



CONSULTING

**IRRHFSU
HFS Unload Utility**

SHARE - 19687 - August 2016



RSH Consulting - Robert S. Hansel



RSH Consulting, Inc. is an IT security professional services firm established in 1992 and dedicated to helping clients strengthen their IBM z/OS mainframe access controls by fully exploiting all the capabilities and latest innovations in RACF. RSH's services include RACF security reviews and audits, initial implementation of new controls, enhancement and remediation of existing controls, and training.

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Robert S. Hansel is Lead RACF Specialist and founder of RSH Consulting, Inc. He began working with RACF in 1986 and has been a RACF administrator, manager, auditor, instructor, developer, and consultant. Mr. Hansel is especially skilled at redesigning and refining large-scale implementations of RACF using role-based access control concepts. He is a leading expert in securing z/OS Unix using RACF. Mr. Hansel has created elaborate automated tools to assist clients with RACF administration, database merging, identity management, and quality assurance.

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IRRHFSU



- Free utility provided by IBM in both source code and executable form
 - Developed by Bruce Wells of IBM
- Extracts File Security Packets (FSPs) and status information (e.g., last used date) for files and directories in the z/OS Unix Hierarchical File System (HFS)
 - Optionally extracts security information on mounted file systems
- Generates a sequential text file with extracted information
- Format of IRRHFSU output records is very similar to IRRDBU00
- IRRHFSU output is suitable for browsing and processing with tools such as REXX, DFSORT, and ICETOOL
- IBM provides SQL for loading output into DB2

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File System Security



- Each directory and file has its own File Security Packet (FSP)
 - Stored in directory's or file's parent directory in the file system
 - Created and deleted along with the directory or file

- FSP contains
 - Owner UID and Group GID
 - Permission bits - Owner/User, Group, and Other
 - Extended Attributes (e.g., APF)
 - Access Control List (ACL)
 - Audit bits

- Access checking is based on user's UNIX identity as established in the User Security Packet (USP)

File Security Packet



File Security Packet - Base Access Control List (ACL) entries

Owner uid	Group gid	Extended Attributes						Permissions									Auditing			Access Control List				
		A	P	R	L	s	s	s	Owner			Group			Other			Owner			Auditor			
									PF	ro	un	oad	et	et	tick	Read	Write	Execute	Read		Write	Execute	Read	Write
chown	chgrp	extattr						chmod									chaudit			setfacl				

Permissions

- r read
- w write
- x execute (dir = search)
- T sticky bit
- t sticky bit + execute
- S set uid / gid
- s set uid / gid + execute

(file - sticky - load program from MVS)

(dir - sticky - only Owner or UID 0 can delete)

Audit

- f failures
- s successes
- a all

All

- null

Extended Attributes (only applies to programs)

- a APF authorized
- p enable program control
- s run shared address space
- l load from shared library region

List File and Directory FSP - ls Command



```
$ ls -alEW rshtest
```

```
drwxr----x  fff--- --s-  4 RSH      SYS1      8192 Oct 15 10:31 .
drwxrwxrwt  fff--- --s-  3 OMVSKERN SYS1     24576 Oct 29  2011 ..
drwxr-xr-x+ fff--- --s-  2 RSH      SYS1      8192 Oct 29  2011 rshdirx
drwxrwxrwx  fff-s- --s-  2 OMVSKERN SYS1      8192 Oct 29  2011 rshtest2
-rwxr-xr-x+ fff--- --s-  1 RSH      SYS1    127910 Oct 15 10:31 sampfile
-rwxr-xrwx  fff--- --s-  1 6179050  SYS1    539070 Oct 29  2011 mastfile
-rwxr-xr-x+ fff--- --s-  1 RSH      9698211  12897 Oct 29  2011 testfile
```

"+" indicates presences of extended ACL

Extended Access Control List (ACL)



- Extension to base (original) file and directory permissions
- Activated by SETR CLASSACT(FSSEC)
- Max entries - 1024
- Supports inheritance of access controls - default ACLs

