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# Small enhancements you might have missed in z/OS

## Edition 2018B

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z/OS System Installation
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# *z/OS Small Enhancements - Edition 2018B*

- z/OS V2.3:
  - RACF: IRRPRMxx
  - (z/OS UNIX: BPXWMIGF facility – in handout)
- z/OS V2.2:
  - z/OS UNIX: True Random Number Generation for /dev/random
  - z/OS UNIX: zlsof updates (with jsonprint)
  - z/OS SDSF: snapshot
  - BCP PROGxx: LPA Volser
  - BCP Dynamic APF: SMF 90-37
- z/OS V2.1:
  - DFSMSdfp and ICKDSF: Protection for initializing non-empty volumes
  - DFSMSdss: Renaming of VSAM physical data sets
- z/OS V1.13 and others:
  - MVS: Digging around in D LOGGER,C
- Older than the hills:
  - ServerPac: Full System Replace vs. Software Upgrade
  - DFSMS: REFUCB in DEVSUPxx (was in R13)

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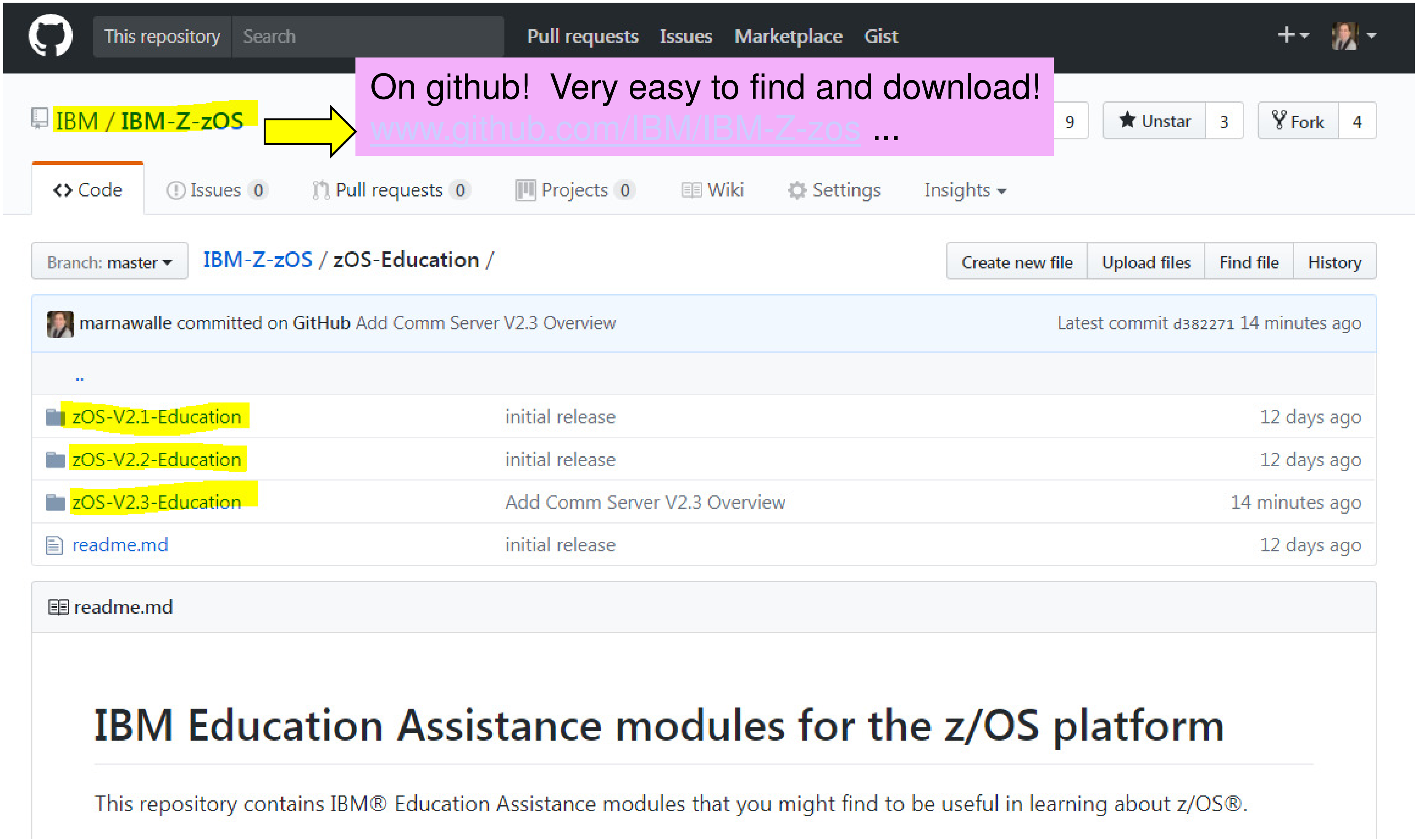
# *z/OS IBM Education Modules - V2R1, V2R2, and V2R3*



On github! Very easy to find and download!
www.github.com/IBM/IBM-Z-zos ...

IBM-Z-zOS / zOS-Education /

marnawalle committed on GitHub Add Comm Server V2.3 Overview — Latest commit d382271 14 minutes ago

| | | |
|---|---|---|
| .. | | |
| zOS-V2.1-Education | initial release | 12 days ago |
| zOS-V2.2-Education | initial release | 12 days ago |
| zOS-V2.3-Education | Add Comm Server V2.3 Overview | 14 minutes ago |
| readme.md | initial release | 12 days ago |

readme.md

## IBM Education Assistance modules for the z/OS platform

This repository contains IBM® Education Assistance modules that you might find to be useful in learning about z/OS®.

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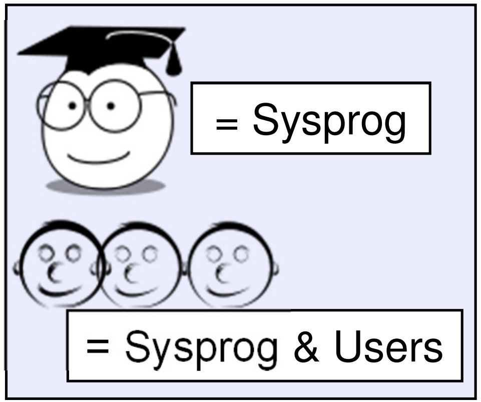
z/OS V2R3

# Little Enhancements

- ❖**RACF: IRRPRMxx**
  - ❖ Take an early peek pre-V2.3!

- ❖**(z/OS UNIX: BPXWMIGF facility – in handout)**



= Sysprog

= Sysprog & Users

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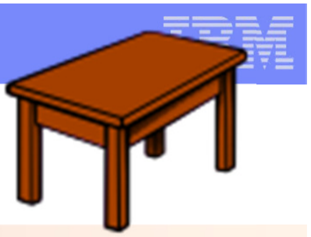
# z/OS V2.3:
# RACF: IRRPRMxx



**What:** Parmlib member for RACF data set name table and range table specification!

- `IEASYSxx RACF=yy`, points to your IRRPRMyy member(s)
  - Each section can be in its own member, but not split over two. Maximum of 3 members.
- You might have one less usermod!
- Accompanying V2.3 TSO command, **RACPRMCK** to verify syntax.

**Considerations:**

- The **DSNT2PRM** tool can help you create a new IRRPRMxx parmlib member.
  - Retrieve tool (and doc) from the RACF Downloads web site, https://www-03.ibm.com/systems/z/os/zos/features/racf/downloads/dsn2prm.html
  - Comments on tool should be directed to RACF-L mailing list.
- IRRPRMxx and RACPRMCK are available **on z/OS V2.3 and higher**.
  - DSNT2PRM + RACPRMCK = good practice.

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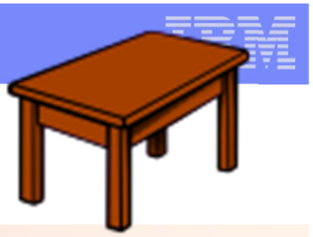
# z/OS V2.3:
# RACF: IRRPRMxx

My trial run on z/OS V2.1…



**Invocation of tool:** *ex 'mwalle.clist(dsnt2prm)' 'mwalle.util.jobs2(dsnt2out)'*

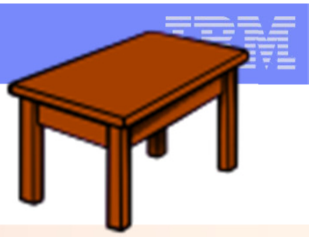
```
DCU004I Generate PARMLIB data based on ICHRDSNT data.
        # of DS = 3
DCU005I Generate PARMLIB data based on ICHRRNG data.
        Ranges = 3

DCU105I INFO:    Verify the generated output using the RACPRMCK command.
DCU106W WARNING: DSNT2PRM running on V2R2 release or lower.
DCU104W WARNING: Using current in-storage Data Set Name Table
  values.  These values may NOT match what you IPLed with.

DCU002W Successful execution of DSNT2PRM, with WARNINGS!  Return code = 4
```

- I tried this on V2.1, just to see what my *possible* IRRPRMxx would look like for V2.3.
- In addition to in-memory, it can also take load module(s) as input!
- The “not matching” warning gives you a heads-up to any RVARY commands that might have been issued. Look carefully at the produced IRRPRMxx to make sure it is desirable.

