

LibRFC Demo From iSeries

DOCUMENT

Subject	Demo for LIBRFC Usage from iSeries via RPGLE
Author	Volker Gueldenpfennig
Creation Date	04.04.2017
Status	Final
Version	1.00

MODIFIKATIONEN

Date	Version	Author	Comments

TABLE OF CONTENTS

▶	1	RPGLE CONRFCSND2	4
	1.1	Demo RPGLE CONRFCSND2	4
	1.2	CONRFCSND2 Update SID	4
	1.3	Customize Table CONRFCSYS	4
	1.4	LIBRFC *SRVPGM	5
	1.5	Logging to table CONRFCSND2	6
▶	2	ABAP Function Module Z_CONRFCSND	8
	2.1	Function Module Z_CONRFCSND	8
	2.1.1	RFC-Enabled	8
	2.1.2	Import Parameters	9
	2.1.3	Export Parameters	10
	2.1.4	Internal Tables	10
	2.2	ABAP Logging Z_CONRFCSND.txt	10
	2.2.1	Consolut Explorer	10
	2.2.2	Transaction AL11	11
	2.3	Transport for ABAP	12
▶	3	Traces	13
	3.1	RFC-Trace File on iSeries	13
	3.2	gw/acl_mode	13

1 RPGLE CONRFCSND2

1.1 Demo RPGLE CONRFCSND2

This program CONRFCSND2 is delivered with the latest CONTOOL version (at least 2.08 of 4.4.2017). consolut Pre-Compile-Statements are used, but not really required.

```
Spalten : 6 100 Ansehen CONT00L/QRPGLESRC
SEU=> CONRFCSND2
FMT * * 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7 ...+... 8 ...+... 9 ...+... 0
***** Datenanfang *****
0001.00 *CL CRTPGMOD MODULE(OTEMP/AM) SRCFILE(&S/QRPGLESRC) + 000000
0002.00 *CL DBGVIEW(*ALL) 000000
0003.00 *CL CRTPGM PGM(&O/AM) MODULE(OTEMP/AM) + 000000
0004.00 *CL BNDSRVPGM(LIBRFC) ACTGRP(*CALLER) 000000
0005.00 ***** 000000
0006.00 * 000000
0007.00 * Programmfunktion RFC: Send & Receive iTab to/from Function Module 000000
0008.00 * 000000
0009.00 * This program transfers some data from RPG in EBCDIC to SAP in ABAP in 000000
0010.00 * ASCII or Unicode. 000000
0011.00 * Be aware, that SAP uses Codepage EBCDIC 500 and therefore "öäå" are typically damaged. 000000
0012.00 * This problem is addressed with QTBLATE, that is deleted in this demo. Please 000000
0013.00 * check out the code of CONRFCSND and then especially conversion table CON273500. 000000
0014.00 * 000000
0015.00 * As the iTab is defined as "all characters", it is not possible, to put binary 000000
0016.00 * or negative decimals in there. If you want to use this, we typically use EDTWRD 000000
0017.00 * in order to get this "written" in a way as ABAP writes it, so that a MOVE in ABAP 000000
0018.00 * will be sufficient (e.g. a "." (dot) as decimal delimiter). 000000
0019.00 * 000000
F3=Verl F5=Aktuell F6=Auffinden F10=Pos. Anz F11=Umschalten F12=Abbrechen
```

A brief description is in the top of the program, so that you can understand, what the program will do. It is written as demo, that just does always the same without any user interaction. It can just be called without any parameters. You have to customize the name of the SID and the table CONRFCSYS first.

