Performing DRD Functions Within an IMS Transaction

John Ganci
Texas Instruments

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Session 9402

Presentation Outline

- Prologue
- Single Point of Control Overview
- Dynamic Resource Definition Overview
- Type-2 Commands Used for DRD
- The Common Service Layer Application Programming Interface
- Implementing Type-2 Commands Within a Transaction
- Sample Transaction Invocations
- Sources of Documentation
- Summary

Prologue

- Texas Instruments allows application developers to request IMS sysgen changes
  - Requests are entered using an IMS transaction
  - Add, change, and delete programs, transactions, and databases
- Sysgens were originally done once per week
- Real-time IMS resource definitions were mandated
- A user modification was written for IMS 1.3 to manage IMS resource definitions in real time
  - Real-time definition (RTD) is the TI name of the provided functionality
  - Accessed via a user transaction (IRSREQ) and a “system programmer” transaction (RTDTRAN)
  - Add, change, delete; PDIR, DDIR, SMB
  - IRSREQ message switches to RTDTRAN
  - System programmers can run RTDTRAN directly
- IMS V10 introduced Dynamic Resource Definition (DRD)
  - New type-2 IMS commands CREATE, UPDATE, DELETE
  - Use SPOC via TSO or batch; no transaction interface provided
  - Provides a CSL API to perform IMS commands from a program
- Challenge
  - Use the CSL API to replace all the user modified code
  - Leave IRSREQ unchanged

Single Point of Control (SPOC) Overview

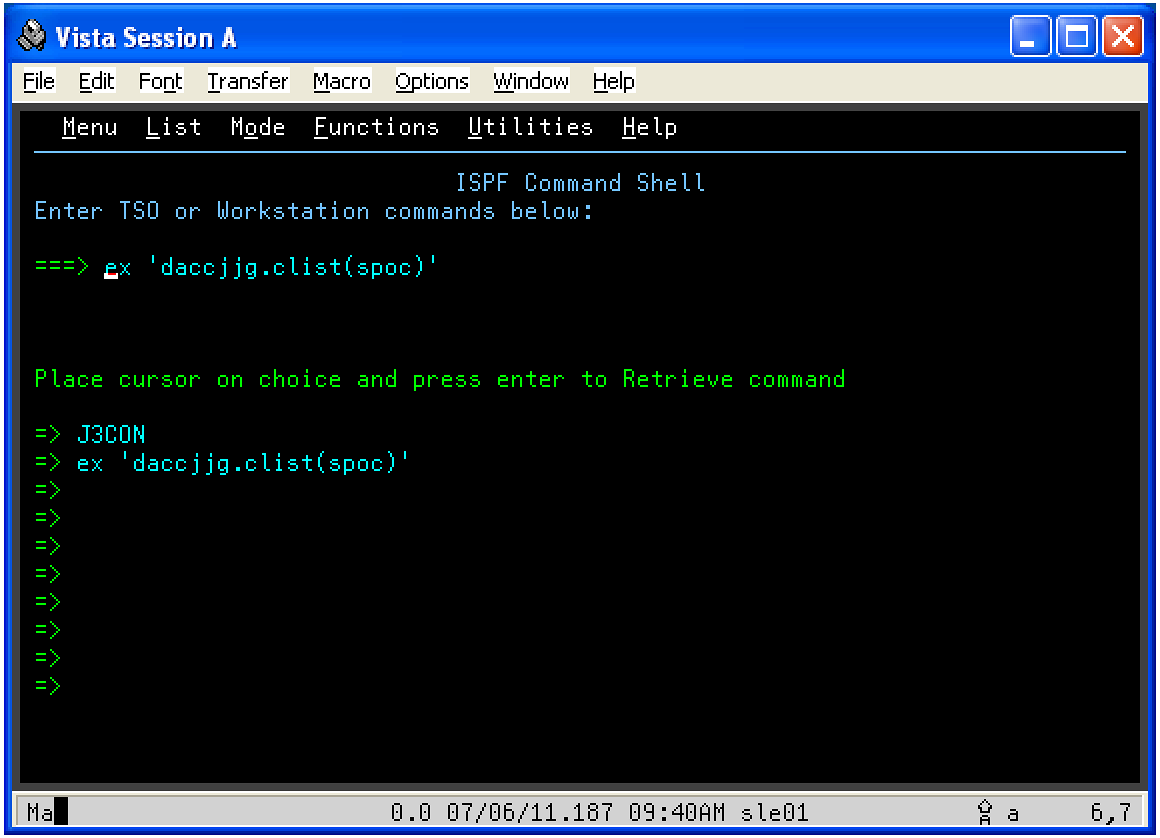
- Common Service Layer (CSL)
- CSL components; each is a separate address space
  - Operations Manager (OM)
    - Command entry
  - Resource Manager (RM)
    - Manage global and IMSplex-wide resources
  - Structured Call Interface (SCI)
    - Communication between address spaces
- SPOC
  - Interfaces between a user and the OM
  - Batch, TSO, REXX
  - Only the TSO interface is discussed here
- Session 9811 “Using IMS Dynamic Resource Definition (DRD)” is a hands-on lab where you can practice using the DRD type-2 commands

SPOC Overview

- TSO access is via ISPF
- Requires IMS datasets
  - SDFSCLST, SDFSDATA, SDFSEXEC, SDFSMLIB, SDFSPLIB, SDFSSLIB, and SDFSTLIB
- Invoke from ISPF Option 6
  - ex 'your.names.SDFSEXEC(DFSSPSRT)' 'HLQ(your.hlq) ALTRESL(''your.ims.reslib'')'
  - Note the double single quotes
  - Easier way
    - Create your own CLIST/REXX EXEC that has all the above data
    - Invoke it: ex 'daccjjg.clist(spoc)'
- First-time setup required
  - Next few slides show what to do

SPOC Overview

- User CLIST DACCJJG.CLIST(SPOC)
  - EXEC 'AACC.IMSADMIN.R11.SDFSEXEC(DFSSPSRT)' 'HLQ(AACC.IMSADMIN.R11) ALTRESL("SYS1.IMSVS.RESLIB")'

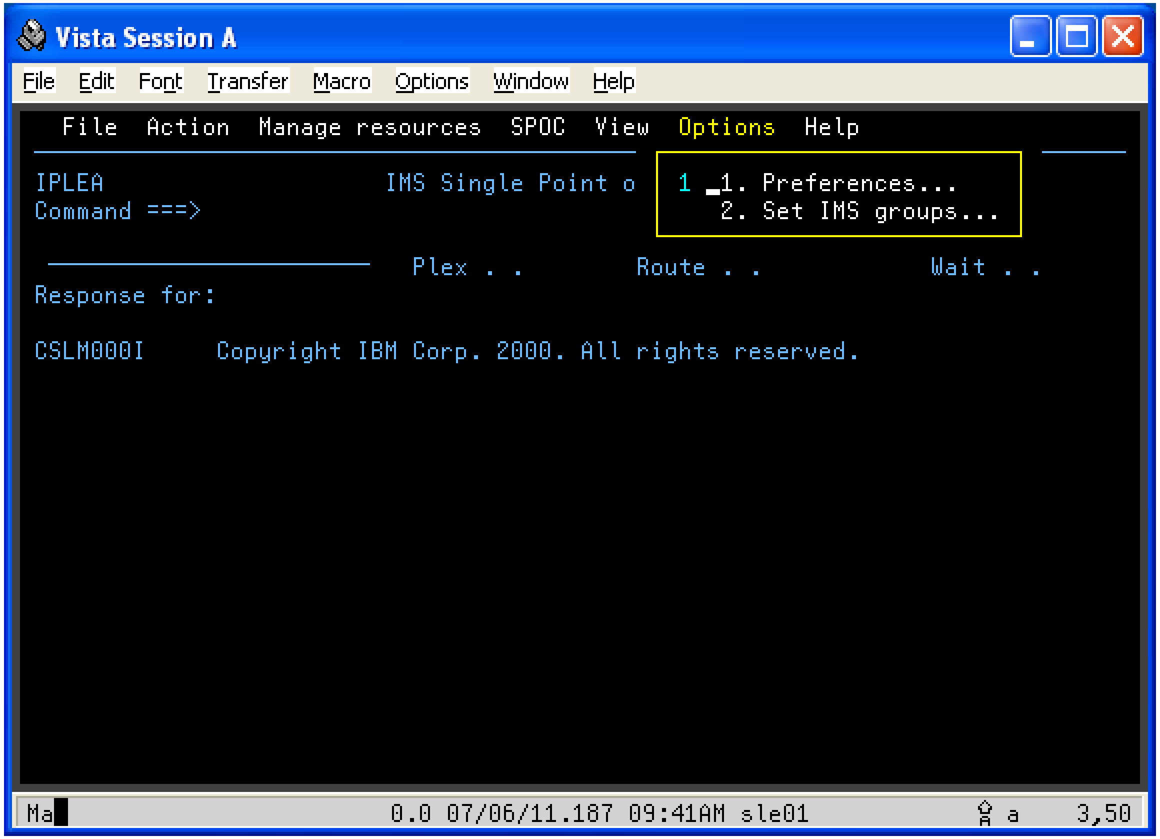

Vista Session A
File Edit Font Transfer Macro Options Window Help
Menu List Mode Functions Utilities Help

```
                        ISPF Command Shell
Enter TSO or Workstation commands below:

===> ex 'daccjjg.clist(spoc)'



Place cursor on choice and press enter to Retrieve command

=> J3CON
=> ex 'daccjjg.clist(spoc)'
=>
=>
=>
=>
=>
=>
=>
=>
```

```
Ma                  0.0 07/06/11.187 09:40AM sle01          a      6,7
```

SPOC Overview

- First time only: Options; Preferences …

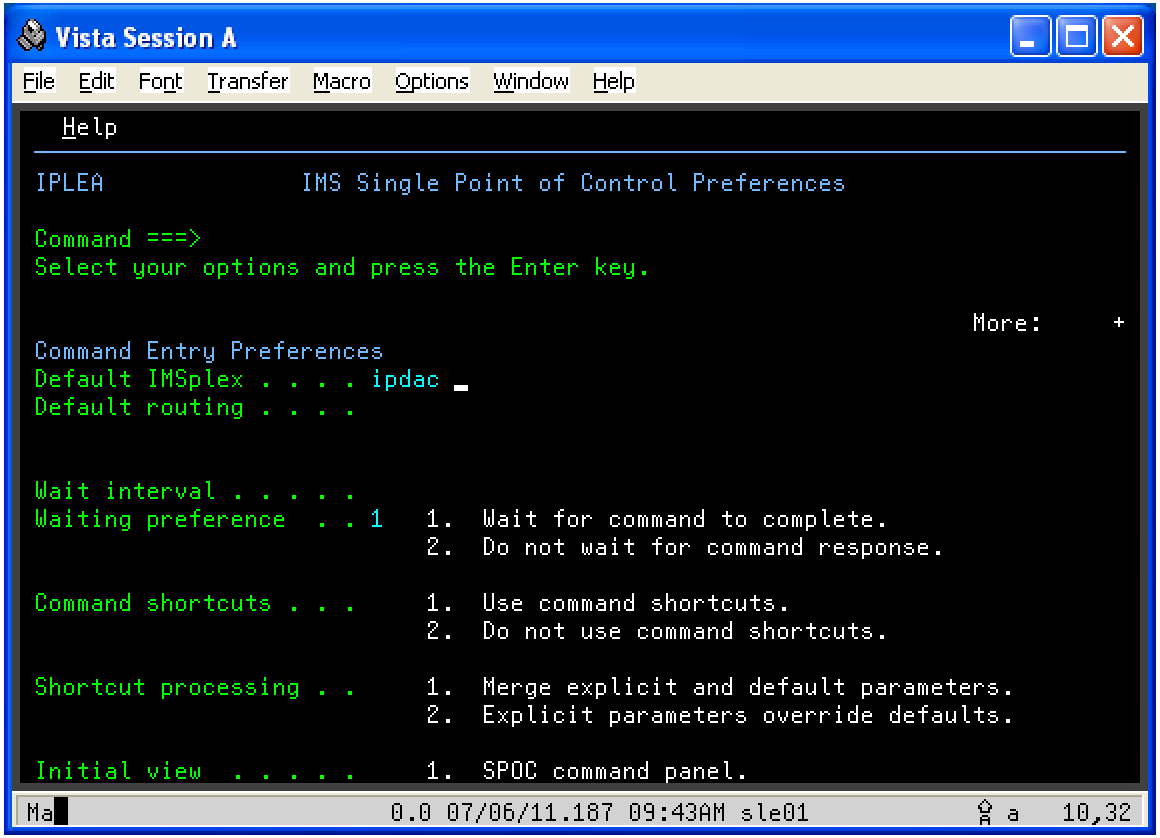


```
  File  Action  Manage resources  SPOC  View  Options  Help
 ─────────────────────────────────────────── ┌──────────────────────────┐ ──────
 IPLEA                    IMS Single Point o │ 1 _1. Preferences...      │
 Command ===>                                │     2. Set IMS groups...  │
                                             └──────────────────────────┘
  _______________________  Plex . .        Route . .              Wait . .
 Response for:

 CSLM000I     Copyright IBM Corp. 2000. All rights reserved.
```

```
 Ma                        0.0 07/06/11.187 09:41AM sle01           a    3,50
```

SPOC Overview

- First time only: set default IMSplex

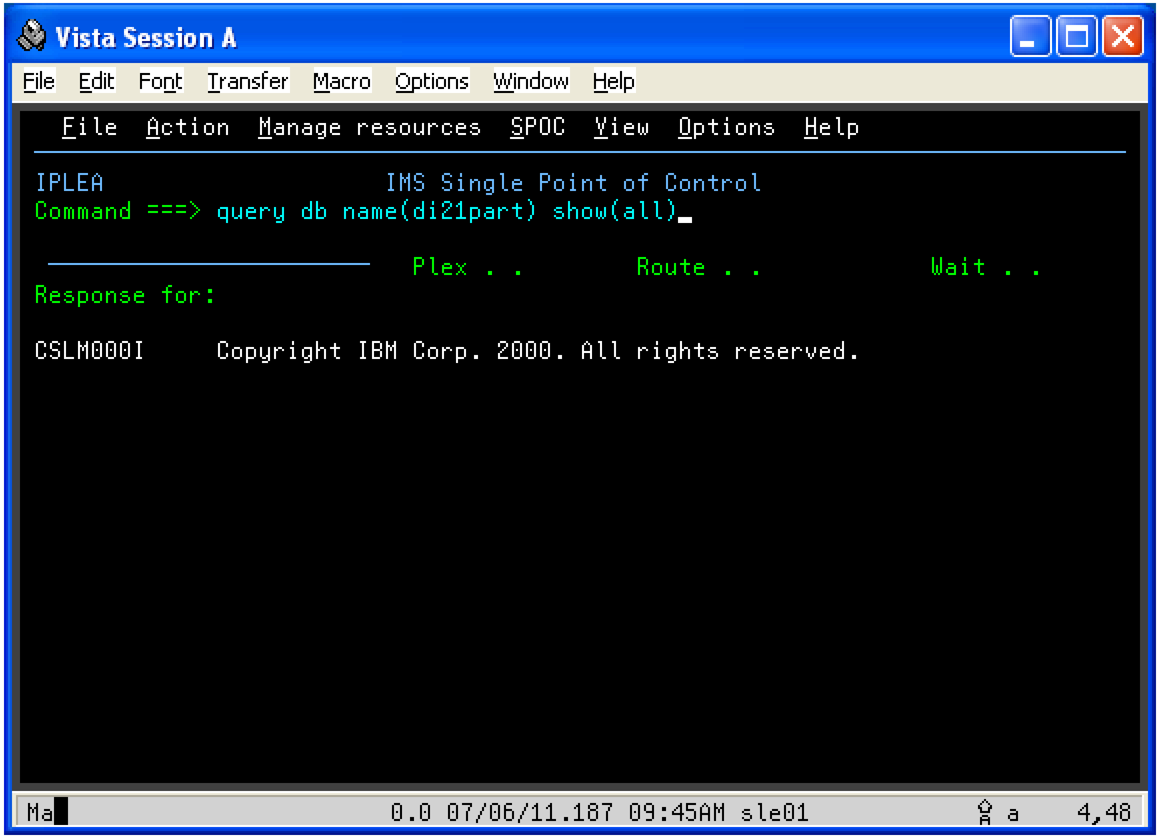


```
  Help
-----------------------------------------------------------------------------
IPLEA                IMS Single Point of Control Preferences

Command ===>
Select your options and press the Enter key.

                                                                   More:     +
Command Entry Preferences
Default IMSplex . . . . ipdac _
Default routing . . . .


Wait interval . . . . .
Waiting preference  . . 1   1.  Wait for command to complete.
                            2.  Do not wait for command response.

Command shortcuts . . .     1.  Use command shortcuts.
                            2.  Do not use command shortcuts.

Shortcut processing . .     1.  Merge explicit and default parameters.
                            2.  Explicit parameters override defaults.

Initial view  . . . . .     1.  SPOC command panel.
```

```
Ma█                        0.0 07/06/11.187 09:43AM sle01          a    10,32
```

SPOC Overview

- Display information about a database …

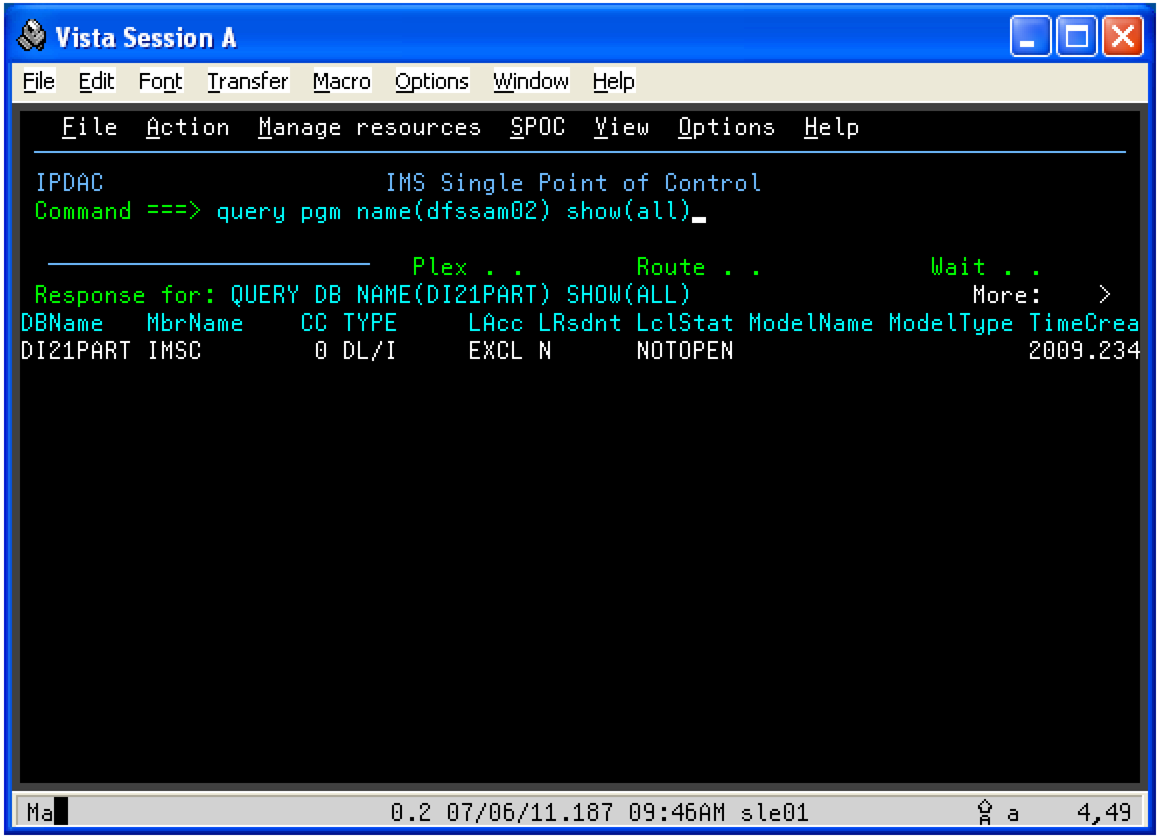


```
   File  Action  Manage resources  SPOC  View  Options  Help
 ------------------------------------------------------------------------------
 IPLEA                          IMS Single Point of Control
 Command ===> query db name(di21part) show(all)_

   _______________________     Plex . .         Route . .           Wait . .
 Response for:

 CSLM000I     Copyright IBM Corp. 2000. All rights reserved.
```

```
 Ma                      0.0 07/06/11.187 09:45AM sle01                a     4,48
```

SPOC Overview

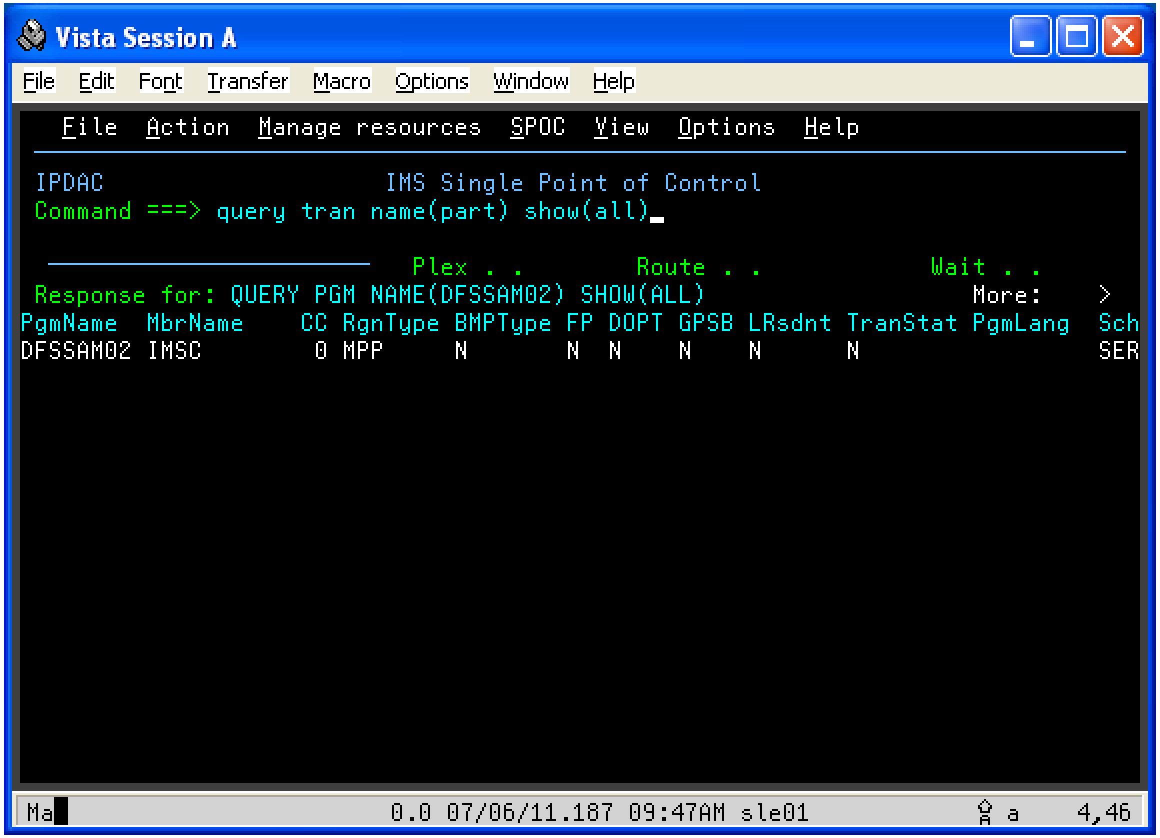
- Output; then display information about a program …



```
  File  Action  Manage resources  SPOC  View  Options  Help
 ------------------------------------------------------------------------------
 IPDAC                   IMS Single Point of Control
 Command ===> query pgm name(dfssam02) show(all)_

  _______________________  Plex . .         Route . .            Wait . .
 Response for: QUERY DB NAME(DI21PART) SHOW(ALL)                   More:    >
DBName   MbrName     CC TYPE     LAcc LRsdnt LclStat ModelName ModelType TimeCrea
DI21PART IMSC         0 DL/I     EXCL N      NOTOPEN                     2009.234

 Ma                                  0.2 07/06/11.187 09:46AM sle01          a      4,49
```

SPOC Overview

- Output; then display information about a transaction …

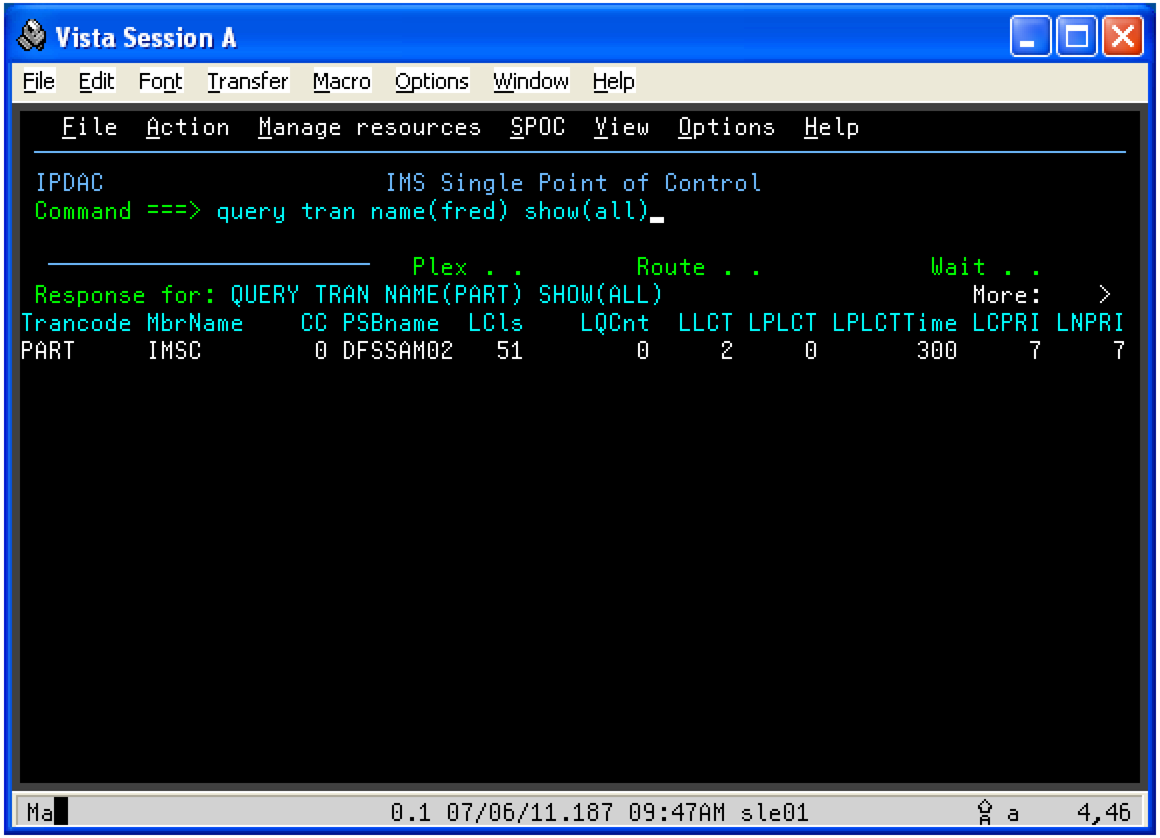


```
   File  Action  Manage resources  SPOC  View  Options  Help

 IPDAC                    IMS Single Point of Control
 Command ===> query tran name(part) show(all)_

  _______________________   Plex . .        Route . .            Wait . .
 Response for: QUERY PGM NAME(DFSSAM02) SHOW(ALL)                   More:    >
PgmName  MbrName    CC RgnType BMPType FP DOPT GPSB LRsdnt TranStat PgmLang  Sch
DFSSAM02 IMSC        0 MPP     N       N  N    N    N      N                 SER
```

```
Ma                    0.0 07/06/11.187 09:47AM sle01                a     4,46
```

SPOC Overview

- Output; then display some invalid output …

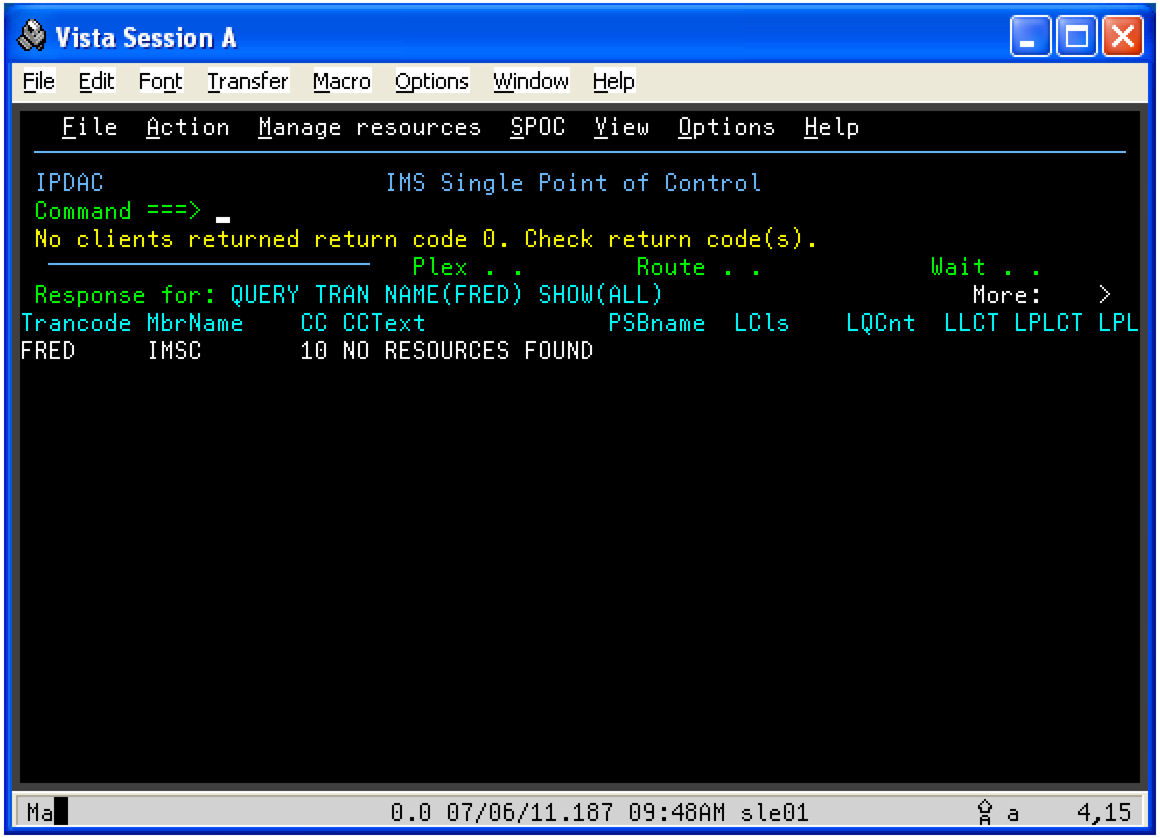


```
   File  Action  Manage resources  SPOC  View  Options  Help
 ------------------------------------------------------------------------------
 IPDAC                         IMS Single Point of Control
 Command ===> query tran name(fred) show(all)_

   ______________________      Plex . .         Route . .           Wait . .
 Response for: QUERY TRAN NAME(PART) SHOW(ALL)                        More:    >
Trancode MbrName     CC PSBname  LCls     LQCnt  LLCT LPLCT LPLCTTime LCPRI LNPRI
PART     IMSC         0 DFSSAM02   51         0     2     0       300     7     7
```

```
Ma                          0.1 07/06/11.187 09:47AM sle01                 a     4,46
```