Extended ACL - getfacl



```
$ getfacl sampfile
#file:  sampfile
#owner: RSH
#group: SYS1
user::rwx
group::r-x
other::r-x
user:RLW:r-x
group:LEVEL1:--x
```

"-a" is the default

```
$ getfacl -adf rshdirx
#file:  rshdirx/
#owner: RSH
#group: SYS1
user::rwx
group::r-x
other::r-x
user:RLW:rwx
user:$OEDFLU:--x
group:LEVEL1:r-x
fdefault:group:LEVEL1:--x
fdefault:user:RLW:r-x
default:group:LEVEL1:--x
default:user:RLW:r-x
```


IRRHFSU Records



0900 HFS File Basic Data record

- One record per file or directory
- Contains File Owner, Group, Permissions, Attributes, Status, Auditing, File System DSNAME, Links

0901 HFS File Access record

- Each record is associated with a 0900 file or directory record
- One record per Extended ACL entry
- Contains User or Group and associated Permissions

0902 HFS File Default Access record

- Each record is associated with a 0900 directory record
- One record per Extended ACL File Default entry
- Contains User or Group and associated Permissions

0903 HFS Directory Default Access record

- Each record is associated with a 0900 directory record
- One record per Extended ACL Directory Default entry
- Contains User or Group and associated Permissions

0904 Mounted File System record (appear first in unload output)

- One record per mounted file system
- Contains DSNAME, Dataset Type (e.g., zFS), Mount Point, Mount Attributes - Mode, Security, SETUID

IRRHFSU Records



- Basic format - 0900-0903 records (position - contents):

1 - 4	Record Type (e.g., 0900)
6 - 1028	File/Directory (full path - /dir1/dir2/filex)
1030 - 1039	Inode (file serial number)
1041 - 4096	Record-specific fields (values or YES NO)

*** With DFSORT/ICETOOL, add 4 to starting position for variable blocked records

- Symbolic links show unresolved variable names (e.g., &SYSNAME/etc)
- Output records provide a RACF USERID and Group ID associated with each UID and GID
 - First RACF ID found is the one displayed
 - No indication other RACF IDs may share same UID or GID
 - To find other RACF IDs, cross-reference with IRRDBU00 output
 - If UID or GID is not defined to RACF, the associated RACF ID field is blank
 - ❖ Warning - if the default group of the user assigned the UID does not have a GID, the USERID field will misleadingly be blank

Obtaining IRRHFSU



IBM RACF Downloads webpage

- www-03.ibm.com/servers/eserver/zseries/zos/racf/goodies.html

IBM RACF: RACF Downloads and Sample Materials - Internet Explorer

http://www-03.ibm.com/syst

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Check out the `eserver/zseries/zos/racf/` directory on the [z/OS FTP Server](#) for the very useful sample utilities shown below. **Please note that the IBM Support Center does not provide support for any of these programs. Please direct all questions and reports of problems to [RACF-L](#).**

- [BPXCHECK](#), a REXX program which reports on RACF settings related to the assignment of z/OS UNIX UIDs and GIDs (for example, AIM stage, BPX.DEFAULT.USER, BPX.NEXT.USER, BPX.UNIQUE.USER, SHARED.IDS, etc).
- [CDT2DYN](#), a utility to help change installation-defined RACF classes into dynamic classes.
- [CUTPWHIS](#), a utility which removes non-usable passwords from the RACF password history. Non-usable passwords are created when the password history (SETROPTS PASSWORD(HISTORY(xxx)) value is reduced.
- [DBSYNC](#), a utility which compares two RACF databases and creates the commands to make them similar. Can also assist in merging RACF databases from different systems.
- [DBU2MSXL](#), a set of scripts which loads the output of the RACF Database Unload Utility (IRRDBU00) into Microsoft® Excel spreadsheet.
- [DBU2MSAC](#), a set of scripts which loads the output of the RACF Database Unload Utility (IRRDBU00) into Microsoft Access.
- [IRRHFSU](#), a utility which unloads the UNIX System Services Hierarchical File System file security information in a manner compatible with with IRRDBU00.