# z/OS V2.3:
# RACF: IRRPRMxx



## Parmlib Member Output:

```
/* --------------------------------------------------------------
--
-- This PARMLIB member was generated on 02/05/18
-- by the DSNT2PRM utility on system ST6.
--
-- In-Storage version of ICHRDSNT & ICHRRNG were used
-- to generate this PARMLIB member.
--
-------------------------------------------------------------- */
DATABASE_OPTIONS
/* ------------------------------------------------------------ */
SYSPLEX(DATASHARING)
DATASETNAMETABLE
  ENTRY
    PRIMARYDSN('SYS1.RACFP01')
    BACKUPDSN('SYS1.RACFB01')
    UPDATEBACKUP(ALL)
    BUFFERS(255)
 ENTRY
    PRIMARYDSN('SYS1.RACFP02')
    BACKUPDSN('SYS1.RACFB02')
    UPDATEBACKUP(ALL)
    BUFFERS(255)
  ENTRY
    PRIMARYDSN('SYS1.RACFP03')
    BACKUPDSN('SYS1.RACFB03')
    UPDATEBACKUP(ALL)
    BUFFERS(255)
```

```
/* ------------------------------------------------------------ */
RANGETABLE
  START('00' HEX)
    ENTRYNUMBER(1)
  START('U71' CHAR)
    ENTRYNUMBER(2)
  START('U80' CHAR)
    ENTRYNUMBER(3)
```

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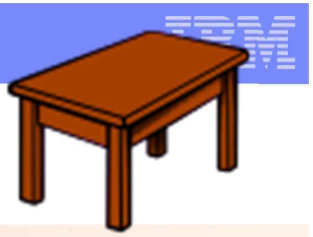
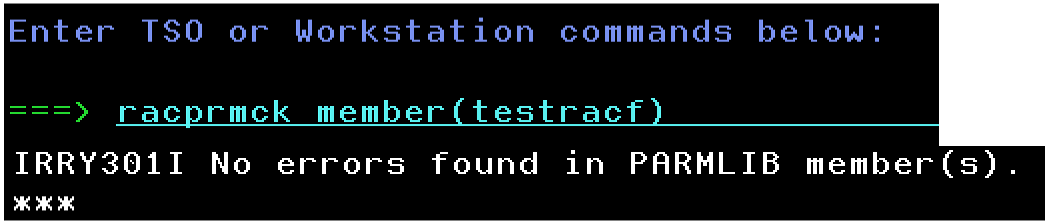
# z/OS V2.3:
# RACF: IRRPRMxx



### Sanity check vs. my trial run on V2.1:

```
RVARY LIST
RACF DATABASE STATUS:
ACTIVE USE  NUM VOLUME   DATASET
------ ---  --- ------   -------
 YES   PRIM   1 RACFS1   SYS1.RACFP01
  YES   BACK   1 RACFS1   SYS1.RACFB01
  YES   PRIM   2 RACFS1   SYS1.RACFP02
  YES   BACK   2 RACFS1   SYS1.RACFB02
  YES   PRIM   3 RACFS1   SYS1.RACFP03
  YES   BACK   3 RACFS1   SYS1.RACFB03
 MEMBER ST6      IS SYSPLEX COMMUNICATIONS ENABLED & IN DATA SHARING MODE.
 RVARY COMMAND HAS FINISHED PROCESSING.
```

### Re-ran DSNT2PRM on V2.3, then final verification before use, on V2.3:



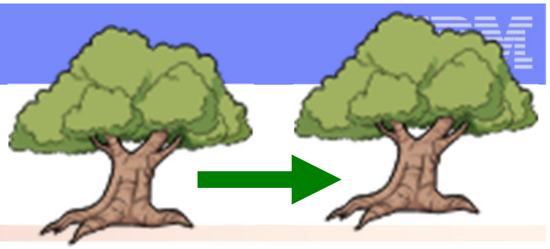
```
Enter TSO or Workstation commands below:

===> racprmck member(testracf)
IRRY301I No errors found in PARMLIB member(s).
***
```

This command runs using the contents of the current parmlib concatenation member you say.

z/OS V2.3:

# z/OS UNIX: BPXWMIGF facility



**What:** New tool for converting HFS to zFS for high availability file systems.

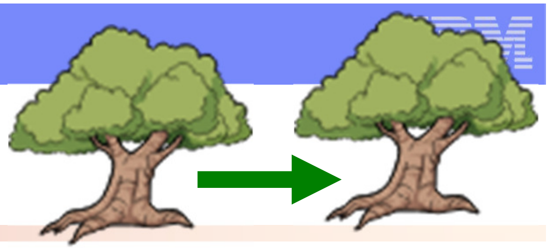
- Available from TSO, z/OS UNIX shell, and via SYSREXX (console)
- HFS does not need to be unmounted. Can be RO or RW.
- Two phases: 1) mirror data and maintain, 2) swap, when ready.

**Many Considerations:**

- all systems in OMVS group must be V2.3 – no downlevels,
- unmounting or moving ownership cancels migration,
- only HFS -> zFS, and only one migration at a time.
- Superuser or SUPERUSER.FILESYS.PFSCTL auth,
- ~~zFS must not be in the OMVS address space~~. Restriction removed with OA53128!
- **Extreme caution to ensure new zFS is mounted after a swap and not the old HFS**,
- …

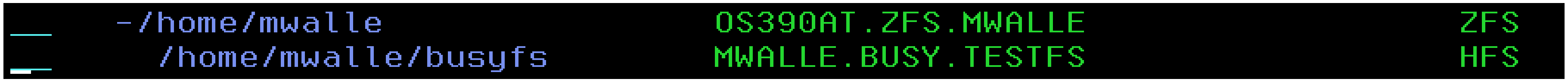
Read about them in *z/OS UNIX: Planning,* and *z/OS UNIX Command Reference.*

# z/OS UNIX: BPXWMIGF facility



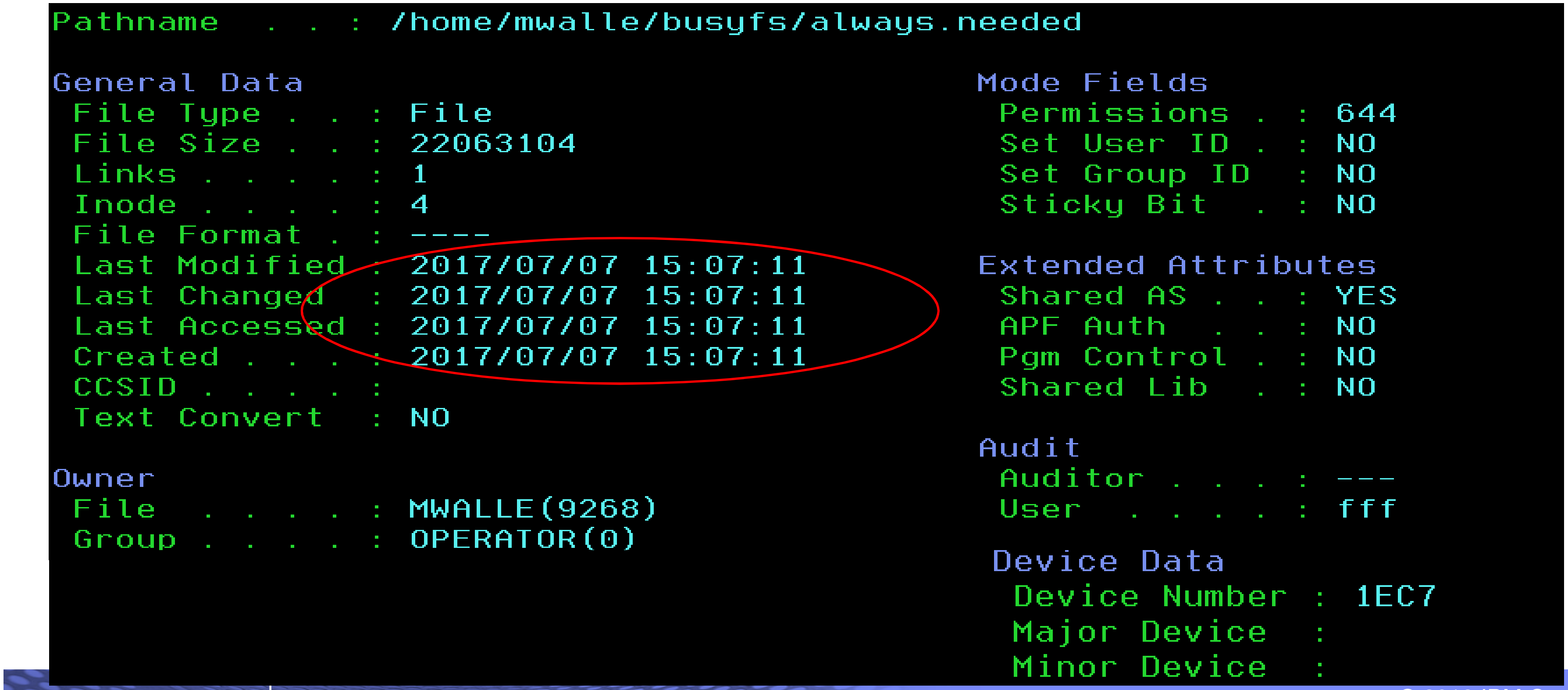
## How to use, one scenario:

At my /busyfs mountpoint, my HFS needs high availability:



```
__     -/home/mwalle                OS390AT.ZFS.MWALLE                    ZFS
__       /home/mwalle/busyfs        MWALLE.BUSY.TESTFS                    HFS
```

Where, the file “always.needed”:



```
Pathname  . . : /home/mwalle/busyfs/always.needed

General Data                                        Mode Fields
 File Type . . : File                                Permissions . : 644
 File Size . . : 22063104                            Set User ID . : NO
 Links . . . . : 1                                   Set Group ID  : NO
 Inode . . . . : 4                                   Sticky Bit  . : NO
 File Format . : ----
 Last Modified : 2017/07/07 15:07:11                Extended Attributes
 Last Changed  : 2017/07/07 15:07:11                 Shared AS . . : YES
 Last Accessed : 2017/07/07 15:07:11                 APF Auth  . . : NO
 Created . . . : 2017/07/07 15:07:11                 Pgm Control . : NO
 CCSID . . . . :                                     Shared Lib  . : NO
 Text Convert  : NO
                                                    Audit
Owner                                                Auditor . . . : ---
 File  . . . . : MWALLE(9268)                        User  . . . . : fff
 Group . . . . : OPERATOR(0)
                                                     Device Data
                                                      Device Number : 1EC7
                                                      Major Device  :
                                                      Minor Device  :
```

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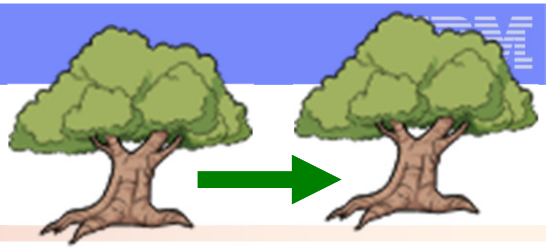
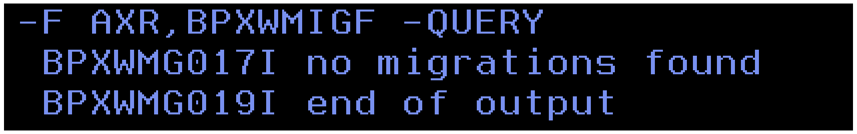
z/OS V2.3:

# z/OS UNIX: BPXWMIGF facility



My zFS replacement is allocated, V5 formatted, is proper size, and is not mounted.

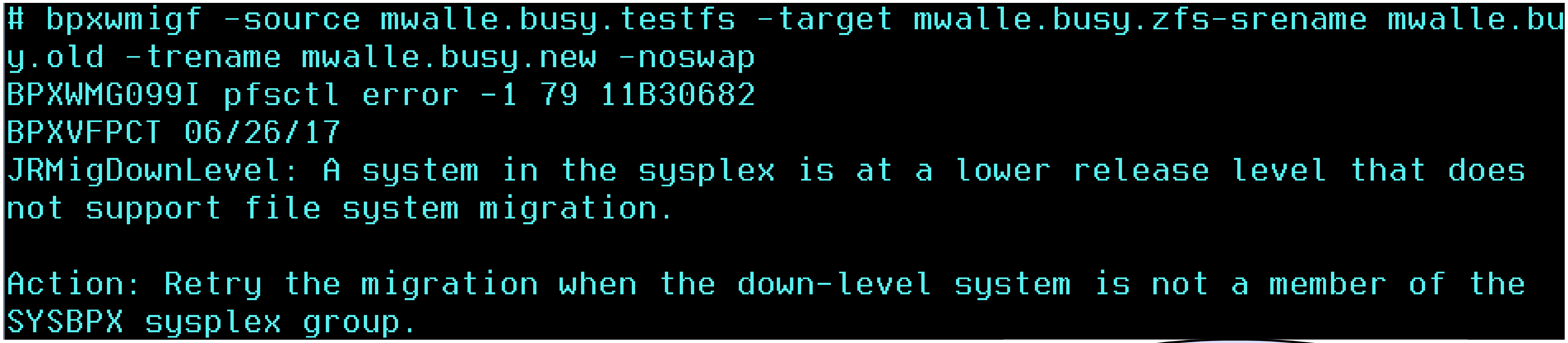
No migrations are ongoing for that HFS:



```
-F AXR,BPXWMIGF -QUERY
 BPXWMG017I no migrations found
 BPXWMG019I end of output
```

Example: as SYSREXX command

Try to migrate #1, without a swap when done. One system was downlevel.



```
# bpxwmigf -source mwalle.busy.testfs -target mwalle.busy.zfs-srename mwalle.bu
y.old -trename mwalle.busy.new -noswap
BPXWMG099I pfsctl error -1 79 11B30682
BPXVFPCT 06/26/17
JRMigDownLevel: A system in the sysplex is at a lower release level that does
not support file system migration.

Action: Retry the migration when the down-level system is not a member of the
SYSBPX sysplex group.
```

Example: as shell command

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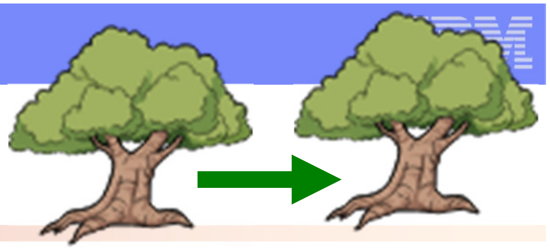
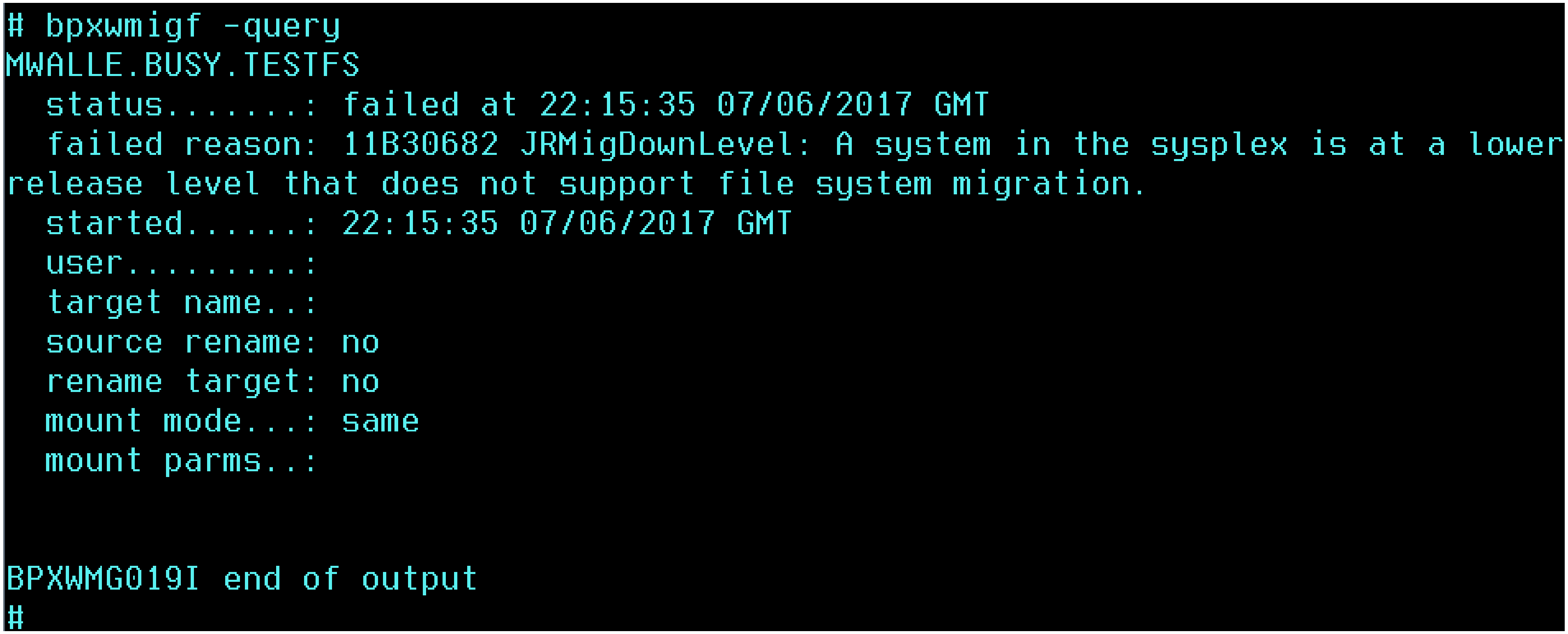
z/OS V2.3:

# z/OS UNIX: BPXWMIGF facility



Query shows failure, and info on the attempted migration:



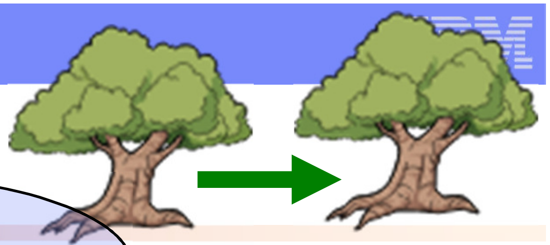
```
# bpxwmigf -query
MWALLE.BUSY.TESTFS
  status........: failed at 22:15:35 07/06/2017 GMT
  failed reason: 11B30682 JRMigDownLevel: A system in the sysplex is at a lower
release level that does not support file system migration.
  started.......: 22:15:35 07/06/2017 GMT
  user..........:
  target name...:
  source rename: no
  rename target: no
  mount mode....: same
  mount parms...:


BPXWMG019I end of output
#
```

…(z/OS V2.2 system was then upgraded to V2.3.)