SPOC Overview

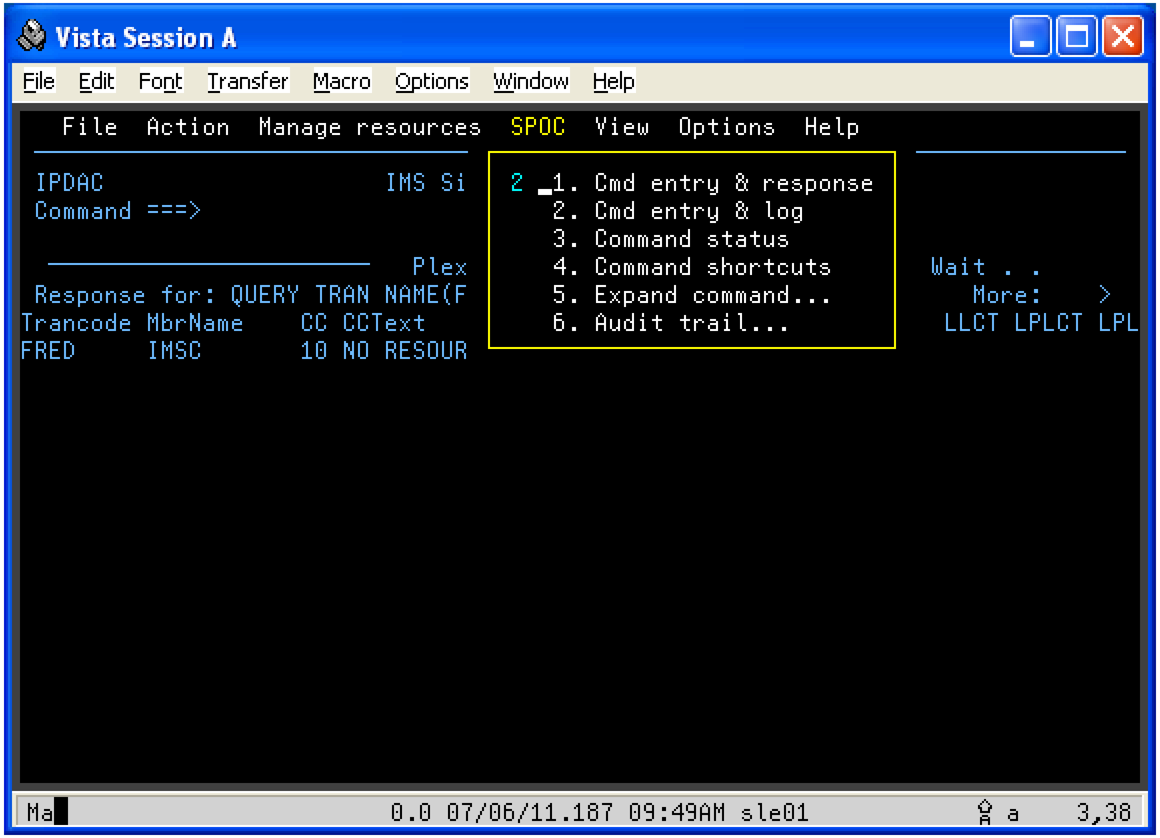
- Output
  - Next two slides show more details about the error



```
   File  Action  Manage resources  SPOC  View  Options  Help

 IPDAC                       IMS Single Point of Control
 Command ===> _
 No clients returned return code 0. Check return code(s).
                           Plex . .          Route . .            Wait . .
 Response for: QUERY TRAN NAME(FRED) SHOW(ALL)                       More:     >
Trancode MbrName    CC CCText              PSBname  LCls    LQCnt  LLCT LPLCT LPL
FRED     IMSC       10 NO RESOURCES FOUND

 Ma                          0.0 07/06/11.187 09:48AM sle01              a     4,15
```

SPOC Overview

- Display command entry and log …

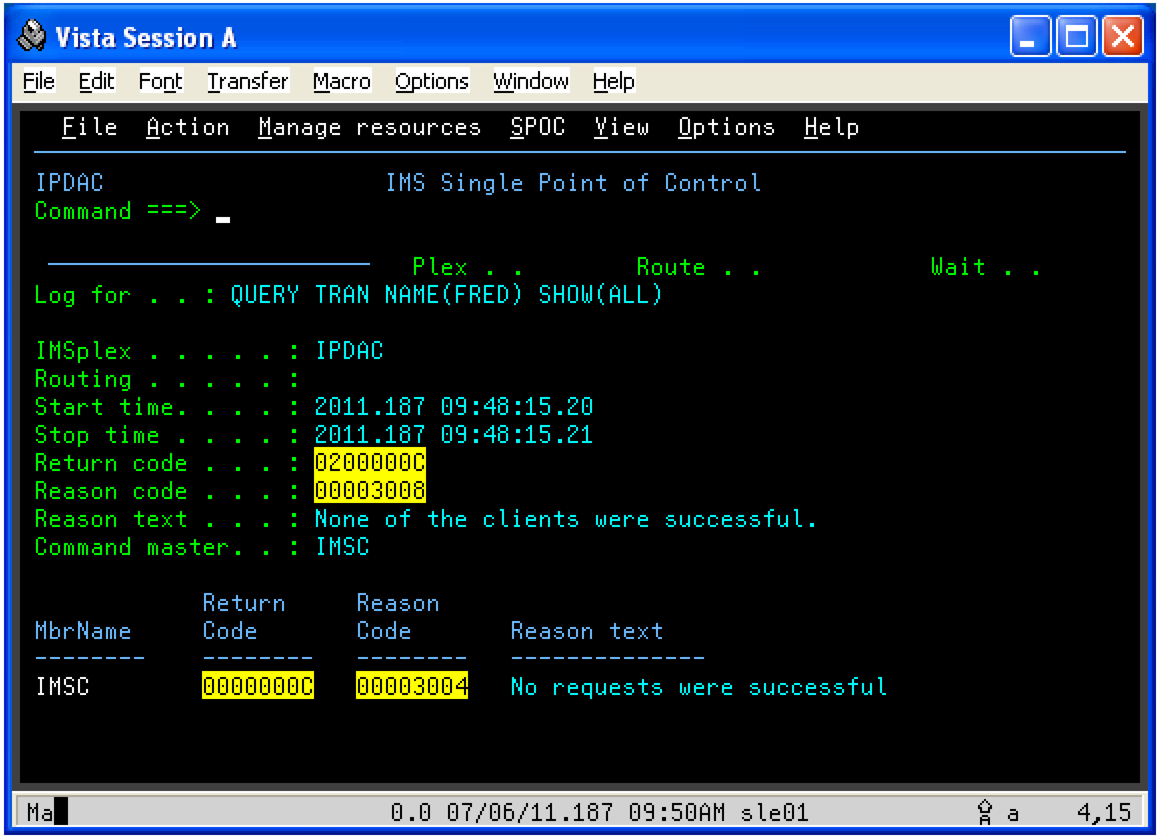


```
   File  Action  Manage resources  SPOC  View  Options  Help

 IPDAC                    IMS Si   2 _1. Cmd entry & response
 Command ===>                         2. Cmd entry & log
                                      3. Command status
                            Plex      4. Command shortcuts      Wait . .
 Response for: QUERY TRAN NAME(F      5. Expand command...         More:     >
Trancode MbrName    CC CCText         6. Audit trail...          LLCT LPLCT LPL
FRED     IMSC       10 NO RESOUR
```

```
Ma                         0.0 07/06/11.187 09:49AM sle01              a      3,38
```

SPOC Overview

- Note the return and reason codes; two sets of them
  - First set is the OM return code and reason code
  - Second set is the QUERY return code and reason code



```
  File  Action  Manage resources  SPOC  View  Options  Help
 ------------------------------------------------------------------------------
IPDAC                        IMS Single Point of Control
Command ===> _

 _______________________   Plex . .         Route . .             Wait . .
Log for . . : QUERY TRAN NAME(FRED) SHOW(ALL)

IMSplex . . . . . : IPDAC
Routing . . . . . :
Start time. . . . : 2011.187 09:48:15.20
Stop time . . . . : 2011.187 09:48:15.21
Return code . . . : 0200000C
Reason code . . . : 00003008
Reason text . . . : None of the clients were successful.
Command master. . : IMSC

            Return      Reason
MbrName     Code        Code        Reason text
--------    --------    --------    --------------
IMSC        0000000C    00003004    No requests were successful

Ma                         0.0 07/06/11.187 09:50AM sle01              a     4,15
```

DRD Overview

- Enabled via IMS PROCLIB member DFSCGxxx
  - MODBLKS=DYN
- Implemented using type-2 commands
- Eliminates the need for a MODBLKS sysgen
- MODBLKS “enhanced” by Resource Definition Data Sets
  - Data is exported/imported to/from the RDDS
  - Exports: sysgen resources and dynamic create/update resources
  - Imports: done at cold start or via the IMPORT command
  - Analogous to a checkpoint dataset for the type-2 commands
- Eventually could remove MODBLKS; just use RDDS
  - We’ve done this
- There are utilities that manage the RDDS
  - See the *IMS V11 System Utilities* manual

Type-2 Commands Used for DRD

- Quick look at the format of type-2 commands and output
- Understand how to construct commands and interpret output
  - Output is in XML
- The *IMS V11 Commands* manuals document
  - Command syntax
  - Command output
  - Return codes, reason codes, and completion codes
- The XML output is also documented in the *IMS V11 System Programming APIs* manual
  - See Chapter 9

Type-2 Commands Used for DRD

- Documented in *IMS V11 Commands, Volumes 1, 2*
- CREATE, DELETE, UPDATE
  - DB, PGM, TRAN
  - Also DBDESC, PGMDESC, RTC, RTCDESC, and TRANDESC
    - Not discussed here
- QUERY
  - Although not needed for DRD, useful for our implementation
- Syntax: <cmd> <type> NAME(<resource>) [<attributes>]
  - DELETE DB NAME(DI21PART)
  - UPDATE TRAN NAME(PART) SET(CLASS(1))
  - QUERY TRAN NAME(PART) SHOW(CLASS,MAXRGN)
- Command invocation
  - Output is in XML
  - May have a return code and reason code
  - May have a completion code
- Examples are shown following the CSL API macro slides

Common Service Layer Application Programming Interface

- Documented in *IMS V11 System Programming APIs*
  - Chapter 3. Writing a CSL client
  - Chapter 4. CSL automated operator program requests
  - Chapter 6. Writing a CSL OM client
  - Chapter 8. Writing a CSL SCI client
  - Chapter 9. CSL Operations Manager XML output
- Describes assembler macros used to perform the client functions
- Documents the SCI, OM, and RM return and reason codes
- Describes output returned for each request
  - Output is in XML

CSL API

- We wrote a CSL SCI client that issues AOP requests
  - Called by RTDTRAN
  - More about our client appears in later slides
- Protocol requires that the client
  - SCI: Connect to SCI
    - Issue a command registration request to register as an AOP
    - Issue a ready request
  - OM: Issue the command and receive command output
  - User: Process command output
  - SCI: Release command output buffer
  - SCI: Disconnect from SCI
    - Quiesce
    - Deregister
- All of the above except the User bullet are done using CSL macros

CSL API – the macros

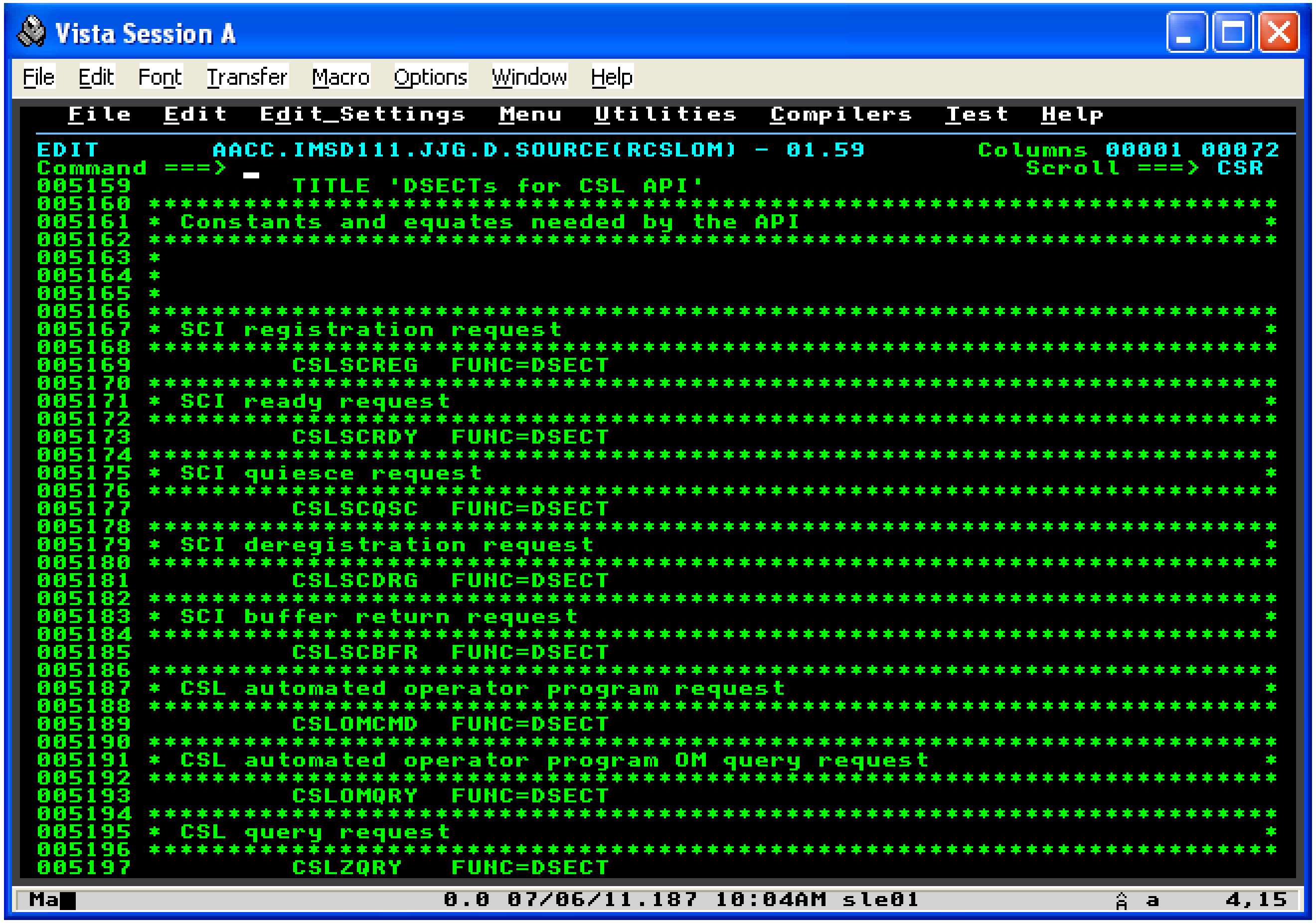
- CSLSCREG
  - Register to SCI (connect with SCI)
- CSLSCRDY
  - Ready the member (IMSplex member) to SCI
- CSLSCBFR
  - Release storage allocated by SCI
- CSLSCQSC
  - Quiesce the member to SCI
- CSLSCDRG
  - Deregister the member from SCI (terminate the SCI connection)
- There are other SCI macros; we did not need them
- CSLOMCMD
  - Requests that an IMS command be issued (type-1 or type-2)

CSL API – the macros

- Each macro invocation returns
  - A return code and a reason code
- Each macro has a DSECT request that generates equates needed by the macro invocation
- *System Programming APIs* documents the values
- Return code high order byte indicates the component that set the return code and reason code
  - X'00' IMS set the return and reason code
  - X'01' SCI set the return and reason code
  - X'02' OM set the return and reason code
  - X'03' RM set the return and reason code
- Examples shown later

CSL API – the macros

- The DSECTs


Vista Session A
File Edit Font Transfer Macro Options Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help

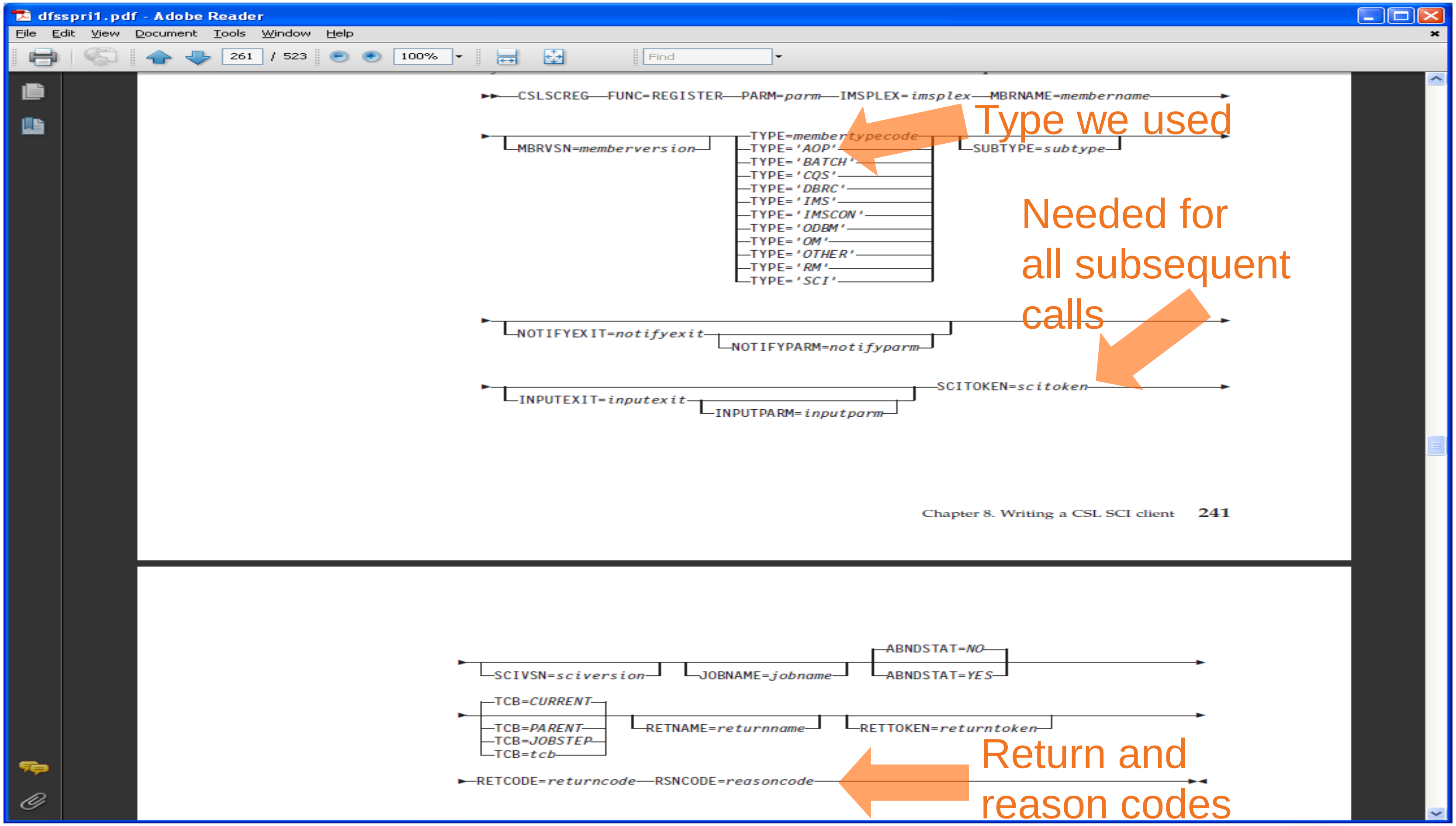
```
EDIT       AACC.IMSD111.JJG.D.SOURCE(RCSLOM) - 01.59          Columns 00001 00072
Command ===>                                                      Scroll ===> CSR
         TITLE 'DSECTs for CSL API'
***********************************************************************
* Constants and equates needed by the API                             *
***********************************************************************
*
*
*
***********************************************************************
* SCI registration request                                            *
***********************************************************************
         CSLSCREG  FUNC=DSECT
***********************************************************************
* SCI ready request                                                   *
***********************************************************************
         CSLSCRDY  FUNC=DSECT
***********************************************************************
* SCI quiesce request                                                 *
***********************************************************************
         CSLSCQSC  FUNC=DSECT
***********************************************************************
* SCI deregistration request                                          *
***********************************************************************
         CSLSCDRG  FUNC=DSECT
***********************************************************************
* SCI buffer return request                                           *
***********************************************************************
         CSLSCBFR  FUNC=DSECT
***********************************************************************
* CSL automated operator program request                              *
***********************************************************************
         CSLOMCMD  FUNC=DSECT
***********************************************************************
* CSL automated operator program OM query request                     *
***********************************************************************
         CSLOMQRY  FUNC=DSECT
***********************************************************************
* CSL query request                                                   *
***********************************************************************
         CSLZQRY   FUNC=DSECT
```

CSL API – the macros

- DFSCMDRR
  - While not needed, the DFSCMDRR macro in SDFSMAC contains equates for the return codes, reason codes, and completion codes for all IMS commands that are routed from OM

CSL API – the macros: CSLSCREG

- Excerpt from *System Programming APIs* manual


dfsspri1.pdf - Adobe Reader
File Edit View Document Tools Window Help
261 / 523
100%
Find

```
►►─CSLSCREG─FUNC=REGISTER─PARM=parm─IMSPLEX=implex─MBRNAME=membername──────►

►─┬──────────────────────────┬─┬─TYPE=membertypecode─┬─┬────────────────────┬─►
  └─MBRVSN=memberversion─────┘ ├─TYPE='AOP'──────────┤ └─SUBTYPE=subtype────┘
                               ├─TYPE='BATCH'────────┤
                               ├─TYPE='CQS'──────────┤
                               ├─TYPE='DBRC'─────────┤
                               ├─TYPE='IMS'──────────┤
                               ├─TYPE='IMSCON'───────┤
                               ├─TYPE='ODBM'─────────┤
                               ├─TYPE='OM'───────────┤
                               ├─TYPE='OTHER'────────┤
                               ├─TYPE='RM'───────────┤
                               └─TYPE='SCI'──────────┘

►─┬──────────────────────────────────────────────────┬─────────────────────►
  └─NOTIFYEXIT=notifyexit─┬────────────────────────┬─┘
                          └─NOTIFYPARM=notifyparm──┘

►─┬──────────────────────────────────────────────┬─SCITOKEN=scitoken──────►
  └─INPUTEXIT=inputexit─┬──────────────────────┬─┘
                        └─INPUTPARM=inputparm──┘

Chapter 8. Writing a CSL SCI client     241

►─┬──────────────────────┬─┬────────────────────┬─┬─ABNDSTAT=NO──┬───────►
  └─SCIVSN=sciversion────┘ └─JOBNAME=jobname────┘ └─ABNDSTAT=YES─┘

►─┬─TCB=CURRENT─┬─┬──────────────────────┬─┬────────────────────────┬─────►
  ├─TCB=PARENT──┤ └─RETNAME=returnname───┘ └─RETTOKEN=returntoken───┘
  ├─TCB=JOBSTEP─┤
  └─TCB=tcb─────┘

►─RETCODE=returncode─RSNCODE=reasoncode──────────────────────────────────►◄
```

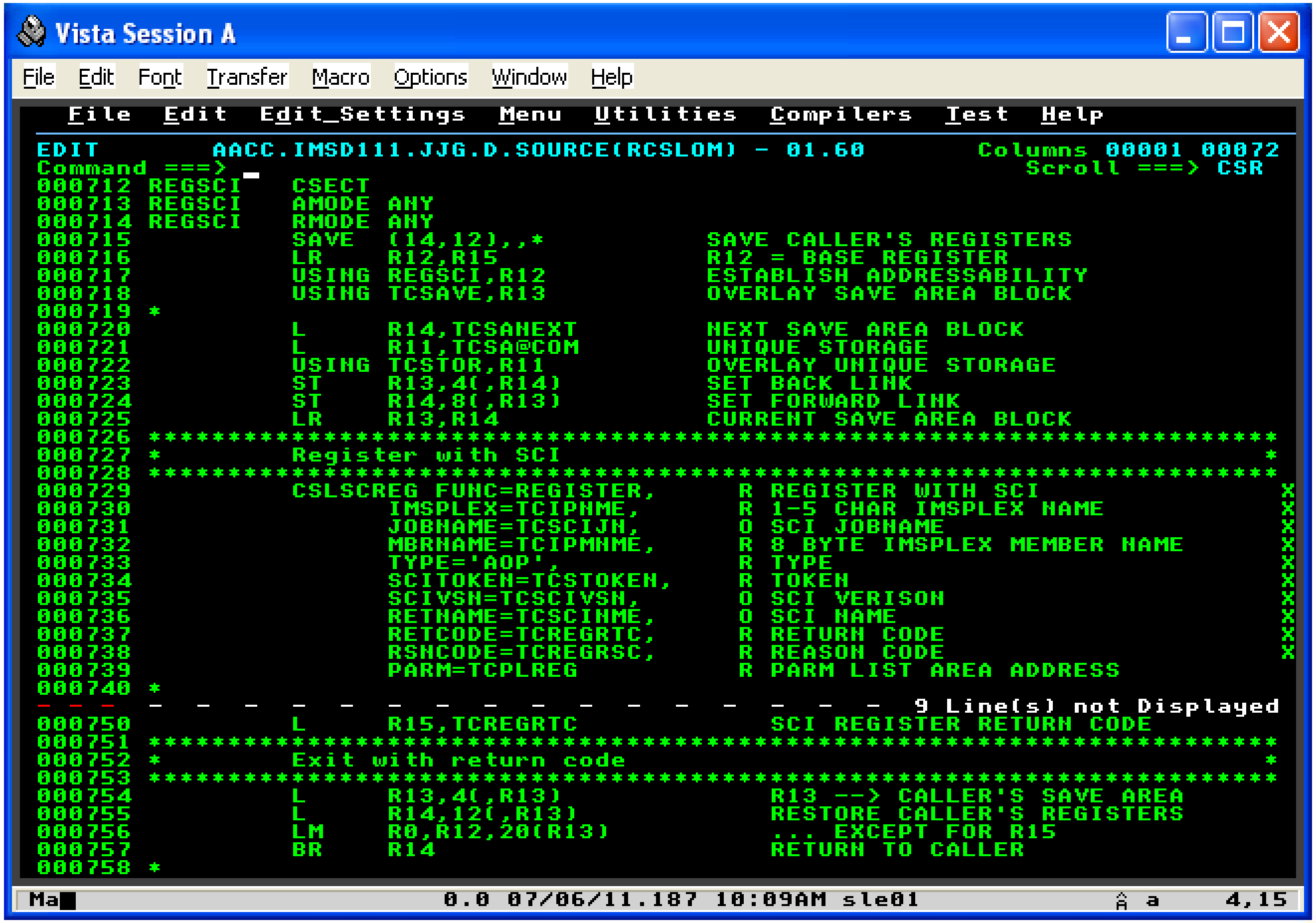
Type we used

Needed for all subsequent calls

Return and reason codes

CSL API - register

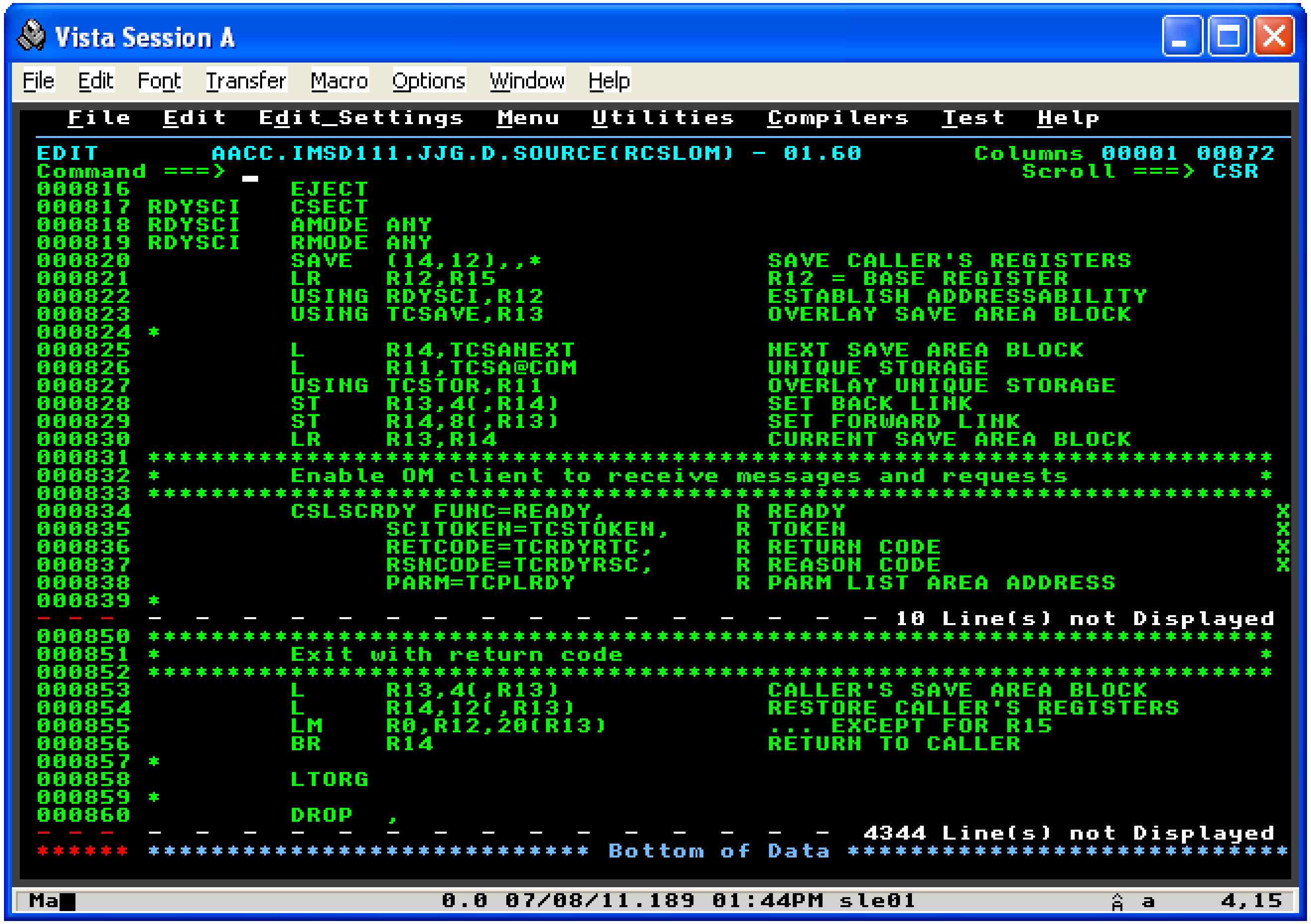
- CSLSCREG invocation



```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
EDIT       AACC.IMSD111.JJG.D.SOURCE(RCSLOM) - 01.60       Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
000712 REGSCI   CSECT
000713 REGSCI   AMODE ANY
000714 REGSCI   RMODE ANY
000715          SAVE  (14,12),,*          SAVE CALLER'S REGISTERS
000716          LR    R12,R15             R12 = BASE REGISTER
000717          USING REGSCI,R12          ESTABLISH ADDRESSABILITY
000718          USING TCSAVE,R13          OVERLAY SAVE AREA BLOCK
000719 *
000720          L     R14,TCSANEXT        NEXT SAVE AREA BLOCK
000721          L     R11,TCSA@COM        UNIQUE STORAGE
000722          USING TCSTOR,R11          OVERLAY UNIQUE STORAGE
000723          ST    R13,4(,R14)         SET BACK LINK
000724          ST    R14,8(,R13)         SET FORWARD LINK
000725          LR    R13,R14             CURRENT SAVE AREA BLOCK
000726 ***********************************************************************
000727 *        Register with SCI                                            *
000728 ***********************************************************************
000729          CSLSCREG FUNC=REGISTER,     R REGISTER WITH SCI               X
000730                IMSPLEX=TCIPNME,      R 1-5 CHAR IMSPLEX NAME           X
000731                JOBNAME=TCSCIJN,      O SCI JOBNAME                     X
000732                MBRNAME=TCIPMNME,     R 8 BYTE IMSPLEX MEMBER NAME      X
000733                TYPE='AOP',           R TYPE                            X
000734                SCITOKEN=TCSTOKEN,    R TOKEN                           X
000735                SCIVSN=TCSCIVSN,      O SCI VERISON                     X
000736                RETNAME=TCSCINME,     O SCI NAME                        X
000737                RETCODE=TCREGRTC,     R RETURN CODE                     X
000738                RSNCODE=TCREGRSC,     R REASON CODE                     X
000739                PARM=TCPLREG          R PARM LIST AREA ADDRESS
000740 *
- - -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  9 Line(s) not Displayed
000750          L     R15,TCREGRTC              SCI REGISTER RETURN CODE
000751 ***********************************************************************
000752 *        Exit with return code                                        *
000753 ***********************************************************************
000754          L     R13,4(,R13)               R13 --> CALLER'S SAVE AREA
000755          L     R14,12(,R13)              RESTORE CALLER'S REGISTERS
000756          LM    R0,R12,20(R13)            ... EXCEPT FOR R15
000757          BR    R14                       RETURN TO CALLER
000758 *
Ma█                      0.0 07/06/11.187 10:09AM sle01                 a     4,15
```