1.2 CONRFCSND2 Update SID

You need to update the SID to your SID:

```
Spalten : 6 100 Ansehen CONT00L/QRPGLESRC
SEU=> CONRFCSND2
FMT D DName+++++ETDsVon+++Bi/L+++IDG.Schlüsselwörter+++++Bemerkungen+++++
0260.00 D TypInt C CONST(8) 000000
0261.00 D TypInt2 C CONST(9) 000000
0262.00 D TypInt1 C CONST(10) 000000
0263.00 D Typ1 C CONST(12) 000000
0264.00 D Typ2 C CONST(13) 000000
0265.00 000000
0266.00 /EJECT 000000
0267.00 ***** 000000
0268.00 * Set Parameters 000000
0269.00 ***** 000000
0270.00 C eval Ep_Sid = 'E34' 000000
0271.00 C eval Ep_Mandant = '900' 000000
0272.00 C eval Ep_Funktion = 'Z_CONRFCSND' 000000
0273.00 000000
```

1.3 Customize Table CONRFCSYS

You need to enter the new SAP system with the proper data in there.

UPDDTA FILE(CONTOOLD/CONRFCSYS)


```

MIT DATEN IN EINER DATEI ARBEITEN                               Modus . . . :  ÄNDERN
Format . . . . :  CONRFCSYSS                                   Datei . . . :  CONRFCSYS

RFC_SID:  █34
RFC_BEZ:  Testsystem
RFC_SYSNR:  02
RFC_USER:  DCW2SAP
RFC_PWD:  CNSLT12(
RFC_LANG:  D_
RFC_MAXREC:  50000
RFC_HOST:  jupiter
RFC_GATE:  3302
RFC_CVTSND:  *NONE
RFC_CVTRCV:  *NONE

```

The LIBRFC *SRVPGM, used in CONTOOL, is able to use upper- and lowercase passwords. But, the declaration in RPGLE is still 8 Bytes. (could be enhanced)

1.4 LIBRFC *SRVPGM

DSPSRVPGM SRVPGM(CONTOOL/LIBRFC)

```

Serviceprograminformationen anzeigen                               Anzeige 1 von 10

Serviceprogramm . . . . . :  LIBRFC
Bibliothek . . . . . :  CONTOOL
Eigner . . . . . :  QPGMR
Serviceprogrammattribut . . . . . :
Detail . . . . . :  *BASIC

Informationen zur Serviceprogrammerstellung:
Datum/Uhrzeit der Serviceprogrammerstellung . . :  01.02.11  13:36:08
Exportquellendatei . . . . . :  QSRVSRC
Bibliothek . . . . . :  GEN700E0PT
Exportteildatei . . . . . :  LIBRFC46D
Attribut der Aktivierungsgruppe . . . . . :  *CALLER
Gemeinsam benutzte Aktivierungsgruppe . . . . . :  *NO
Aktuelle Exportkennung . . . . . :  BB7ACF35241FAF6808B9C536
3D215844
Benutzerprofil . . . . . :  *USER

Eingabetaste --> Weiter

F3=Verlassen  F11=Zeichenkennung anzeigen  F12=Abbrechen

```



```

Serviceprograminformationen anzeigen
Anzeige 1 von 10

Serviceprogramm . . . . . : LIBRFC
Bibliothek . . . . . : CONT00L
Eigner . . . . . : QPGMR
Serviceprogrammattribut . . . . . :
Detail . . . . . : ^BASIC

Übernommene Berechtigung verwenden . . . . . : ^YES
ID des codierten Zeichensatzes (CCSID) . . . . . : 65535
Anzahl der Module . . . . . : 216
Anzahl der Serviceprogramme . . . . . : 28
Anzahl nicht aufgelöster Referenzen . . . . . : 0
Anzahl der Copyrights . . . . . : 1
Alle Erstellungsdaten . . . . . : ^YES
Überwachte Daten verdichtet . . . . . : ^YES
Laufzeitinformationen verdichtet . . . . . : ^NO
Aktualisierung zulassen . . . . . : ^YES

Weitere ...

Eingabetaste --> Weiter