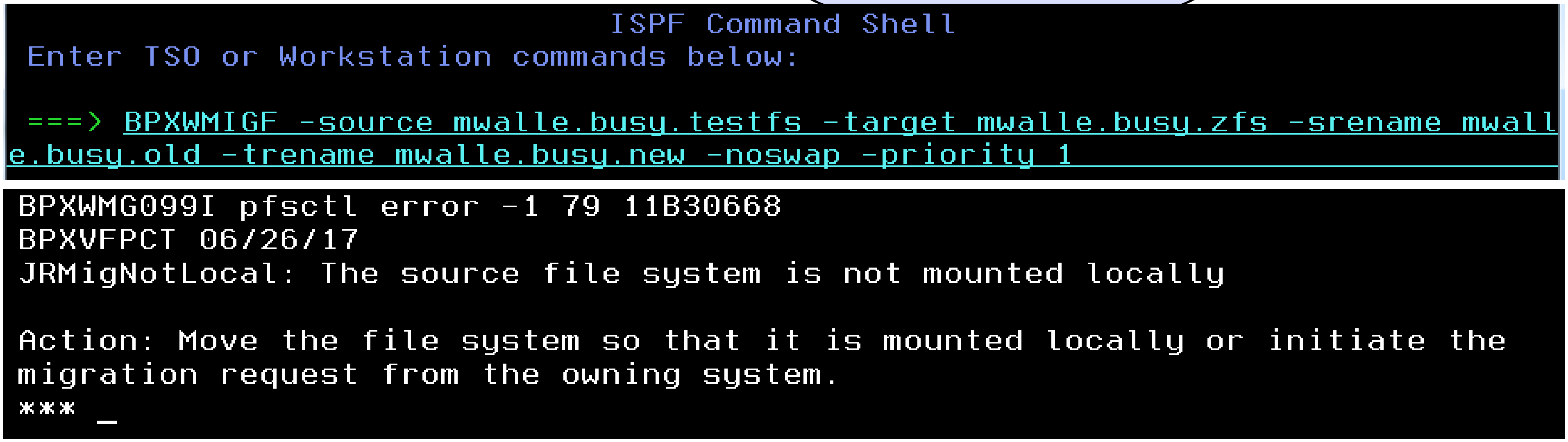
## z/OS V2.3:

# z/OS UNIX: BPXWMIGF facility



Example: as TSO/E command

Try to migrate #2 :



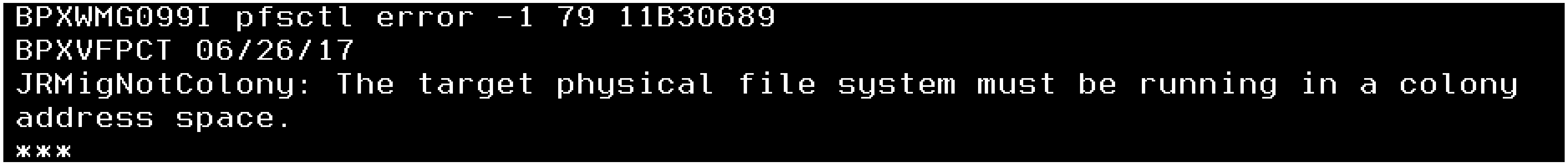
```
                              ISPF Command Shell
 Enter TSO or Workstation commands below:

 ===> BPXWMIGF -source mwalle.busy.testfs -target mwalle.busy.zfs -srename mwall
e.busy.old -trename mwalle.busy.new -noswap -priority 1
```

```
BPXWMG099I pfsctl error -1 79 11B30668
BPXVFPCT 06/26/17
JRMigNotLocal: The source file system is not mounted locally

Action: Move the file system so that it is mounted locally or initiate the
migration request from the owning system.
*** _
```

…logged onto the owning system. Try to migrate #3:



```
BPXWMG099I pfsctl error -1 79 11B30689
BPXVFPCT 06/26/17
JRMigNotColony: The target physical file system must be running in a colony
address space.
***
```

***Advice:*** *Make sure you have the PTF for OA53128 installed so that you can put zFS in the OMVS address space (V2.2), and use bpxwmigf.*

-noswap is the default

-priority 1..9 9 slower migration and decreases performance impact to applications. 2 default.

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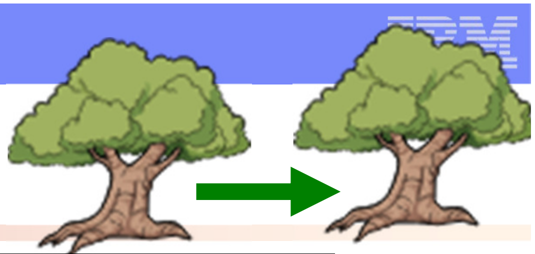
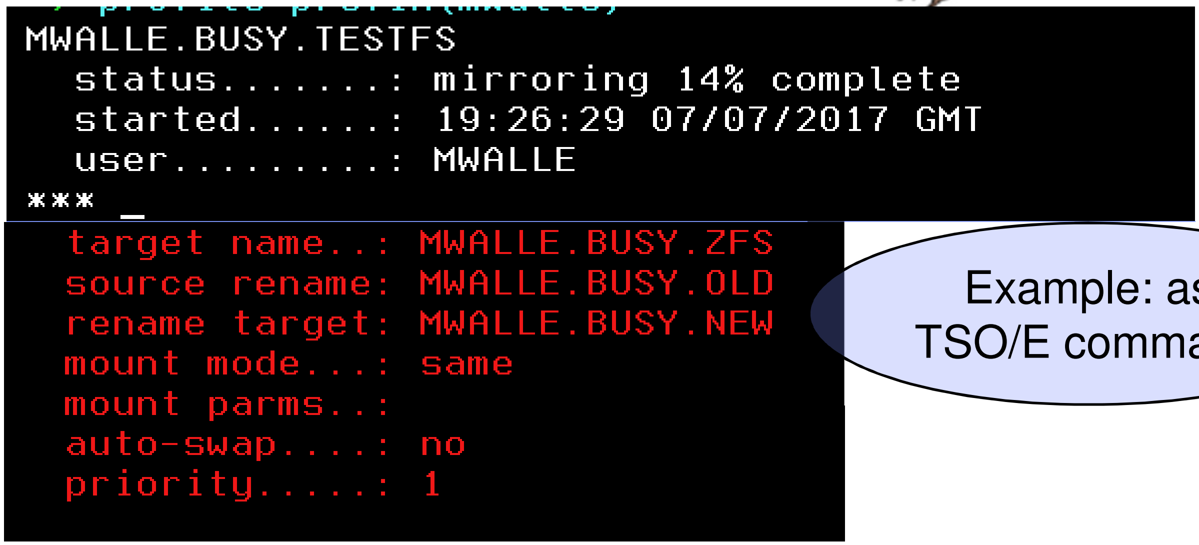
## z/OS V2.3:

# z/OS UNIX: BPXWMIGF facility



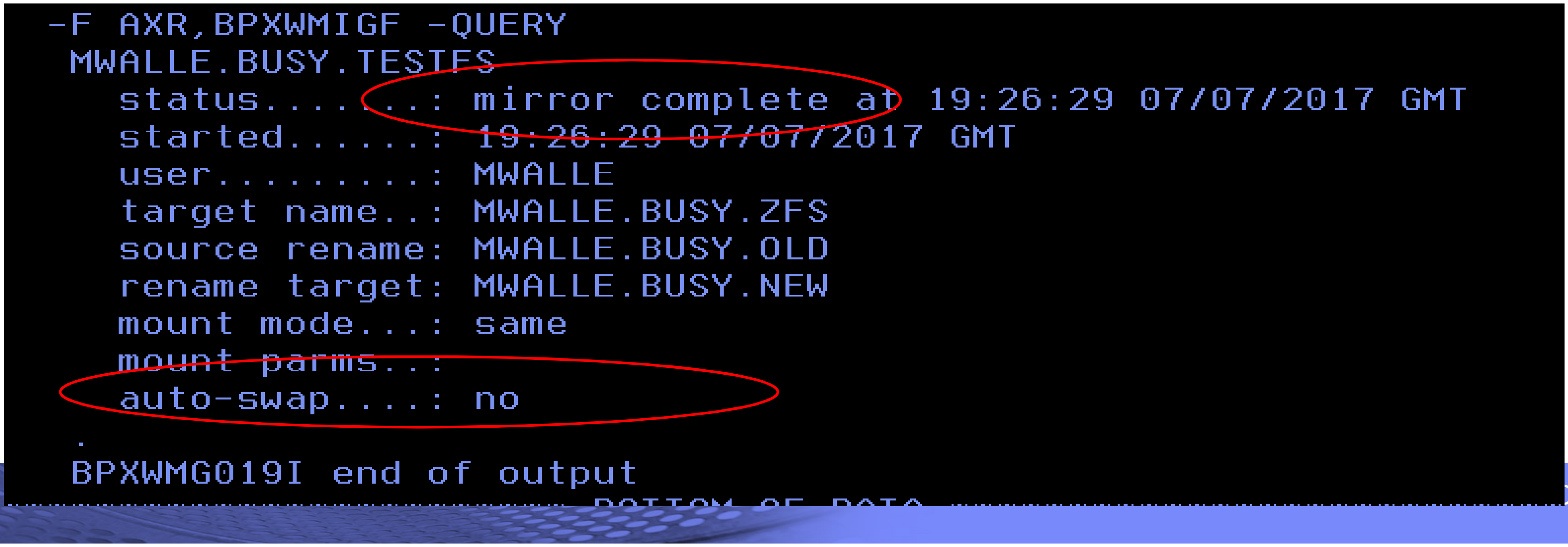
Try to migrate #4 :



```
MWALLE.BUSY.TESTFS
  status.......: mirroring 14% complete
  started......: 19:26:29 07/07/2017 GMT
  user.........: MWALLE
*** _
  target name..: MWALLE.BUSY.ZFS
  source rename: MWALLE.BUSY.OLD
  rename target: MWALLE.BUSY.NEW
  mount mode...: same
  mount parms..:
  auto-swap....: no
  priority.....: 1
```