CSL API - ready

- CSLSCRDY invocation; note the SCITOKEN value on line 835

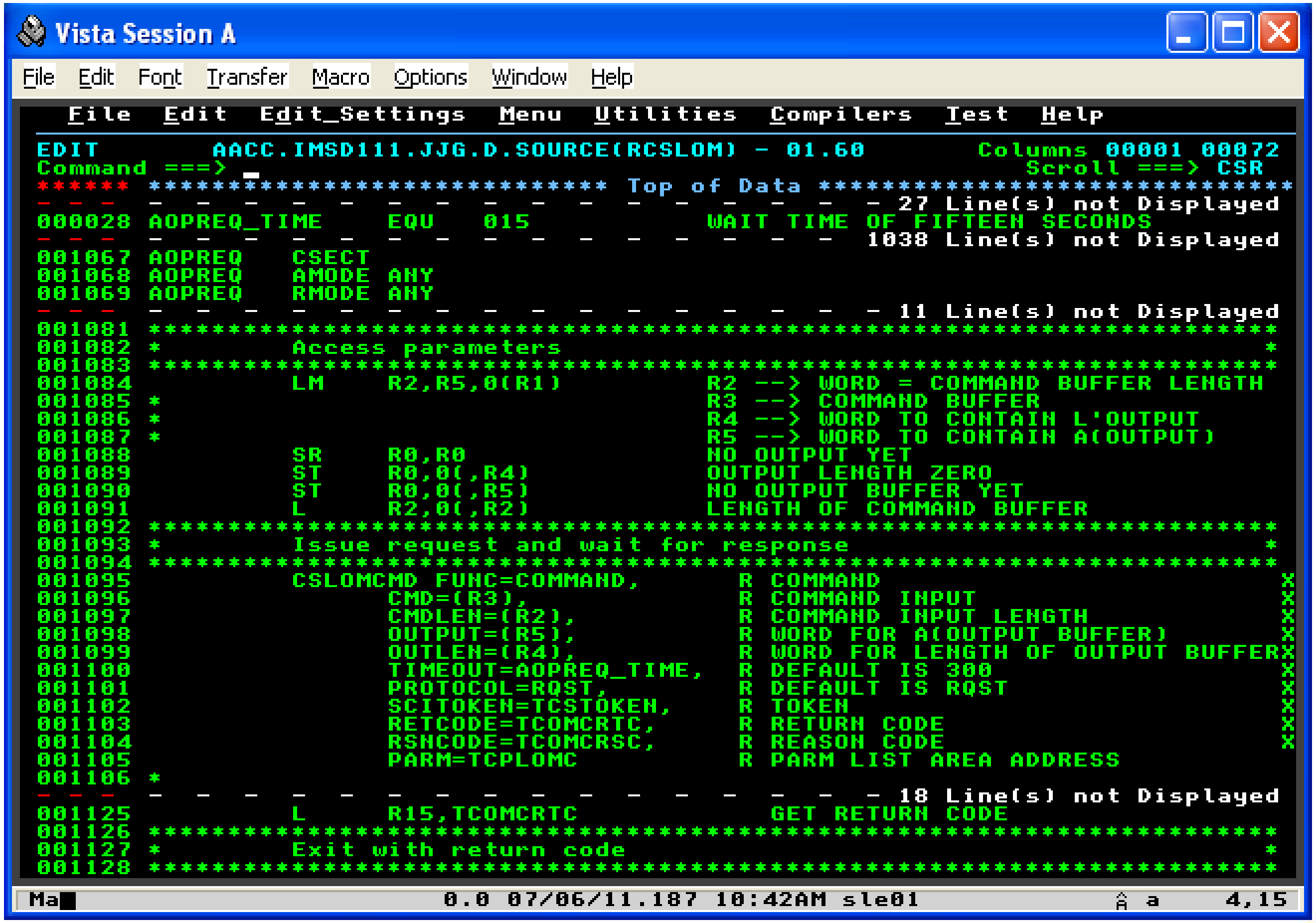


Vista Session A
File Edit Font Transfer Macro Options Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help

```
EDIT       AACC.IMSD111.JJG.D.SOURCE(RCSLOM) - 01.60       Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
000816          EJECT
000817 RDYSCI   CSECT
000818 RDYSCI   AMODE ANY
000819 RDYSCI   RMODE ANY
000820          SAVE  (14,12),,*              SAVE CALLER'S REGISTERS
000821          LR    R12,R15                 R12 = BASE REGISTER
000822          USING RDYSCI,R12              ESTABLISH ADDRESSABILITY
000823          USING TCSAVE,R13              OVERLAY SAVE AREA BLOCK
000824 *
000825          L     R14,TCSANEXT            NEXT SAVE AREA BLOCK
000826          L     R11,TCSA@COM            UNIQUE STORAGE
000827          USING TCSTOR,R11              OVERLAY UNIQUE STORAGE
000828          ST    R13,4(,R14)             SET BACK LINK
000829          ST    R14,8(,R13)             SET FORWARD LINK
000830          LR    R13,R14                 CURRENT SAVE AREA BLOCK
000831 ***********************************************************************
000832 *        Enable OM client to receive messages and requests            *
000833 ***********************************************************************
000834          CSLSCRDY FUNC=READY,        R READY                           X
000835                SCITOKEN=TCSTOKEN,    R TOKEN                           X
000836                RETCODE=TCRDYRTC,     R RETURN CODE                     X
000837                RSNCODE=TCRDYRSC,     R REASON CODE                     X
000838                PARM=TCPLRDY          R PARM LIST AREA ADDRESS
000839 *
- - -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  - 10 Line(s) not Displayed
000850 ***********************************************************************
000851 *        Exit with return code                                        *
000852 ***********************************************************************
000853          L     R13,4(,R13)             CALLER'S SAVE AREA BLOCK
000854          L     R14,12(,R13)            RESTORE CALLER'S REGISTERS
000855          LM    R0,R12,20(R13)          ... EXCEPT FOR R15
000856          BR    R14                     RETURN TO CALLER
000857 *
000858          LTORG
000859 *
000860          DROP  ,
- - -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  4344 Line(s) not Displayed
****** **************************** Bottom of Data *****************************
```

CSL API – issue command

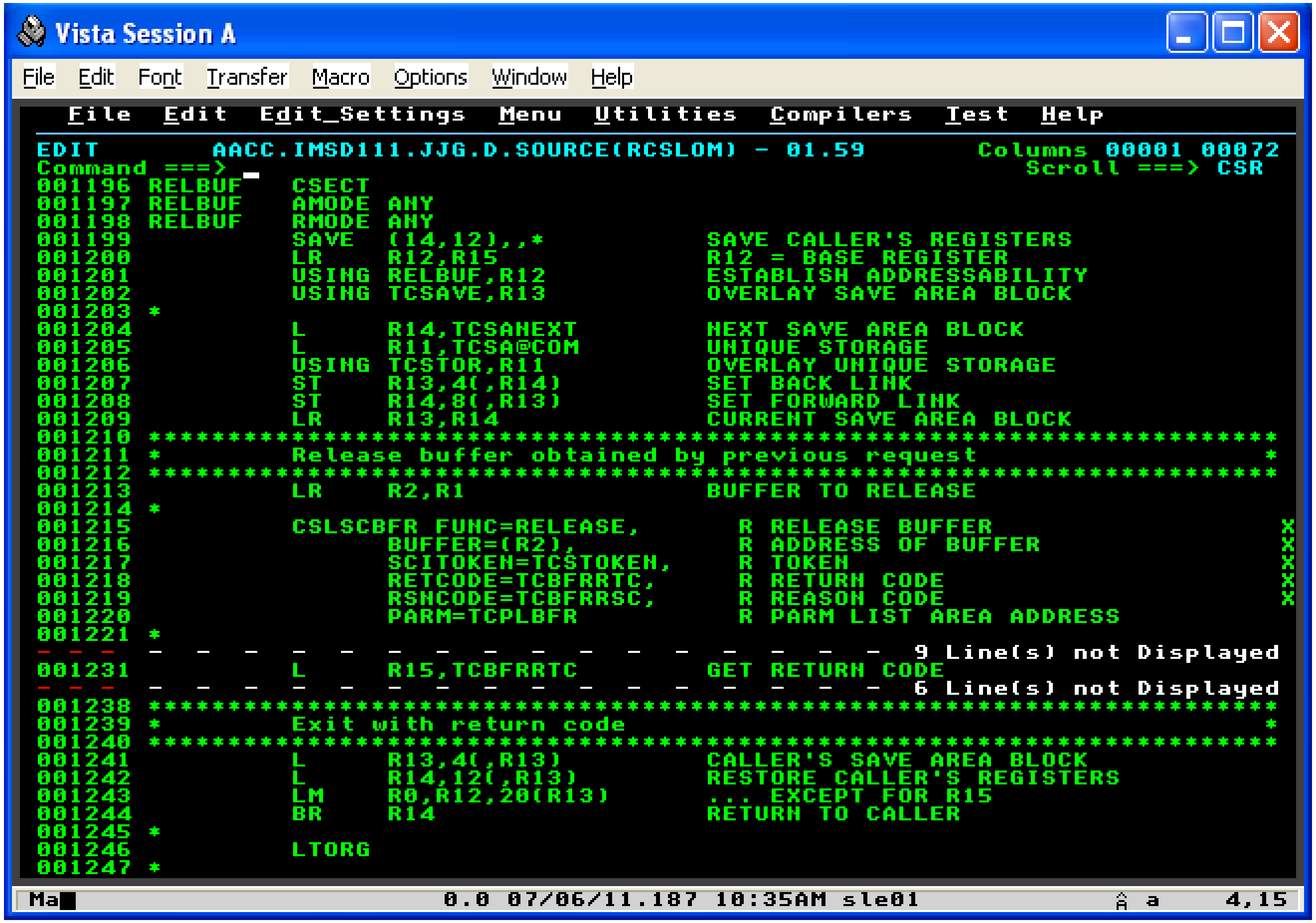
- CSLOMCMD invocation; note output values on lines 1098-99


Vista Session A
File Edit Font Transfer Macro Options Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help

```
EDIT       AACC.IMSD111.JJG.D.SOURCE(RCSLOM) - 01.60       Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
- - -  - - - - - - - - - - - - - - - - - - - - - - - - 27 Line(s) not Displayed
000028 AOPREQ_TIME    EQU   015           WAIT TIME OF FIFTEEN SECONDS
- - -  - - - - - - - - - - - - - - - - - - - - - - - 1038 Line(s) not Displayed
001067 AOPREQ   CSECT
001068 AOPREQ   AMODE ANY
001069 AOPREQ   RMODE ANY
- - -  - - - - - - - - - - - - - - - - - - - - - - - - 11 Line(s) not Displayed
001081 ***********************************************************************
001082 *        Access parameters                                            *
001083 ***********************************************************************
001084          LM    R2,R5,0(R1)         R2 --> WORD = COMMAND BUFFER LENGTH
001085 *                                  R3 --> COMMAND BUFFER
001086 *                                  R4 --> WORD TO CONTAIN L'OUTPUT
001087 *                                  R5 --> WORD TO CONTAIN A(OUTPUT)
001088          SR    R0,R0               NO OUTPUT YET
001089          ST    R0,0(,R4)           OUTPUT LENGTH ZERO
001090          ST    R0,0(,R5)           NO OUTPUT BUFFER YET
001091          L     R2,0(,R2)           LENGTH OF COMMAND BUFFER
001092 ***********************************************************************
001093 *        Issue request and wait for response                          *
001094 ***********************************************************************
001095          CSLOMCMD FUNC=COMMAND,      R COMMAND                        X
001096                CMD=(R3),             R COMMAND INPUT                  X
001097                CMDLEN=(R2),          R COMMAND INPUT LENGTH           X
001098                OUTPUT=(R5),          R WORD FOR A(OUTPUT BUFFER)      X
001099                OUTLEN=(R4),          R WORD FOR LENGTH OF OUTPUT BUFFERX
001100                TIMEOUT=AOPREQ_TIME,  R DEFAULT IS 300                 X
001101                PROTOCOL=RQST,        R DEFAULT IS RQST                X
001102                SCITOKEN=TCSTOKEN,    R TOKEN                          X
001103                RETCODE=TCOMCRTC,     R RETURN CODE                    X
001104                RSNCODE=TCOMCRSC,     R REASON CODE                    X
001105                PARM=TCPLOMC          R PARM LIST AREA ADDRESS
001106 *
- - -  - - - - - - - - - - - - - - - - - - - - - - - - 18 Line(s) not Displayed
001125          L     R15,TCOMCRTC          GET RETURN CODE
001126 ***********************************************************************
001127 *        Exit with return code                                        *
001128 ***********************************************************************
 Ma                      0.0 07/06/11.187 10:42AM sle01             a     4,15
```

CSL API – release buffer

- CSLSCBFR invocation; release buffer

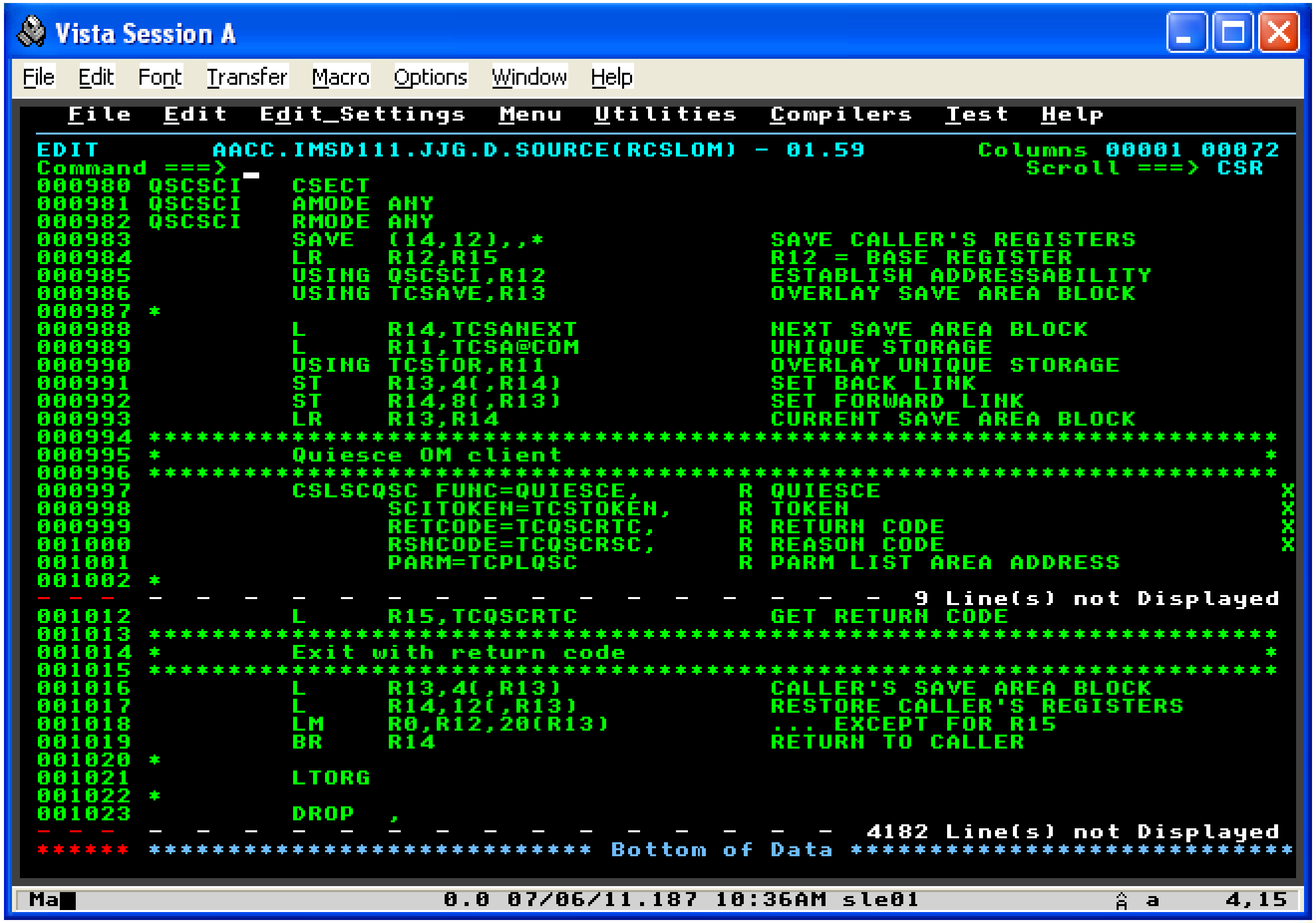

Vista Session A
File Edit Font Transfer Macro Options Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help

```
EDIT       AACC.IMSD111.JJG.D.SOURCE(RCSLOM) - 01.59          Columns 00001 00072
Command ===>                                                     Scroll ===> CSR
RELBUF   CSECT
RELBUF   AMODE ANY
RELBUF   RMODE ANY
         SAVE  (14,12),,*          SAVE CALLER'S REGISTERS
         LR    R12,R15             R12 = BASE REGISTER
         USING RELBUF,R12          ESTABLISH ADDRESSABILITY
         USING TCSAVE,R13          OVERLAY SAVE AREA BLOCK
*
         L     R14,TCSANEXT        NEXT SAVE AREA BLOCK
         L     R11,TCSA@COM        UNIQUE STORAGE
         USING TCSTOR,R11          OVERLAY UNIQUE STORAGE
         ST    R13,4(,R14)         SET BACK LINK
         ST    R14,8(,R13)         SET FORWARD LINK
         LR    R13,R14             CURRENT SAVE AREA BLOCK
***********************************************************************
*        Release buffer obtained by previous request                  *
***********************************************************************
         LR    R2,R1               BUFFER TO RELEASE
*
         CSLSCBFR FUNC=RELEASE,      R RELEASE BUFFER                  X
               BUFFER=(R2),          R ADDRESS OF BUFFER               X
               SCITOKEN=TCSTOKEN,    R TOKEN                           X
               RETCODE=TCBFRRTC,     R RETURN CODE                     X
               RSNCODE=TCBFRRSC,     R REASON CODE                     X
               PARM=TCPLBFR          R PARM LIST AREA ADDRESS
*
- - -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  9 Line(s) not Displayed
         L     R15,TCBFRRTC        GET RETURN CODE
- - -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  6 Line(s) not Displayed
***********************************************************************
*        Exit with return code                                        *
***********************************************************************
         L     R13,4(,R13)         CALLER'S SAVE AREA BLOCK
         L     R14,12(,R13)        RESTORE CALLER'S REGISTERS
         LM    R0,R12,20(R13)      ... EXCEPT FOR R15
         BR    R14                 RETURN TO CALLER
*
         LTORG
*
```

```
Ma                 0.0 07/06/11.187 10:35AM sle01               a      4,15
```

CSL API - quiesce

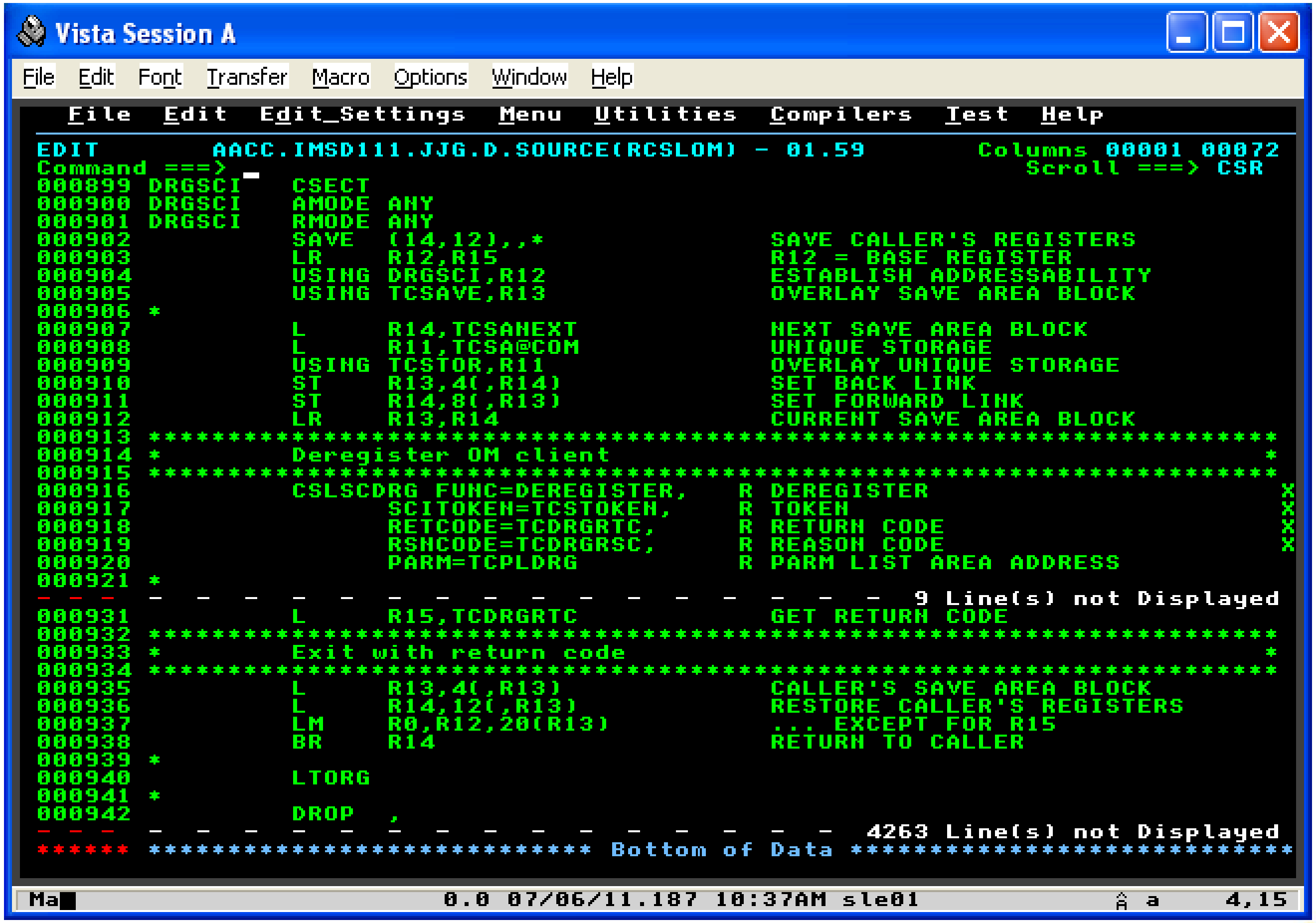
- CSLSCQSC invocation



```
  File  Edit  Edit_Settings  Menu  Utilities  Compilers  Test  Help
EDIT       AACC.IMSD111.JJG.D.SOURCE(RCSLOM) - 01.59       Columns 00001 00072
Command ===> _                                                Scroll ===> CSR
000980 QSCSCI   CSECT
000981 QSCSCI   AMODE ANY
000982 QSCSCI   RMODE ANY
000983          SAVE  (14,12),,*              SAVE CALLER'S REGISTERS
000984          LR    R12,R15                 R12 = BASE REGISTER
000985          USING QSCSCI,R12              ESTABLISH ADDRESSABILITY
000986          USING TCSAVE,R13              OVERLAY SAVE AREA BLOCK
000987 *
000988          L     R14,TCSANEXT            NEXT SAVE AREA BLOCK
000989          L     R11,TCSA@COM            UNIQUE STORAGE
000990          USING TCSTOR,R11              OVERLAY UNIQUE STORAGE
000991          ST    R13,4(,R14)             SET BACK LINK
000992          ST    R14,8(,R13)             SET FORWARD LINK
000993          LR    R13,R14                 CURRENT SAVE AREA BLOCK
000994 ***********************************************************************
000995 *        Quiesce OM client                                            *
000996 ***********************************************************************
000997          CSLSCQSC FUNC=QUIESCE,      R QUIESCE                        X
000998                SCITOKEN=TCSTOKEN,    R TOKEN                          X
000999                RETCODE=TCQSCRTC,     R RETURN CODE                    X
001000                RSNCODE=TCQSCRSC,     R REASON CODE                    X
001001                PARM=TCPLQSC          R PARM LIST AREA ADDRESS
001002 *
- - -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -   9 Line(s) not Displayed
001012          L     R15,TCQSCRTC            GET RETURN CODE
001013 ***********************************************************************
001014 *        Exit with return code                                        *
001015 ***********************************************************************
001016          L     R13,4(,R13)             CALLER'S SAVE AREA BLOCK
001017          L     R14,12(,R13)            RESTORE CALLER'S REGISTERS
001018          LM    R0,R12,20(R13)          ... EXCEPT FOR R15
001019          BR    R14                     RETURN TO CALLER
001020 *
001021          LTORG
001022 *
001023          DROP  ,
- - -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  4182 Line(s) not Displayed
****** **************************** Bottom of Data ****************************
 Ma█                                0.0 07/06/11.187 10:36AM sle01       a    4,15
```