```

```

Serviceprograminformationen anzeigen
Anzeige 3 von 10

Serviceprogramm . . . . . : LIBRFC
Bibliothek . . . . . : CONT00L
Eigner . . . . . : QPGMR
Serviceprogrammattribut . . . . . :
Detail . . . . . : ^MODULE

Auswahl eingeben und Eingabetaste drücken.
5=Beschreibung anzeigen 6=Beschreibung drucken

Aus-      Modul      Bibliothek  Attribut  Erstell.-  Optimier.-  Testhilfe-
wahl      Modul      Bibliothek  Attribut  datum     stufe      daten
---      ---      ---      ---      ---      ---      ---
  █      ABCN4C5C1A  GEN700E0PT  CLE       10.04.10   40        ^NO
  █      ABRFCLG_MT  GEN700E0PT  CLE       10.04.10   40        ^NO
  █      ABRF317C55  GEN700E0PT  CLE       10.04.10   40        ^NO
  █      AS4STACK    GEN700E0PT  CPPLE     09.04.10   40        ^NO
  █      RFC0_MT     GEN700E0PT  CLE       10.04.10   40        ^NO
  █      RFC0X_MT    GEN700E0PT  CLE       10.04.10   40        ^NO
  █      RFC_MT      GEN700E0PT  CLE       10.04.10   40        ^NO