Obtaining IRRHFSU



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The HFS Unload Utility

In the z/OS UNIX environment, a hierarchical file system contains files and directories. The security information for these files and directories resides within the file system itself, not within the RACF database. Thus, the RACF Database Unload Utility (IRRD00) cannot be used to report on file system security data.

The irrfsu utility reports on file system security data in a manner consistent with IRRD00. A different record type is created for mounted file systems, for each file and directory, and for each access control list entry contained within a file or directory. The format of these records are documented the same way IRRD00 output is documented in the z/OS Security Server (RACF) Macros and Interfaces manual. Sample DB2 load and table statements are provided for these record types.

The irrfsu utility can be invoked as a UNIX command, or from batch using the BPXBATCH program. It can be run against the entire file system, or a list of subtrees within the file system. The output can be appended to your IRRD00 output so you can combine the data within a relational database for integrated queries.

The utility also contains an access list cleanup function, in the spirit of RACF's IRRID00 utility.

The irrfsu utility consists of these files:

- Documentation for irrfsu in PDF format (12.4KB)
- C source code for the utility (TXT, 47.9KB)
- An executable version of the utility, compiled for z/OS V1.13 (116KB)
- Sample DB2 load statements (TXT, 8KB)
- Sample DB2 table statements (TXT, 19.3KB)

You can download these files either by using your browser or by using anonymous file transfer protocol (ftp). From your browser, select "file" and "save as". For anonymous ftp, use the site public.dhe.ibm.com. irrfsu can be found in the directory /eserver/zseries/zos/racf/irrfsu/. Full installation instructions are in the HFSUnloadReadMe.pdf file.

We welcome your comments and questions on the irrfsu utility. Please direct them to the RACF-L mailing list. Subscription information for RACF-L can be found from the [RACF-L Discussion List Page](#).

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Obtaining IRRHFSU



- Items provided ...
 - HFSUnloadReadMe.pdf Documentation Manual
 - irrhfsu.txt C source code (text)
 - irrhfsu.o Executable object module (binary)
 - RACHFSLD.txt Sample DB2 Load Statements
 - RACHFSTB.txt Sample DB2 Table Statements

Installing IRRHFSU



■ To install as a Unix program

- PC - CMD window - upload file

```
cd \win-directory-where-irrhfsu.o-resides
FTP your-mainframe-ipaddress-or-dnsname
cd /your-home-directory
mkdir hfsu-subdirectory
cd hfsu-subdirectory
bin
put irrhfsu.o
quit
```

- z/OS - OMVS command - set 'r-x' permission to allow OWNER to execute

```
cd /your-home-directory
chmod 700 hfsu-subdirectory
cd hfsu-subdirectory
chmod 500 irrhfsu.o
```

- Optionally rename irrhfsu.o

```
mv irrhfsu.o hfsu
```

■ To install as an MVS program

- Allocate a PDSE library dataset

```
//jobname JOB job-card-parameters
//          EXEC PGM=IEFBR14
//HFSU      DD DSN=pdse.library,
//          DISP=(NEW,CATLG,DELETE),
//          SPACE=(TRK,(10,5,3)),
//          UNIT=SYSDA,
//          DSNTYPE=LIBRARY,
//          DCB=(RECFM=U,
//          BLKSIZE=23760)
```

- Install as a Unix program and then copy to MVS PDSE library

```
cp irrhfsu.o "'/'pdse.library(IRRHFSU)'"
```

Executing IRRHFSU - Command Syntax



```
irrhfsu.o [-c] [-m] [-M] [-f output-file] path1 [path2 ... ]
```

path File or Directory (e.g., /u)

- c Clean up orphaned ACL entries
- m Create 0904 records along with other 0900-series records
 - Creates records for all mounted file systems, not just that of target directory
- M Create only 0904 records (ignores any specified *path*)
- f Name of output Unix file or dataset (*//dsname*)
 - Opens in append mode