CSL API - deregister

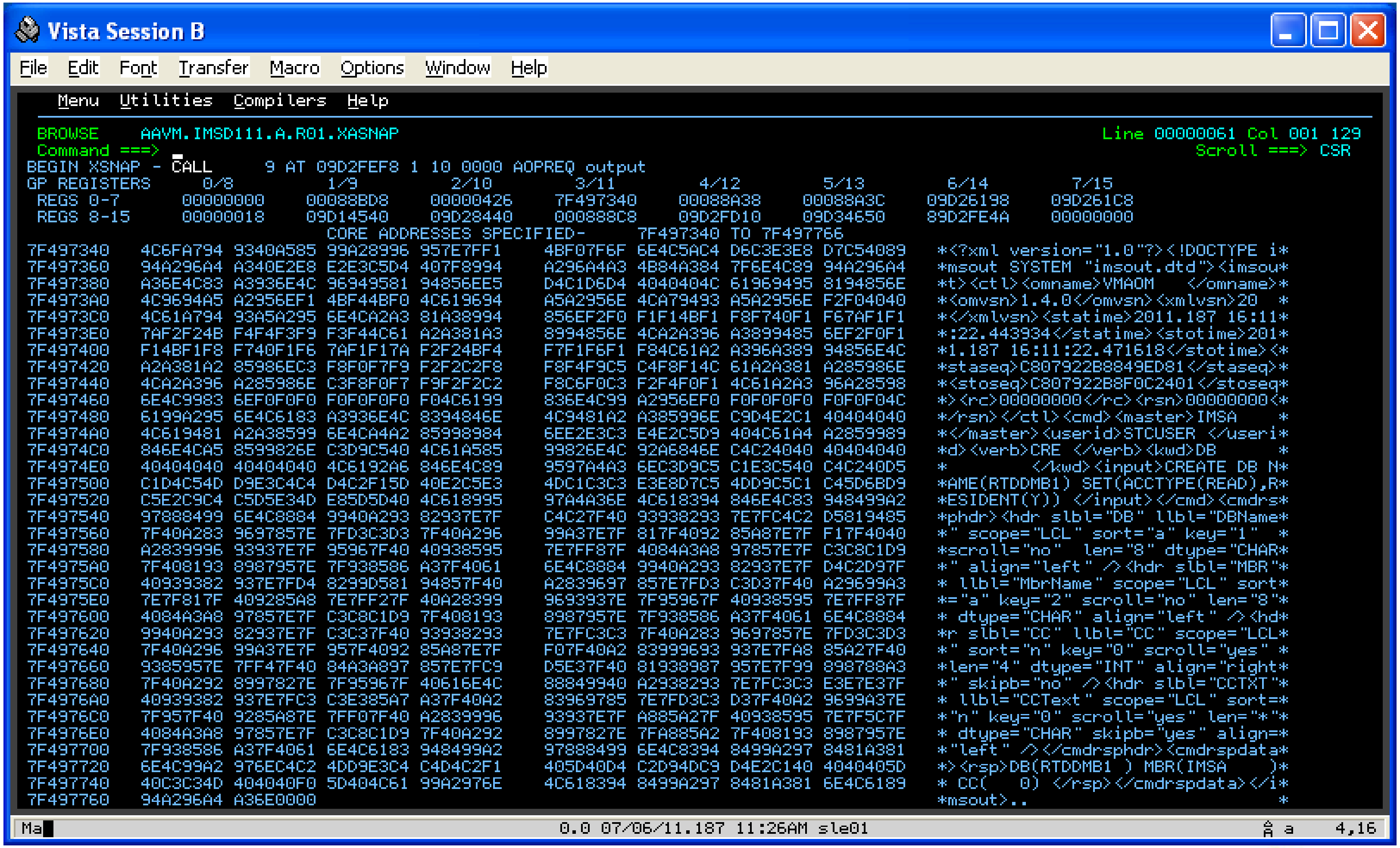
- CSLSCDRG invocation


Vista Session A
File Edit Font Transfer Macro Options Window Help
File Edit Edit_Settings Menu Utilities Compilers Test Help

```
EDIT       AACC.IMSD111.JJG.D.SOURCE(RCSLOM) - 01.59       Columns 00001 00072
Command ===>                                                  Scroll ===> CSR
DRGSCI   CSECT
DRGSCI   AMODE ANY
DRGSCI   RMODE ANY
         SAVE  (14,12),,*              SAVE CALLER'S REGISTERS
         LR    R12,R15                 R12 = BASE REGISTER
         USING DRGSCI,R12              ESTABLISH ADDRESSABILITY
         USING TCSAVE,R13              OVERLAY SAVE AREA BLOCK
*
         L     R14,TCSANEXT            NEXT SAVE AREA BLOCK
         L     R11,TCSA@COM            UNIQUE STORAGE
         USING TCSTOR,R11              OVERLAY UNIQUE STORAGE
         ST    R13,4(,R14)             SET BACK LINK
         ST    R14,8(,R13)             SET FORWARD LINK
         LR    R13,R14                 CURRENT SAVE AREA BLOCK
***********************************************************************
*        Deregister OM client                                         *
***********************************************************************
         CSLSCDRG FUNC=DEREGISTER,   R DEREGISTER                      X
               SCITOKEN=TCSTOKEN,    R TOKEN                           X
               RETCODE=TCDRGRTC,     R RETURN CODE                     X
               RSNCODE=TCDRGRSC,     R REASON CODE                     X
               PARM=TCPLDRG          R PARM LIST AREA ADDRESS
*
-  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -   9 Line(s) not Displayed
         L     R15,TCDRGRTC            GET RETURN CODE
***********************************************************************
*        Exit with return code                                        *
***********************************************************************
         L     R13,4(,R13)             CALLER'S SAVE AREA BLOCK
         L     R14,12(,R13)            RESTORE CALLER'S REGISTERS
         LM    R0,R12,20(R13)          ... EXCEPT FOR R15
         BR    R14                     RETURN TO CALLER
*
         LTORG
*
         DROP  ,
-  -  -  -  -  -  -  -  -  -  -  -  -  -  -   4263 Line(s) not Displayed
**************************** Bottom of Data ****************************
Ma                       0.0 07/06/11.187 10:37AM sle01            a     4,15
```

CSL API – CSLOMCMD sample output 1

- Actual buffer from successful create database

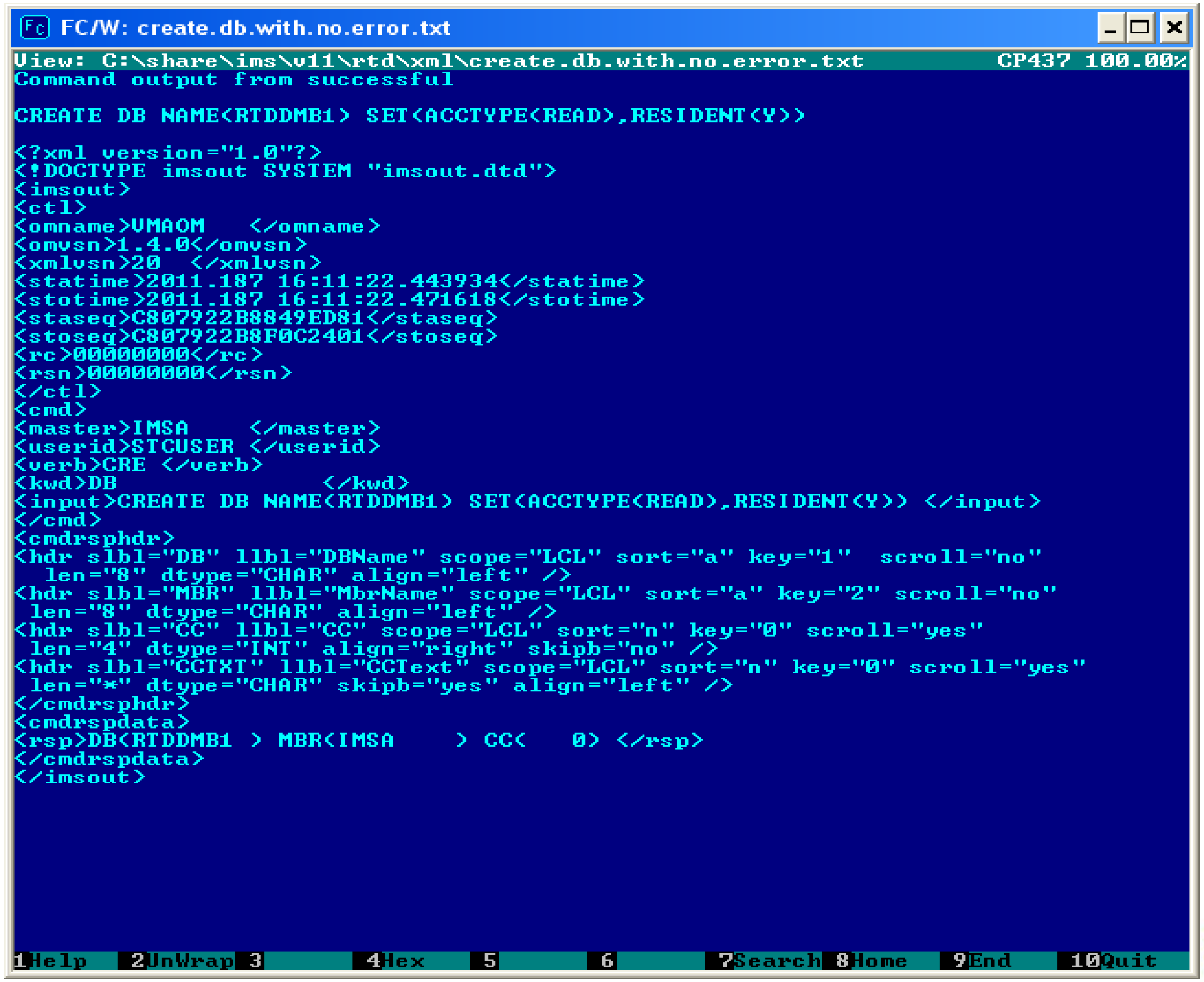


```
   Menu  Utilities  Compilers  Help
 ------------------------------------------------------------------------------------------------------------------------------
 BROWSE    AAVM.IMSD111.A.R01.XASNAP                                                              Line 00000061 Col 001 129
 Command ===>                                                                                              Scroll ===> CSR
BEGIN XSNAP - CALL     9 AT 09D2FEF8 1 10 0000 AOPREQ output
GP REGISTERS     0/8         1/9         2/10        3/11        4/12        5/13        6/14        7/15
 REGS 0-7      00000000    00088BD8    00000426    7F497340    00088A38    00088A3C    09D26198    09D261C8
 REGS 8-15     00000018    09D14540    09D28440    000888C8    09D2FD10    09D34650    89D2FE4A    00000000
                             CORE ADDRESSES SPECIFIED-     7F497340 TO 7F497766
7F497340   4C6FA794 9340A585 99A28996 957E7FF1    4BF07F6F 6E4C5AC4 D6C3E3E8 D7C54089   *<?xml version="1.0"?><!DOCTYPE i*
7F497360   94A296A4 A340E2E8 E2E3C5D4 407F8994    A296A4A3 4B84A384 7F6E4C89 94A296A4   *msout SYSTEM "imsout.dtd"><imsou*
7F497380   A36E4C83 A3936E4C 96949581 94856EE5    D4C1D6D4 4040404C 61969495 8194856E   *t><ctl><omname>VMAOM   </omname>*
7F4973A0   4C9694A5 A2956EF1 4BF44BF0 4C619694    A5A2956E 4CA79493 A5A2956E F2F04040   *<omvsn>1.4.0</omvsn><xmlvsn>20  *
7F4973C0   4C61A794 93A5A295 6E4CA2A3 81A38994    856EF2F0 F1F14BF1 F8F740F1 F67AF1F1   *</xmlvsn><statime>2011.187 16:11*
7F4973E0   7AF2F24B F4F4F3F9 F3F44C61 A2A381A3    8994856E 4CA2A396 A3899485 6EF2F0F1   *:22.443934</statime><stotime>201*
7F497400   F14BF1F8 F740F1F6 7AF1F17A F2F24BF4    F7F1F6F1 F84C61A2 A396A389 94856E4C   *1.187 16:11:22.471618</stotime><*
7F497420   A2A381A2 85986EC3 F8F0F7F9 F2F2C2F8    F8F4F9C5 C4F8F14C 61A2A381 A285986E   *staseq>C807922B8849ED81</staseq>*
7F497440   4CA2A396 A285986E C3F8F0F7 F9F2F2C2    F8C6F0C3 F2F4F0F1 4C61A2A3 96A28598   *<stoseq>C807922B8F0C2401</stoseq*
7F497460   6E4C9983 6EF0F0F0 F0F0F0F0 F04C6199    836E4C99 A2956EF0 F0F0F0F0 F0F0F04C   *><rc>00000000</rc><rsn>00000000<*
7F497480   6199A295 6E4C6183 A3936E4C 8394846E    4C9481A2 A385996E C9D4E2C1 40404040   */rsn></ctl><cmd><master>IMSA    *
7F4974A0   4C619481 A2A38599 6E4CA4A2 85998984    6EE2E3C3 E4E2C5D9 404C61A4 A2859989   *</master><userid>STCUSER </useri*
7F4974C0   846E4CA5 8599826E C3D9C540 4C61A585    99826E4C 92A6846E C4C24040 40404040   *d><verb>CRE </verb><kwd>DB      *
7F4974E0   40404040 40404040 4C6192A6 846E4C89    9597A4A3 6EC3D9C5 C1E3C540 C4C240D5   *        </kwd><input>CREATE DB N*
7F497500   C1D4C54D D9E3C4C4 D4C2F15D 40E2C5E3    4DC1C3C3 E3E8D7C5 4DD9C5C1 C45D6BD9   *AME(RTDDMB1) SET(ACCTYPE(READ),R*
7F497520   C5E2C9C4 C5D5E34D E85D5D40 4C618995    97A4A36E 4C618394 846E4C83 948499A2   *ESIDENT(Y)) </input></cmd><cmdrs*
7F497540   97888499 6E4C8884 9940A293 82937E7F    C4C27F40 93938293 7E7FC4C2 D5819485   *phdr><hdr slbl="DB" llbl="DBName*
7F497560   7F40A283 9697857E 7FD3C3D3 7F40A296    99A37E7F 817F4092 85A87E7F F17F4040   *" scope="LCL" sort="a" key="1"  *
7F497580   A2839996 93937E7F 95967F40 40938595    7E7FF87F 4084A3A8 97857E7F C3C8C1D9   *scroll="no"  len="8" dtype="CHAR*
7F4975A0   7F408193 8987957E 7F938586 A37F4061    6E4C8884 9940A293 82937E7F D4C2D97F   *" align="left" /><hdr slbl="MBR"*
7F4975C0   40939382 937E7FD4 8299D581 94857F40    A2839697 857E7FD3 C3D37F40 A29699A3   * llbl="MbrName" scope="LCL" sort*
7F4975E0   7E7F817F 409285A8 7E7FF27F 40A28399    9693937E 7F95967F 40938595 7E7FF87F   *="a" key="2" scroll="no" len="8"*
7F497600   4084A3A8 97857E7F C3C8C1D9 7F408193    8987957E 7F938586 A37F4061 6E4C8884   * dtype="CHAR" align="left" /><hd*
7F497620   9940A293 82937E7F C3C37F40 93938293    7E7FC3C3 7F40A283 9697857E 7FD3C3D3   *r slbl="CC" llbl="CC" scope="LCL*
7F497640   7F40A296 99A37E7F 957F4092 85A87E7F    F07F40A2 83999693 937E7FA8 85A27F40   *" sort="n" key="0" scroll="yes" *
7F497660   9385957E 7FF47F40 84A3A897 857E7FC9    D5E37F40 81938987 957E7F99 898788A3   *len="4" dtype="INT" align="right*
7F497680   7F40A292 8997827E 7F95967F 40616E4C    88849940 A2938293 7E7FC3C3 E3E7E37F   *" skipb="no" /><hdr slbl="CCTXT"*
7F4976A0   40939382 937E7FC3 C3E385A7 A37F40A2    83969785 7E7FD3C3 D37F40A2 9699A37E   * llbl="CCText" scope="LCL" sort=*
7F4976C0   7F957F40 9285A87E 7FF07F40 A2839996    93937E7F A885A27F 40938595 7E7F5C7F   *"n" key="0" scroll="yes" len="*"*
7F4976E0   4084A3A8 97857E7F C3C8C1D9 7F40A292    8997827E 7FA885A2 7F408193 8987957E   * dtype="CHAR" skipb="yes" align=*
7F497700   7F938586 A37F4061 6E4C6183 948499A2    97888499 6E4C8394 8499A297 8481A381   *"left" /></cmdrsphdr><cmdrspdata*
7F497720   6E4C99A2 976EC4C2 4DD9E3C4 C4D4C2F1    405D40D4 C2D94DC9 D4E2C140 4040405D   *><rsp>DB(RTDDMB1 ) MBR(IMSA    )*
7F497740   40C3C34D 404040F0 5D404C61 99A2976E    4C618394 8499A297 8481A381 6E4C6189   * CC(   0) </rsp></cmdrspdata></i*
7F497760   94A296A4 A36E0000                                                            *msout>..                        *
```

```
Ma                                                 0.0 07/06/11.187 11:26AM sle01                                    a     4,16
```

CSL API – CSLOMCMD sample output 1 (edited)

- Edited printable part of the returned buffer



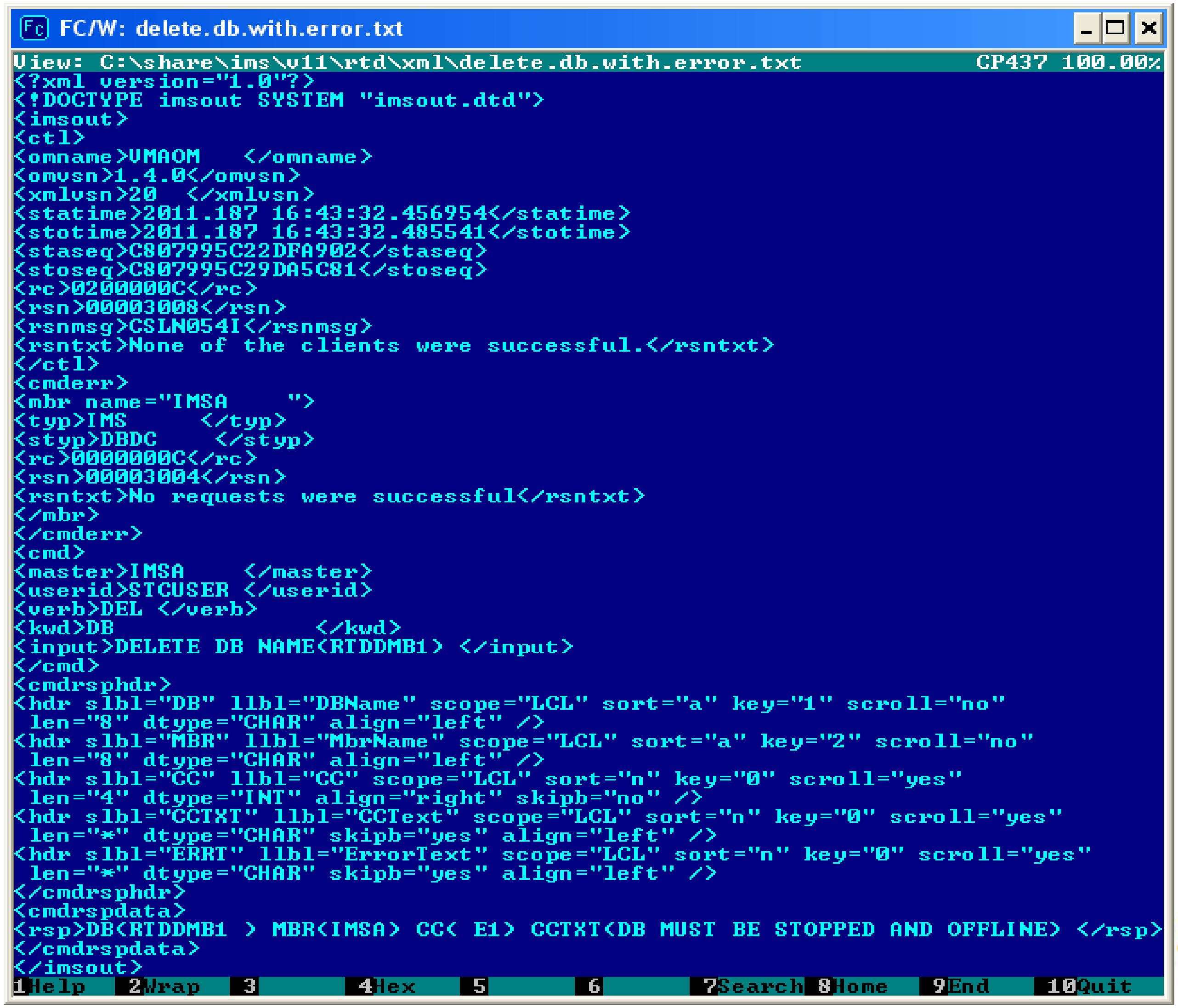
```
View: C:\share\ims\v11\rtd\xml\create.db.with.no.error.txt        CP437 100.00%
Command output from successful

CREATE DB NAME(RTDDMB1) SET(ACCTYPE(READ),RESIDENT(Y))

<?xml version="1.0"?>
<!DOCTYPE imsout SYSTEM "imsout.dtd">
<imsout>
<ctl>
<omname>VMAOM   </omname>
<omvsn>1.4.0</omvsn>
<xmlvsn>20  </xmlvsn>
<statime>2011.187 16:11:22.443934</statime>
<stotime>2011.187 16:11:22.471618</stotime>
<staseq>C807922B8849ED81</staseq>
<stoseq>C807922B8F0C2401</stoseq>
<rc>00000000</rc>
<rsn>00000000</rsn>
</ctl>
<cmd>
<master>IMSA    </master>
<userid>STCUSER </userid>
<verb>CRE </verb>
<kwd>DB              </kwd>
<input>CREATE DB NAME(RTDDMB1) SET(ACCTYPE(READ),RESIDENT(Y)) </input>
</cmd>
<cmdrsphdr>
<hdr slbl="DB" llbl="DBName" scope="LCL" sort="a" key="1"  scroll="no"
  len="8" dtype="CHAR" align="left" />
<hdr slbl="MBR" llbl="MbrName" scope="LCL" sort="a" key="2" scroll="no"
 len="8" dtype="CHAR" align="left" />
<hdr slbl="CC" llbl="CC" scope="LCL" sort="n" key="0" scroll="yes"
 len="4" dtype="INT" align="right" skipb="no" />
<hdr slbl="CCTXT" llbl="CCText" scope="LCL" sort="n" key="0" scroll="yes"
 len="*" dtype="CHAR" skipb="yes" align="left" />
</cmdrsphdr>
<cmdrspdata>
<rsp>DB(RTDDMB1 ) MBR(IMSA    ) CC(   0) </rsp>
</cmdrspdata>
</imsout>
```

OM rc,rsn

Completion code

CSL API – CSLOMCMD sample output 2 (edited)

- Unsuccessful delete database; edited returned buffer



```
View: C:\share\ims\v11\rtd\xml\delete.db.with.error.txt            CP437 100.00%
<?xml version="1.0"?>
<!DOCTYPE imsout SYSTEM "imsout.dtd">
<imsout>
<ctl>
<omname>VMAOM   </omname>
<omvsn>1.4.0</omvsn>
<xmlvsn>20  </xmlvsn>
<statime>2011.187 16:43:32.456954</statime>
<stotime>2011.187 16:43:32.485541</stotime>
<staseq>C807995C22DFA902</staseq>
<stoseq>C807995C29DA5C81</stoseq>
<rc>0200000C</rc>
<rsn>00003008</rsn>
<rsnmsg>CSLN054I</rsnmsg>
<rsntxt>None of the clients were successful.</rsntxt>
</ctl>
<cmderr>
<mbr name="IMSA    ">
<typ>IMS     </typ>
<styp>DBDC    </styp>
<rc>0000000C</rc>
<rsn>00003004</rsn>
<rsntxt>No requests were successful</rsntxt>
</mbr>
</cmderr>
<cmd>
<master>IMSA    </master>
<userid>STCUSER </userid>
<verb>DEL </verb>
<kwd>DB             </kwd>
<input>DELETE DB NAME(RTDDMB1) </input>
</cmd>
<cmdrsphdr>
<hdr slbl="DB" llbl="DBName" scope="LCL" sort="a" key="1" scroll="no"
 len="8" dtype="CHAR" align="left" />
<hdr slbl="MBR" llbl="MbrName" scope="LCL" sort="a" key="2" scroll="no"
 len="8" dtype="CHAR" align="left" />
<hdr slbl="CC" llbl="CC" scope="LCL" sort="n" key="0" scroll="yes"
 len="4" dtype="INT" align="right" skipb="no" />
<hdr slbl="CCTXT" llbl="CCText" scope="LCL" sort="n" key="0" scroll="yes"
 len="*" dtype="CHAR" skipb="yes" align="left" />
<hdr slbl="ERRT" llbl="ErrorText" scope="LCL" sort="n" key="0" scroll="yes"
 len="*" dtype="CHAR" skipb="yes" align="left" />
</cmdrsphdr>
<cmdrspdata>
<rsp>DB(RTDDMB1 ) MBR(IMSA) CC( E1) CCTXT(DB MUST BE STOPPED AND OFFLINE) </rsp>
</cmdrspdata>
</imsout>
```

OM rc,rsn

Command rc,rsn

Completion code

CSL API - summary

- Token returned by register request
- All subsequent invocations use the token
- All invocations receive a return code and reason code
- All macros, return and reason codes are documented in the *System Programming APIs* manual
- All XML output is documented in
  - *Command Reference* manuals
  - *System Programming APIs* manual
- Command security is required for non-authorized programs
  - Unless CSL OM runs with no security
  - Need something like DFSCCMD0 command authorization checking

Implementation – describe environment

- TI's Real-Time Definition manages IMS … with IMS!
  - Extension of using "/" commands
  - Implementation is via a transaction
- IMS V9 RTD transaction ran as a normal transaction
  - GU
  - Process input
    - Determine request (Add, Change, Delete; SMB, PDIR, DDIR)
    - Process the request
      - Some parts inline
      - Some parts in Control Region
      - Some parts in another TI specific address space
  - Insert output (to user transaction or input lterm)
- IMS V10 goal
  - Replace "Process the request" (user modifications galore)
    - Replace with CSL API calls that issue type-2 commands

Implementation – describe environment …

- CSL API is easy to use but is complex
- We decided to isolate all CSL API calls in a separate module
- Transaction calls the separate module
  - Analogous to an ASMTDLI call
  - Transaction knows nothing about the CSL API
    - Well, almost nothing
- There are new concepts the transaction needs to know
  - The type-2 commands
  - XML

Implementation – describe environment …

- The CSL API module
  - Provides an interface between the transaction and OM
  - Receives as input a type-2 command
  - Does all OM interaction using CSL macros
    - Initialize CSL OM (Register, Ready)
    - Issue the command
    - Copy returned output from CSL buffer to an obtained user buffer
    - Release CSL output buffer
    - Terminate CSL OM (Quiesce, Deregister)
    - Copy CSL return, reason codes, error message(s) to user area
- Application does not know about CSL or OM
  - Maybe a little: return and reason codes
  - Must “learn” a new language: XML

Implementation – describe environment (Ends)

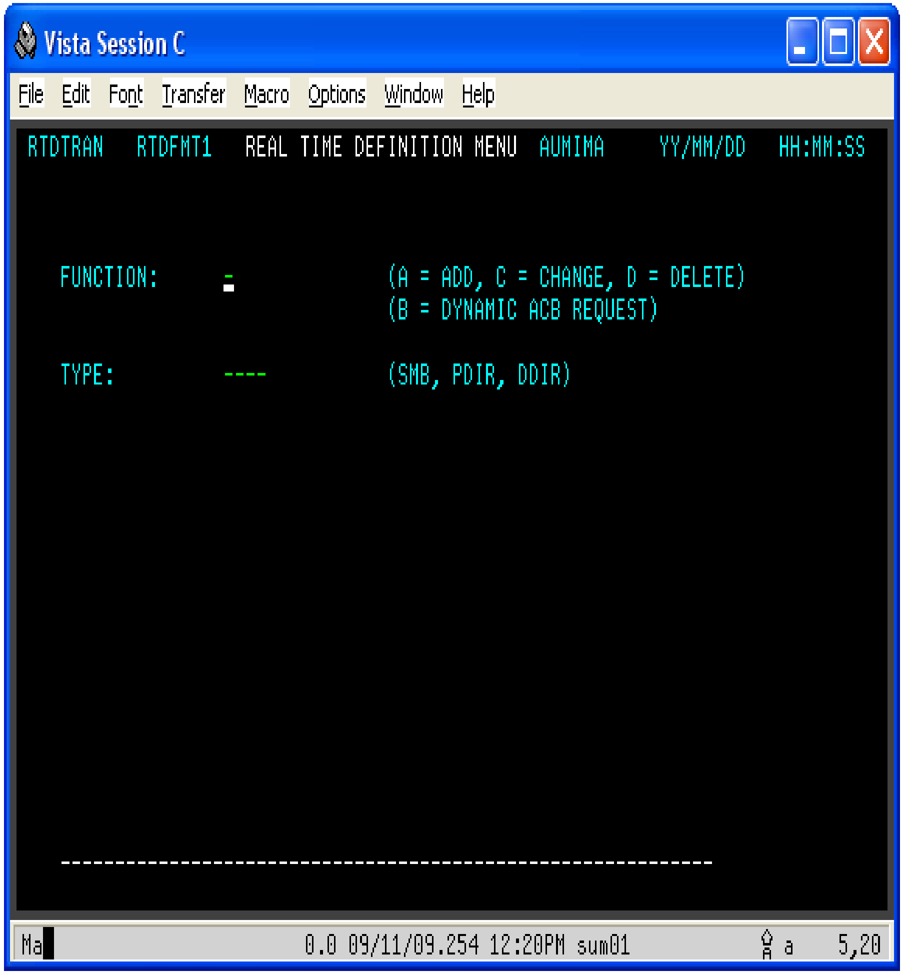
- Summary of IMS V10 (and beyond) transaction processing
  - GU
  - Decode input; determine function
  - Construct appropriate type-2 command
  - Call the “CSL API interface” with the request
  - Process the returned buffer and return code data
  - Release the returned buffer
  - Insert response to transaction or lterm
    - The response to the IRSREQ transaction is unchanged!
    - We will see examples of the lterm responses real soon

Sample transaction interactions

- First compare IMS V9 screens to IMS V10/V11 screens
  - IMS V9
    - Formatted screens
      - But uses a local modification!
  - IMS V10/V11
    - Unformatted screens