Weitere ...

F3=Verlassen  F12=Abbrechen  F17=Anfang  F18=Ende

```

We do use the LIBRFC, that is compiled with 7.0 SAP-Sources, but contains the export for the 4.6D level. So, the new password options would be available.
This LIBRFC does contain the observabilities, so that it will “work for ever” on each OS/400 release.

1.5 Logging to table CONRFCSND2

All calls are logged to the table CONT00L/CONRFCSND2:

DSPPFM FILE(CONT00L/CONRFCSND2)


```
Physische Teildatei anzeigen
Datei .....: CONRFCSND2      Bibliothek .....: CONT00L
Teildatei .....: CONRFCSND2    Satz .....: 1
Steuerung .....: ☐      Spalte .....: 1
Suchen .....: _____
*...+...1...+...2...+...3...+...4...+...5...+...6...+...7.

>>> New Start of RPGLE CONRFCSND2

RPG Row 1
RPG Row 2
Latin1 273 Umlauts: öüäÖÜÄ&ëè
Latin1 273 Brackets: []{}
Timestamp UTC:      20170404065829
IMPART: 1
IMPREC: 000000001234
IMPPARM: ImpParmRPG

>>> New Start of RPGLE CONRFCSND2

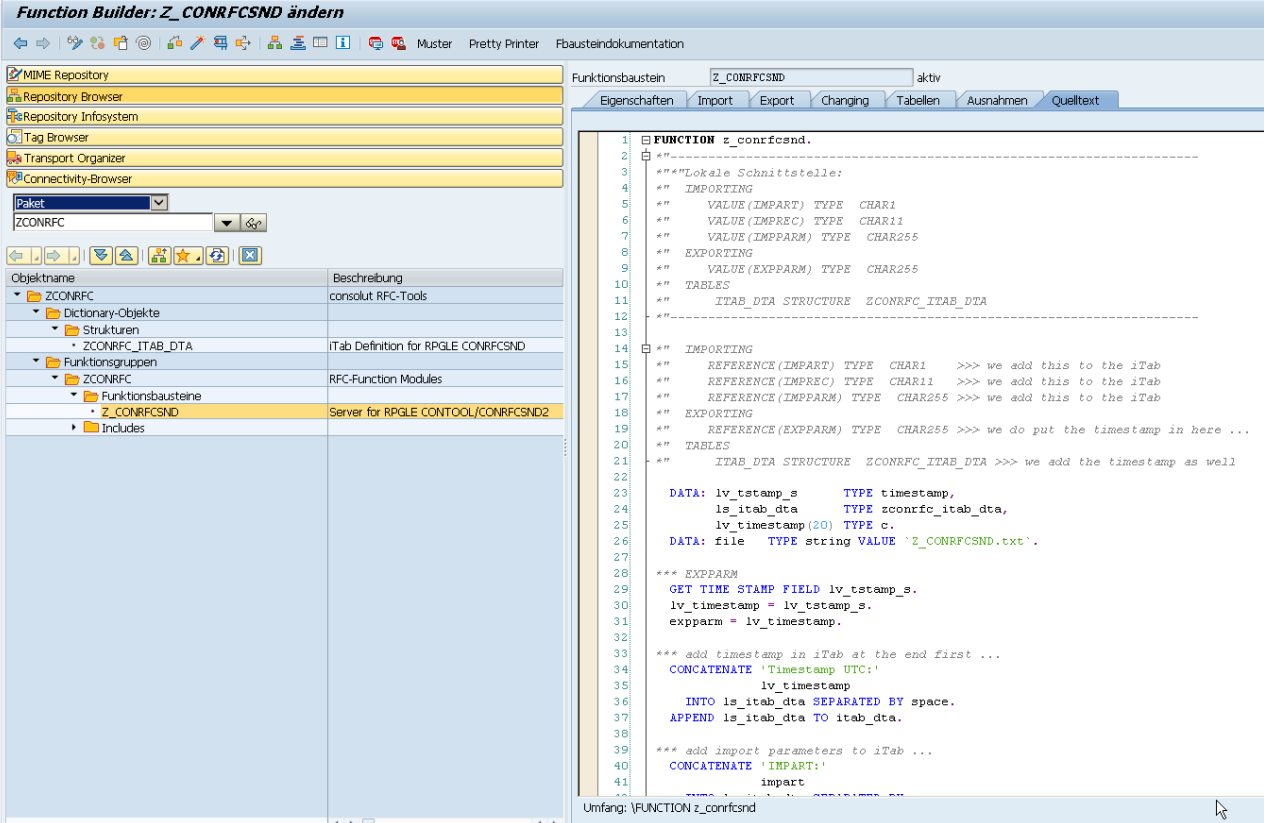
RPG Row 1
RPG Row 2
```