Example: as TSO/E command

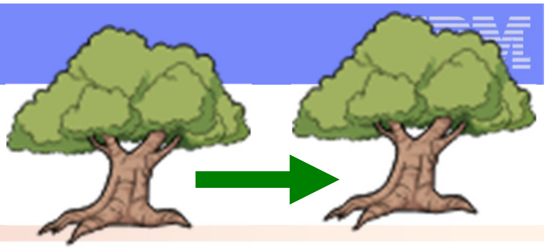
**...**finally a migration success! (Any error would have cancelled the migration)



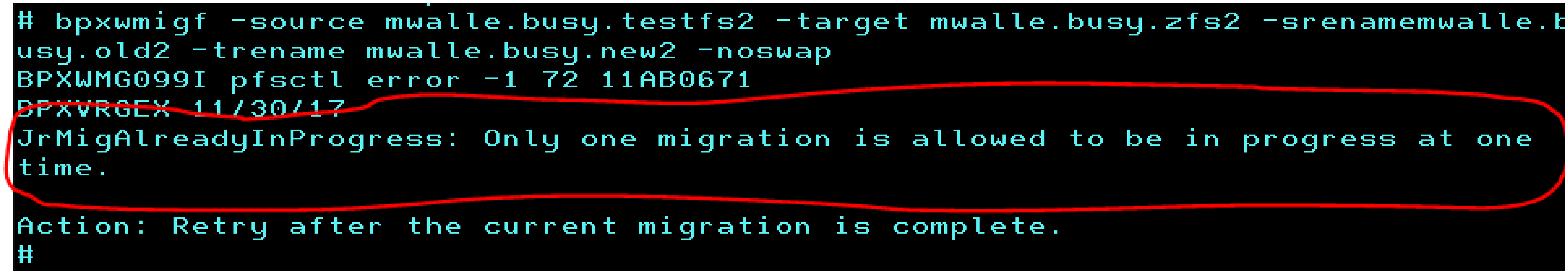
```
 -F AXR,BPXWMIGF -QUERY
  MWALLE.BUSY.TESTFS
    status.......: mirror complete at 19:26:29 07/07/2017 GMT
    started......: 19:26:29 07/07/2017 GMT
    user.........: MWALLE
    target name..: MWALLE.BUSY.ZFS
    source rename: MWALLE.BUSY.OLD
    rename target: MWALLE.BUSY.NEW
    mount mode...: same
    mount parms..:
    auto-swap....: no
  .
  BPXWMG019I end of output
```

## z/OS V2.3:

# z/OS UNIX: BPXWMIGF facility

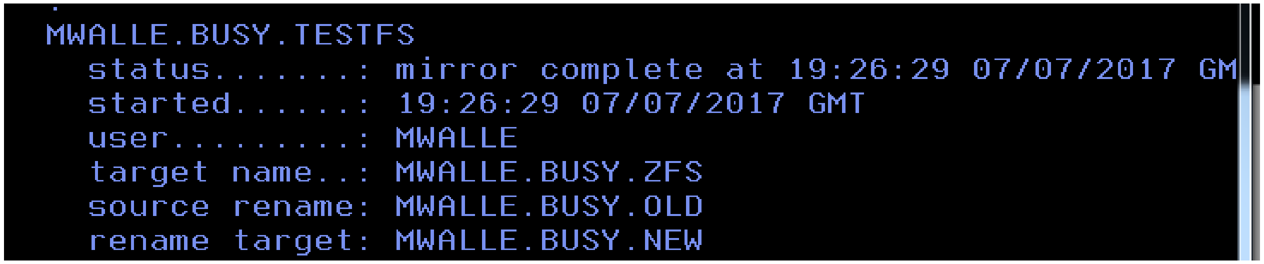


With OA53128, can only do one migration at a time:



```
# bpxwmigf -source mwalle.busy.testfs2 -target mwalle.busy.zfs2 -srenamemwalle.b
usy.old2 -trename mwalle.busy.new2 -noswap
BPXWMG099I pfsctl error -1 72 11AB0671
BPXVRGEX 11/30/17
JrMigAlreadyInProgress: Only one migration is allowed to be in progress at one
time.

Action: Retry after the current migration is complete.
#
```



```
MWALLE.BUSY.TESTFS
   status.......: mirror complete at 19:26:29 07/07/2017 GM
   started......: 19:26:29 07/07/2017 GMT
   user.........: MWALLE
   target name..: MWALLE.BUSY.ZFS
   source rename: MWALLE.BUSY.OLD
   rename target: MWALLE.BUSY.NEW
```

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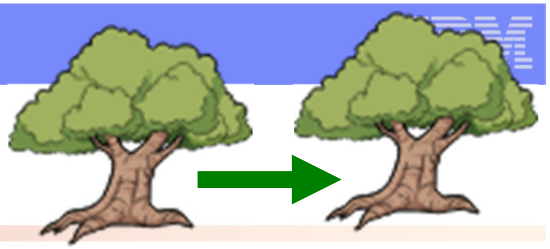
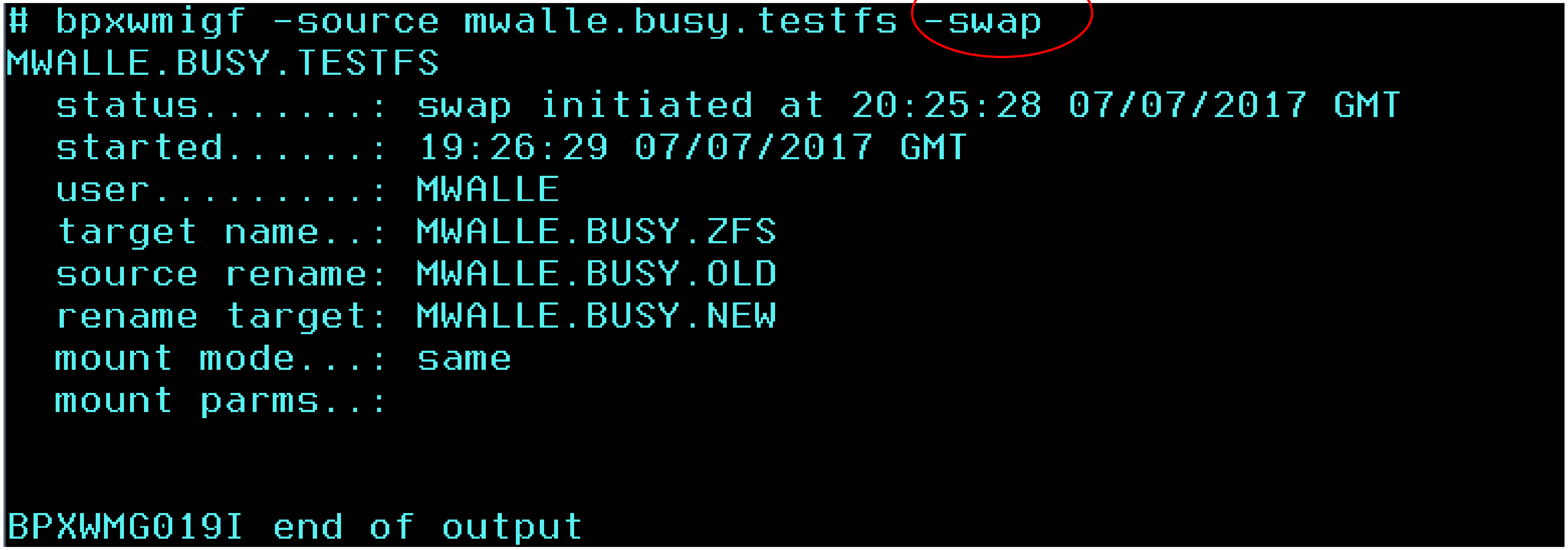
# z/OS V2.3:
# z/OS UNIX: BPXWMIGF facility



Read to swap, do it:



```
# bpxwmigf -source mwalle.busy.testfs -swap
MWALLE.BUSY.TESTFS
  status........: swap initiated at 20:25:28 07/07/2017 GMT
  started.......: 19:26:29 07/07/2017 GMT
  user..........: MWALLE
  target name...: MWALLE.BUSY.ZFS
  source rename: MWALLE.BUSY.OLD
  rename target: MWALLE.BUSY.NEW
  mount mode....: same
  mount parms...:


BPXWMG019I end of output
```

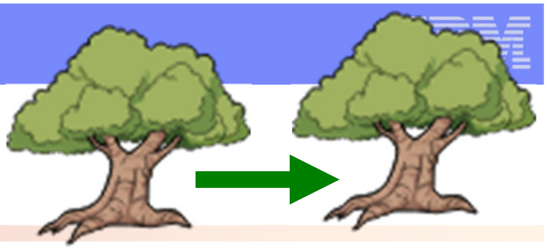
Access to the file system is very briefly quiesced during the swap, which is transparent to applications.