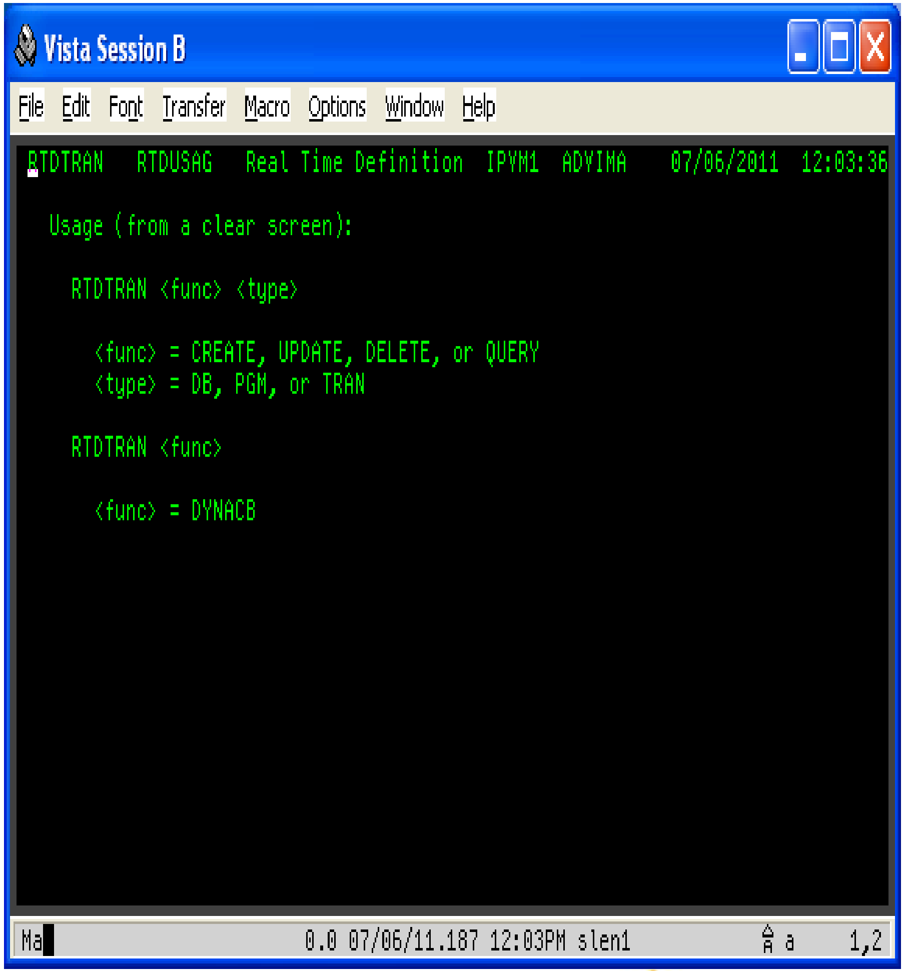
Sample transaction interactions: IMS V9 vs V11

- Initial screen; displayed by entering RTDTRAN



```
RTDTRAN   RTDFMT1   REAL TIME DEFINITION MENU  AUMIMA     YY/MM/DD   HH:MM:SS



   FUNCTION:      _              (A = ADD, C = CHANGE, D = DELETE)
                                 (B = DYNAMIC ACB REQUEST)

   TYPE:          ----           (SMB, PDIR, DDIR)
















   ------------------------------------------------------------
```

```
Ma                    0.0 09/11/09.254 12:20PM sum01          a     5,20
```

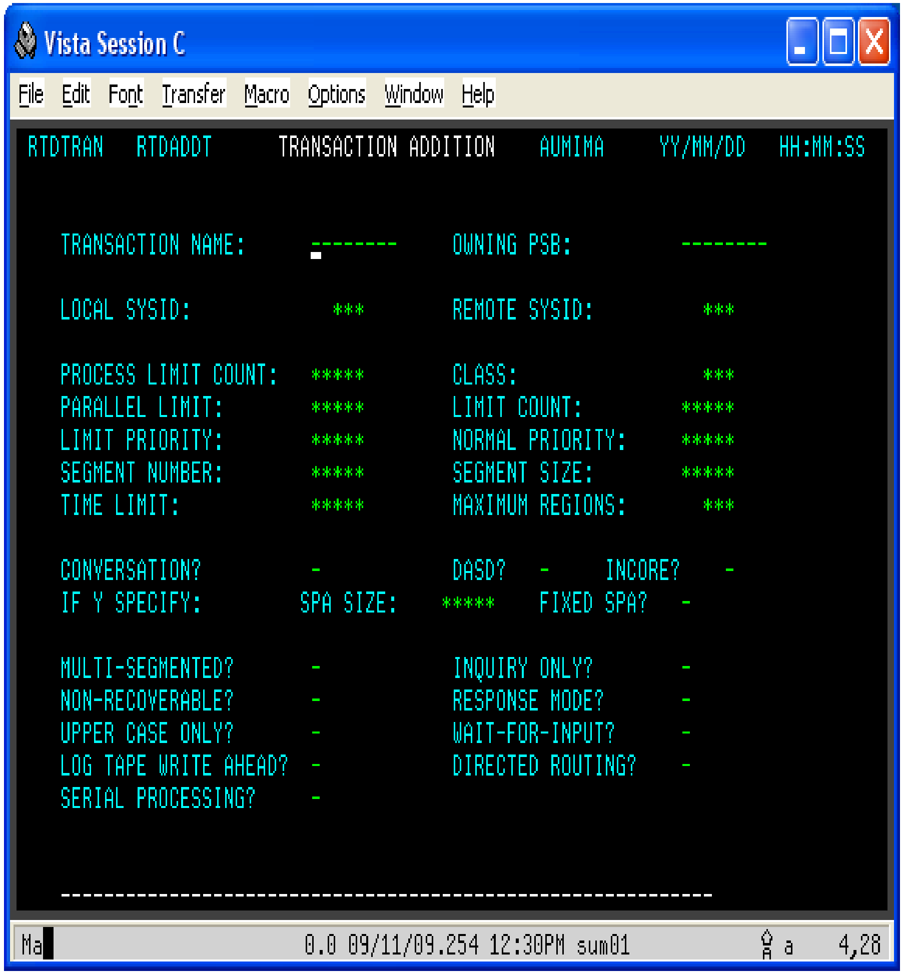


```
RTDTRAN   RTDUSAG   Real Time Definition  IPVM1  ADVIMA    07/06/2011  12:03:36

  Usage (from a clear screen):

    RTDTRAN <func> <type>

      <func> = CREATE, UPDATE, DELETE, or QUERY
      <type> = DB, PGM, or TRAN

    RTDTRAN <func>

      <func> = DYNACB
```

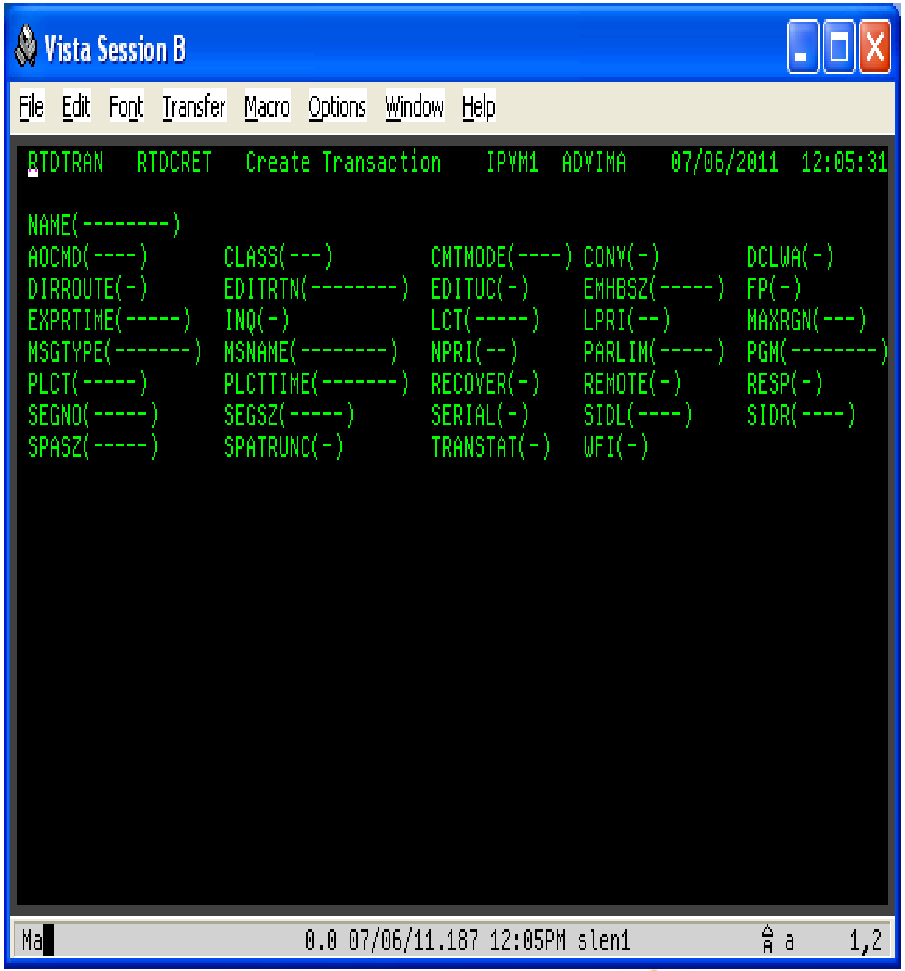
```
Ma                         0.0 07/06/11.187 12:03PM slen1          a     1,2
```

Sample transaction interactions: IMS V9 vs V11

- “Create transaction” input screen



```
RTDTRAN   RTDADDT      TRANSACTION ADDITION    AUMIMA     YY/MM/DD    HH:MM:SS


   TRANSACTION NAME:      --------     OWNING PSB:          --------

   LOCAL SYSID:             ***        REMOTE SYSID:          ***

   PROCESS LIMIT COUNT:   *****        CLASS:                 ***
   PARALLEL LIMIT:        *****        LIMIT COUNT:         *****
   LIMIT PRIORITY:        *****        NORMAL PRIORITY:     *****
   SEGMENT NUMBER:        *****        SEGMENT SIZE:        *****
   TIME LIMIT:            *****        MAXIMUM REGIONS:       ***

   CONVERSATION?          -            DASD?   -     INCORE?    -
   IF Y SPECIFY:         SPA SIZE:   *****   FIXED SPA?   -

   MULTI-SEGMENTED?       -            INQUIRY ONLY?        -
   NON-RECOVERABLE?       -            RESPONSE MODE?       -
   UPPER CASE ONLY?       -            WAIT-FOR-INPUT?      -
   LOG TAPE WRITE AHEAD?  -            DIRECTED ROUTING?    -
   SERIAL PROCESSING?     -


   ------------------------------------------------------------

Ma                        0.0 09/11/09.254 12:30PM sum01          a     4,28
```

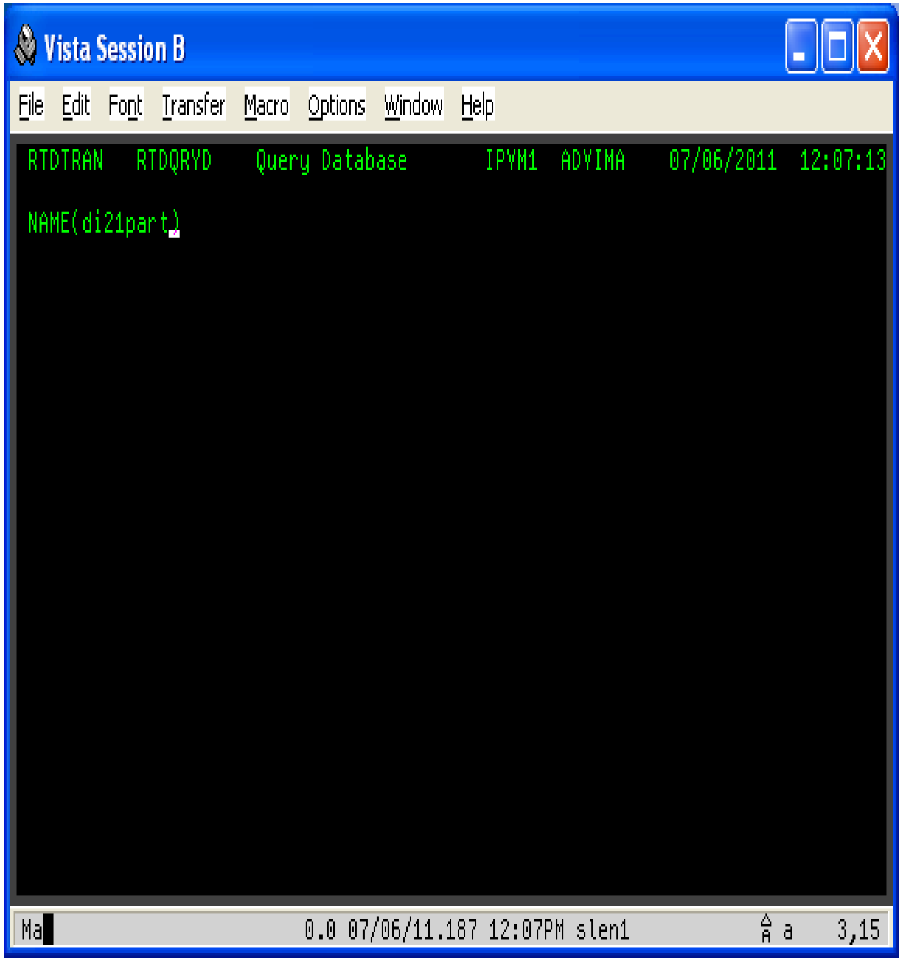


```
RTDTRAN   RTDCRET   Create Transaction   IPVM1  ADVIMA    07/06/2011  12:05:31

NAME(--------)
AOCMD(----)       CLASS(---)          CMTMODE(----) CONV(-)        DCLWA(-)
DIRROUTE(-)       EDITRTN(--------)   EDITUC(-)     EMHBSZ(-----)  FP(-)
EXPRTIME(-----)   INQ(-)              LCT(-----)    LPRI(--)       MAXRGN(---)
MSGTYPE(-------)  MSNAME(--------)    NPRI(--)      PARLIM(-----)  PGM(--------)
PLCT(-----)       PLCTTIME(-------)   RECOVER(-)    REMOTE(-)      RESP(-)
SEGNO(-----)      SEGSZ(-----)        SERIAL(-)     SIDL(----)     SIDR(----)
SPASZ(-----)      SPATRUNC(-)         TRANSTAT(-)   WFI(-)

Ma                          0.0 07/06/11.187 12:05PM slen1            a     1,2
```

SHARE in Orlando 2011

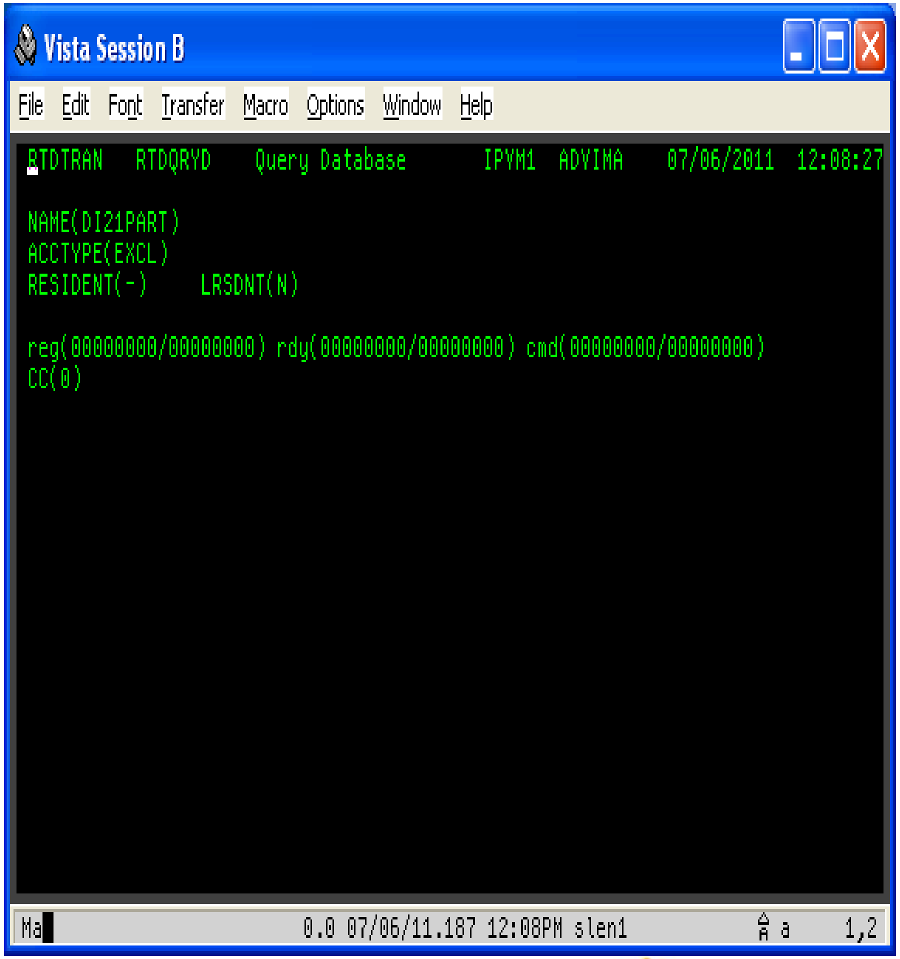
Sample transaction interactions: query database

- RTDTRAN QUERY DB; fill in database name; Enter



```
RTDTRAN   RTDQRYD    Query Database      IPVM1  ADYIMA    07/06/2011  12:07:13

NAME(di21part)
```

```
Ma                         0.0 07/06/11.187 12:07PM slen1                a     3,15
```

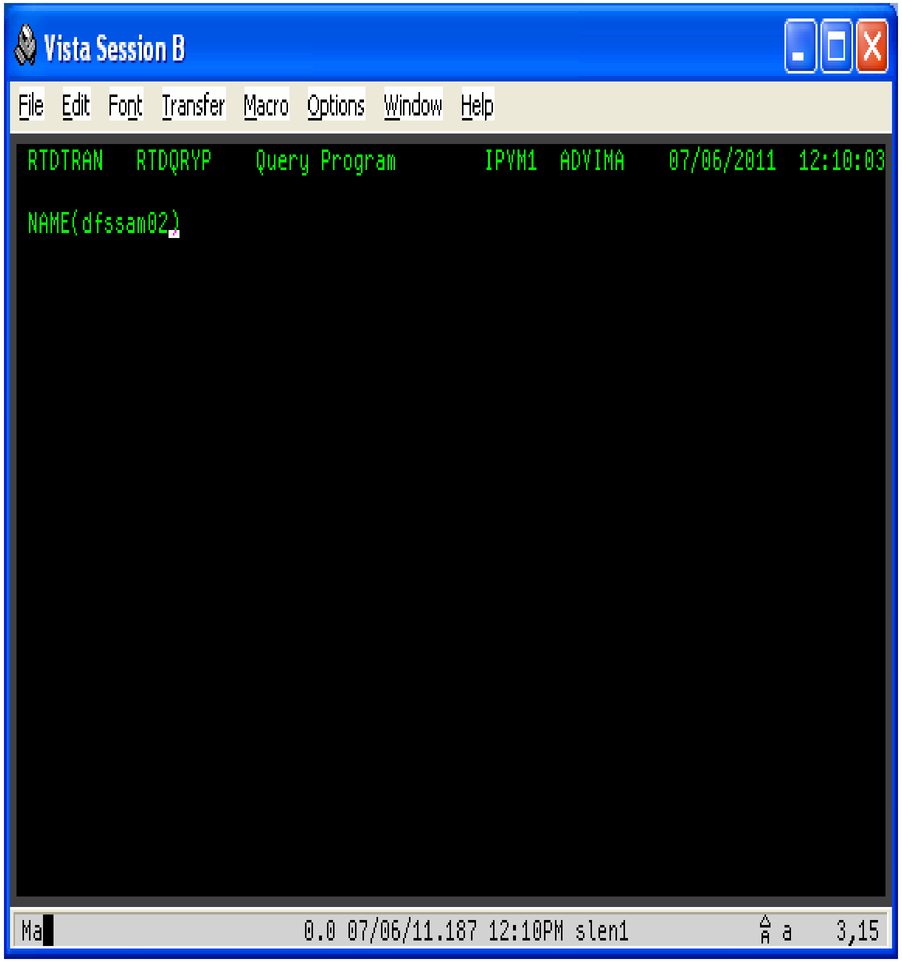


```
RTDTRAN   RTDQRYD    Query Database      IPVM1  ADYIMA    07/06/2011  12:08:27

NAME(DI21PART)
ACCTYPE(EXCL)
RESIDENT(-)      LRSDNT(N)

reg(00000000/00000000) rdy(00000000/00000000) cmd(00000000/00000000)
CC(0)
```

```
Ma                         0.0 07/06/11.187 12:08PM slen1                a     1,2
```

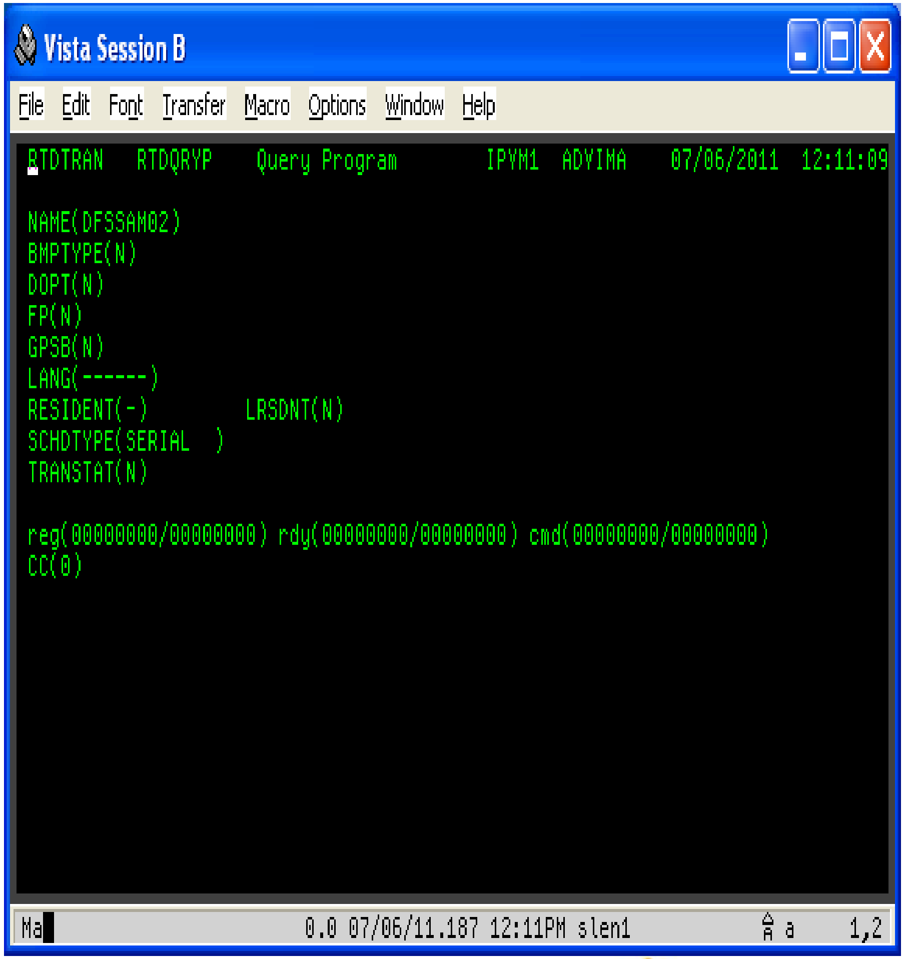
Sample transaction interactions: query program

- RTDTRAN QUERY PGM; fill in program name; Enter



```
RTDTRAN   RTDQRYP    Query Program         IPYM1  ADVIMA    07/06/2011  12:10:03

NAME(dfssam02)
```

```
Ma                        0.0 07/06/11.187 12:10PM slen1            a     3,15
```

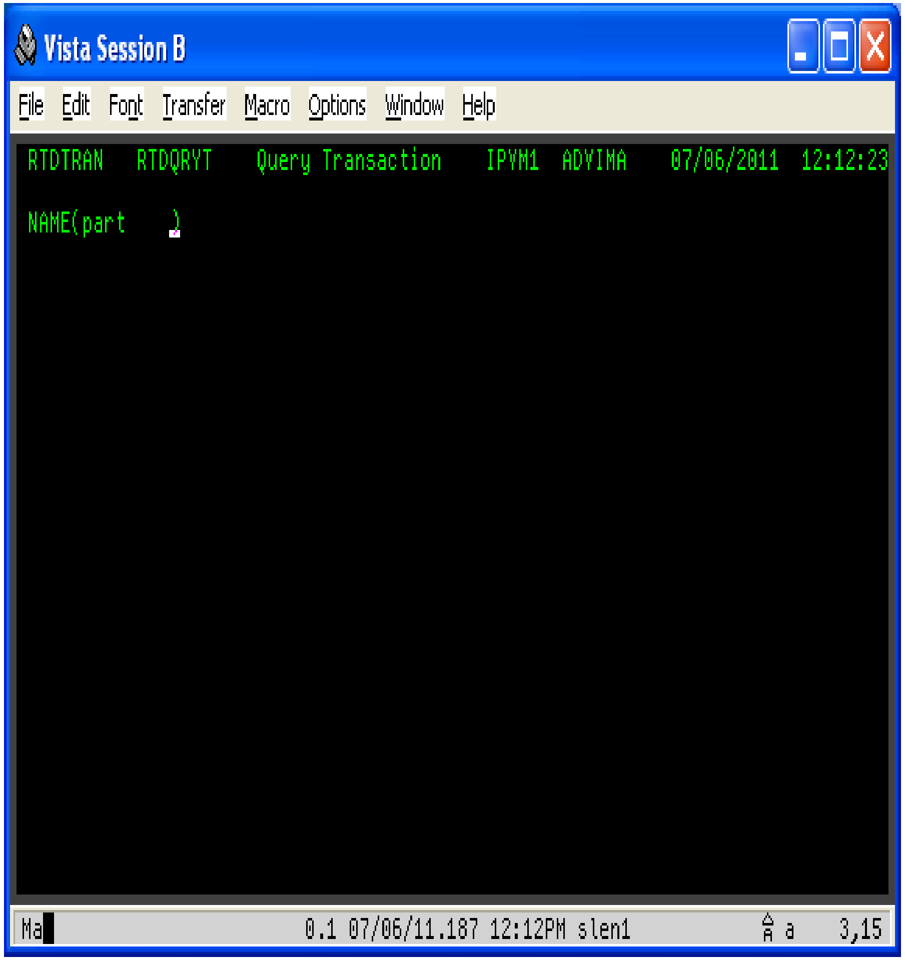


```
RTDTRAN   RTDQRYP    Query Program         IPYM1  ADVIMA    07/06/2011  12:11:09

NAME(DFSSAM02)
BMPTYPE(N)
DOPT(N)
FP(N)
GPSB(N)
LANG(------)
RESIDENT(-)         LRSDNT(N)
SCHDTYPE(SERIAL  )
TRANSTAT(N)

reg(00000000/00000000) rdy(00000000/00000000) cmd(00000000/00000000)
CC(0)
```

```
Ma                        0.0 07/06/11.187 12:11PM slen1            a     1,2
```

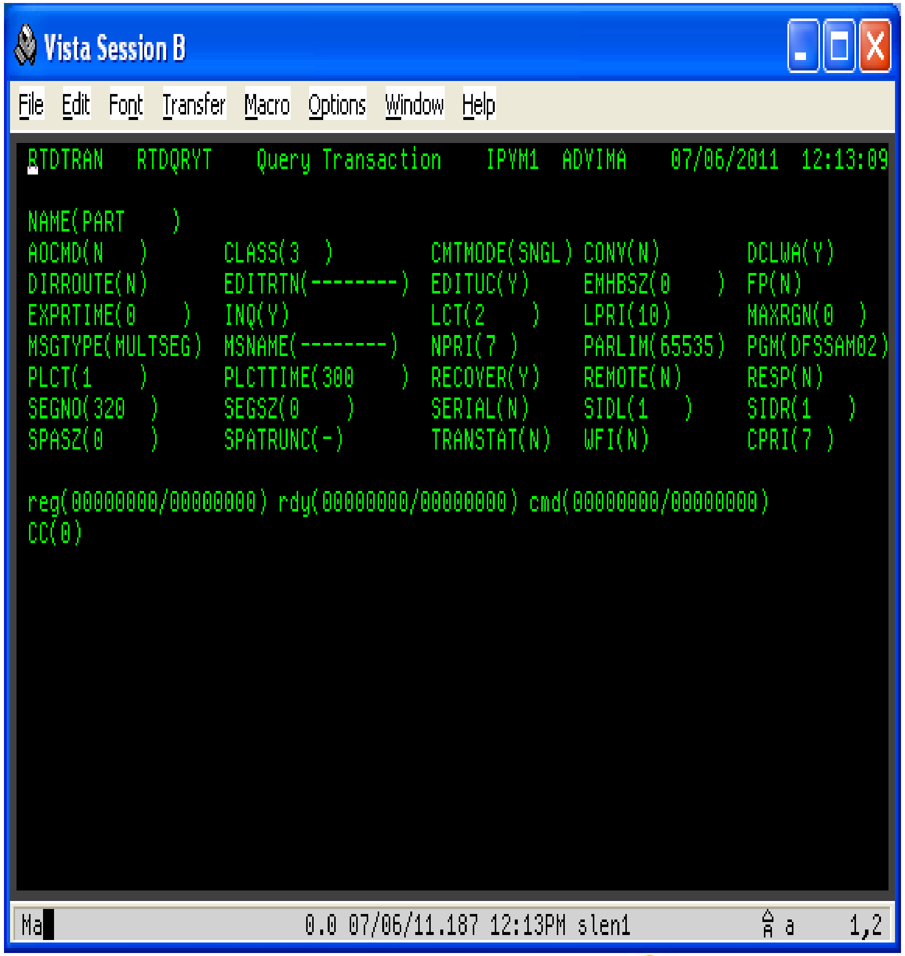
Sample transaction interactions: query transaction

- RTDTRAN QUERY TRAN; fill in transaction name; Enter



```
RTDTRAN   RTDQRYT   Query Transaction   IPYM1  ADVIMA    07/06/2011  12:12:23

NAME(part    )
```

```
Ma          0.1 07/06/11.187 12:12PM slen1          a    3,15
```

