SAFTRACE

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SESSION J2

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Agenda

- Overview
  - What is SAFTRACE?
  - Why and when should it be used?
  - Who should use it and how do I use it?
    - examples -   RACROUTE - AUTH
- Objectives
  - Understand how to use SAFTRACE
- Example of it IN ACTION !!
- Session Summary
- Sources and Additional Information
- Appendices (A & B)

What is SAFTRACE?

A security product trace

- SAFTRACE provides the ability to trace all Racroutes, RACF Callable services, and RACF Database Manager requests that go through the RACF routers. When tracing these services, the trace routine will copy the parameter list into a GTF record **before and after** the service runs.

  (creating a pre and post trace record)

- Available at z/OS V1R2 and above..........

IPCS formatting

- Once collected records are formatted with IPCS exit IRRUSR57 (alias AMDUSR57) making them readable.

Who should use it?

SAFTRACE is a powerful DIAGNOSTIC TOOL targeted for use by IBM Support or customers with a STRONG working knowledge of RACF interfaces.

- **Primarily RACF L2**
- Other L2 teams
- On site support (with direction if required)
- Customers with "some" RACF internals knowledge (i.e. especially parameter lists)
  - format is oriented towards an MVS SYSPROG
  - may need to weed through high volume of data

How can SAFTRACE be used?

Diagnostic situations where SAFTRACE can be helpful:

- To understand WHAT calls are being made for any given situation.
- If RACF database contention has been observed:

  Trace DATABASE(ALTER) requests on the specific ASID indicated via GRS contention displays. Alter requests generally prevent readers (majority) from getting service.
- Excessive database i/o (for a given address space)

  Trace reads to see what CLASS / ENTITIES are related.
- Excessive Verify's:

  If your systems has an excessive amount of Verify's, set a trace on RACROUTE(TYPE(2,5,9)) and determine who is issuing all of the RACROUTE calls.
- Timings - use a statistical package to calculate time difference between pre to post call for each 'pair' of GTF records. Insure pairings are correct.
- USS CALLABLE services.... What exactly is occuring?

  What info is passed to this call and what RCs do we return?. Best used in concert with USS CTRACE facility..

Where are the trace points?

Where do we trace?

Trace Points…

IBM SAF routers ICHSFR00 and IRRSFR11

- Internal calls to the security product may not be traced.
- All calls made via RACROUTE or Callable Service interface will be traced.
- Calls that issue SVC (pre-RACROUTE, such as RACINIT, RACDEF, RACHECK, RACLIST, etc.) or directly enter the security product **will not be** traced

RACF Database manager ICHEINTY interface

- All ICHEINTYs and internal security product calls to the database manager.

How Do I use it?

Activating the trace?

Activating a trace...

```
[subsystem-prefix] SET  [TRACE(
                  [ RACROUTE(ALL * | NONE | TYPE(t1, t2,...)) |
                        NORACROUTE ] |

                  [ DATABASE ([ALL * | NONE] |
                        [ALTER | NOALTER]     |
                        [ALTERI | NOALTERI]   |
                        [READ | NOREAD])      |
                         NODATABASE  ]        |

               [ CALLABLE(ALL | NONE | TYPE(t1, t2, ...))  |
                          NOCALLABLE]

                 [ ASID(asid1, asid2, .. |*.) |NOASID | ALLASIDS ]
                 [ JOBNAME(jobname1, jobname2, ... | *) |
                        NOJOBNAME | ALLJOBNAMES  ]
                                 )]
```

* ALL is not recommended for RACROUTE or DATABASE as trace output could be **very** large.

Activating a trace

Sample GTF PROC

```
//GTFRACF PROC MEMBER=GTFPRM#O
//BR14     EXEC PGM=IEFBR14,REGION=512K
//SYSPRINT DD SYSOUT=*
//D DD DISP=(OLD,DELETE),UNIT=3380,VOL=SER=TEMP01,
//  DSN=SYS1.TRACE
//IEFPROC EXEC PGM=AHLGTF,PARM='MODE=EXT,DEBUG=NO,SA=100K,AB=100K',
//              REGION=2880K,TIME=NOLIMIT
//IEFRDER DD   DSNAME=SYS1.TRACE,UNIT=3380,VOL=SER=TEMP01,
//              DISP=(NEW,CATLG),SPACE=(TRK,(100))
//SYSLIB  DD   DSNAME=RACFDRVR.PARMLIB.R6(&MEMBER),DISP=SHR
```

Sample Parmlib Member: GTFPRM#O

```
TRACE=USRP
USR=(F44),END
```

Activating a trace…

1. Start the GTF using the GTFRACF (see Sample PROC 1.) or other procedure:

    START GTFRACF.GTF,,,NOPROMPT

    Noprompt implies that the PROC has what it needs.