**Now, I carefully verify that “rename target” data set is to mount correctly from now on in my BPXPRMxx or policies.**

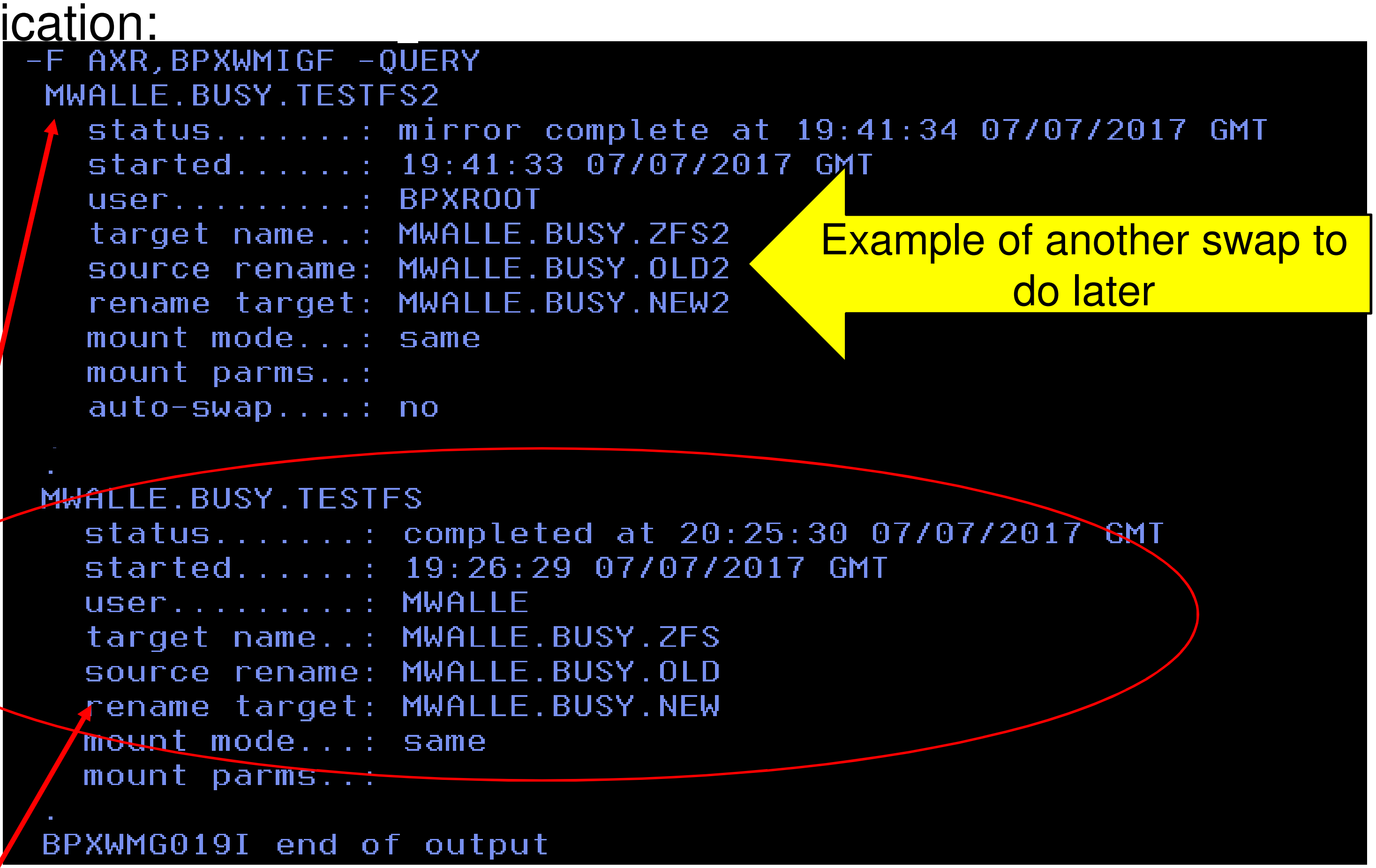
- Use of `-srename` helped me avoid mounting the old one.

# z/OS V2.3:

# z/OS UNIX: BPXWMIGF facility

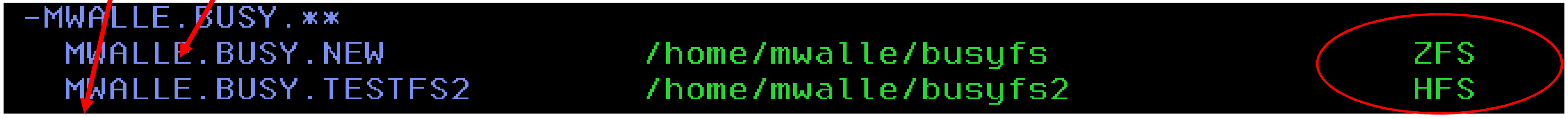


Final verification:



```
-F AXR,BPXWMIGF -QUERY
 MWALLE.BUSY.TESTFS2
   status.......: mirror complete at 19:41:34 07/07/2017 GMT
   started......: 19:41:33 07/07/2017 GMT
   user.........: BPXROOT
   target name..: MWALLE.BUSY.ZFS2
   source rename: MWALLE.BUSY.OLD2
   rename target: MWALLE.BUSY.NEW2
   mount mode...: same
   mount parms..:
   auto-swap....: no
 .
 .
 MWALLE.BUSY.TESTFS
   status.......: completed at 20:25:30 07/07/2017 GMT
   started......: 19:26:29 07/07/2017 GMT
   user.........: MWALLE
   target name..: MWALLE.BUSY.ZFS
   source rename: MWALLE.BUSY.OLD
   rename target: MWALLE.BUSY.NEW
   mount mode...: same
   mount parms..:
 .
 BPXWMG019I end of output
```

Example of another swap to do later



```
-MWALLE.BUSY.**
  MWALLE.BUSY.NEW              /home/mwalle/busyfs                   ZFS
  MWALLE.BUSY.TESTFS2          /home/mwalle/busyfs2                  HFS
```