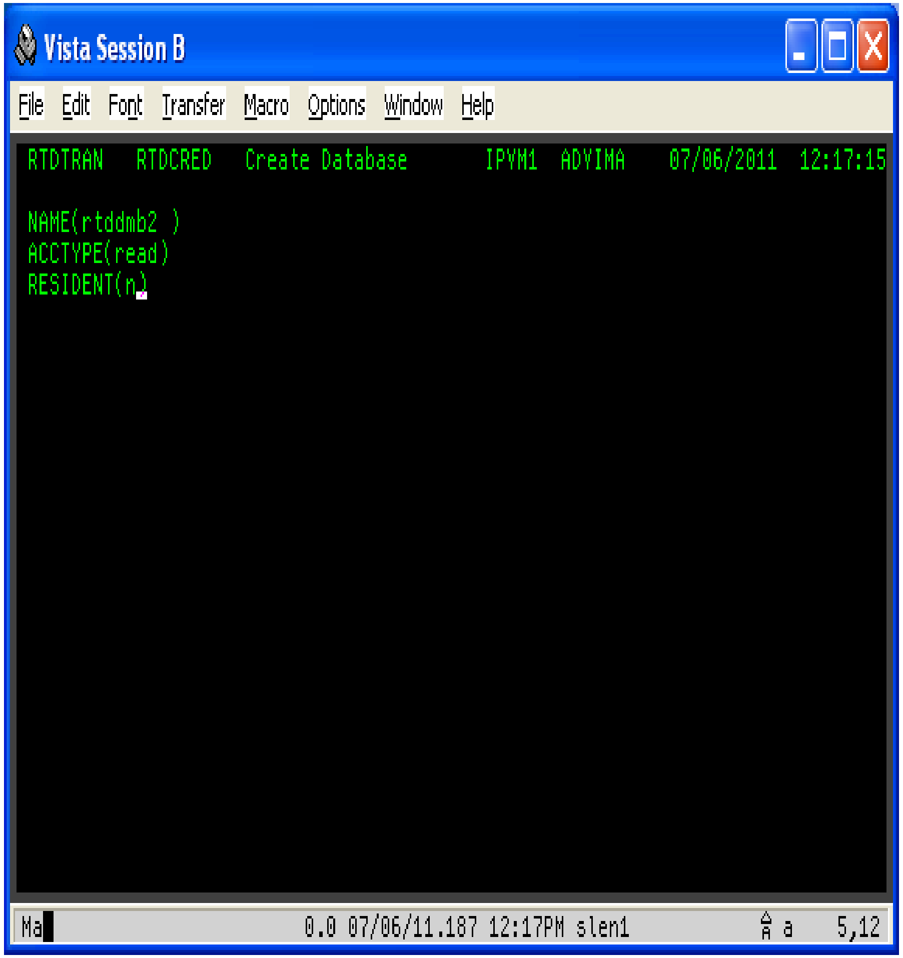


```
RTDTRAN   RTDQRYT   Query Transaction   IPYM1  ADVIMA    07/06/2011  12:13:09

NAME(PART    )
AOCMD(N    )       CLASS(3   )        CMTMODE(SNGL) CONV(N)       DCLWA(Y)
DIRROUTE(N)        EDITRTN(--------) EDITUC(Y)     EMHBSZ(0    ) FP(N)
EXPRTIME(0    )    INQ(Y)             LCT(2    )    LPRI(10)      MAXRGN(0  )
MSGTYPE(MULTSEG)   MSNAME(--------)  NPRI(7 )      PARLIM(65535) PGM(DFSSAM02)
PLCT(1    )        PLCTTIME(300    ) RECOVER(Y)    REMOTE(N)     RESP(N)
SEGNO(320  )       SEGSZ(0    )       SERIAL(N)     SIDL(1    )   SIDR(1    )
SPASZ(0    )       SPATRUNC(-)        TRANSTAT(N)   WFI(N)        CPRI(7 )

reg(00000000/00000000) rdy(00000000/00000000) cmd(00000000/00000000)
CC(0)
```

```
Ma          0.0 07/06/11.187 12:13PM slen1          a    1,2
```

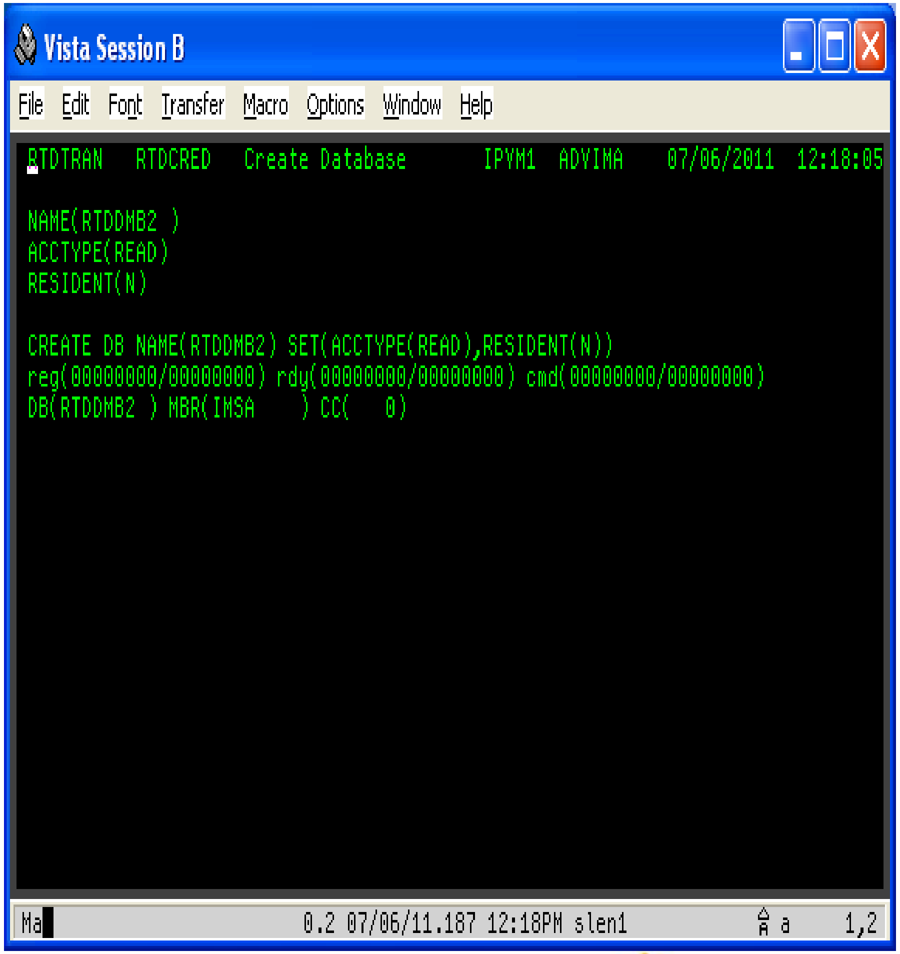
Sample interactions: successful create database

- RTDTRAN CREATE DB; fill in fields; Enter



```
RTDTRAN   RTDCRED   Create Database       IPYM1  ADVIMA    07/06/2011  12:17:15

NAME(rtddmb2 )
ACCTYPE(read)
RESIDENT(n)
```

```
Ma                            0.0 07/06/11.187 12:17PM slen1          a    5,12
```

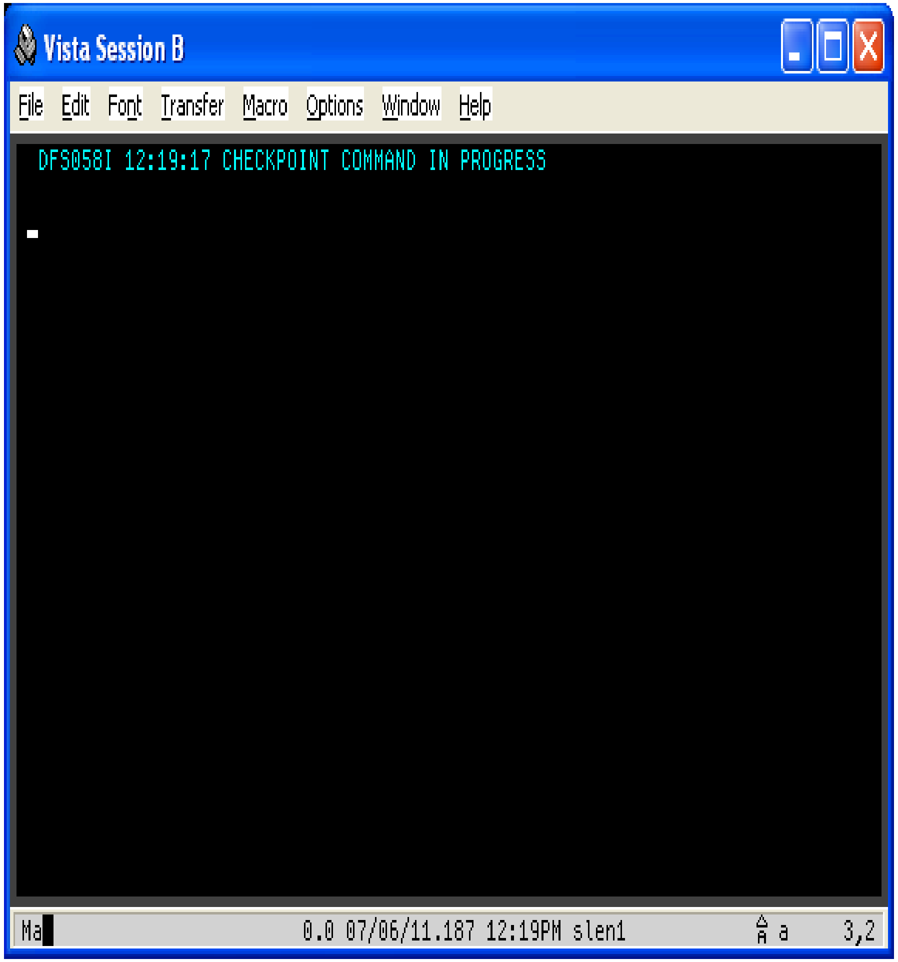


```
RTDTRAN   RTDCRED   Create Database       IPYM1  ADVIMA    07/06/2011  12:18:05

NAME(RTDDMB2 )
ACCTYPE(READ)
RESIDENT(N)

CREATE DB NAME(RTDDMB2) SET(ACCTYPE(READ),RESIDENT(N))
reg(00000000/00000000) rdy(00000000/00000000) cmd(00000000/00000000)
DB(RTDDMB2 ) MBR(IMSA     ) CC(   0)
```

```
Ma                            0.2 07/06/11.187 12:18PM slen1          a    1,2
```

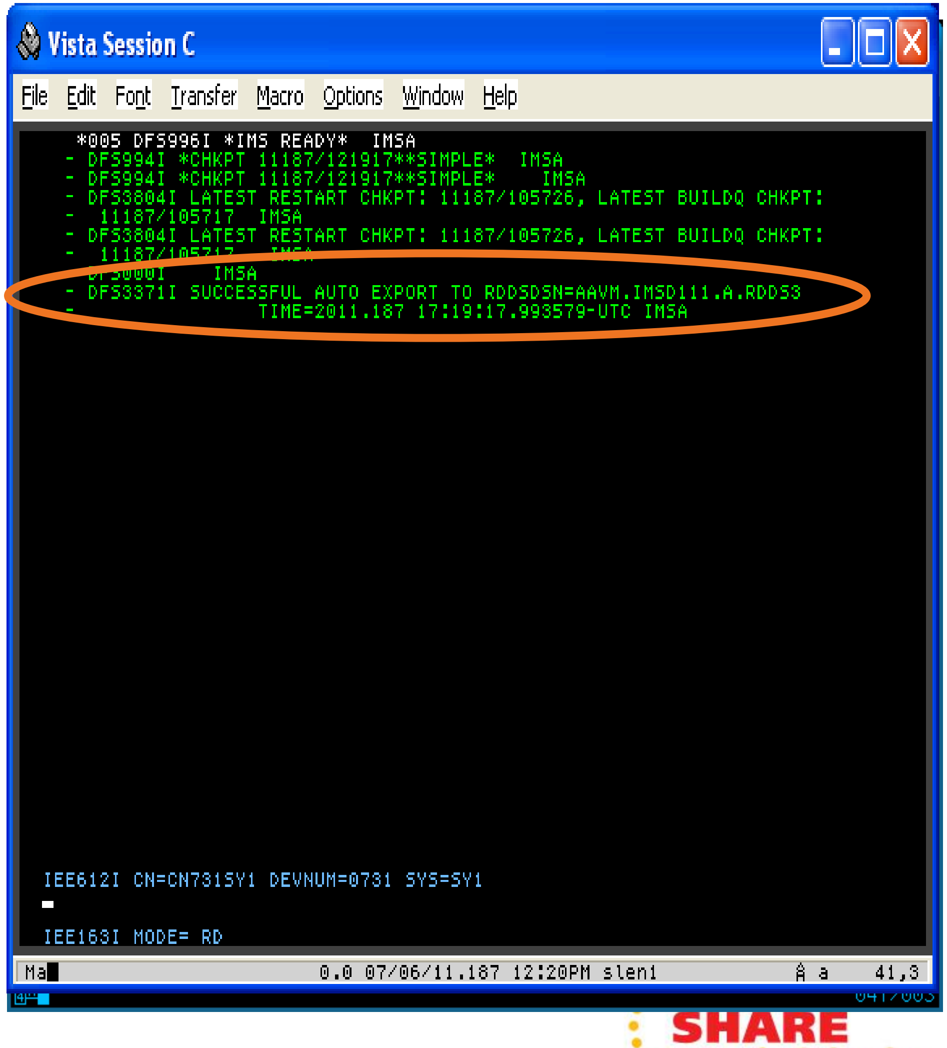
Sample interactions: checkpoint and export

- Take checkpoint; note z/OS console messages



```
DFS058I 12:19:17 CHECKPOINT COMMAND IN PROGRESS
```

```
Ma                          0.0 07/06/11.187 12:19PM slen1          a     3,2
```

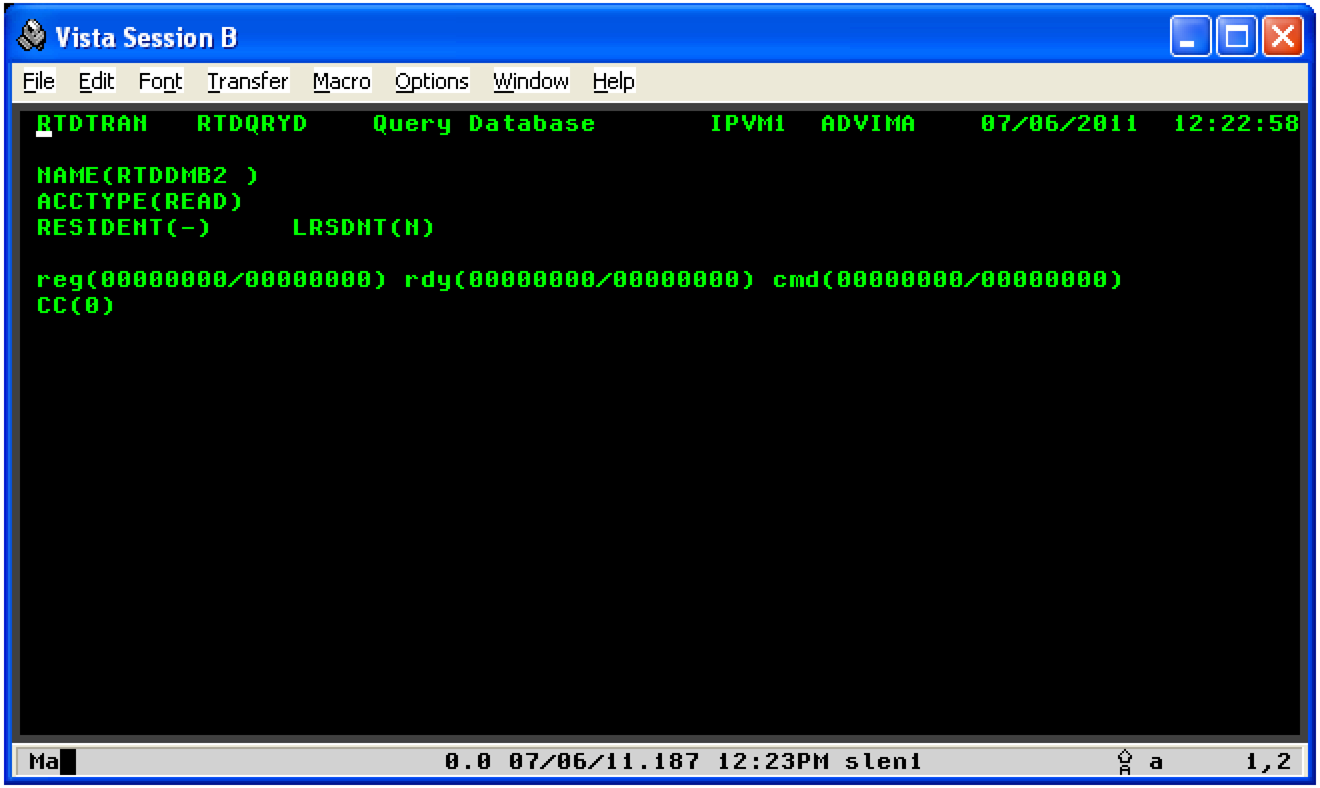


```
  *005 DFS996I *IMS READY*  IMSA
 - DFS994I *CHKPT 11187/121917**SIMPLE*  IMSA
 - DFS994I *CHKPT 11187/121917**SIMPLE*    IMSA
 - DFS3804I LATEST RESTART CHKPT: 11187/105726, LATEST BUILDQ CHKPT:
 -  11187/105717  IMSA
 - DFS3804I LATEST RESTART CHKPT: 11187/105726, LATEST BUILDQ CHKPT:
 -  11187/105717   IMSA
   DFS000I    IMSA
 - DFS3371I SUCCESSFUL AUTO EXPORT TO RDDSDSN=AAVM.IMSD111.A.RDDS3
 -              TIME=2011.187 17:19:17.993579-UTC IMSA



IEE612I CN=CN731SY1 DEVNUM=0731 SYS=SY1

IEE163I MODE= RD
```

```
Ma                          0.0 07/06/11.187 12:20PM slen1          a    41,3
```

Sample interactions: verify create database

- Issue another query database to verify create
  - Note resident values

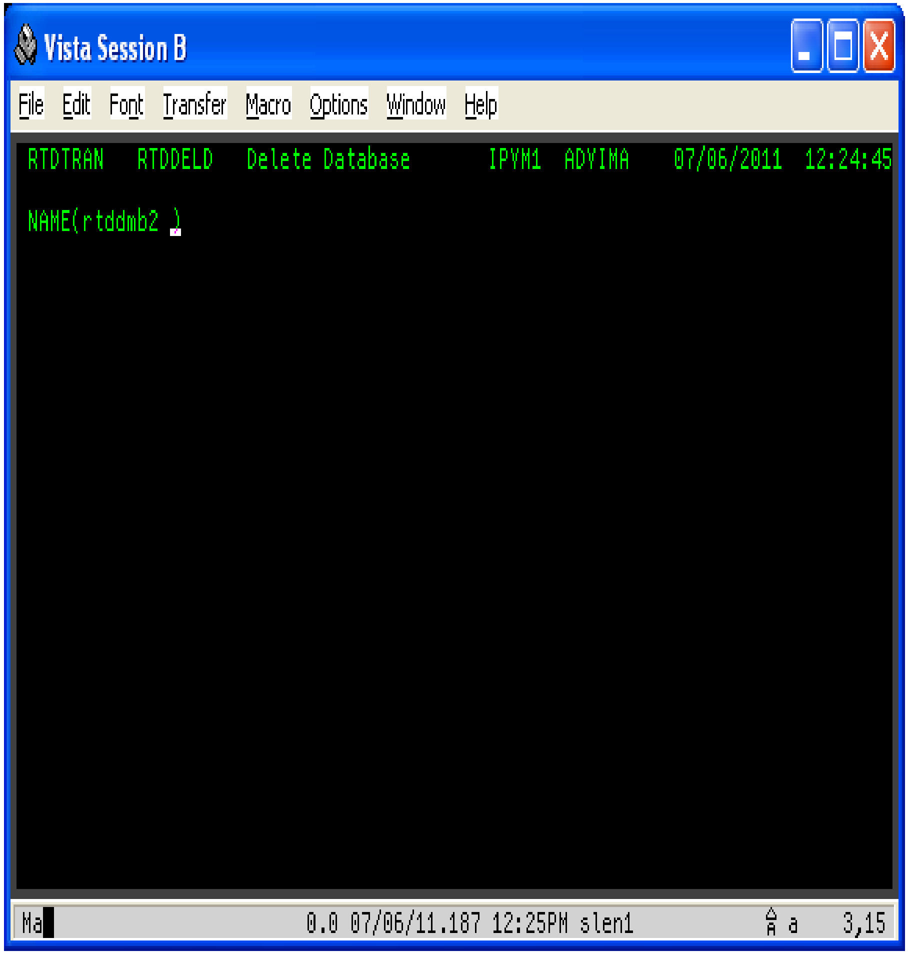


```
RTDTRAN    RTDQRYD     Query Database        IPVM1   ADVIMA     07/06/2011   12:22:58

NAME(RTDDMB2 )
ACCTYPE(READ)
RESIDENT(-)      LRSDNT(N)

reg(00000000/00000000) rdy(00000000/00000000) cmd(00000000/00000000)
CC(0)
```

```
Ma                                0.0 07/06/11.187 12:23PM slen1             a        1,2
```

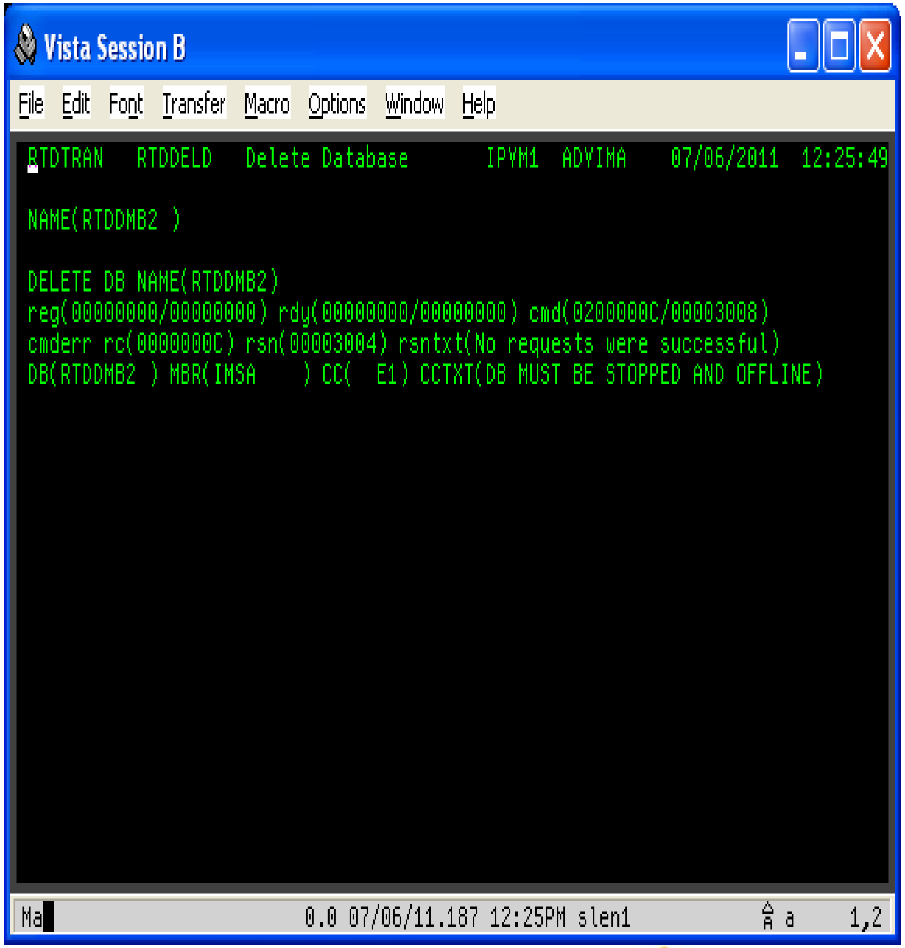
Sample interactions: unsuccessful delete #1

- RTDTRAN DELETE DB; fill in name; Enter



```
RTDTRAN   RTDDELD   Delete Database       IPYM1  ADVIMA    07/06/2011  12:24:45

NAME(rtddmb2 )
```

```
Ma                         0.0 07/06/11.187 12:25PM slen1          a     3,15
```



```
RTDTRAN   RTDDELD   Delete Database       IPYM1  ADVIMA    07/06/2011  12:25:49

NAME(RTDDMB2 )

DELETE DB NAME(RTDDMB2)
reg(00000000/00000000) rdy(00000000/00000000) cmd(0200000C/00003008)
cmderr rc(0000000C) rsn(00003004) rsntxt(No requests were successful)
DB(RTDDMB2 ) MBR(IMSA     ) CC(  E1) CCTXT(DB MUST BE STOPPED AND OFFLINE)
```

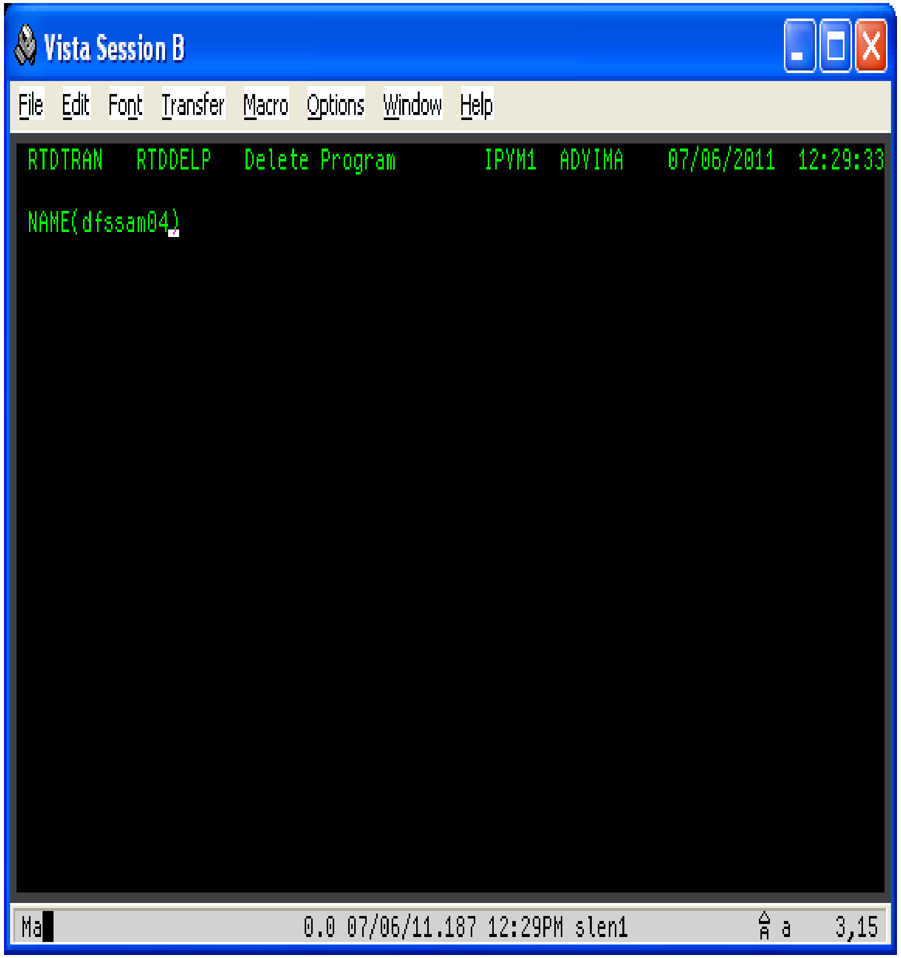
```
Ma                         0.0 07/06/11.187 12:25PM slen1          a     1,2
```

Sample interactions: unsuccessful delete #1

- The DELETE DB failed
- The CSLOMCMD invocation has a return code and reason code
- The DELETE DB invocation has a return code and reason code
  - It also has a completion code
- CSLOMCMD
  - *System Programming APIs* documents values
  - Return/reason code X'0200000C/00003008'
    - Return code high byte X'02' means OM set the values
- DELETE DB
  - *Command Reference Volume 1* documents values
  - Return/reason code X'0000000C/00003004'
  - Completion code X'E1'

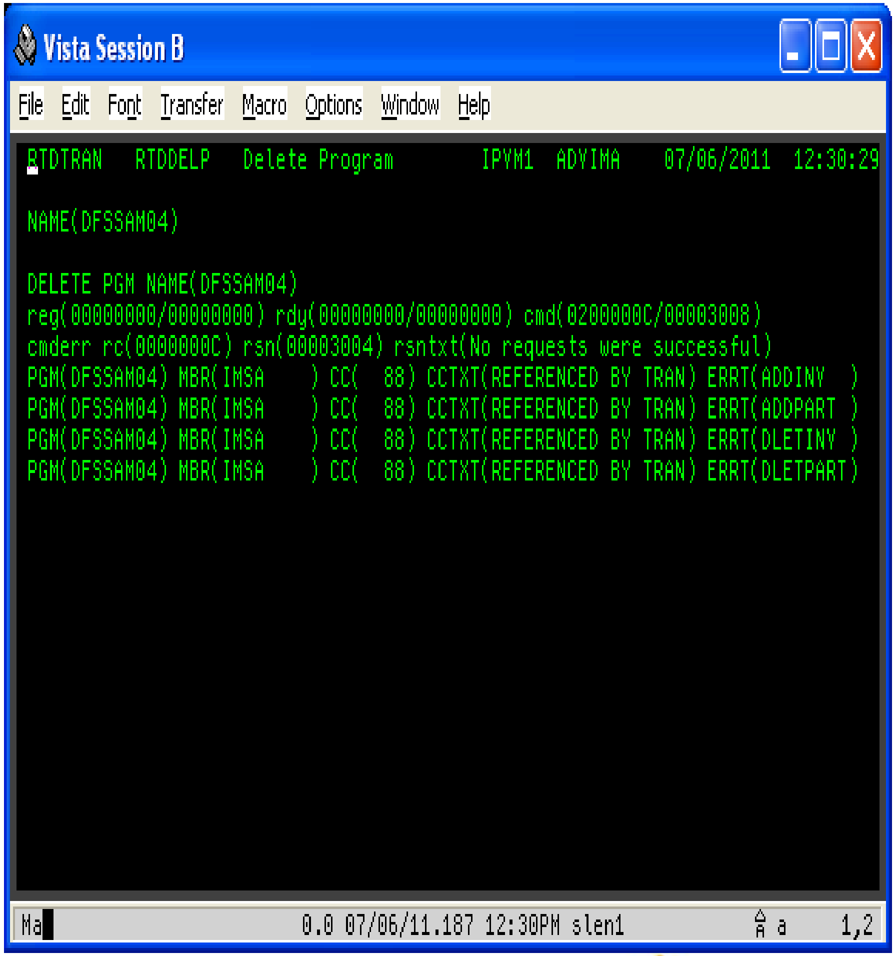
Sample interactions: unsuccessful delete #2

- RTDTRAN DELETE PGM; fill in name; Enter



```
RTDTRAN   RTDDELP   Delete Program        IPYM1  ADYIMA    07/06/2011  12:29:33

NAME(dfssam04)
```

```
Ma                           0.0 07/06/11.187 12:29PM slen1           a    3,15
```