2. Use the SET command to enable your trace:

    @SET TRACE(RACROUTE(TYPE(1))
    JOBNAME(HARDGR2)) LIST

    << use of JOBNAME is key >>

3. Reproduce the scenario that trace is required for, e.g.; start batch job, login, start application, use CICS application or access resource.

Activating a trace...

4. Next stop GTF to prevent excessive traces

   STOP GTF

5. shut off the TRACE

@SET TRACE(NORACROUTE NOJOBNAME)

6. Use IPCS to view the trace data.

   The input trace data is contained in the dataset specified on the IEFRDER DD card in the GTFRACF (or other) procedure. The sample GTFRACF procedure specifies 'SYS1.TRACE' . Once the TSO IPCS session is active use the IPCS subcommand

   "IP GTF USR" to display the formatted trace.

Usage notes

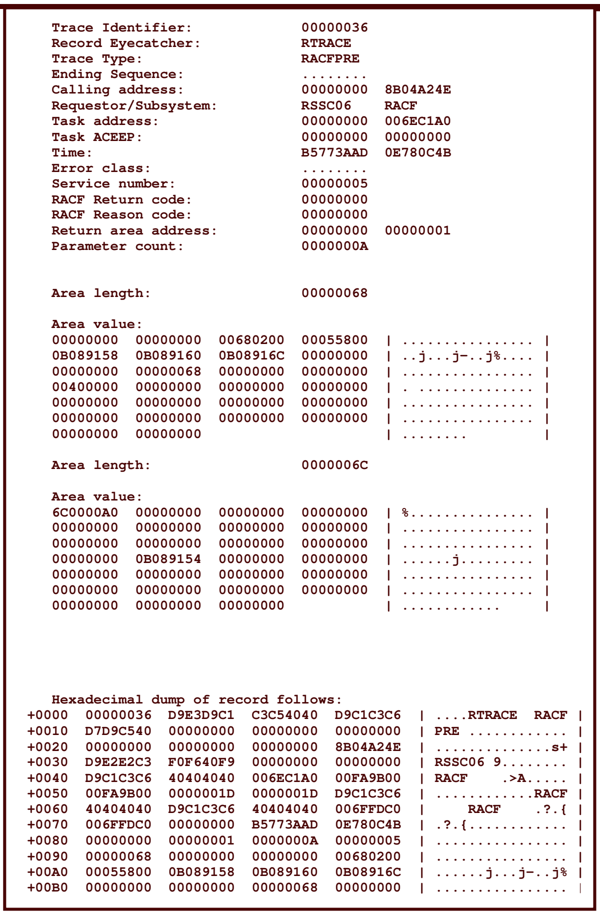
Things to know:

- The RACF subsystem must be up and running.
- GTF must be active.
- For OMVS calls, you need an '*' in the jobname filter to trace spawned processes. Otherwise, you will not get a complete set of records. Example:
- @SET TRACE(CALLABLE(TYPE(xx)) JOBNAME(HARDGR*)) LIST will trace jobnames HARDGR1, HARDGR2 etc

SET LIST - Sample output

```
  - RACFR12  IRRH005I (@) RACF SUBSYSTEM INFORMATION:
  -    TRACE OPTIONS                  - NOIMAGE
  -                                   - NOAPPC
  -                                   - RACROUTE
  -                                       1
  -                                   - NOCALLABLE
  -                                   - NODATABASE
  -                                   - NOASID
  -                                   - JOBNAME
  -                                      HARDGR2
  -    SUBSYSTEM USERID               - IBMUSER
  -    JESNODE (FOR TRANSMITS)        - POKVMMCL
  -    AUTOMATIC COMMAND DIRECTION IS *NOT* ALLOWED
  -    AUTOMATIC PASSWORD DIRECTION IS *NOT* ALLOWED
  -    PASSWORD SYNCHRONIZATION IS *NOT* ALLOWED
  -    AUTOMATIC DIRECTION OF APPLICATION UPDATES IS *NOT* ALLOWED
  -    RACF STATUS INFORMATION:
  -          TEMPLATE VERSION         - HRF7705
00-          DYNAMIC PARSE VERSION    - HRF7705
```