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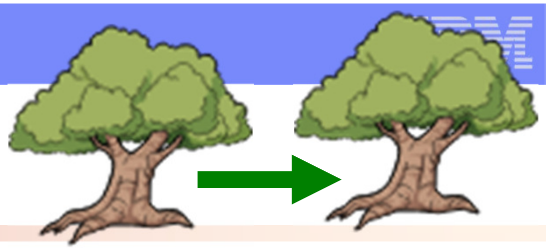
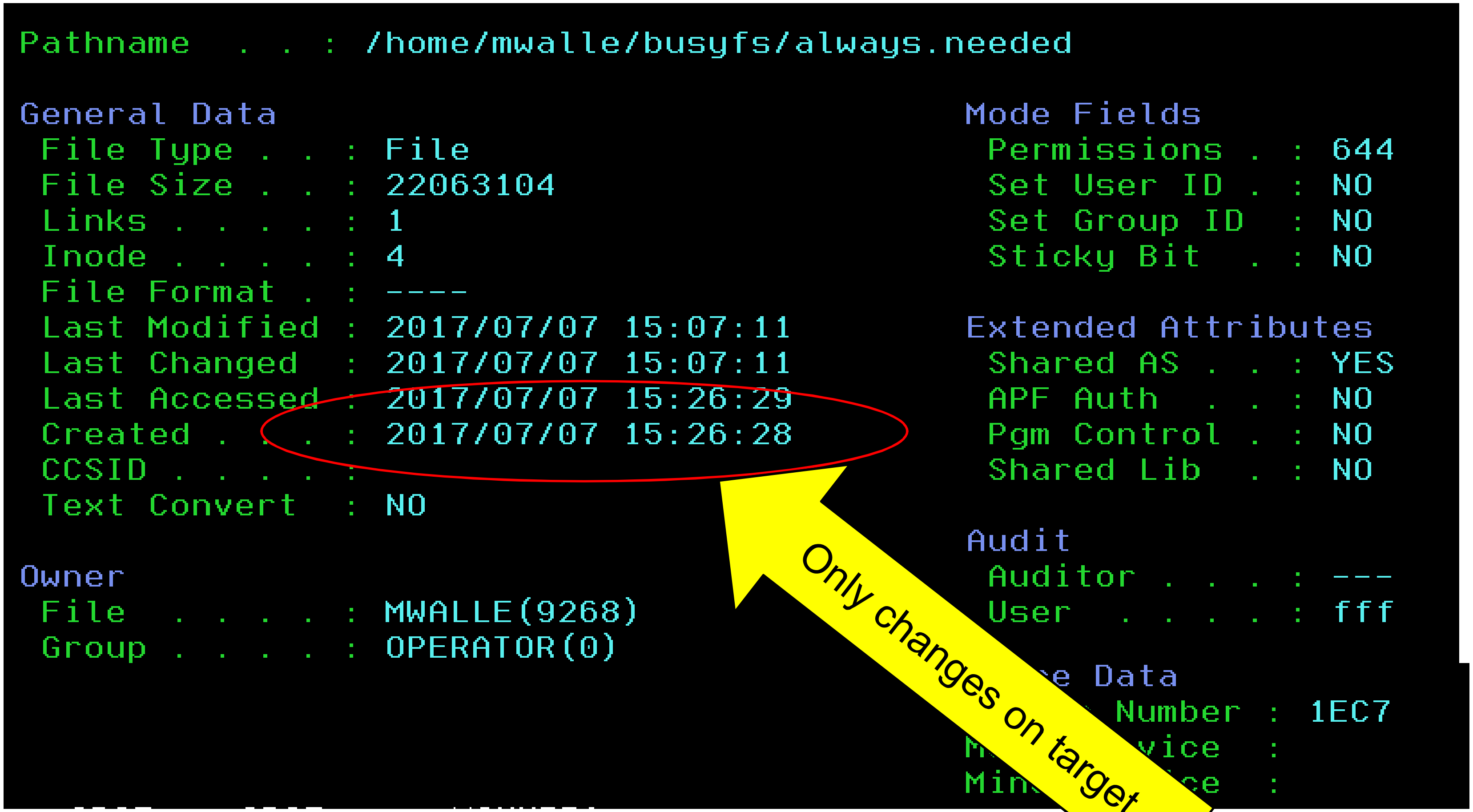
# z/OS V2.3:
# z/OS UNIX: BPXWMIGF facility



And yet more verification:



```
Pathname  . . : /home/mwalle/busyfs/always.needed

General Data                                Mode Fields
 File Type . . : File                        Permissions . : 644
 File Size . . : 22063104                    Set User ID . : NO
 Links . . . . : 1                           Set Group ID  : NO
 Inode . . . . : 4                           Sticky Bit  . : NO
 File Format . : ----
 Last Modified : 2017/07/07 15:07:11        Extended Attributes
 Last Changed  : 2017/07/07 15:07:11         Shared AS . . : YES
 Last Accessed : 2017/07/07 15:26:29         APF Auth  . . : NO
 Created . . . : 2017/07/07 15:26:28         Pgm Control . : NO
 CCSID . . . . :                             Shared Lib  . : NO
 Text Convert  : NO
                                            Audit
Owner                                        Auditor . . . : ---
 File  . . . . : MWALLE(9268)                User  . . . . : fff
 Group . . . . : OPERATOR(0)
                                               e Data
                                                  Number : 1EC7
                                            M       vice   :
                                            Min       ce   :
```

Only changes on target

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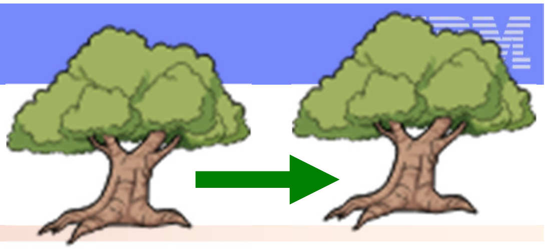
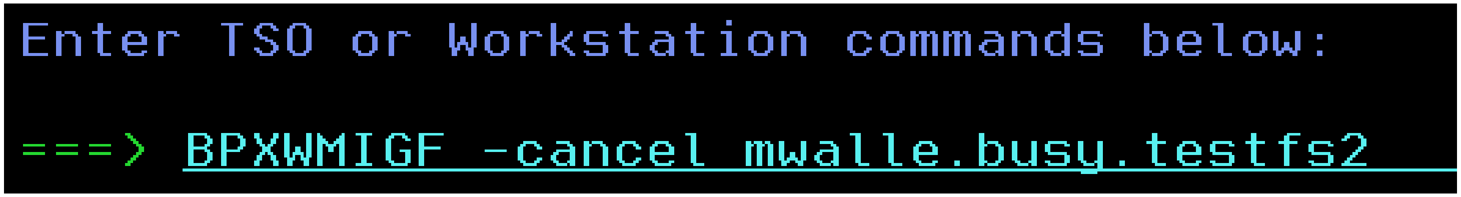
## z/OS V2.3:
## z/OS UNIX: BPXWMIGF facility

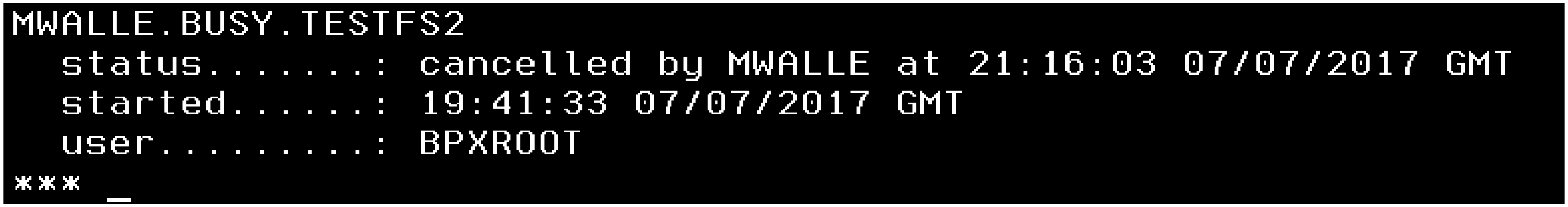


Cancelling a migration, before swap is done:



```
Enter TSO or Workstation commands below:

===> BPXWMIGF -cancel mwalle.busy.testfs2
```



```
MWALLE.BUSY.TESTFS2
  status........: cancelled by MWALLE at 21:16:03 07/07/2017 GMT
  started.......: 19:41:33 07/07/2017 GMT
  user..........: BPXROOT
*** _
```

**BPXWMIGF – query**
**indicates one cancelled, and one completed, as expected.**

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z/OS V2R2

## Little Enhancements

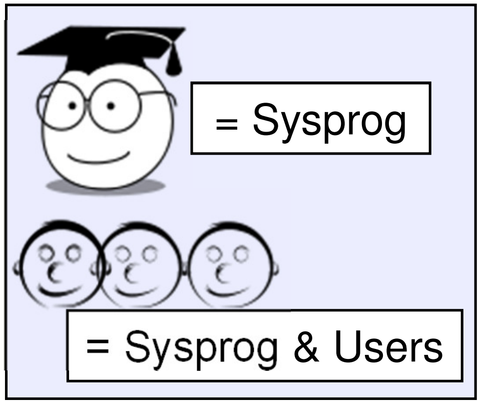
❖**z/OS UNIX: True Random Number Generation for /dev/random**

❖**z/OS UNIX: zlsof updates (with jsonprint)**

❖**SDSF: snapshot**

❖**BCP PROGxx: LPA Volser**

❖**BCP Dynamic APF: SMF 90-37**



# z/OS UNIX: True Random Number Generation for /dev/random

- **What**: Prior to z/OS V2R2 OA55437 and running pre-z14, usage of `/dev/random` and `/dev/urandom` required:
  - ICSF active, and
  - Users have authority to the CSFRNG service (or this verification turned off with definition in `XFACILIT` class of `CSF.CSFSERV.AUTH.CSFRNG.DISABLE`).
- With OA55437 and z14, z/OS UNIX will use the TRNG in the z14 hardware, not ICSF.

- **How to use:** .
  - Install PTFs, and forgo the ICSF set up requirement for `/dev/random` and `/dev/urandom.`
- **Considerations:** PTFs closed 2 July 2018.

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# z/OS UNIX: zlsof updates

- **What**:
  - zlsof is a handy utility to look at open files, sockets, and pipes.
  - Originally on the z/OS UNIX Tools and Toys website
  - z/OS V2.1:  moved into z/OS /bin and enhanced (for instance with lock holders and waiters when the byte range lock manager is used)
  - z/OS V2.2 with OA55246: additional enhancements for extended processing information, and generate output in JSON format.
- **How to use:**
  - Install PTFs, and use new zlsof options –x and –json.