Executing IRRHFSU - OMVS Shell



- Enter `irrhfsu.o` with options at the `===>` command line prompt

- Send output to Unix file (two options):

```
irrhfsu.o -f unix-output-filename path1 [ path2 ... ]
```

```
irrhfsu.o path1 [path2 ... ] > unix-output-filename
```

- Using redirect ">" overwrites existing file's contents

- Send output to z/OS dataset

```
irrhfsu.o -f //OUTPUT.FILE.NAME path1 [ path2 ... ]
```

- Send output to display

```
irrhfsu.o path1 [ path2 ... ]
```

```
irrhfsu.o -M
```

- Example: `irrhfsu.o -m -f //RSH.HFS.ALL /`

Executing IRRHFSU - BPXBATCH Batch



```
//RSHHFSU JOB (0),'ROBERT HANSEL',NOTIFY=&SYSUID, ...
//STEP0010 EXEC PGM=BPXBATCH,
// PARM='PGM /u/RSH/hfsu/irrhfsu.o -m -f //RSH.HFSU.SYSA /'
//STDERR DD PATH='/u/RSH/hfsuerr',
// PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
// PATHMODE=SIRWXU
```

```
//RSHHFSU JOB (0),'ROBERT HANSEL',NOTIFY=&SYSUID, ...
//STEP0010 EXEC PGM=BPXBATCH
//STDPARM DD * (Note: Use NUM OFF)
PGM /u/RSH/hfsu/irrhfsu.o -m
-f //RSH.HFSU.SYSA /
//STDERR DD PATH='/u/RSH/hfsuerr',
// PATHOPTS=(OWRONLY,OCREAT,OTRUNC),
// PATHMODE=SIRWXU
```

Note: Unix file and directory names and program options are case-sensitive

Executing IRRHFSU - MVS Program Batch



```
//RSHHFSU JOB (0),'ROBERT HANSEL',NOTIFY=&SYSUID, ...
//HFSUNLD EXEC PGM=IRRHFSU,PARM=( '/-m /' ) (Start parm with /)
//STEPLIB DD DSN=RSH.IRRHFSU.LOAD,DISP=SHR
//SYSPRINT DD DSN=RSH.HFSU.SYSA, (Alternative to -f)
//          DISP=( ,CATLG,DELETE),UNIT=TAPE,
//          DCB=(RECFM=VB,LRECL=4096,BLKSIZE=0)
```

- Note: (1) Unix file and directory names and program options are case-sensitive
(2) The / at the beginning of the PARM indicates to LE that the LE parameters have ended

Required Authority to Execute



- To unload a directory
 - FSACCESS *zfs-dataset* - UPDATE (except if System-AUDITOR or ROAUDIT)
... plus either of the following ...
 - READ and SEARCH (r-x) to the directory and SEARCH (--x) to all directories in the path
 - UID 0
 - FACILITY BPX.SUPERUSER - READ - execute 'su' command
 - RACF System-AUDITOR or ROAUDIT authority
 - UNIXPRIV SUPERUSER.FILESYS - READ
 - UNIXPRIV SUPERUSER.FILESYS.DIRSRCH - READ

- To create or write to the output file
 - Dataset - pre-allocated - UPDATE
 - Dataset - to be created - ALTER
 - Unix file already created - WRITE (-w-) to the file and SEARCH (--x) to all directories in the path
 - Unix file to be created - WRITE and SEARCH (-wx) to target directory and SEARCH (--x) to all directories in the path

Execution Tips



- Do NOT execute with a RACF ID having UAUDIT
 - Could generate an excessive number of SMF records causing an SMF buffer overflow

- Do NOT execute on a system where UNIXMAP is inactive, AIM Stage 2 or 3 has not been implemented, and VLF is not caching UID and GID mappings
 - UID and GID lookups may cause performance problems
 - To improve performance, irrhfsu locally caches last 10 UID and GID mappings