Output trace format



```
Trace Identifier:             00000036
Record Eyecatcher:            RTRACE
Trace Type:                   RACFPRE
Ending Sequence:              ........
Calling address:              00000000  8B04A24E
Requestor/Subsystem:          RSSC06    RACF
Task address:                 00000000  006EC1A0
Task ACEEP:                   00000000  00000000
Time:                         B5773AAD  0E780C4B
Error class:                  ........
Service number:               00000005
RACF Return code:             00000000
RACF Reason code:             00000000
Return area address:          00000000  00000001
Parameter count:              0000000A


Area length:                  00000068

Area value:
00000000  00000000  00680200  00055800  | ................ |
0B089158  0B089160  0B08916C  00000000  | ..j...j-..j%.... |
00000000  00000068  00000000  00000000  | ................ |
00400000  00000000  00000000  00000000  | . .............. |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000                      | ........         |

Area length:                  0000006C

Area value:
6C0000A0  00000000  00000000  00000000  | %............... |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  0B089154  00000000  00000000  | ......j......... |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000            | ............     |



   Hexadecimal dump of record follows:
+0000  00000036  D9E3D9C1  C3C54040  D9C1C3C6  | ....RTRACE  RACF |
+0010  D7D9C540  00000000  00000000  00000000  | PRE ............ |
+0020  00000000  00000000  00000000  8B04A24E  | ..............s+ |
+0030  D9E2E2C3  F0F640F9  00000000  00000000  | RSSC06 9........ |
+0040  D9C1C3C6  40404040  006EC1A0  00FA9B00  | RACF    .>A..... |
+0050  00FA9B00  0000001D  0000001D  D9C1C3C6  | ............RACF |
+0060  40404040  D9C1C3C6  40404040  006FFDC0  |     RACF    .?.{ |
+0070  006FFDC0  00000000  B5773AAD  0E780C4B  | .?.{............ |
+0080  00000000  00000001  0000000A  00000005  | ................ |
+0090  00000068  00000000  00000000  00680200  | ................ |
+00A0  00055800  0B089158  0B089160  0B08916C  | ......j...j-..j% |
+00B0  00000000  00000000  00000068  00000000  | ................ |
```

Header portion (fixed length)

Unloaded parameters from RACF parameter list

Raw hex dump of entire GTF record including header

Header portion of trace output

```
Following is a formatted R_TRACE record.
 This trace record was generated by IRRTRC00 with
IDENT(R_TRACE).
Trace Identifier:             00000036
Record Eyecatcher:            RTRACE
Trace Type:                   RACFPRE / RACFPOST
(will be one of these:)       OMVSPRE / OMVSPOST
                              MNGRPRE / MNGRPOST
Ending Sequence:              ........
Calling address:              00000000  85D4872E
Requestor/Subsystem:          ........  ........
Primary jobname:              HARDGR2
Primary asid:                 00000018
Primary ACEEP:                00000000  005FF340
Home jobname:                 HARDGR2
Home asid:                    00000018
Home ACEEP:                   00000000  005FF340
Task address:                 00000000  005C8D90
Task ACEEP:                   00000000  00000000
Time:                         B97004AF  74D51E48
Error class:                  ........
Service number:               00000001    (in HEX)
RACF Return code:             00000008
RACF Reason code:             00000000
Return area address:          00000000  0005AB90
Parameter count:              0000000B
```

Parameter portion of trace output - I

```
Area length:                00000068

Area value:
00000000  00000000  00D00000  00010000  | ........}....... |
00000000  00000000  0005A990  00000000  | ..........z..... |
00000000  00000068  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000                      | ........         |

Area length:                00000068

Area value:
68000000  9C000000  80000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  0005AC60  0005AC8C  0005AC94  | .......-.......m |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000                      | ........         |
Area length:                00000008

Area value:
D6C6C6E2  C5E30024                      | OFFSET..         |

Area length:                0000002C

Area value:
D7C1C7C5  F0F84BC3  C1E3C1D3  D6C74040  | PAGE08.CATALOG   |
40404040  40404040  40404040  40404040  |                  |
40404040  40404040  40404040            |                  |
```

Doc'd in book:
z/OS V1R4.0 Security Server RACF Diagnosis Guide
Chapter 6. Diagnosis reference for RACF
6.1 Parameter list descriptions

Parameter portion of trace output -2

```
Area length:                  00000008

Area value:
D6C6C6E2  C5E30028                          | OFFSET..         |

Area length:                  00000008

Area value:
07C4C1E3  C1E2C5E3                          | .DATASET         |
Area length:                  00000008

Area value:
D6C6C6E2  C5E3002C                          | OFFSET..         |

Area length:                  00000006

Area value:
D7C1C7C5  F0F8                              | PAGE08           |
Area length:                  000000A8

Area value:
C1C3C5C5  FF0000A8  02000000  00000000  | ACEE...y........ |
00000000  07C8C1D9  C4C7D9F2  4006E3E2  | .....HARDGR2 .TS |
D6C7D9D7  40408101  8003138F  40404040  | OGRP  a.....     |
40404040  00A85B00  20000000  00000000  |     .y$......... |
D3D6C3C1  D3C3F1F1  00000000  00800000  | LOCALC11........ |
00000000  00000000  40404040  40404040  | ........         |
00000000  005FF3E8  00000000  005C8A08  | .....¬3Y.....*.. |
7FFFB9B0  005FF438  00000000  0103138F  | "....¬4......... |
00000000  00200000  00000000  00000000  | ................ |
00000000  00000000  005FF470  7F6C0000  | .........¬4."%.. |
00000000  005FF500                      | .....¬5.         |
```