Here, you do see, that even when the umlauts were wrong, it is at least “roundtrip-save” ... so, be aware, that the characters are received wrong in SAP as SAP uses CCSID 500 instead of 273!

2 ABAP Function Module Z_CONRFCSEND

2.1 Function Module Z_CONRFCSEND

This function module is part of package ZCONRFC. As you can see this package does contain a very few things only in order to keep it really simple.



Function Builder: Z_CONRFCSEND ändern

Objektname: ZCONRFC | Beschreibung: consolut RFC-Tools

Objekttypen: Dictionary-Objekte, Strukturen, Funktionen, Funktionsbausteine, Includes

Strukturen: ZCONRFC_ITAB_DTA (ITab Definition for RPGLE CONRFCSEND)

Funktionsgruppen: ZCONRFC (RFC-Function Modules)

Funktionsbausteine: Z_CONRFCSEND (Server for RPGLE CONTOOL/CONRFCSEND2)

Includes: Includes

Quelltext:

```
1 FUNCTION z_conrfcsnd.
2
3  ***"Lokale Schnittstelle:
4  IMPORTING
5  VALUE (IMPART) TYPE  CHAR1
6  VALUE (IMPREC) TYPE  CHAR11
7  VALUE (IMPPARM) TYPE  CHAR255
8  EXPORTING
9  VALUE (EXPPARM) TYPE  CHAR255
10
11  TABLES
12  ITAB_DTA STRUCTURE ZCONRFC_ITAB_DTA
13
14  *** IMPORTING
15  REFERENCE (IMPART) TYPE  CHAR1    >>> we add this to the iTab
16  REFERENCE (IMPREC) TYPE  CHAR11   >>> we add this to the iTab
17  REFERENCE (IMPPARM) TYPE  CHAR255 >>> we add this to the iTab
18  EXPORTING
19  REFERENCE (EXPPARM) TYPE  CHAR255 >>> we do put the timestamp in here ...
20
21  TABLES
22  ITAB_DTA STRUCTURE ZCONRFC_ITAB_DTA >>> we add the timestamp as well
23
24  DATA: lv_tstamp_s      TYPE timestamp,
25         ls_itab_dta      TYPE zconrfc_itab_dta,
26         lv_timestamp(20) TYPE c.
27
28  DATA: file TYPE string VALUE 'Z_CONRFCSEND.txt'.
29
30  *** EXPPARM
31  GET TIME STAMP FIELD lv_tstamp_s.
32  lv_timestamp = lv_tstamp_s.
33  expparm = lv_timestamp.
34
35  *** add timestamp in iTab at the end first ...
36  CONCATENATE 'Timestamp UTC:'
37  lv_timestamp
38  INTO ls_itab_dta SEPARATED BY space.
39  APPEND ls_itab_dta TO itab_dta.
40
41  *** add import parameters to iTab ...
42  CONCATENATE 'IMPART:'
43  IMPART
44  INTO ls_itab_dta SEPARATED BY space.
45  APPEND ls_itab_dta TO itab_dta.
46
47  *** add import parameters to iTab ...
48  CONCATENATE 'IMPREC:'
49  IMPREC
50  INTO ls_itab_dta SEPARATED BY space.
51  APPEND ls_itab_dta TO itab_dta.
52
53  *** add import parameters to iTab ...
54  CONCATENATE 'IMPPARM:'
55  IMPPARM
56  INTO ls_itab_dta SEPARATED BY space.
57  APPEND ls_itab_dta TO itab_dta.
58
59  RETURN.
```

2.1.1 RFC-Enabled

The function module is RFC-enabled, so that it can be called from external programs via RFC.

Funktionsbaustein **Z_CONRFCSD** aktiv

Eigenschaften Import Export Changing Tabellen Ausnahmen Quelltext

Klassifizierung

Funktionsgruppe **ZCONRFC** RFC-Function Modules

Kurztext **Server for RPGLE CONTOOL/CONRFCSD2**

Ablaufart

☐ Normaler Funktionsbaustein

☒ Remote fähiger Baustein ☐ basXML unterstützt

☐ Verbuchungsbaustein

☒ Start sofort

☐ Start sofort-nicht nachverbuchbar

☐ Start verzögert

☐ Sammellauf

Allgemeine Daten

Verantwortlicher **VOLKER**

letzter Änderer **VOLKER**

Änderungsdatum **04.04.2017**

Paket **ZCONRFC**

Programmname **SAPLZCONRFC**

Includename **LZCONRFCU01**

Originalsprache **DE**

Nicht freigegeben

☐ Editiersperre

☐ Global

2.1.2 Import Parameters

Funktionsbaustein **Z_CONRFCSD** aktiv

Eigenschaften Import Export Changing Tabellen Ausnahmen Quelltext

Parametername	Typi...	Bezugstyp	Vorschlagswert	Op...	W...	Kurztext
IMPART	TYPE	CHAR1		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Einstelliges Kennzeichen
IMPREC	TYPE	CHAR11		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Character Länge 11
IMPPARM	TYPE	CHAR255		<input type="checkbox"/>	<input checked="" type="checkbox"/>	char255
				<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	

Be aware. That “pass by reference” is not allowed here – just “pass by value”.

2.1.3 Export Parameters

Parametername	Typisierung	Bezugstyp	Wertüb...	Kurztext
EXPPARM	TYPE	CHAR255	<input checked="" type="checkbox"/>	char255
			<input type="checkbox"/>	
			<input type="checkbox"/>	

Here, “pass by value” is the only option as well.

2.1.4 Internal Tables

Parametername	Typisierung	Bezugstyp	Optional	Kurztext	Lar
ITAB_DTA	LIKE	ZCONRFC_ITAB_DTA	<input type="checkbox"/>	ITab Definition for RPGLE CONRFCSND	
			<input type="checkbox"/>		
			<input type="checkbox"/>		

This is a table, that contains character-like fields only. Otherwise, the call from iSeries will be really a bigger issue.