- If sending output to a dataset ...
 - IRRHFSU creates dataset with RECFM=VB, LRECL=4096, and SPACE=(6144, (8,24))
 - Recommend pre-allocating dataset with substantial space

- Output is not sorted - sort 0900-0903 records by directory/file and record type
SORT FIELDS=(10,1023,CH,A,5,4,CH,A)

- Last access date of a directory is updated when unloaded by IRRHFSU

Execution Tips



- Analyzing Unix security for the entire z/OS environment requires unloading the file system on every individual z/OS system image (a.k.a., LPAR)
 - If the file system is shared by multiple images (BPXPRMxx parameter SYSPLEX=YES), and these images also share a RACF database, only need to unload the file system on one of the sharing systems
- Contents of unmounted file system datasets will not appear in the unload
- Contents of automounted file system datasets (e.g., user file systems) will not appear in the unload if not currently mounted
 - Can cause automounted file systems to be mounted temporarily by listing their contents with an ls command prior to executing IRRHFSU (e.g., ls -al /u/userid)
 - Can unload automounted file systems by specifying directory as IRRHFSU input
- RSH has found it helpful to ...
 - Convert YES/NO fields into Unix permission and attribute display symbols (e.g., r-x)
 - Add tabs between fields to facilitate importation into Excel

IRRHFSU Cleanup Option



- Execution option to remove obsolete entries from Extended ACLs (UID or GID with no matching RACF ID)

`irrhfsu -c ...`

- Unloads and then automatically deletes obsolete ACL entries
 - Assumes no matching USERID or Group ID means UID or GID is not assigned
- Authority to execute
 - FSACCESS *zfs-dataset* - UPDATE (except if System-AUDITOR or ROAUDIT)
... plus either of the following ...
 - UID 0
 - FACILITY BPX.SUPERUSER - READ - execute 'su' command
 - UNIXPRIV SUPERUSER.FILESYS.CHANGEPERMS - READ - plus any of the following
 - ❖ READ and SEARCH (r-x) to all directories to be cleaned and SEARCH (--x) to all directories in the path
 - ❖ RACF System-AUDITOR or ROAUDIT
 - ❖ UNIXPRIV SUPERUSER.FILESYS - READ
 - ❖ UNIXPRIV SUPERUSER.FILESYS.DIRSRCH - READ

Execution Errors



- If problems are encountered, browse file hfsuerr for error messages (specified in STDERR DD)
- See IRRHFSU documentation for most error messages
- If output dataset not pre-allocated with sufficient space, may get a B37 abend or fprint() error
- IRRHFSU will fail if it hits a corrupted directory

Sample ICETOOL Report - Orphaned IDs



Find OWNER and GROUP with no matching RACF ID

```
//          JOB    ...
//S010URPT EXEC PGM=ICETOOL
//SYSOUT   DD    SYSOUT=*
//TOOLMSG  DD    SYSOUT=*
//DFSMSG   DD    SYSOUT=*
//HFSUFILE DD    DISP=SHR,DSN=irrhfsu.output.file
//SELDATA  DD    DSN=&&TEMP,DISP=(NEW,PASS,DELETE),UNIT=SYSDA,
//          SPACE=(CYL,(1,1),RLSE),DCB=(RECFM=VB,LRECL=4096)
//HFSUDID  DD    DSN=hfsudid.report.file,DISP=(NEW,CATLG,DELETE),
//          UNIT=SYSDA,SPACE=(TRK,(1,1),RLSE)
//TOOLIN   DD    *
//          - see next slide -
//UDIDCNTL DD    *
//          - see slide after next -
```