Parameter portion of trace output -3

```
Area length:                  00000050

Area value:
50012206  0001C000  00000000  00000000  | &.....{......... |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
D3D6C3C1  D3C3F1F1  00000000  00000000  | LOCALC11........ |
C8C1D9C4  C7D9F240  E3E2D6C7  D9D74040  | HARDGR2 TSOGRP   |

Area length:                  00000090

Area value:
C1C3C5E7  03000000  00FAA5F8  00000000  | ACEX......v8.... |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000024  005FF550  00000000  | .........¬5&.... |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
00000000  00000000  00000000  00000000  | ................ |
```

How do I read a trace? (continued)

Special Control Blocks and other handling:

- ACEE: not only is the ACEE unloaded, but so are the USP, TOKEN, and ACEX if available.
- CRED: (IRRPCRED) After the CRED structure is unloaded, the first path name, the second path name, the first filename and second filename are unloaded.

Things not dumped

- Work Areas: Work Areas in general are not unloaded.
- Passwords: Are not unloaded.
- Installation parameters
- ENVIRIN and ENVIROUT parameters
- Certificates

Raw data portion of trace output

```
  Hexadecimal dump of record follows:
+0000  00000036  D9E3D9C1  C3C54040  D9C1C3C6  | ....RTRACE  RACF |
+0010  D7D9C540  00000000  00000000  00000000  | PRE ............ |
+0020  00000000  00000000  00000000  00000000  | ................ |
+0030  85D4872E  00000000  00000000  40400000  | eMg.........  .. |
+0040  00000000  00000000  00000000  00000000  | ................ |
+0050  00000000  00000000  005C8D90  00000000  | .........*...... |
+0060  00F9CA00  00000000  00F9CA00  00000018  | .9.......9...... |
+0070  00000018  C8C1D9C4  C7D9F240  C8C1D9C4  | ....HARDGR2 HARD |
+0080  C7D9F240  00000000  005FF340  00000000  | GR2 .....¬3 .... |
+0090  005FF340  00000000  00000000  B97004AF  | .¬3 ............ |
+00A0  74D51E48  00000000  00000000  0005AB90  | .N.............. |
+00B0  0000000B  00000001  00000068  00000000  | ................ |
+00C0  00000000  00D00000  00010000  00000000  | .....}.......... |
+00D0  00000000  0005A990  00000000  00000000  | ......z......... |
+00E0  00000068  00000000  00000000  00000000  | ................ |
+00F0  00000000  00000000  00000000  00000000  | ................ |
+0100  00000000  00000000  00000000  00000000  | ................ |
+0110  00000000  00000000  00000000  00000000  | ................ |
+0120  00000000  00000068  68000000  9C000000  | ................ |
+0130  80000000  00000000  00000000  00000000  | ................ |
+0140  00000000  00000000  00000000  0005AC60  | ...............- |
+0150  0005AC8C  0005AC94  00000000  00000000  | .......m........ |
+0160  00000000  00000000  00000000  00000000  | ................ |
+0170  00000000  00000000  00000000  00000000  | ................ |
+0180  00000000  00000000  00000000  00000000  | ................ |
+0190  00000008  D6C6C6E2  C5E30024  0000002C  | ....OFFSET...... |
+01A0  D7C1C7C5  F0F84BC3  C1E3C1D3  D6C74040  | PAGE08.CATALOG   |
+01B0  40404040  40404040  40404040  40404040  |                  |
+01C0  40404040  40404040  40404040  00000008  |             .... |
+01D0  D6C6C6E2  C5E30028  00000008  07C4C1E3  | OFFSET.......DAT |
+01E0  C1E2C5E3  00000008  D6C6C6E2  C5E3002C  | ASET....OFFSET.. |
+01F0  00000006  D7C1C7C5  F0F80000  00A8C1C3  | ....PAGE08...yAC |
+0200  C5C5FF00  00A80200  00000000  00000000  | EE...y.......... |
+0210  000007C8  C1D9C4C7  D9F24006  E3E2D6C7  | ...HARDGR2 .TSOG |
+0220  D9D74040  81018003  138F4040  40404040  | RP  a.....       |
+0230  404000A8  5B002000  00000000  0000D3D6  |   .y$.........LO |
+0240  C3C1D3C3  F1F10000  00000080  00000000  | CALC11.......... |
+0250  00000000  00004040  40404040  40400000  | ......        .. |
+0260  0000005F  F3E80000  0000005C  8A087FFF  | ...¬3Y.....*..". |
+0270  B9B0005F  F4380000  00000103  138F0000  | ...¬4........... |
+0280  00000020  00000000  00000000  00000000  | ................ |
+0290  00000000  0000005F  F4707F6C  00000000  | .......¬4."%.... |
+02A0  0000005F  F5000000  00505001  22060001  | ...¬5....&&..... |
+02B0  C0000000  00000000  00000000  00000000  | {........
.etc
```

Reading a trace...