This data is imported and exported. So, you can import an internal table, update this table and return the table to RPGLE – or parts of it.

Right now, we are only able to support one internal table here. As soon, as you define a second internal table, the RPGLE might dump.

2.2 ABAP Logging Z_CONRFCSND.txt

The function module always dumps the contents of the internal table to a file on the OS in the work directory (not to a table, just a file (e.g. IFS-file)) into the file Z_CONRFCSND.txt.

You can watch this with WRKLNK, WRKLNKSAP, with any other editor of your choice on the SAP server.

2.2.1 Consolut Explorer

Or you just use the nice consolut explorer tool as follows:

Consolut - Explorer Version 1.10, 26.02.2014

Alle Ordner aufklappen Alle Ordner zuklappen Umbenennen Löschen Auffrischen Kopieren Dateiname in Clipboard Upload Datei Download Datei Zippen Einstellungen ändern

Benutzerordner

- DIR_BI
- DIR_RALPH
- DIR_E34_BI
- DIR_TEMP
- DIR_SAP_TEMP
- DIR_IMPORT
- DIR_BI
- Z_KONTOAUSZUG
- DIR_G

Systemordner

- DIR_GLOBAL
- DIR_HOME
- snapshot.tmp
- DIR_TEMP
- DIR_TRANS

D:\usr\sap\E34\DVEBMGS02\work -> 354 Files

Dateiname incl. Endung	Datellänge	Eigner	Änderung	Änderu...	Berech...
VMCavailable.log	138.798	SAPServ	04.04.2017	08:41:21	666
Z_CONRFCSND.txt	239	SAPServ	04.04.2017	08:41:19	666
dsp+work.status	254	SAPServ		08:41:18	666
available.log	7.614	SAPServ		08:41:01	666
dev_w5	1.248.184	SAPServ		08:40:35	666
dev_1cm	3.889.787	SAPServ		08:38:43	666
dev_w10	1.766.083	SAPServ		08:38:35	666
E34_msg_server_adtl_storage	384	SAPServ		08:38:34	666
dev_w11	2.001.983	SAPServ		08:37:43	666
dev_w14	2.191.149	SAPServ		08:36:35	666
dev_w12	2.084.115	SAPServ		08:34:35	666
dev_w2	869.086	SAPServ		08:28:39	666
dev_w13	2.204.452	SAPServ		08:22:43	666
dev_w21	6.896.895	SAPServ		08:19:23	666
dev_rd	15.241.729	SAPServ		08:15:45	666
dev_rfc20	4.150.208	SAPServ			666
dev_w20	7.649.758	SAPServ			666
dev_w3	988.469	SAPServ		08:14:23	666
dev_tp	2.898	SAPServ		08:14:19	666
dev_ext	14.896	SAPServ		08:14:18	666

```

>>> New Start of PuBa Z_CONRFCSND:
20170404064119

RPG Row 1
RPG Row 2
Latin1 273 Umlauts: !)(\)[-ëëë
Latin1 273 Brackets: ÄÜäü
Timestamp UTC: 20170404064119
IMPART: 1
IMPREC: 00000001234
IMPARM: ImpParamRPG

>>> New Start of PuBa Z_CONRFCSND:
20170404065829

RPG Row 1
RPG Row 2
Latin1 273 Umlauts: !)(\)[-ëëë
Latin1 273 Brackets: ÄÜäü
Timestamp UTC: 20170404065829
  