Sample ICETOOL Report - Orphaned IDs



Find OWNER and GROUP with no matching RACF ID

```
//TOOLIN DD *
SORT FROM(HFSUFILE) TO(SELDATA) USING(UDID)
DISPLAY FROM(SELDATA) LIST(HFSUDID) -
    PAGE TITLE('HFS OBJECTS WITH UNDEFINED UID OR GID') -
    DATE TIME -
    LINES(999) -
    BLANK -
    ON(1036,10,CH)    HEADER('OWNER-UID') -
    ON(1046,8,CH)    HEADER('USERID') -
    ON(1054,10,CH)   HEADER('GROUP-GID') -
    ON(1064,8,CH)    HEADER('GROUP') -
    ON(1112,3,CH)    HEADER('ACL') -
    ON(1115,3,CH)    HEADER('DDACL') -
    ON(1118,3,CH)    HEADER('FDACL') -
    ON(1072,10,CH)   HEADER('CREATED') -
    ON(1082,10,CH)   HEADER('LAST-MOD') -
    ON(1092,10,CH)   HEADER('STATUS-CHGD') -
    ON(1102,10,CH)   HEADER('LAST-ACC') -
    ON(1028,8,CH)    HEADER('FILETYPE') -
    ON(5,1023,CH)    HEADER('PATH+FILE/DIRECTORY-NAME')
```

Sample ICETOOL Report - Orphaned IDs



Find OWNER and GROUP with no matching RACF ID

```
//UDIDCNTL DD *
OPTION VLSHRT,VLSCMP,DYNALLOC=(3390,4)
INCLUDE COND=(5,4,CH,EQ,C'0900',AND,
              (1065,8,CH,EQ,C'      ',OR,
              1085,8,CH,EQ,C'      '))
INREC FIELDS=(1,4,10,1023,1045,8,1054,10,1065,8,1074,10,1085,8,
              1273,10,1333,10,1313,10,1293,10,1369,3,1374,3,1379,3)
SORT FIELDS=(5,1023,CH,A)
```

Sample ICETOOL Report - Default ID Assignment



Find OWNER or GROUP assigned to default user or group

```
//          JOB    ...
//S010URPT EXEC PGM=ICETOOL
//SYSOUT   DD    SYSOUT=*
//TOOLMSG  DD    SYSOUT=*
//DFSMSG   DD    SYSOUT=*
//HFSUFILE DD    DISP=SHR,DSN=irrhfsu.output.file
//SELDATA  DD    DSN=&&TEMP,DISP=(NEW,PASS,DELETE),UNIT=SYSDA,
//          SPACE=(CYL,(1,1),RLSE),DCB=(RECFM=VB,LRECL=4096)
//HFSUDUO  DD    DSN=hfsuduo.report.file,DISP=(NEW,CATLG,DELETE),
//          UNIT=SYSDA,SPACE=(TRK,(1,1),RLSE)
//TOOLIN   DD    *
//          - see next slide -
//UDUOCNTL DD    *
//          - see slide after next -
```

Sample ICETOOL Report - Default ID Assignment



Find OWNER or GROUP assigned to default user or group

```
//TOOLIN DD *
SORT FROM(HFSUFILE) TO(SELDATA) USING(UDUO)
DISPLAY FROM(SELDATA) LIST(HFSUDUO) -
    PAGE TITLE('HFS OBJECTS WITH DEFAULT UID/GID AS OWNER/GROUP') -
    DATE TIME -
    LINES(999) -
    BLANK -
    ON(1036,10,CH) HEADER('OWNER-UID') -
    ON(1046,8,CH)  HEADER('USERID') -
    ON(1054,10,CH) HEADER('GROUP-GID') -
    ON(1064,8,CH)  HEADER('GROUP') -
    ON(1112,3,CH)  HEADER('ACL') -
    ON(1115,3,CH)  HEADER('DDACL') -
    ON(1118,3,CH)  HEADER('FDACL') -
    ON(1072,10,CH) HEADER('CREATED') -
    ON(1082,10,CH) HEADER('LAST-MOD') -
    ON(1092,10,CH) HEADER('STATUS-CHGD') -
    ON(1102,10,CH) HEADER('LAST-ACC') -
    ON(1028,8,CH)  HEADER('FILETYPE') -
    ON(5,1023,CH)  HEADER('PATH+FILE/DIRECTORY-NAME')
```