Sample RACROUTE trace for a specific sitation....

Situation to be traced

USERID HARDGR2 has OPERATIONS authority at userid level but is permitted to dataset profile (by virtue of a group connect) with only READ access.

Why can this userid DELETE (uncatalog and scratch) a dataset covered by this profile?

userid HARDGR2 issues:

```
DELETE 'IBMUSER.DELETE.DATASET2'
```

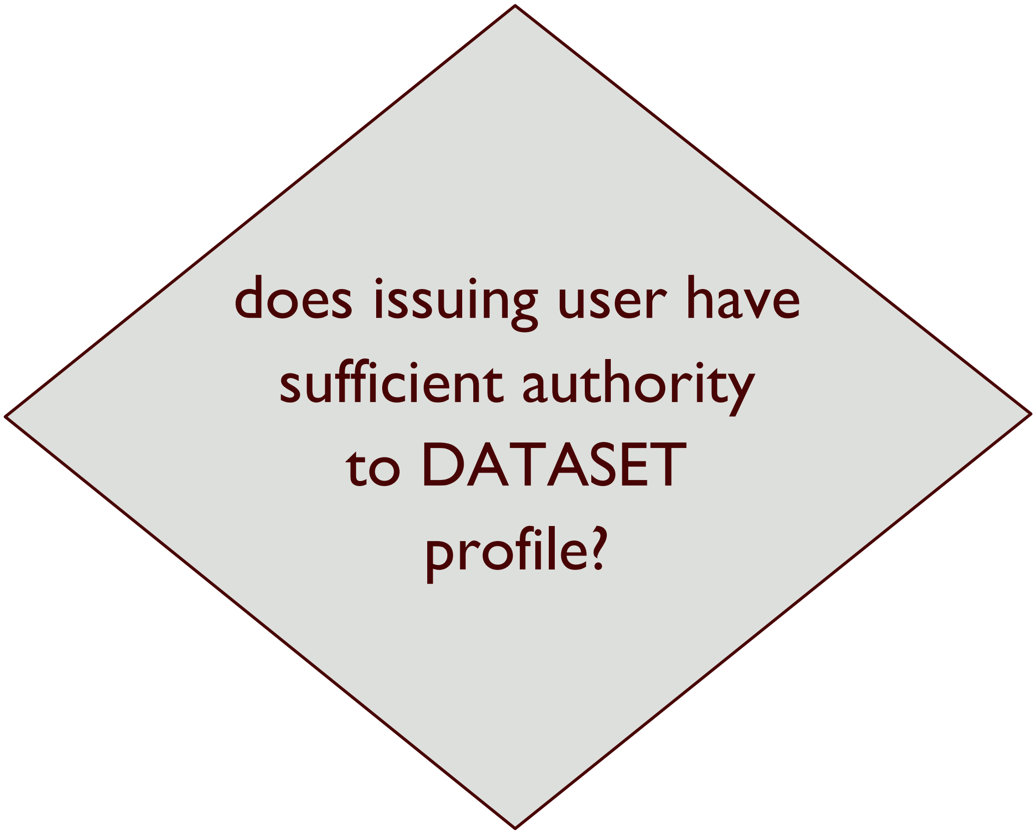
and sees

```
IDC0550I ENTRY (A) IBMUSER.DELETE.DATASET2
            DELETED
```

why did the delete occur?   why wasn't authority denied?

SAFTRACE can and will demonstrate exactly why..

DELETE 'IBMUSER.DELETE.DATASET2'