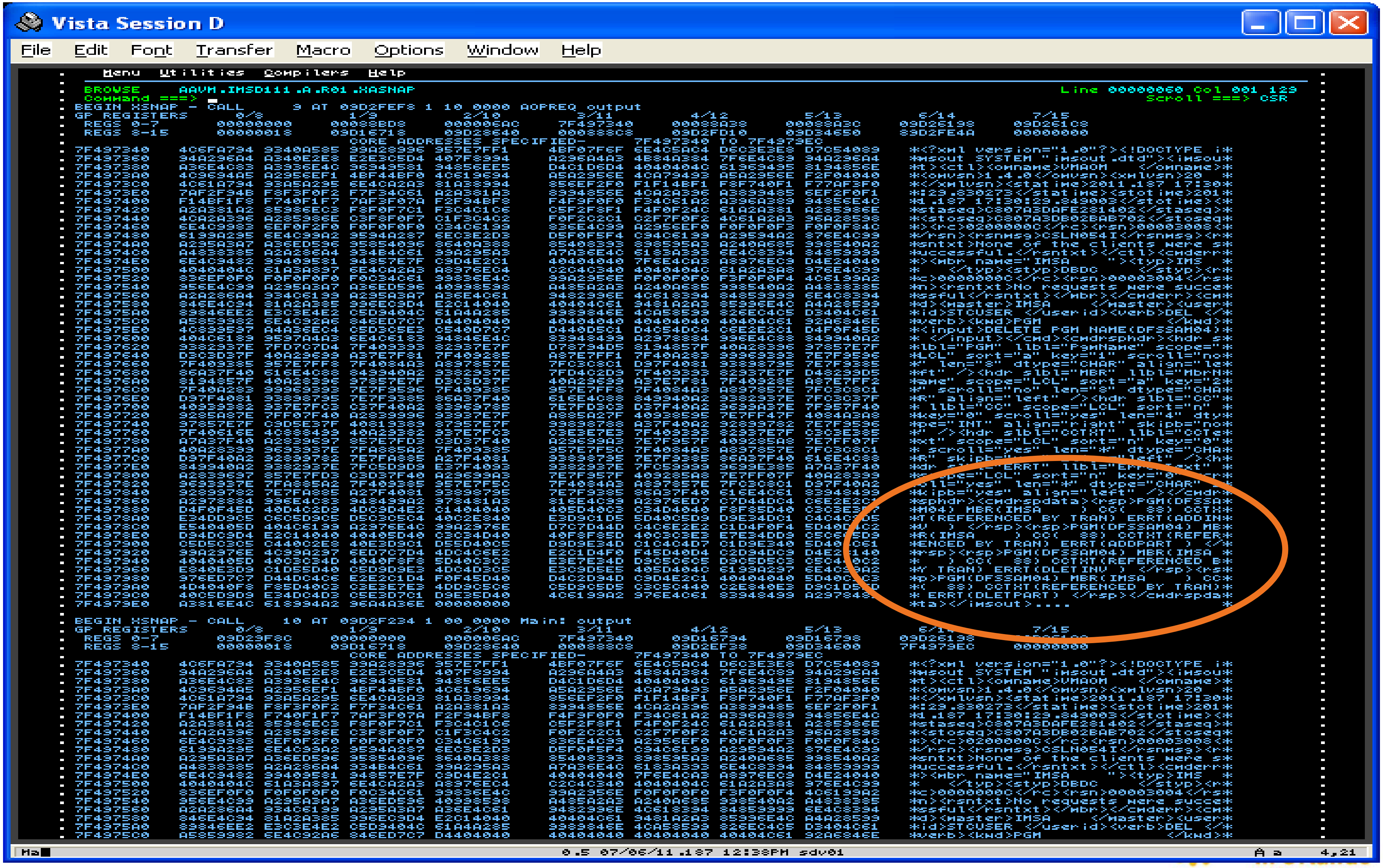


```
RTDTRAN   RTDDELP   Delete Program        IPYM1  ADYIMA    07/06/2011  12:30:29

NAME(DFSSAM04)

DELETE PGM NAME(DFSSAM04)
reg(00000000/00000000) rdy(00000000/00000000) cmd(0200000C/00003008)
cmderr rc(0000000C) rsn(00003004) rsntxt(No requests were successful)
PGM(DFSSAM04) MBR(IMSA    ) CC(   88) CCTXT(REFERENCED BY TRAN) ERRT(ADDINY  )
PGM(DFSSAM04) MBR(IMSA    ) CC(   88) CCTXT(REFERENCED BY TRAN) ERRT(ADDPART )
PGM(DFSSAM04) MBR(IMSA    ) CC(   88) CCTXT(REFERENCED BY TRAN) ERRT(DLETINY )
PGM(DFSSAM04) MBR(IMSA    ) CC(   88) CCTXT(REFERENCED BY TRAN) ERRT(DLETPART)
```

```
Ma                           0.0 07/06/11.187 12:30PM slen1           a    1,2
```

Sample interactions: unsuccessful delete #2

- Returned buffer (hard to read!)

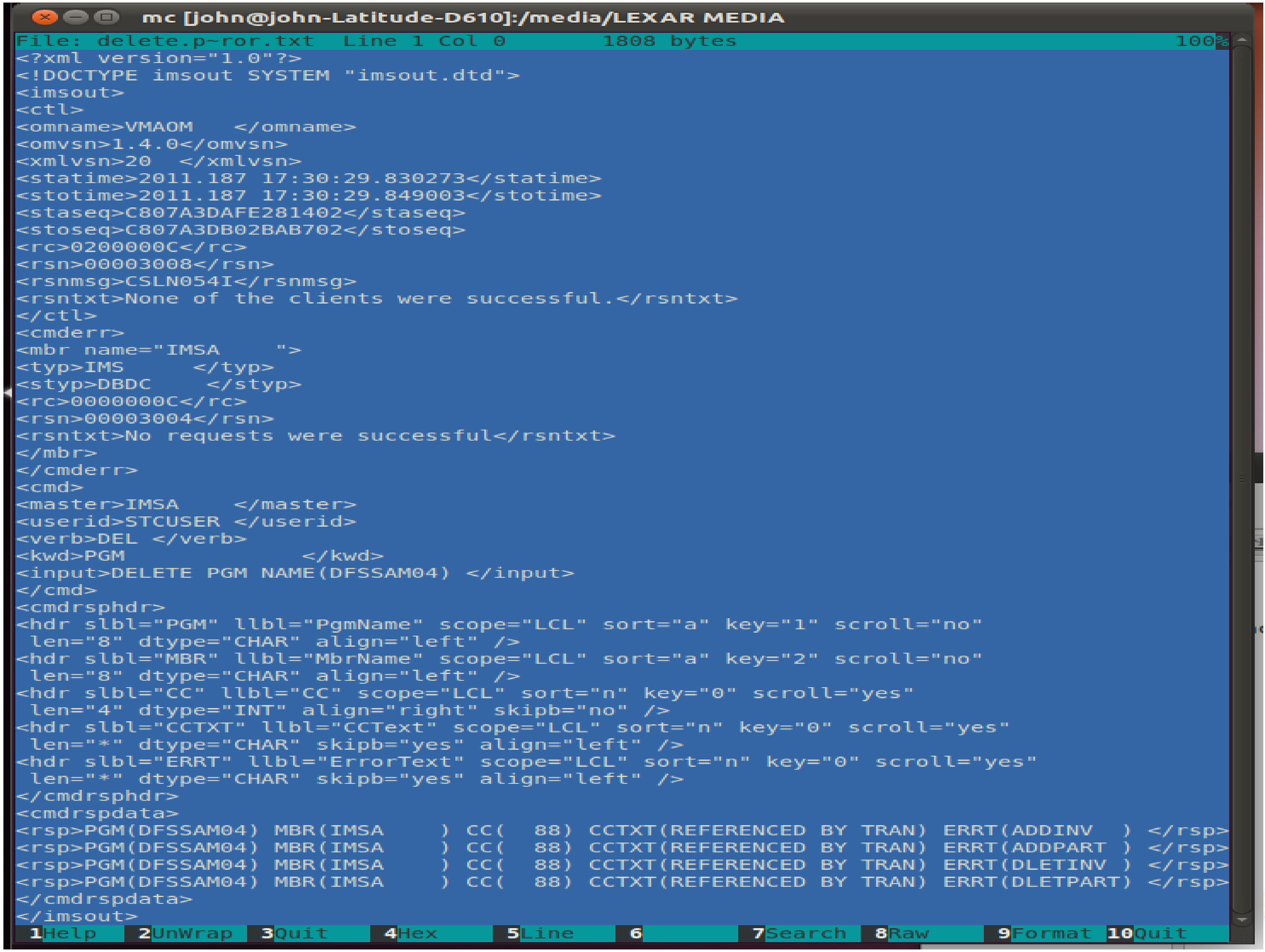


```
 BROWSE    AAVM.IMSD111.A.R01.XASNAP                          Line 00000060 Col 001 129
 Command ===>                                                            Scroll ===> CSR
BEGIN XSNAP - CALL       9 AT 09D2FEF8 1 10 0000 AOPREQ output
GP REGISTERS      0/8         1/9         2/10        3/11        4/12        5/13        6/14        7/15
 REGS 0-7      00000000    00088BD8    000006AC    7F497340    00088A38    00088A3C    09D26198    09D261C8
 REGS 8-15     00000018    09D16718    09D28640    000888C8    09D2FD10    09D34650    89D2FE4A    00000000
                               CORE ADDRESSES SPECIFIED-     7F497340 TO 7F4979EC
7F497340    4C6FA794 9340A585 99A28996 957E7FF1    4BF07F6F 6E4C5AC4 D6C3E3E8 D7C54089    *<?xml version="1.0"?><!DOCTYPE i*
7F497360    94A296A4 A340E2E8 E2E3C5D4 407F8994    A296A4A3 4B84A384 7F6E4C89 94A296A4    *msout SYSTEM "imsout.dtd"><imsou*
7F497380    A36E4C83 A3936E4C 96949581 94856EE5    D4C1D6D4 4040404C 61969495 8194856E    *t><ctl><omname>VMAOM    </omname>*
7F4973A0    4C9694A5 A2956EF1 4BF44BF0 4C619694    A5A2956E 4CA79493 A5A2956E F2F04040    *<omvsn>1.4.0</omvsn><xmlvsn>20  *
7F4973C0    4C61A794 93A5A295 6E4CA2A3 81A38994    856EF2F0 F1F14BF1 F8F740F1 F77AF3F0    *</xmlvsn><statime>2011.187 17:30*
7F4973E0    7AF2F94B F8F3F0F2 F7F34C61 A2A381A3    8994856E 4CA2A396 A3899485 6EF2F0F1    *:29.830273</statime><stotime>201*
7F497400    F14BF1F8 F740F1F7 7AF3F07A F2F94BF8    F4F9F0F0 F34C61A2 A396A389 94856E4C    *1.187 17:30:29.849003</stotime><*
7F497420    A2A381A2 85986EC3 F8F0F7C1 F3C4C1C6    C5F2F8F1 F4F0F24C 61A2A381 A285986E    *staseq>C807A3DAFE281402</staseq>*
7F497440    4CA2A396 A285986E C3F8F0F7 C1F3C4C2    F0F2C2C1 C2F7F0F2 4C61A2A3 96A28598    *<stoseq>C807A3DB02BAB702</stoseq*
7F497460    6E4C9983 6EF0F2F0 F0F0F0F0 C34C6199    836E4C99 A2956EF0 F0F0F0F3 F0F0F84C    *><rc>0200000C</rc><rsn>00003008<*
7F497480    6199A295 6E4C99A2 9594A287 6EC3E2D3    D5F0F5F4 C94C6199 A29594A2 876E4C99    */rsn><rsnmsg>CSLN054I</rsnmsg><r*
7F4974A0    A295A3A7 A36ED596 95854096 8640A388    85408393 89859596 A240A685 998540A2    *sntxt>None of the clients were s*
7F4974C0    A4838385 A2A286A4 934B4C61 99A295A3    A7A36E4C 6183A393 6E4C8394 84859999    *uccessful.</rsntxt></ctl><cmderr*
7F4974E0    6E4C9482 99409581 94857E7F C9D4E2C1    40404040 7F6E4CA3 A8976EC9 D4E24040    *><mbr name="IMSA    "><typ>IMS  *
7F497500    4040404C 61A3A897 6E4CA2A3 A8976EC4    C2C4C340 4040404C 61A2A3A8 976E4C99    *    </typ><styp>DBDC    </styp><r*
7F497520    836EF0F0 F0F0F0F0 F0C34C61 99836E4C    99A2956E F0F0F0F0 F3F0F0F4 4C6199A2    *c>0000000C</rc><rsn>00003004</rs*
7F497540    956E4C99 A295A3A7 A36ED596 40998598    A485A2A3 A240A685 998540A2 A4838385    *n><rsntxt>No requests were succe*
7F497560    A2A286A4 934C6199 A295A3A7 A36E4C61    9482996E 4C618394 84859999 6E4C8394    *ssful</rsntxt></mbr></cmderr><cm*
7F497580    846E4C94 81A2A385 996EC9D4 E2C14040    40404C61 9481A2A3 85996E4C A4A28599    *d><master>IMSA    </master><user*
7F4975A0    89846EE2 E3C3E4E2 C5D9404C 61A4A285    9989846E 4CA58599 826EC4C5 D3404C61    *id>STCUSER </userid><verb>DEL </*
7F4975C0    A5859982 6E4C92A6 846ED7C7 D4404040    40404040 40404040 40404C61 92A6846E    *verb><kwd>PGM             </kwd>*
7F4975E0    4C899597 A4A36EC4 C5D3C5E3 C540D7C7    D440D5C1 D4C54DC4 C6E2E2C1 D4F0F45D    *<input>DELETE PGM NAME(DFSSAM04)*
7F497600    404C6189 9597A4A3 6E4C6183 94846E4C    83948499 A2978884 996E4C88 849940A2    * </input></cmd><cmdrsphdr><hdr s*
7F497620    9382937E 7FD7C7D4 7F409393 82937E7F    D78794D5 8194857F 40A28396 97857E7F    *lbl="PGM" llbl="PgmName" scope="*
7F497640    D3C3D37F 40A29699 A37E7F81 7F409285    A87E7FF1 7F40A283 99969393 7E7F9596    *LCL" sort="a" key="1" scroll="no*
7F497660    7F409385 957E7FF8 7F4084A3 A897857E    7FC3C8C1 D97F4081 93898795 7E7F9385    *" len="8" dtype="CHAR" align="le*
7F497680    86A37F40 616E4C88 849940A2 9382937E    7FD4C2D9 7F409393 82937E7F D48299D5    *ft" /><hdr slbl="MBR" llbl="MbrN*
7F4976A0    8194857F 40A28396 97857E7F D3C3D37F    40A29699 A37E7F81 7F409285 A87E7FF2    *ame" scope="LCL" sort="a" key="2*
7F4976C0    7F40A283 99969393 7E7F9596 7F409385    957E7FF8 7F4084A3 A897857E 7FC3C8C1    *" scroll="no" len="8" dtype="CHA*
7F4976E0    D97F4081 93898795 7E7F9385 86A37F40    616E4C88 849940A2 9382937E 7FC3C37F    *R" align="left" /><hdr slbl="CC"*
7F497700    40939382 937E7FC3 C37F40A2 83969785    7E7FD3C3 D37F40A2 9699A37E 7F957F40    * llbl="CC" scope="LCL" sort="n" *
7F497720    9285A87E 7FF07F40 A2839996 93937E7F    A885A27F 40938595 7E7FF47F 4084A3A8    *key="0" scroll="yes" len="4" dty*
7F497740    97857E7F C9D5E37F 40819389 87957E7F    99898788 A37F40A2 92899782 7E7F9596    *pe="INT" align="right" skipb="no*
7F497760    7F40616E 4C888499 40A29382 937E7FC3    C3E3E7E3 7F409393 82937E7F C3C3E385    *" /><hdr slbl="CCTXT" llbl="CCTe*
7F497780    A7A37F40 A2839697 857E7FD3 C3D37F40    A29699A3 7E7F957F 409285A8 7E7FF07F    *xt" scope="LCL" sort="n" key="0"*
7F4977A0    40A28399 9693937E 7FA885A2 7F409385    957E7F5C 7F4084A3 A897857E 7FC3C8C1    * scroll="yes" len="*" dtype="CHA*
7F4977C0    D97F40A2 92899782 7E7FA885 A27F4081    93898795 7E7F9385 86A37F40 616E4C88    *R" skipb="yes" align="left" /><h*
7F4977E0    849940A2 9382937E 7FC5D9D9 E37F4093    9382937E 7FC59999 9699E385 A7A37F40    *dr slbl="ERRT" llbl="ErrorText" *
7F497800    A2839697 857E7FD3 C3D37F40 A29699A3    7E7F957F 409285A8 7E7FF07F 40A28399    *scope="LCL" sort="n" key="0" scr*
7F497820    9693937E 7FA885A2 7F409385 957E7F5C    7F4084A3 A897857E 7FC3C8C1 D97F40A2    *oll="yes" len="*" dtype="CHAR" s*
7F497840    92899782 7E7FA885 A27F4081 93898795    7E7F9385 86A37F40 616E4C61 83948499    *kipb="yes" align="left" /></cmdr*
7F497860    A2978884 996E4C83 948499A2 978481A3    816E4C99 A2976ED7 C7D44DC4 C6E2E2C1    *sphdr><cmdrspdata><rsp>PGM(DFSSA*
7F497880    D4F0F45D 40D4C2D9 4DC9D4E2 C1404040    405D40C3 C34D4040 F8F85D40 C3C3E3E7    *M04) MBR(IMSA    ) CC(  88) CCTX*
7F4978A0    E34DD9C5 C6C5D9C5 D5C3C5C4 40C2E840    E3D9C1D5 5D40C5D9 D9E34DC1 C4C4C9D5    *T(REFERENCED BY TRAN) ERRT(ADDIN*
7F4978C0    E540405D 404C6199 A2976E4C 99A2976E    D7C7D44D C4C6E2E2 C1D4F0F4 5D40D4C2    *V  ) </rsp><rsp>PGM(DFSSAM04) MB*
7F4978E0    D94DC9D4 E2C14040 40405D40 C3C34D40    40F8F85D 40C3C3E3 E7E34DD9 C5C6C5D9    *R(IMSA    ) CC(  88) CCTXT(REFER*
7F497900    C5D5C3C5 C440C2E8 40E3D9C1 D55D40C5    D9D9E34D C1C4C4D7 C1D9E340 5D404C61    *ENCED BY TRAN) ERRT(ADDPART ) </*
7F497920    99A2976E 4C99A297 6ED7C7D4 4DC4C6E2    E2C1D4F0 F45D40D4 C2D94DC9 D4E2C140    *rsp><rsp>PGM(DFSSAM04) MBR(IMSA *
7F497940    4040405D 40C3C34D 4040F8F8 5D40C3C3    E3E7E34D D9C5C6C5 D9C5D5C3 C5C440C2    *   ) CC(  88) CCTXT(REFERENCED B*
7F497960    E840E3D9 C1D55D40 C5D9D9E3 4DC4D3C5    E3C9D5E5 405D404C 6199A297 6E4C99A2    *Y TRAN) ERRT(DLETINV ) </rsp><rs*
7F497980    976ED7C7 D44DC4C6 E2E2C1D4 F0F45D40    D4C2D94D C9D4E2C1 40404040 5D40C3C3    *p>PGM(DFSSAM04) MBR(IMSA    ) CC*
7F4979A0    4D4040F8 F85D40C3 C3E3E7E3 4DD9C5C6    C5D9C5D5 C3C5C440 C2E840E3 D9C1D55D    *(  88) CCTXT(REFERENCED BY TRAN)*
7F4979C0    40C5D9D9 E34DC4D3 C5E3D7C1 D9E35D40    4C6199A2 976E4C61 83948499 A2978481    * ERRT(DLETPART) </rsp></cmdrspda*
7F4979E0    A3816E4C 61899496 A4A36E00 00000000                                           *ta></imsout>....                *

BEGIN XSNAP - CALL      10 AT 09D2F234 1 00 0000 Main: output
GP REGISTERS      0/8         1/9         2/10        3/11        4/12        5/13        6/14        7/15
 REGS 0-7      09D29F8C    00000000    000006AC    7F497340    09D16794    09D16798    09D26198    09D261C8
 REGS 8-15     00000018    09D16718    09D28640    000888C8    09D2EF38    09D34600    7F4979EC    00000000
                               CORE ADDRESSES SPECIFIED-     7F497340 TO 7F4979EC
7F497340    4C6FA794 9340A585 99A28996 957E7FF1    4BF07F6F 6E4C5AC4 D6C3E3E8 D7C54089    *<?xml version="1.0"?><!DOCTYPE i*
7F497360    94A296A4 A340E2E8 E2E3C5D4 407F8994    A296A4A3 4B84A384 7F6E4C89 94A296A4    *msout SYSTEM "imsout.dtd"><imsou*
7F497380    A36E4C83 A3936E4C 96949581 94856EE5    D4C1D6D4 4040404C 61969495 8194856E    *t><ctl><omname>VMAOM    </omname>*
7F4973A0    4C9694A5 A2956EF1 4BF44BF0 4C619694    A5A2956E 4CA79493 A5A2956E F2F04040    *<omvsn>1.4.0</omvsn><xmlvsn>20  *
7F4973C0    4C61A794 93A5A295 6E4CA2A3 81A38994    856EF2F0 F1F14BF1 F8F740F1 F77AF3F0    *</xmlvsn><statime>2011.187 17:30*
7F4973E0    7AF2F94B F8F3F0F2 F7F34C61 A2A381A3    8994856E 4CA2A396 A3899485 6EF2F0F1    *:29.830273</statime><stotime>201*
7F497400    F14BF1F8 F740F1F7 7AF3F07A F2F94BF8    F4F9F0F0 F34C61A2 A396A389 94856E4C    *1.187 17:30:29.849003</stotime><*
7F497420    A2A381A2 85986EC3 F8F0F7C1 F3C4C1C6    C5F2F8F1 F4F0F24C 61A2A381 A285986E    *staseq>C807A3DAFE281402</staseq>*
7F497440    4CA2A396 A285986E C3F8F0F7 C1F3C4C2    F0F2C2C1 C2F7F0F2 4C61A2A3 96A28598    *<stoseq>C807A3DB02BAB702</stoseq*
7F497460    6E4C9983 6EF0F2F0 F0F0F0F0 C34C6199    836E4C99 A2956EF0 F0F0F0F3 F0F0F84C    *><rc>0200000C</rc><rsn>00003008<*
7F497480    6199A295 6E4C99A2 9594A287 6EC3E2D3    D5F0F5F4 C94C6199 A29594A2 876E4C99    */rsn><rsnmsg>CSLN054I</rsnmsg><r*
7F4974A0    A295A3A7 A36ED596 95854096 8640A388    85408393 89859596 A240A685 998540A2    *sntxt>None of the clients were s*
7F4974C0    A4838385 A2A286A4 934B4C61 99A295A3    A7A36E4C 6183A393 6E4C8394 84859999    *uccessful.</rsntxt></ctl><cmderr*
7F4974E0    6E4C9482 99409581 94857E7F C9D4E2C1    40404040 7F6E4CA3 A8976EC9 D4E24040    *><mbr name="IMSA    "><typ>IMS  *
7F497500    4040404C 61A3A897 6E4CA2A3 A8976EC4    C2C4C340 4040404C 61A2A3A8 976E4C99    *    </typ><styp>DBDC    </styp><r*
7F497520    836EF0F0 F0F0F0F0 F0C34C61 99836E4C    99A2956E F0F0F0F0 F3F0F0F4 4C6199A2    *c>0000000C</rc><rsn>00003004</rs*
7F497540    956E4C99 A295A3A7 A36ED596 40998598    A485A2A3 A240A685 998540A2 A4838385    *n><rsntxt>No requests were succe*
7F497560    A2A286A4 934C6199 A295A3A7 A36E4C61    9482996E 4C618394 84859999 6E4C8394    *ssful</rsntxt></mbr></cmderr><cm*
7F497580    846E4C94 81A2A385 996EC9D4 E2C14040    40404C61 9481A2A3 85996E4C A4A28599    *d><master>IMSA    </master><user*
7F4975A0    89846EE2 E3C3E4E2 C5D9404C 61A4A285    9989846E 4CA58599 826EC4C5 D3404C61    *id>STCUSER </userid><verb>DEL </*
7F4975C0    A5859982 6E4C92A6 846ED7C7 D4404040    40404040 40404040 40404C61 92A6846E    *verb><kwd>PGM             </kwd>*
```

```
Ma                           0.5 07/06/11.187 12:38PM sdv01                          A a     4,21
```

Sample interactions: unsuccessful delete #2

- Edited printable part of the returned buffer

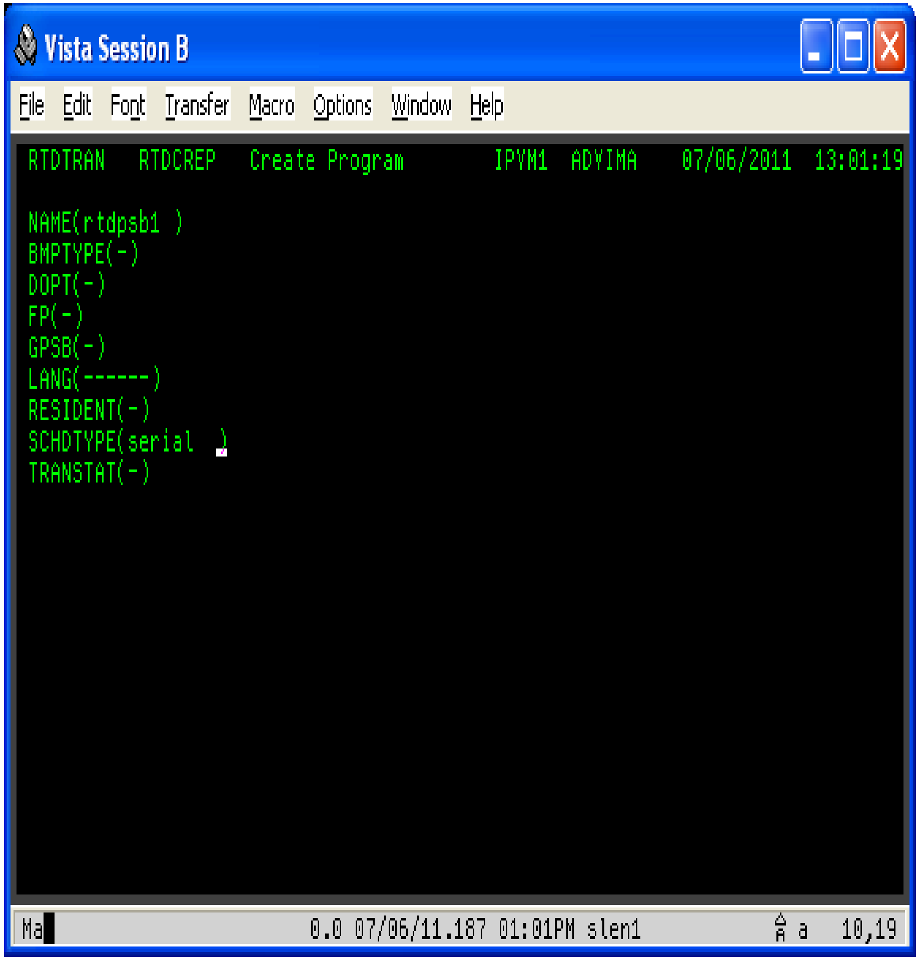


```
File: delete.p~ror.txt  Line 1 Col 0        1808 bytes                                    100%
<?xml version="1.0"?>
<!DOCTYPE imsout SYSTEM "imsout.dtd">
<imsout>
<ctl>
<omname>VMAOM   </omname>
<omvsn>1.4.0</omvsn>
<xmlvsn>20  </xmlvsn>
<statime>2011.187 17:30:29.830273</statime>
<stotime>2011.187 17:30:29.849003</stotime>
<staseq>C807A3DAFE281402</staseq>
<stoseq>C807A3DB02BAB702</stoseq>
<rc>0200000C</rc>
<rsn>00003008</rsn>
<rsnmsg>CSLN054I</rsnmsg>
<rsntxt>None of the clients were successful.</rsntxt>
</ctl>
<cmderr>
<mbr name="IMSA    ">
<typ>IMS    </typ>
<styp>DBDC    </styp>
<rc>0000000C</rc>
<rsn>00003004</rsn>
<rsntxt>No requests were successful</rsntxt>
</mbr>
</cmderr>
<cmd>
<master>IMSA    </master>
<userid>STCUSER </userid>
<verb>DEL </verb>
<kwd>PGM             </kwd>
<input>DELETE PGM NAME(DFSSAM04) </input>
</cmd>
<cmdrsphdr>
<hdr slbl="PGM" llbl="PgmName" scope="LCL" sort="a" key="1" scroll="no"
 len="8" dtype="CHAR" align="left" />
<hdr slbl="MBR" llbl="MbrName" scope="LCL" sort="a" key="2" scroll="no"
 len="8" dtype="CHAR" align="left" />
<hdr slbl="CC" llbl="CC" scope="LCL" sort="n" key="0" scroll="yes"
 len="4" dtype="INT" align="right" skipb="no" />
<hdr slbl="CCTXT" llbl="CCText" scope="LCL" sort="n" key="0" scroll="yes"
 len="*" dtype="CHAR" skipb="yes" align="left" />
<hdr slbl="ERRT" llbl="ErrorText" scope="LCL" sort="n" key="0" scroll="yes"
 len="*" dtype="CHAR" skipb="yes" align="left" />
</cmdrsphdr>
<cmdrspdata>
<rsp>PGM(DFSSAM04) MBR(IMSA    ) CC(   88) CCTXT(REFERENCED BY TRAN) ERRT(ADDINV   ) </rsp>
<rsp>PGM(DFSSAM04) MBR(IMSA    ) CC(   88) CCTXT(REFERENCED BY TRAN) ERRT(ADDPART  ) </rsp>
<rsp>PGM(DFSSAM04) MBR(IMSA    ) CC(   88) CCTXT(REFERENCED BY TRAN) ERRT(DLETINV  ) </rsp>
<rsp>PGM(DFSSAM04) MBR(IMSA    ) CC(   88) CCTXT(REFERENCED BY TRAN) ERRT(DLETPART) </rsp>
</cmdrspdata>
</imsout>
```