Sample ICETOOL Report - Default ID Assignment



Find OWNER or GROUP assigned to default user or group

```
//UDUOCNTL DD *
OPTION VLSHRT,VLSCMP,DYNALLOC=(3390,4)
INCLUDE COND=(5,4,CH,EQ,C'0900',AND,
              (1054,10,CH,EQ,C'uuuuuuuuuu',OR,
              1074,10,CH,EQ,C'gggggggggg'))
INREC FIELDS=(1,4,10,1023,1045,8,1054,10,1065,8,1074,10,1085,8,
              1273,10,1333,10,1313,10,1293,10,1369,3,1374,3,1379,3)
SORT FIELDS=(5,1023,CH,A)
```

'u...u' and 'g...g' are the UID and GID assigned to the default user and default group, respectively, specified in the APPLDATA field of the FACILITY class profile BPX.DEFAULT.USER, padded to the left with 0s to 10 digits in length

Sample ICETOOL Report - OTHER WRITE Access



Find files and directories where OTHER has WRITE (-w-) permission

```
//          JOB    ...
//S010URPT EXEC PGM=ICETOOL
//SYSOUT   DD    SYSOUT=*
//TOOLMSG  DD    SYSOUT=*
//DFSMSG   DD    SYSOUT=*
//HFSUFILE DD    DISP=SHR,DSN=RSH.HFSU.OUT
//SELDATA  DD    DSN=&&TEMP,DISP=(NEW,PASS,DELETE),UNIT=SYSDA,
//          SPACE=(CYL,(20,5),RLSE),DCB=(RECFM=VB,LRECL=4096)
//HFSUOTW  DD    DSN=RSH.HFSUOTW.REPORT.FILE,DISP=(NEW,CATLG,DELETE),
//          UNIT=SYSDA,SPACE=(CYL,(20,5),RLSE)
//TOOLIN   DD    *
- see next slide -
//UOTWCNTL DD    *
- see slide after next -
```

Sample ICETOOL Report - OTHER WRITE Access



Find files and directories where OTHER has WRITE (-w-) permission

```
//TOOLIN DD *
SORT FROM(HFSUFILE) TO(SELDATA) USING(UOTW)
DISPLAY FROM(SELDATA) LIST(HFSUOTW) -
    PAGE TITLE('HFS OBJECTS WITH OTHER WRITE PERMISSION') -
    DATE TIME -
    LINES(999) -
    BLANK -
    ON(1036,10,CH) HEADER('OWNER-UID') -
    ON(1046,8,CH) HEADER('USERID') -
    ON(1054,10,CH) HEADER('GROUP-GID') -
    ON(1064,8,CH) HEADER('GROUP') -
    ON(1112,3,CH) HEADER('ACL') -
    ON(1115,3,CH) HEADER('DDACL') -
    ON(1118,3,CH) HEADER('FDACL') -
    ON(1072,10,CH) HEADER('CREATED') -
    ON(1082,10,CH) HEADER('LAST-MOD') -
    ON(1092,10,CH) HEADER('STATUS-CHGD') -
    ON(1102,10,CH) HEADER('LAST-ACC') -
    ON(1028,8,CH) HEADER('FILETYPE') -
    ON(5,1023,CH) HEADER('PATH+FILE/DIRECTORY-NAME')
```

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```
//UOTWCNTL DD *
OPTION VLSHRT,VLSCMP,DYNALLOC=(3390,4)
INCLUDE COND=(5,4,CH,EQ,C'0900',AND,
              1144,3,CH,EQ,C'YES',AND,
              (1045,8,CH,EQ,C'FILE',OR,
              1045,8,CH,EQ,C'DIR'))
INREC FIELDS=(1,4,10,1023,1045,8,1054,10,1065,8,1074,10,1085,8,
              1273,10,1333,10,1313,10,1293,10,1369,3,1374,3,1379,3)
SORT FIELDS=(5,1023,CH,A)
```