does issuing user have sufficient authority to DATASET profile?

```
Following is a formatted R_TRACE record.
  This trace record was generated by IRRTRC00 with
               IDENT(R_TRACE).
  Trace Identifier:                00000036
  Record Eyecatcher:               RTRACE
  Trace Type:                      RACFPOST
  Ending Sequence:                 ........
  Calling address:                 00000000  85D1349C
  Requestor/Subsystem:             ........  ........
  Primary jobname:                 HARDGR2
  Primary asid:                    000001F7
  Primary ACEEP:                   00000000  005C83D8
  Home jobname:                    HARDGR2
  Home asid:                       000001F7
  Home ACEEP:                      00000000  005C83D8
  Task address:                    00000000  005C8D90
  Task ACEEP:                      00000000  00000000
  Time:                            B986A9AA  984ECB07
  Error class:                     ........
  Service number:                  00000001
  RACF Return code:                00000008
  RACF Reason code:                00000000
  Return area address:             00000000  00000000
  Parameter count:                 0000000B


IGG0290A
DADSM SCRATCH
igg0290a 10/12/01 HDZ11E0 EP AT 05D12AE8    balr 14,15 AT
       05D1349A  05EF  X'09b2'
 RACROUTE REQUEST=AUTH,CLASS=DATASET
```

```
Area length:                  00000028

Area value:
00000008  00000000  00280000  00010000   | ........................$.y.... |
00000000  00000000  005B69A8  00000000   | ........                        |
00000000  00000028

Area length:                  0000003C

Area value:       << 1100 1100  >>
3C000000  CC000000  80000000  00000000   | ................................ |
00000000  00000000  00000000  00000000
00000000  005B6638  005B6910  005B5CC4   | .....$...$...$*D............     |
00000000  00000000  00000080

  CC    11001100
             ^
    LOG=NOFAIL
    If the authorization check fails, the attempt is not recorded. If the
     authorization check succeeds, the attempt is recorded as in ASIS

Area length:                  00000008

Area value:
D6C6C6E2  C5E30024                       | OFFSET..                        |

Area length:                  0000002C

Area value:
C9C2D4E4  E2C5D94B  C4C5D3C5  E3C54BC4   | IBMUSER.DELETE.DATASET2         |
C1E3C1E2  C5E3F240  40404040  40404040   |                                 |
40404040  40404040  40404040

Area length:                  00000008

Area value:
D6C6C6E2  C5E30028                       | OFFSET..                        |

Area length:                  00000008

Area value:
07C4C1E3  C1E2C5E3                       | .DATASET                        |

Area length:                  00000008

Area value:
D6C6C6E2  C5E3002C                       | OFFSET..                        |

Area length:                  00000006

Area value:
E3C5D4D7  F0F1                           | TEMP01                          |
```

DELETE 'IBMUSER.DELETE.DATASET2'

no, next check...

does issuing user have sufficient authority to DASDVOL profile for dataset?

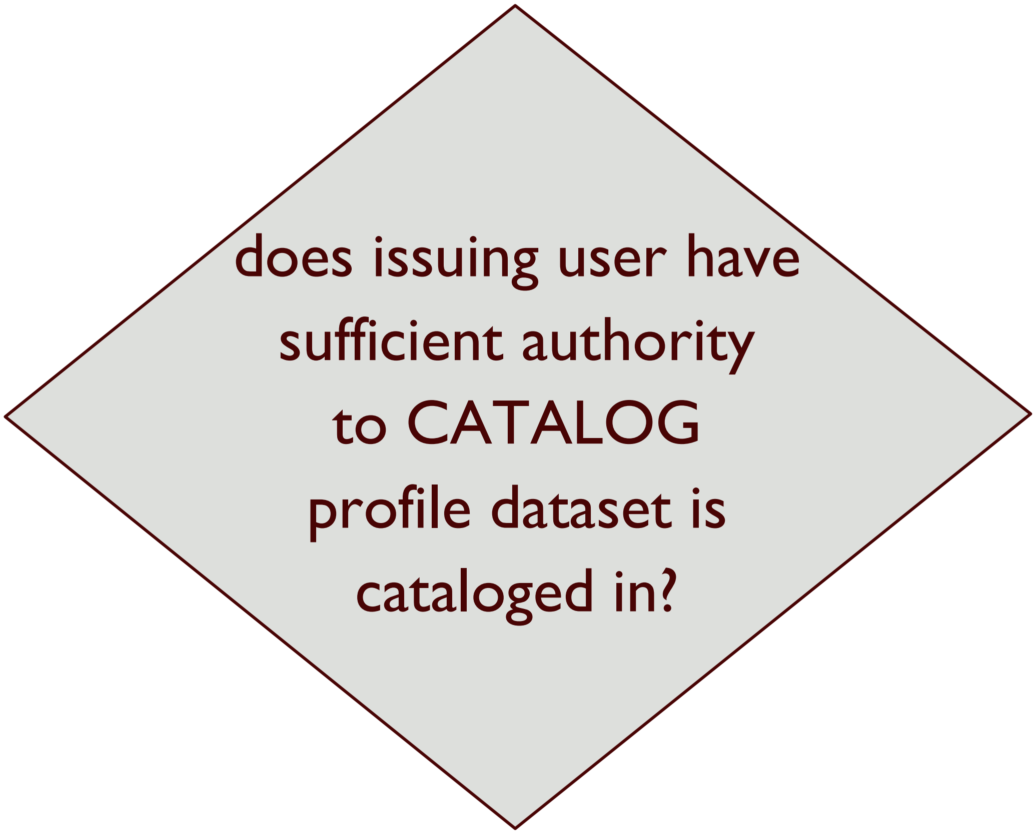
```
Following is a formatted R_TRACE record.
This trace record was generated by IRRTRC00 with
    IDENT(R_TRACE).
Trace Identifier:              00000036
Record Eyecatcher:             RTRACE
Trace Type:                    RACFPOST
Ending Sequence:               ........
Calling address:               00000000  85D13B4C
Requestor/Subsystem:           ........  ........
Primary jobname:               HARDGR2
Primary asid:                  000001F7
Primary ACEEP:                 00000000  005C83D8
Home jobname:                  HARDGR2
Home asid:                     000001F7
Home ACEEP:                    00000000  005C83D8
Task address:                  00000000  005C8D90
Task ACEEP:                    00000000  00000000
Time:                          B986A9AA  98DD5007
Error class:                   ........
Service number:                00000001
RACF Return code:              00000000
RACF Reason code:              00000000
Return area address:           00000000  00000000
Parameter count:               00000009
```

```
IGG0290A
DADSM SCRATCH
igg0290a 10/12/01 HDZ11E0 EP AT 05D12AE8
    balr 14,15 AT 05D13B4A  05EF  x'1062'
RACROUTE REQUEST=AUTH,CLASS=DASDVOL
```

```
Area length:                   00000028

Area value:
00000000  00000000  00280000  00010000  |.........................$.y.... |
00000000  00000000  005B69A8  00000000  | ........                         |
00000000  00000028
Area length:                   0000003C

Area value:
3C000000  0C000000  80000000  00000000  | ................................ |
00000000  00000000  00000000  00000000
00000000  005B5CC4  005B6910  00000000  | .....$*D.$..................     |
00000000  00000000  00000000

Area length:                   00000008

Area value:
D6C6C6E2  C5E30024                      | OFFSET..                         |

Area length:                   00000006

Area value:
E3C5D4D7  F0F1                          | TEMP01                           |

Area length:                   00000008

Area value:
D6C6C6E2  C5E30028                      | OFFSET..                         |

Area length:                   00000008

Area value:
07C4C1E2  C4E5D6D3                      | .DASDVOL                         |
```