1Help 2UnWrap 3Quit 4Hex 5Line 6 7Search 8Raw 9Format 10Quit

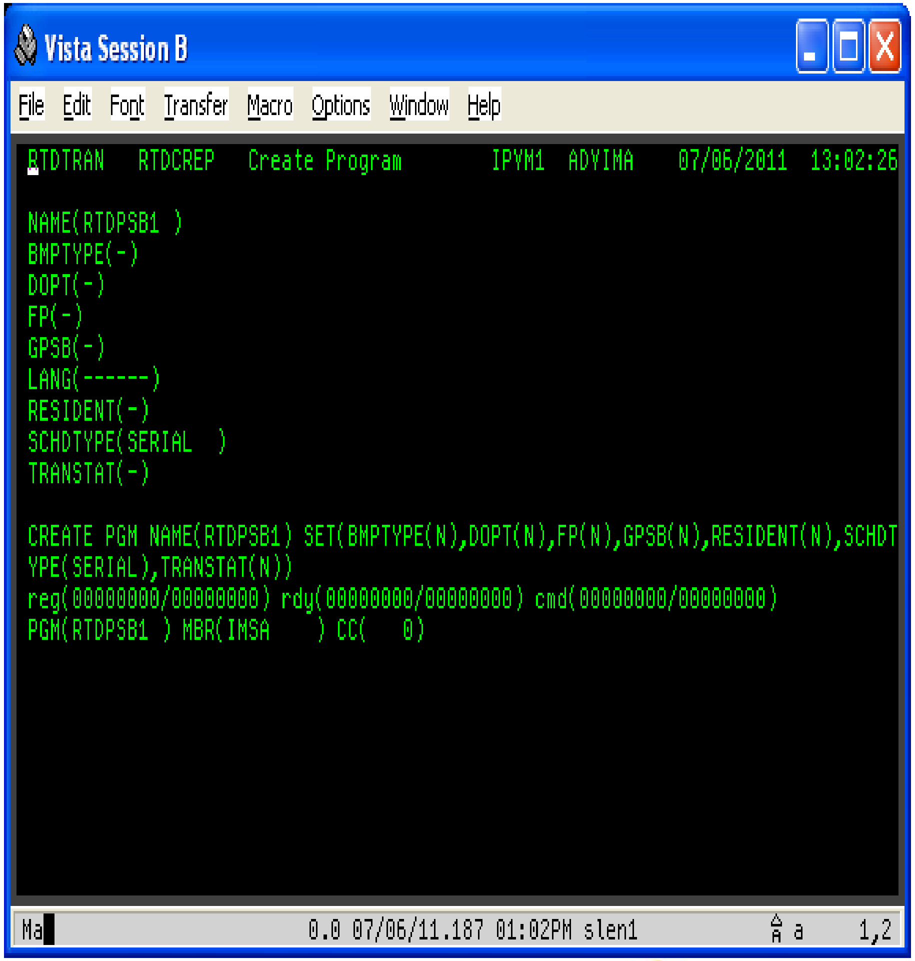
Sample interactions: successful create program

- RTDTRAN CREATE PGM; fill in data; Enter



```
RTDTRAN    RTDCREP    Create Program        IPYM1  ADYIMA     07/06/2011  13:01:19

NAME(rtdpsb1 )
BMPTYPE(-)
DOPT(-)
FP(-)
GPSB(-)
LANG(------)
RESIDENT(-)
SCHDTYPE(serial  )
TRANSTAT(-)
```

```
Ma                       0.0 07/06/11.187 01:01PM slen1                a    10,19
```

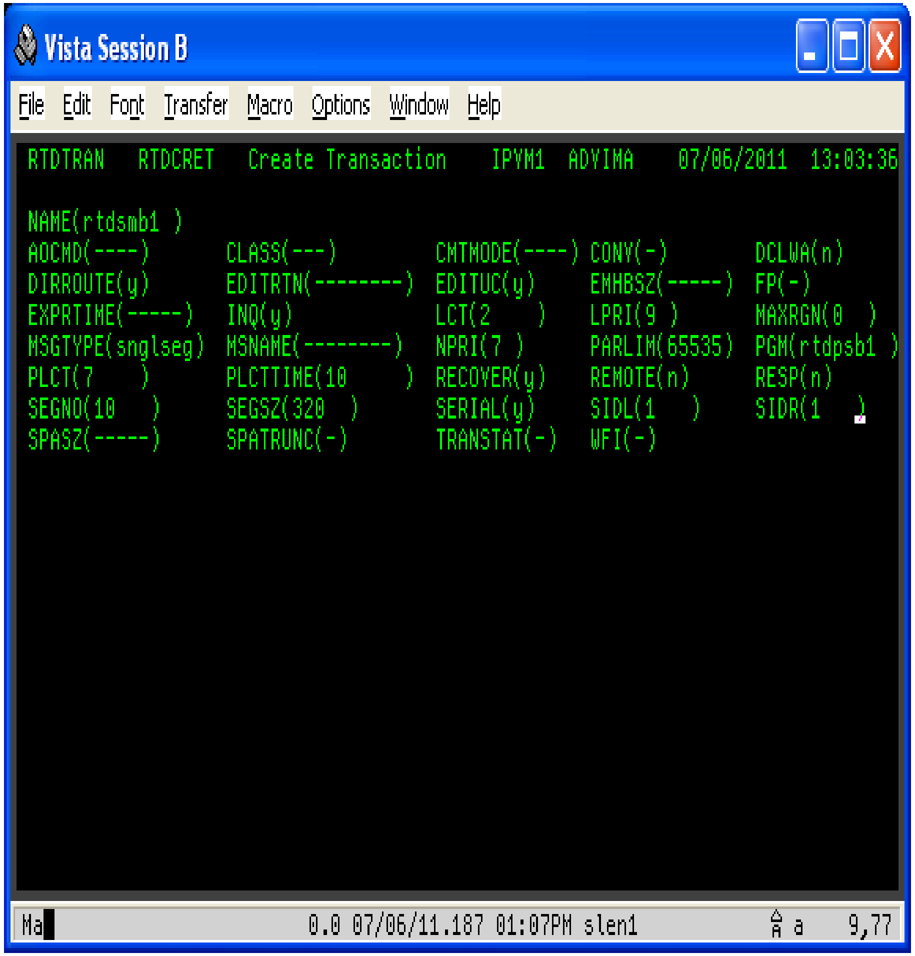


```
RTDTRAN    RTDCREP    Create Program        IPYM1  ADYIMA     07/06/2011  13:02:26

NAME(RTDPSB1 )
BMPTYPE(-)
DOPT(-)
FP(-)
GPSB(-)
LANG(------)
RESIDENT(-)
SCHDTYPE(SERIAL  )
TRANSTAT(-)

CREATE PGM NAME(RTDPSB1) SET(BMPTYPE(N),DOPT(N),FP(N),GPSB(N),RESIDENT(N),SCHDT
YPE(SERIAL),TRANSTAT(N))
reg(00000000/00000000) rdy(00000000/00000000) cmd(00000000/00000000)
PGM(RTDPSB1 ) MBR(IMSA     ) CC(    0)
```

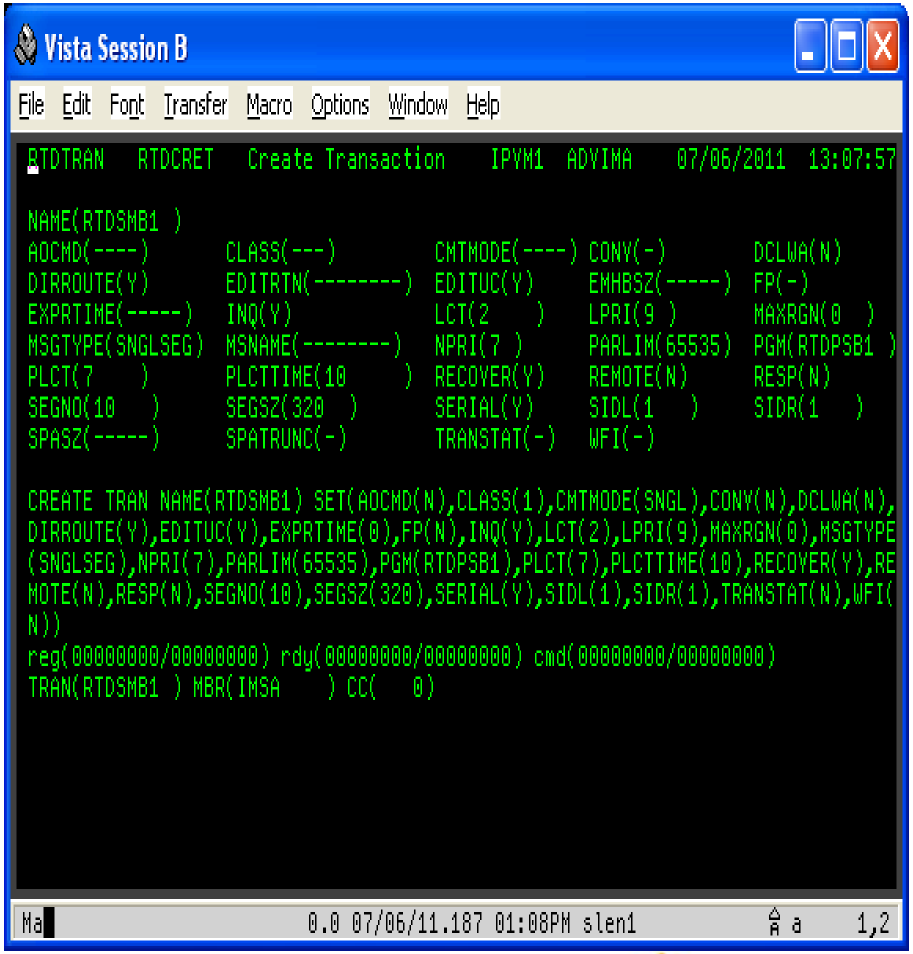
```
Ma                       0.0 07/06/11.187 01:02PM slen1                a     1,2
```

Sample interactions: successful create transaction

- RTDTRAN CREATE TRAN; fill in data; Enter



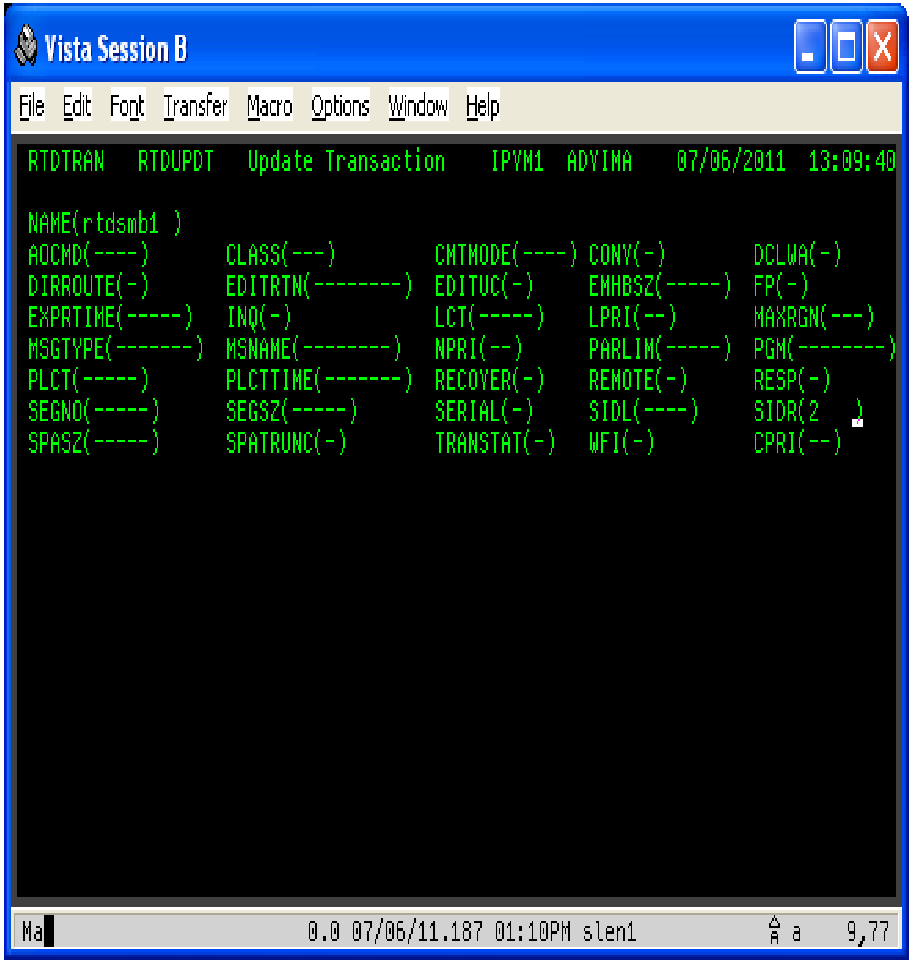
```
RTDTRAN    RTDCRET    Create Transaction    IPVM1  ADVIMA    07/06/2011  13:03:36

NAME(rtdsmb1 )
AOCMD(----)       CLASS(---)         CMTMODE(----) CONV(-)        DCLWA(n)
DIRROUTE(y)       EDITRTN(--------)  EDITUC(y)     EMHBSZ(-----)  FP(-)
EXPRTIME(-----)   INQ(y)             LCT(2     )   LPRI(9 )       MAXRGN(0   )
MSGTYPE(snglseg)  MSNAME(--------)   NPRI(7 )      PARLIM(65535)  PGM(rtdpsb1 )
PLCT(7     )      PLCTTIME(10      )  RECOVER(y)   REMOTE(n)      RESP(n)
SEGNO(10    )     SEGSZ(320   )      SERIAL(y)     SIDL(1    )    SIDR(1    )
SPASZ(-----)      SPATRUNC(-)        TRANSTAT(-)   WFI(-)

Ma                        0.0 07/06/11.187 01:07PM slen1                a     9,77
```



```
RTDTRAN    RTDCRET    Create Transaction    IPVM1  ADVIMA    07/06/2011  13:07:57

NAME(RTDSMB1 )
AOCMD(----)       CLASS(---)         CMTMODE(----) CONV(-)        DCLWA(N)
DIRROUTE(Y)       EDITRTN(--------)  EDITUC(Y)     EMHBSZ(-----)  FP(-)
EXPRTIME(-----)   INQ(Y)             LCT(2     )   LPRI(9 )       MAXRGN(0   )
MSGTYPE(SNGLSEG)  MSNAME(--------)   NPRI(7 )      PARLIM(65535)  PGM(RTDPSB1 )
PLCT(7     )      PLCTTIME(10      )  RECOVER(Y)   REMOTE(N)      RESP(N)
SEGNO(10    )     SEGSZ(320   )      SERIAL(Y)     SIDL(1    )    SIDR(1    )
SPASZ(-----)      SPATRUNC(-)        TRANSTAT(-)   WFI(-)

CREATE TRAN NAME(RTDSMB1) SET(AOCMD(N),CLASS(1),CMTMODE(SNGL),CONV(N),DCLWA(N),
DIRROUTE(Y),EDITUC(Y),EXPRTIME(0),FP(N),INQ(Y),LCT(2),LPRI(9),MAXRGN(0),MSGTYPE
(SNGLSEG),NPRI(7),PARLIM(65535),PGM(RTDPSB1),PLCT(7),PLCTTIME(10),RECOVER(Y),RE
MOTE(N),RESP(N),SEGNO(10),SEGSZ(320),SERIAL(Y),SIDL(1),SIDR(1),TRANSTAT(N),WFI(
N))
reg(00000000/00000000) rdy(00000000/00000000) cmd(00000000/00000000)
TRAN(RTDSMB1  ) MBR(IMSA     ) CC(    0)

Ma                        0.0 07/06/11.187 01:08PM slen1                a     1,2
```

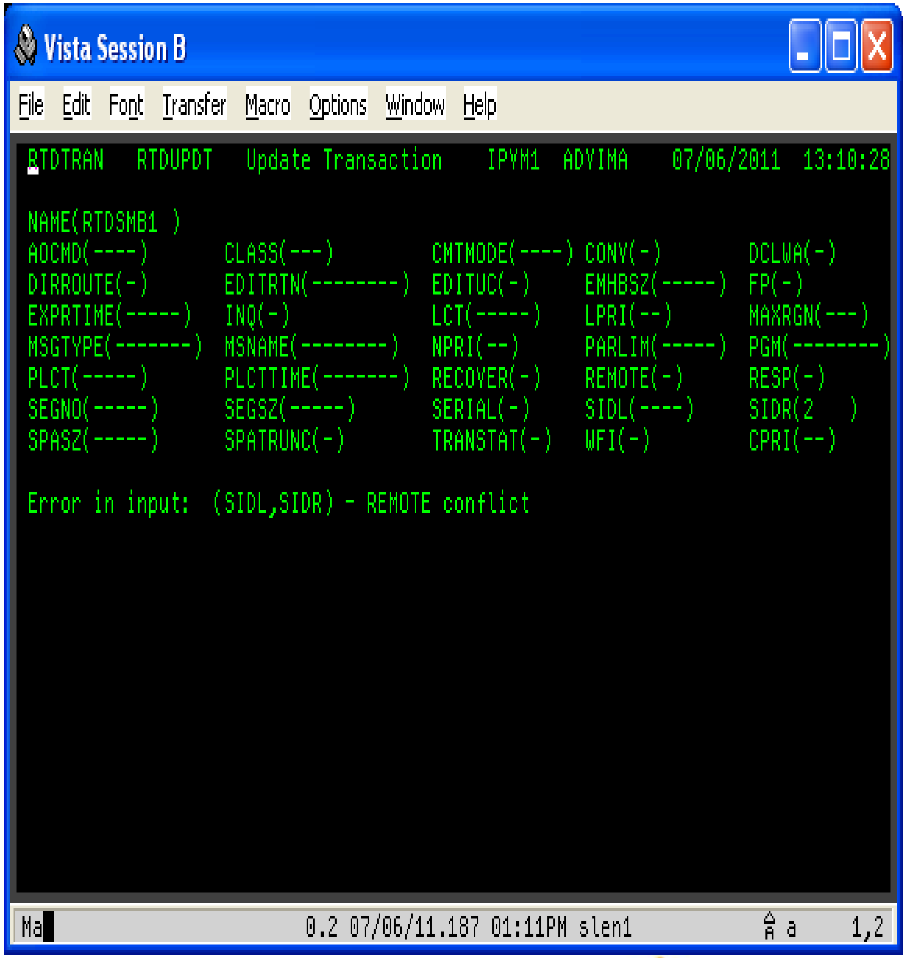
Sample interactions: WARNING about MSC
See PK89475: update SIDR without setting REMOTE(Y)

- RTDTRAN UPDATE TRAN; fill one data value; Enter



```
RTDTRAN   RTDUPDT   Update Transaction    IPVM1  ADVIMA    07/06/2011  13:09:40

NAME(rtdsmb1 )
AOCMD(----)       CLASS(---)         CMTMODE(----) CONV(-)        DCLWA(-)
DIRROUTE(-)       EDITRTN(--------)  EDITUC(-)     EMHBSZ(-----)  FP(-)
EXPRTIME(-----)   INQ(-)             LCT(-----)    LPRI(--)       MAXRGN(---)
MSGTYPE(-------)  MSNAME(--------)   NPRI(--)      PARLIM(-----)  PGM(--------)
PLCT(-----)       PLCTTIME(-------)  RECOVER(-)    REMOTE(-)      RESP(-)
SEGNO(-----)      SEGSZ(-----)       SERIAL(-)     SIDL(----)     SIDR(2   )
SPASZ(-----)      SPATRUNC(-)        TRANSTAT(-)   WFI(-)         CPRI(--)
```

```
Ma              0.0 07/06/11.187 01:10PM slen1          a     9,77
```

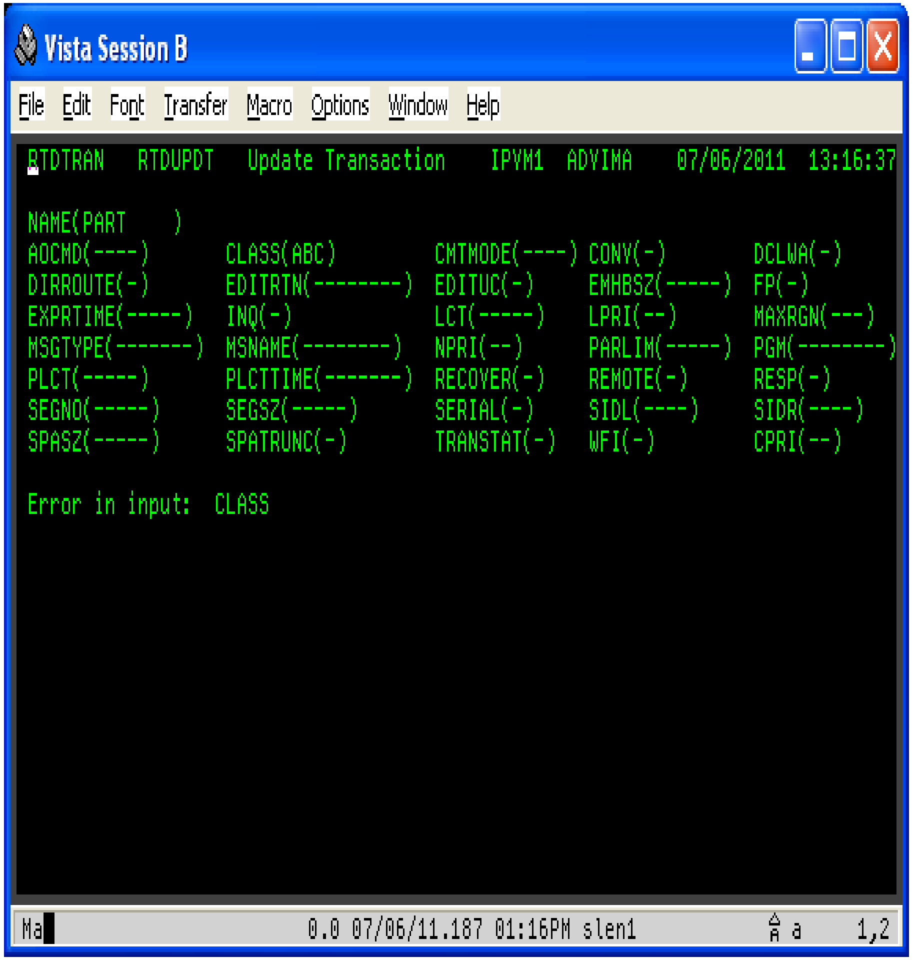


```
RTDTRAN   RTDUPDT   Update Transaction    IPVM1  ADVIMA    07/06/2011  13:10:28

NAME(RTDSMB1 )
AOCMD(----)       CLASS(---)         CMTMODE(----) CONV(-)        DCLWA(-)
DIRROUTE(-)       EDITRTN(--------)  EDITUC(-)     EMHBSZ(-----)  FP(-)
EXPRTIME(-----)   INQ(-)             LCT(-----)    LPRI(--)       MAXRGN(---)
MSGTYPE(-------)  MSNAME(--------)   NPRI(--)      PARLIM(-----)  PGM(--------)
PLCT(-----)       PLCTTIME(-------)  RECOVER(-)    REMOTE(-)      RESP(-)
SEGNO(-----)      SEGSZ(-----)       SERIAL(-)     SIDL(----)     SIDR(2   )
SPASZ(-----)      SPATRUNC(-)        TRANSTAT(-)   WFI(-)         CPRI(--)

Error in input:  (SIDL,SIDR) - REMOTE conflict
```

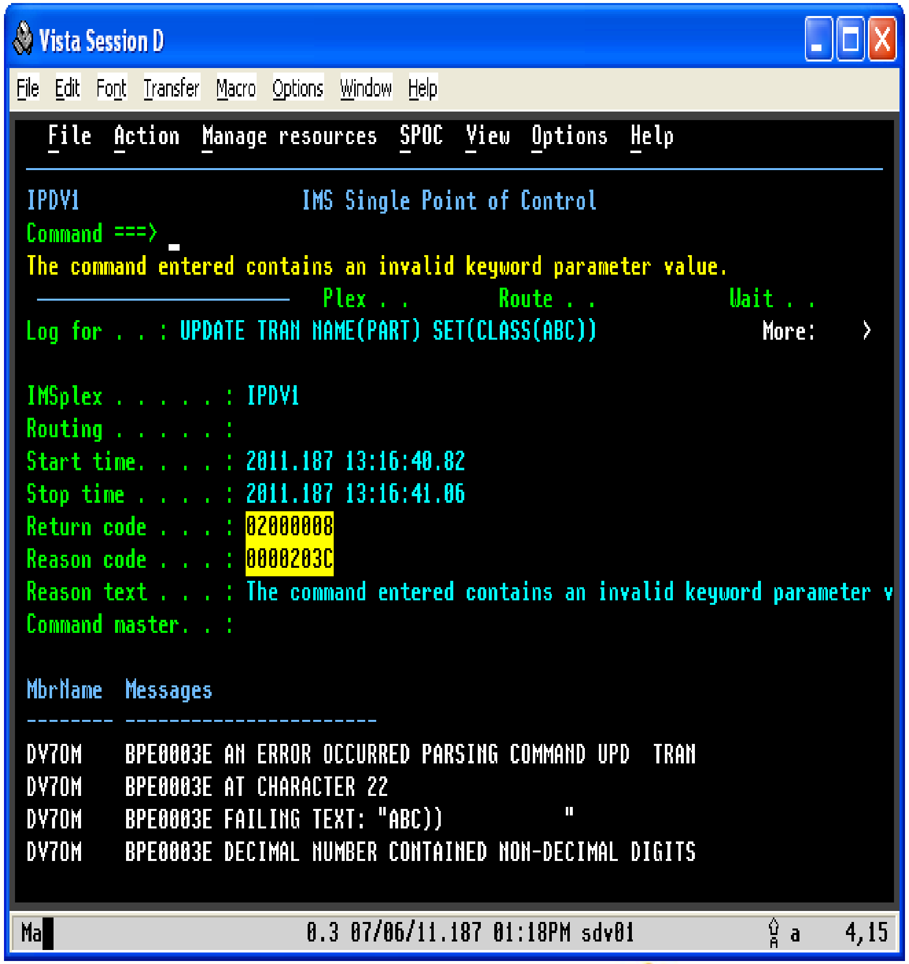
```
Ma              0.2 07/06/11.187 01:11PM slen1          a     1,2
```

Sample interactions: RTDTRAN vs SPOC

- RTDTRAN update on left; SPOC update on right


Vista Session B
File Edit Font Transfer Macro Options Window Help
Ma 0.0 07/06/11.187 01:16PM slen1 a 1,2

```
RTDTRAN   RTDUPDT   Update Transaction    IPVM1  ADVIMA    07/06/2011  13:16:37

NAME(PART    )
AOCMD(----)       CLASS(ABC)        CMTMODE(----) CONV(-)        DCLWA(-)
DIRROUTE(-)       EDITRTN(--------) EDITUC(-)     EMHBSZ(-----)  FP(-)
EXPRTIME(-----)   INQ(-)            LCT(-----)    LPRI(--)       MAXRGN(---)
MSGTYPE(-------)  MSNAME(--------)  NPRI(--)      PARLIM(-----)  PGM(--------)
PLCT(-----)       PLCTTIME(-------) RECOVER(-)    REMOTE(-)      RESP(-)
SEGNO(-----)      SEGSZ(-----)      SERIAL(-)     SIDL(----)     SIDR(----)
SPASZ(-----)      SPATRUNC(-)       TRANSTAT(-)   WFI(-)         CPRI(--)

Error in input:  CLASS
```


Vista Session D
File Edit Font Transfer Macro Options Window Help
File Action Manage resources SPOC View Options Help
Ma 0.3 07/06/11.187 01:18PM sdv01 a 4,15

```
IPDV1                    IMS Single Point of Control
Command ===>
The command entered contains an invalid keyword parameter value.
                           Plex . .        Route . .           Wait . .
Log for . . : UPDATE TRAN NAME(PART) SET(CLASS(ABC))                More:    >

IMSplex . . . . . . : IPDV1
Routing . . . . . . :
Start time. . . . . : 2011.187 13:16:40.82
Stop time . . . . . : 2011.187 13:16:41.06
Return code . . . . : 02000008
Reason code . . . . : 0000203C
Reason text . . . . : The command entered contains an invalid keyword parameter v
Command master. . . :

MbrName   Messages
--------  -----------------------

DV70M     BPE0003E AN ERROR OCCURRED PARSING COMMAND UPD  TRAN
DV70M     BPE0003E AT CHARACTER 22
DV70M     BPE0003E FAILING TEXT: "ABC))            "
DV70M     BPE0003E DECIMAL NUMBER CONTAINED NON-DECIMAL DIGITS
```

Sample transaction interactions: summary

- All RTDTRAN interactions are similar
  - Enter rtdtran <function> <resource>
  - Fill in values in the “fields”
    - The “fields” are not really fields since the screen is unformatted
    - Not all values have to be filled in
  - Transaction does some editing of the input
    - May abort the request early and show the error
    - If no early error, constructs the type-2 command and calls RCSLOM
    - Extracts data from values returned by RCSLOM (data and output buffer)
  - Screen response echoes input
    - Shows the built command for CREATE, DELETE, UPDATE
    - Shows the CSL register, ready, and command return/reason codes
    - Shows the command completion code(s)
    - Shows additional data if an error occurs
  - Output to IRSREQ is completely different (but unchanged from IMS V9!)
    - It is the IRSREQ input buffer, with an added IRSREQ return code

Sources of Documentation

- *IMS V11 Command Reference, Volume 1*
  - CREATE, DELETE commands
- *IMS V11 Command Reference, Volume 2*
  - QUERY, UPDATE commands
- *IMS V11 Operations and Automation*
  - SPOC introduction
- *IMS V11 System Definition*
  - System definition macros for IMS resources
- *IMS V11 System Programming APIs*
  - Chapters 3, 4, 6: Writing CSL client, AOP requests, CSL OM client
  - Chapter 8: Writing CSL SCI client
  - Chapter 9: OM XML output
- *IMS V11 System Utilities*
  - Chapters 26, 42-46: Batch SPOC, RDDS utilities

Summary

- IMS V10 added Dynamic Resource Definition
- New type-2 commands to manage resources
- Requires Common Service Layer
  - At least SCI and OM
- Type-2 commands entered from non-IMS environment
  - TSO SPOC
  - Batch
- IBM provides an API to access the CSL via a program
  - Very well documented
- TI rewrote it Real-Time Definition transaction to use DRD
  - Used the CSL API; isolated the CSL code in a separate module
    - Some error checking done by TI code, some by IMS code
  - Other programs also use the RCSLOM module
- Command security is still an issue
- Now you, too, can manage IMS resources using IMS!