | indicates a choice of values

For example, `./sasrfcb –p 6991 –R ZSASRDBT –V ZVARIANT1 –d 1`

Note: The batch RFC server currently cannot be started as a daemon.

For Windows NT

Start as a Console Application.

In a DOS window, change to the install directory and start the server as follows:

```
sasrfcb –p portno -R ZSASRDBT –V Variant –d 0|1|2
```

where

- portno is the port number
- d is the diagnostic level
- […] indicates optional
- | indicates a choice of values

For example, `./sasrfcb –p 6991 –R ZSASRDBT –V VARIANT1 –d 1`

When using the SAS GUI, all the Login setup parameters are the same as for the regular RFC server, except that no CPIC information is required.

Note: The Batch RFC Server currently cannot be started as a service.

Appendix J - Using Transport to Install SAP objects

Installation

A transport file has been included in your Access to R/3 software package. This transport file includes all of the components needed to run SAS ACCESS/R3. To upload the transport file to your R3 systems, follow the instructions below:

1. Move the transport files into the appropriate directories on your R3 systems.

NT: Copy the `R900207.SI1` file located in `!sasroot/sasmisc` to `<drive>:\usr\sap\trans\data`.
Copy the `K900207.SI1` file located in `!sasroot/sasmisc` to `<drive>:\usr\sap\trans\cofiles`.

UNIX: Copy the `R900207.SI1` file located in `!sasroot/misc/dbi` to `/usr/sap/trans/data`.
Copy the `K900207.SI1` file located in `!sasroot/misc/dbi` to `/usr/sap/trans/cofiles`.

2. Go to the transport program directory of the R3 system you want to apply the transport.

NT: `<drive>:\usr\sap\trans\bin`

UNIX: `/usr/sap/trans`

3. Load the transport into the transport buffer with the following command:

```
tp addtobuffer  SI1K900207 <target sid>
```

4. Import the transport.

   Test your connection to the target system and then import the transport with the following commands:

```
tp  connect <target sid>
```

```
tp import  SI1K900207 <target sid>  client=<target client> U2
```

   Note: The U2 option allows the original to be overwritten if you have installed these ABAP objects for 8.1 release.

5. Check the exit code. If you receive an error of 8 or higher, the import failed. You must resolve the problem and reimport the transport. Check the transport log for more information.

Appendix K - Install BAPI Connector

Introduction

The BAPI connector was developed in Release 8.2 to allow calls from SAS to any RFC function. This includes those BAPIs implemented as RFCs in SAP R/3. The SAP functions called using BAPI connector have to be RFC-enabled, synchronous, and have no user interaction. Currently, the BAPI connector is only supported for Windows NT, Compaq Tru64 UNIX, HP-UX, Solaris, and AIX platforms.

The interface can also be used to read data from SAP R/3 systems, perform certain calculations in R/3, and then load data into an R/3 system.

In order to use the BAPI connector, the `librfc32.dll` on Windows NT has to be installed. When SAPGUI is installed, the `librfc32.dll` should be installed in your Windows system directory.

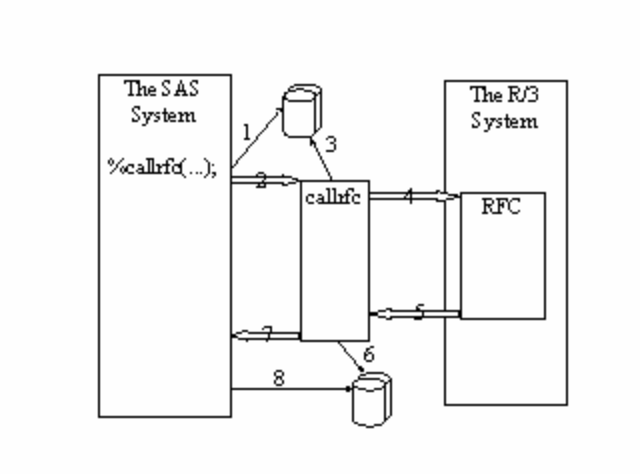

Figure 7 - BAPI Connector Basic Configuration

Basic Configuration

1. SAS creates input files for callrfc.
2. SAS starts callrfc executable and passes info via parameters.
3. callrfc parses input parameters and reads input files.
4. callrfc calls R/3 RFC function.
5. R/3 RFC function passes parameters and tables back to callrfc.
6. callrfc writes metadata and data for output parameters and tables into external files.
7. callrfc finishes and control goes back to the SAS System.
8. SAS reads metadata and using meta information generates SAS data steps to read data.

Authorization

The user must have permission for Remote Function Calls in order to run the BAPI connector.

Please note that certain BAPIs may require additional authorizations depending on the way the BAPI is implemented and which authorization object it uses.

Windows NT

You may install either SAS/ACCESS Interface to R3 or SAS/ACCESS Interface to R3 – BAPI Connector, or both. The default selection under Windows NT when selecting SAS/ACCESS to R3 product is all. To install the BAPI connector only, follow the steps below:

1. Select SAS/ACCESS Interface To R3 product.
2. Press the **Option** button, The Select Sub-components"window will display with all entries selected.
3. Select Common Files and SAS/ACCESS Interface to R3 – BAPI Connector by deselecting SAS/ACCESS Interface to R3. Please note that the Common files entry is required. You can optionally select Samples and Help Files for systems with IE.
4. Press **OK**.