DELETE 'IBMUSER.DELETE.DATASET2'

yes, dataset can be SCRATCHed.
may it be UNCATALOGed also?



does issuing user have sufficient authority to CATALOG profile dataset is cataloged in?

Following is a formatted R_TRACE record.

This trace record was generated by IRRTRC00 with IDENT(R_TRACE).

```
Trace Identifier:             00000036
Record Eyecatcher:            RTRACE
Trace Type:                   RACFPOST
Ending Sequence:              ........
Calling address:              00000000  85D4872E
Requestor/Subsystem:          ........  ........
Primary jobname:              HARDGR2
Primary asid:                 000001F7
Primary ACEEP:                00000000  005C83D8
Home jobname:                 HARDGR2
Home asid:                    000001F7
Home ACEEP:                   00000000  005C83D8
Task address:                 00000000  005C8D90
Task ACEEP:                   00000000  00000000
Time:                         B986A9A9  6F2E5E00
Error class:                  ........
Service number:               00000001
RACF Return code:             00000000
RACF Reason code:             00000000
Return area address:          00000000  0005CB90
Parameter count:              0000000B

IGG0CLH0
FUNCTION = PERFORMING SAF, RACF, TGET,
       DADSM SCRATCH,  USVR, WTOR IN THE
       USER'S ADDRESS SPACE.
igg0CLH0 10/13/01 HDZ11G0 ep at  05D483B8
   balr 14,15 at 05D4872C  05EF  X'0374'
```

```
Area length:                  00000068

Area value:
00000000  00000000  00D00000  00010000  | .........}................I..... |
00000000  00000000  0005C990  00000000
00000000  00000068  00000000  00000000  | ................................ |
00000000  00000000  00000000  00000000
00000000  00000000  00000000  00000000  | ................................ |
00000000  00000000  00000000  00000000
00000000  00000000                      | ........                         |
                                                            |
Area length:                  00000068

Area value:
68000000  9C000000  80000000  00000000  | ................................ |
00000000  00000000  00000000  00000000
00000000  0005CC60  0005CC8C  0005CC94  | .......¯.......m................ |
00000000  00000000  00000000  00000000
00000000  00000000  00000000  00000000  | ................................ |
00000000  00000000  00000000  00000000
00000000  00000000                      | ........                         |

Area length:                  00000008

Area value:
D6C6C6E2  C5E30024                      | OFFSET..                         |

Area length:                  0000002C

Area value:
D7C1C7C5  F0F84BC3  C1E3C1D3  D6C74040  | PAGE08.CATALOG                   |
40404040  40404040  40404040  40404040
40404040  40404040  40404040            |                                  |

Area length:                  00000006

 Area value:
 D7C1C7C5  F0F8                         | PAGE08                           |
Area length:                  00000008

Area value:
D6C6C6E2  C5E30028                      | OFFSET..                         |

Area length:                  00000008

Area value:
07C4C1E3  C1E2C5E3                      | .DATASET                         |

Area length:                  00000008

Area value:
D6C6C6E2  C5E3002C                      | OFFSET..                         |
```