```

2.2.2 Transaction AL11

Liste Bearbeiten Springen Einstellungen System Hilfe

Verzeichnis: D:\usr\sap\E34\DVEBMGS02\work

benutzbar	gesehen	geändert	Länge	Eigentümer	letz.Änd.	letz.Änd.	Filename
X			138852	SAPServiceE34	04.04.2017	09:51:21	VMCavailable.log
X			14260	SAPServiceE34	10.06.2014	16:44:41	Z_COA_Z_GENERAL_Z_NEW...
X			22482	SAPServiceE34	10.06.2014	16:44:35	Z_COA_Z_GENERAL_Z_NEW...
X			717	SAPServiceE34	04.04.2017	08:58:30	Z_CONRFCSND.txt
X			1816	SAPServiceE34	17.06.2014	15:04:15	Z_KDSTAMM
X			7614	SAPServiceE34	04.04.2017	09:51:01	available.log
				SAPServiceE34	11.07.2014	14:05:24	bbkpf.h
				SAPServiceE34	03.11.2016	15:00:59	bbseg.h
X			1825	Administrators	22.09.2016	19:09:36	dev_LDAP_MARS.trc
X			5321	SAPServiceE34	04.04.2017	08:53:42	dev_cp

=>

SAP-Verzeichnisse

Verzeichnis: D:\usr\sap\E34\DVEBMGS02\work
Name: Z_CONRFCSND.txt

>>> New Start of FuBa Z_CONRFCSND:
20170404064119

RPG Row 1

RPG Row 2

Latin1 273 Umlauts: {}{\}[\~êëè

Latin1 273 Brackets: ÄÜäü

Timestamp UTC: 20170404064119

IMPART: 1

IMPREC: 00000001234

IMPPARM: ImpParmRPG

>>> New Start of FuBa Z_CONRFCSND:
20170404065829

RPG Row 1

RPG Row 2

2.3 Transport for ABAP

In order to get this ABAP into your system pretty easy, we provide the following transport for you:

E34K980397 VOLKER ZCONRFC - Demo ABAP-Client/Server for consolut libRFC-Tools

You just import this transport and will see the ABAP above.

3 Traces

3.1 RFC-Trace File on iSeries

The file has always the name dev_rfc.trc and is located in your “current directory”, that you can find out with DSPCURDIR:

```
Aktuelles Arbeitsverzeichnis anzeigen

Verzeichnis . . . . . : /home/volker
```

dspf 'dev_rfc.trc'

```
Ansehen: /home/volker/dev_rfc.trc
Satz:    1   v.      9 um 18           Spalte:  1   122 um 131
Strg:    _____

....+...1...+...2...+...3...+...4...+...5...+...6...+...7...+...8...+...9...+...0...+...1...+...2...+
*****Datenanfang*****

**** ERROR file opened at 20170403 225219 Central European Daylight Saving Time, SAP-REL 700,0,251 RFC-VER 3 1151051 MT-SL
T:00000000:00004E30 Error in program 'SAPCPIC': =====> Der Funktionsbaustein 'Z_CONRFCSND' ist nicht 'remote' aufrufbar.
T:00000000:00004E30 Error in program 'SAPCPIC': <* RfcReceive A10 : returns 3:RFC_SYS_EXCEPTION
T:00000000:00004E30 Error in program 'SAPCPIC': <* RfcCallReceive A10 : returns 3:RFC_SYS_EXCEPTION
>TS> Mon Apr  3 22:54:57 2017
T:00000000:00004E30 Error in program 'SAPCPIC': =====> Der Funktionsbaustein 'Z_CONRFCSND' ist nicht 'remote' aufrufbar.
T:00000000:00004E30 Error in program 'SAPCPIC': <* RfcReceive A20 : returns 3:RFC_SYS_EXCEPTION
T:00000000:00004E30 Error in program 'SAPCPIC': <* RfcCallReceive A20 : returns 3:RFC_SYS_EXCEPTION
*****Datenende*****
```

3.2 gw/acl_mode

In case, you are having issues, to login to the SAP system, you should check in this parameter. It could be the case, that you would have to set it to 0 or to toggle around with the parameters & files gw/sec_info or gw/reg_info.