UNIX

The installation under UNIX is similar to that under Windows NT, but there is no Common Files entry. You are offered two options: SAS/ACCESS Interface to R3 and SAS/ACCESS Interface to R3 – BAPI connector. To install the BAPI connector only, select SAS/ACCESS Interface to R3 – BAPI connector, then proceed.

Glossary

ABAP/4 development user

An ABAP/4 development user is a R/3 user ID with ABAP/4 developer permission. It is used to create the ABAP/4 function group, the function module and the report that are part of the SAS/ACCESS Interface to R/3. For R/3 Release 3.0 and above a developer user also require an OSS Access key. An development user ID is only required while installing the SAS/ACCESS Interface to R/3.

Authorization

The R/3 System has a powerful tool to restrict or grant permission to access certain objects in the R/3 System or to perform certain actions. The SAS/ACCESS Interface to R/3 need not only the permission to read tables but permission for communication as well.

Client

In commercial, organizational and technical terms, a self-contained unit in an R/3 system, for example, a company group, a business unit, or a corporation, with separate master records and its own set of tables.

CPI-C

The Common Programming Interface - Communications (CPI-C) is an interface for direct program-to-program communication for applications. The SAS/ACCESS Interface to R/3 uses the ABAP/4 implementation of the CPI-C protocol for internal communication and data transfer between two ABAP/4 programs.

CPIC user

References to a CPIC user indicate a R/3 user ID with the user type CPIC. The CPIC user ID is used by the SAS/ACCESS Interface to R/3 for the communication between the function module and the report internally in the R/3 Application server.

Data Dictionary Extract

The SAS/ACCESS Interface to R/3 Application provides a navigation tool based on metadata from the R/3 Data Dictionary. The tool operates on a copy of the metadata - the Data Dictionary Extract.

OSS Access key

An OSS Access key is a string of characters ABAP/4 developers must enter the first time they create or modify ABAP/4 objects like programs, function modules and function groups. An OSS Access key can be obtained from SAP AG's Online Service System (OSS).

R/3 System Application Server

The components of the three-tier client/server architecture of the R/3 System are: database, application and presentation layer. The SAS/ACCESS Interface to R/3 communicates with the application server.

RFC

The Remote Function Call (RFC) interface is SAP AG's implementation of a remote procedure call. It is provided for integration of R/2 and R/3 Systems and external programs. The SAS/ACCESS Interface to R/3 uses the RFC interface for communication and data transfer between the R/3 System and the SAS RFC Server.

RFC SDK

The RFC Software Development Kit (RFC SDK) contains a library and source files to implement the communication between an external program and a function module in the R/3 System. The SAS RFC Server needs the libraries from the RFC SDK. On UNIX platforms the name of the library is librfc.a, on Windows NT librfc32.dll. On Windows NT the RFC SDK need not be installed if librfc32.dll is already available.

RFC user

References to a RFC user indicate a R/3 user ID that is used by the SAS/ACCESS Interface to R/3 for the communication between the SAS RFC server and the function module in the R/3 Application server. The user type of this ID can be dialog or CPIC. It is possible to use one CPIC enabled user ID for the RFC user and for the CPIC user (see CPIC user in glossary).

SAS/ACCESS Interface to R/3 Application

This is the GUI of the SAS/ACCESS Interface to R/3. The GUI is used to navigate the metadata extracted from R/3. It generates SAS source code to read data from an R/3 System.

SAS RFC Server

The SAS RFC Server is a program provided with the SAS/ACCESS Interface to R/3. It is the component for the communication between the SAS System and the R/3 System. On UNIX platforms the SAS RFC Server must be linked to the library from the RFC SDK. Several configurations are possible: The SAS RFC Server can be installed on the box where the SAS System is installed, on the box of the R/3 Application Server or on any other box in the network. It is recommended to use either of the first two options.

SAS Views of R/3 data

The SAS Views of R/3 data are SAS DATA Step Views that read R/3 tables. These views use the socket access method to communicate with the SAS RFC Server which gets the data from the R/3 System. The SAS source code for the views is generated by the SAS/ACCESS Interface to R/3.

SAPGUI

The SAPGUI is the front-end for the R/3 System. During the installation of the SAS/ACCESS Interface to R/3 a SAPGUI is required to install parts of the interface in the R/3 System.

Sideinfo file

The sideinfo file contains connection parameters. The environment variable SIDE_INFO defines the path for the sideinfo file. If the environment variable SIDE_INFO is not set, the sideinfo file must be located in the working directory. For the SAS/ACCESS Interface to R/3 the sideinfo file can be used to define the parameters for the communication between the SAS RFC Server and a R/3 System.

TXCOM

The R/3 table TXCOM is a side info table that is installed in each R/3 System. For the SAS/ACCESS Interface to R/3 the connection parameters for the CPI-C communication between two ABAP/4 programs in the same R/3 System must be defined in the TXCOM table.