Conclusion:

Even though this user has OPERATIONS but is specifically permitted to dataset profile with READ authority, it gives implicit ALTER to both DASDVOL profile and CATALOG dataset profile allowing SCRATCH and UNCATALOG to STILL occur.

:-b

Session Summary

- What SAFTRACE is.
- Uses of the trace.
- Activating a trace.
- Read a trace.
- Real world example

Additional information

- z/OS V1R6 Security Server RACF Callable Services
- z/OS V1R6 Security Server RACF Diagnosis Guide
- z/OS V1R6 Security Server RACF Command Language Reference
- z/OS V1R6 Security Server RACF Data Areas

Appendix A

RACROUTE Types

RACROUTE REQUEST=	Service Number or TYPE (HEX)	Service Number or Type (Decimal)
AUTH	1	1
FASTAUTH	2	2
LIST	3	3
DEFINE	4	4
VERIFY	5	5
EXTRACT	6	6
DIRAUTH	7	7
TOKENMAP	8	8
VERIFYX	9	9
TOKENXTR	A	10
TOEKNBLD	B	11
EXTRACT, BR=YES	C	12
AUDIT	D	13
STAT	E	14
SIGNON	F	15
TOKENMAP, XMEM	10	16
TOKENXTR, XMEM	11	17

Appendix B

Callable Service Types

CALLABLE SERVICE	Service Number or TYPE (HEX)	Service Number or TYPE (DECIMAL)
IRRRIU00 - initUSP	1	1
IRRRDU00 - deleteUSP	2	2
IRRRMF00 - makeFSP	3	3
reserved	4	4
IRRRMM00 - R_umask	5	5
IRRRKA00 - ck_access	6	6
IRRRKP00 - ck_priv	7	7
IRRRUM00 - getUMAP	8	8
IRRRGM00 - getGMAP	9	9
IRRRGG00 - R_getgroups	A	10
IRRRSU00 - R_setuid	B	11
IRRREU00 - R_seteuid	C	12
IRRRSG00 - R_setgid	D	13
IRRREG00 - R_setegid	E	14
IRRRCO00 - R_chown	F	15

Appendix B

Callable Service Types

CALLABLE SERVICE	Service Number or TYPE (HEX)	Service Number or TYPE (DECIMAL)
IRRRCF00 - R_chmod	10	16
IRRRCA00 - R_chaudit	11	17
IRRREX00 - R_exec	12	18
IRRRAU00 - R_audit	13	19
IRRRKO00 - ck_process_owner	14	20
IRRRQS00 - query_system_security_options	15	21
IRRRQF00 - query_file_security_options	16	22
IRRRCS00 - clear_setid	17	23
IRRRKF00 - ch_file_owner	18	24
IRRRMR00 - make_root_FSP	19	25
IRRRPT00 - R_ptrace	1A	26
IRRRUG00 - R_getgroupsbyname	1B	27
IRRRFK00 - R_fork	1C	28
IRRRMI00 - makeISP	1D	29
IRRRKI00 - ck_IPC_access	1E	30

Appendix B

Callable Service Types

CALLABLE SERVICE	Service Number or TYPE (HEX)	Service Number or TYPE (DECIMAL)
IRRRCI00 - R_IPC_ctl	1F	31
IRRRC200 - ck_owner_two_files	20	32
IRRRGE00 - get_uid_gid_supgrps	21	33
IRRRDI00 - R_dceinfo	22	34
IRRRDK00 - R_dcekey	23	35
IRRRUD00 - R_dceruid	24	36
IRRRDA00 - R_dceauth	25	37
IRRRIA00 - Initacee	26	38
*IRRSEQ00 - R_admin	27	39
*IRRSIM00 - R_usermap	28	40
*IRRSDL00 - R_datalib	29	41
*IRRSMK00 -	2A	42
*IRRSPK00 - R_ticketserve	2B	43
IRRSPX00 - R_PKIServ	2C	44
IRRSCH00 - R_cacheserv	2D	45
IRRSPY00 - R_proxyserv	2E	46