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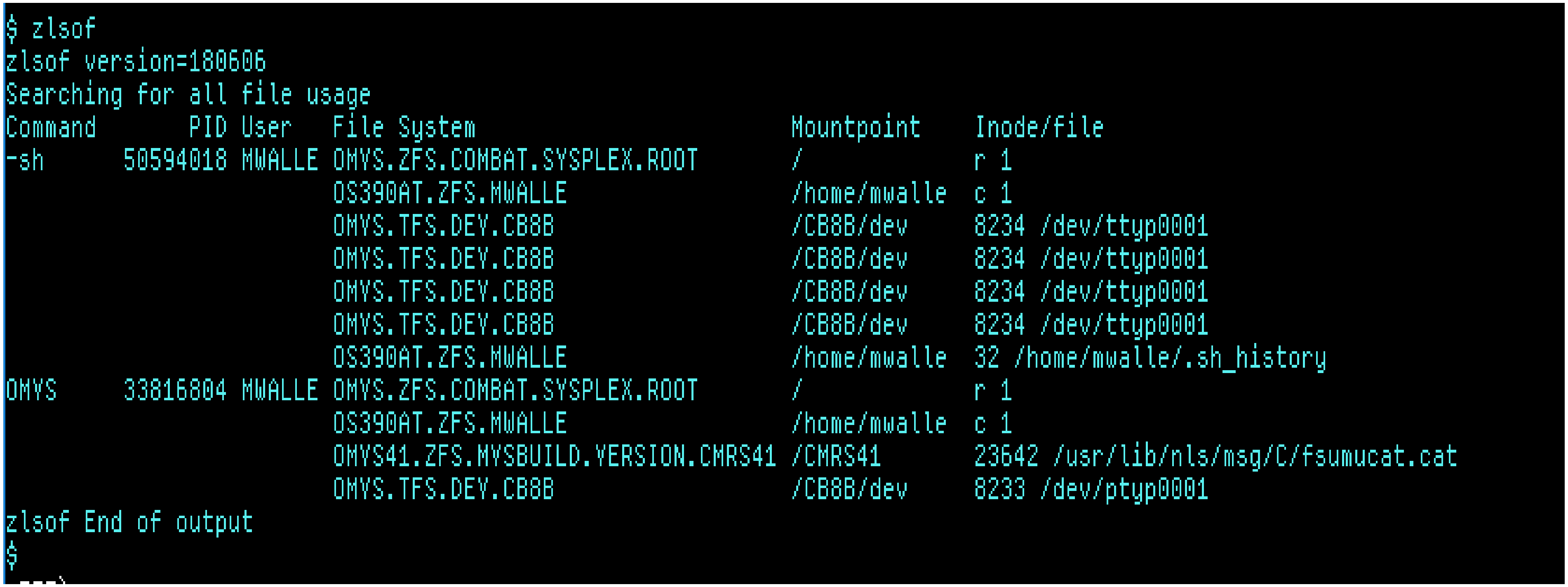
# z/OS UNIX: zlsof updates

## Without using new functions:

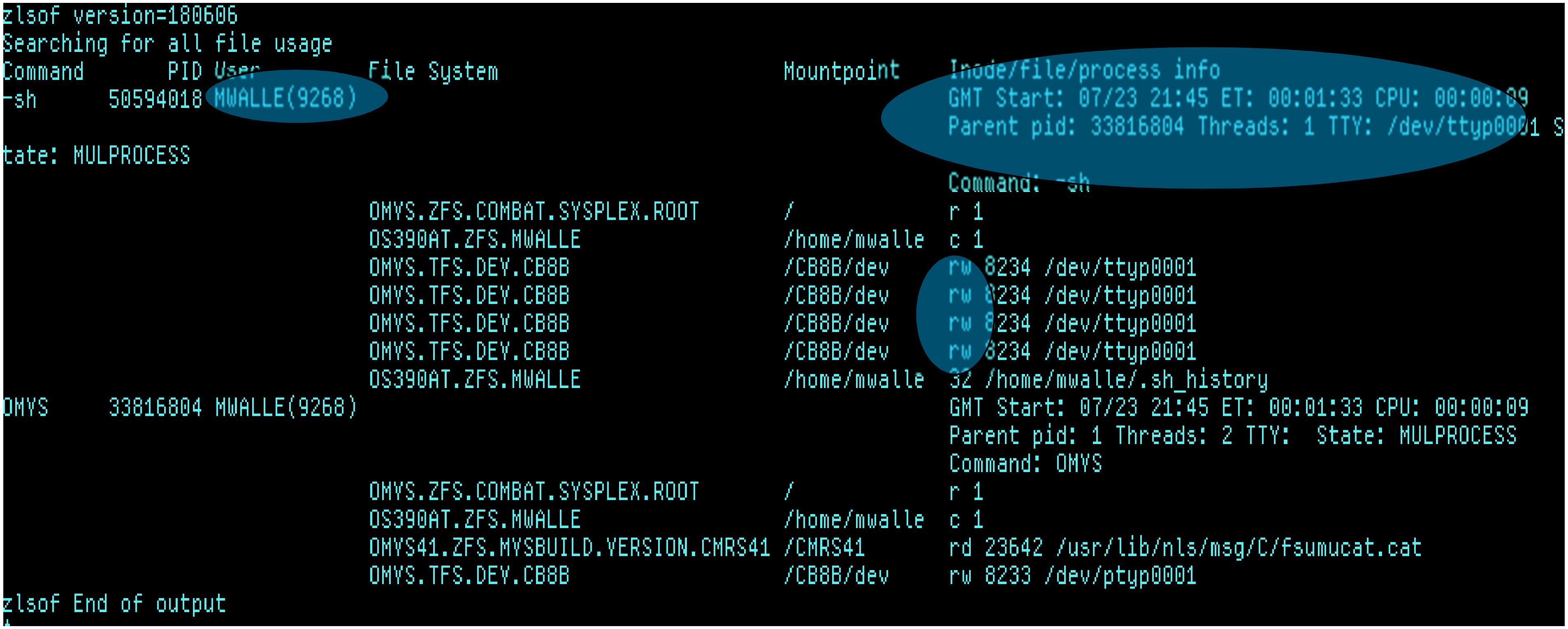


```
$ zlsof
zlsof version=180606
Searching for all file usage
Command       PID User   File System                        Mountpoint    Inode/file
-sh      50594018 MWALLE OMVS.ZFS.COMBAT.SYSPLEX.ROOT       /             r 1
                         OS390AT.ZFS.MWALLE                 /home/mwalle  c 1
                         OMVS.TFS.DEV.CB8B                  /CB8B/dev     8234 /dev/ttyp0001
                         OMVS.TFS.DEV.CB8B                  /CB8B/dev     8234 /dev/ttyp0001
                         OMVS.TFS.DEV.CB8B                  /CB8B/dev     8234 /dev/ttyp0001
                         OMVS.TFS.DEV.CB8B                  /CB8B/dev     8234 /dev/ttyp0001
                         OS390AT.ZFS.MWALLE                 /home/mwalle  32 /home/mwalle/.sh_history
OMVS     33816804 MWALLE OMVS.ZFS.COMBAT.SYSPLEX.ROOT       /             r 1
                         OS390AT.ZFS.MWALLE                 /home/mwalle  c 1
                         OMVS41.ZFS.MVSBUILD.VERSION.CMRS41 /CMRS41       23642 /usr/lib/nls/msg/C/fsumucat.cat
                         OMVS.TFS.DEV.CB8B                  /CB8B/dev     8233 /dev/ptyp0001
zlsof End of output
$
```

zlsof default output for an unauthorized invoker consists of open file information for processes that are associated with the user.
If the invoker is authorized, the default output consists of open file information for all processes in the system.

# z/OS UNIX: zlsof updates

## Using new –x option:



```
zlsof version=180606
Searching for all file usage
Command       PID User         File System                        Mountpoint    Inode/file/process info
-sh      50594018 MWALLE(9268)                                                  GMT Start: 07/23 21:45 ET: 00:01:33 CPU: 00:00:09
                                                                                Parent pid: 33816804 Threads: 1 TTY: /dev/ttyp0001 S
tate: MULPROCESS
                                                                                Command: -sh
                               OMVS.ZFS.COMBAT.SYSPLEX.ROOT       /             r 1
                               OS390AT.ZFS.MWALLE                 /home/mwalle  c 1
                               OMVS.TFS.DEV.CB8B                  /CB8B/dev     rw 8234 /dev/ttyp0001
                               OMVS.TFS.DEV.CB8B                  /CB8B/dev     rw 8234 /dev/ttyp0001
                               OMVS.TFS.DEV.CB8B                  /CB8B/dev     rw 8234 /dev/ttyp0001
                               OMVS.TFS.DEV.CB8B                  /CB8B/dev     rw 8234 /dev/ttyp0001
                               OS390AT.ZFS.MWALLE                 /home/mwalle  32 /home/mwalle/.sh_history
OMVS     33816804 MWALLE(9268)                                                  GMT Start: 07/23 21:45 ET: 00:01:33 CPU: 00:00:09
                                                                                Parent pid: 1 Threads: 2 TTY:  State: MULPROCESS
                                                                                Command: OMVS
                               OMVS.ZFS.COMBAT.SYSPLEX.ROOT       /             r 1
                               OS390AT.ZFS.MWALLE                 /home/mwalle  c 1
                               OMVS41.ZFS.MVSBUILD.VERSION.CMRS41 /CMRS41       rd 23642 /usr/lib/nls/msg/C/fsumucat.cat
                               OMVS.TFS.DEV.CB8B                  /CB8B/dev     rw 8233 /dev/ptyp0001
zlsof End of output
```

Shows extended process information. The information includes UID with the user name, start time, elapsed time, CPU time, ppid, thread number, controlling TTY information, state of the process, and read/write open mode.

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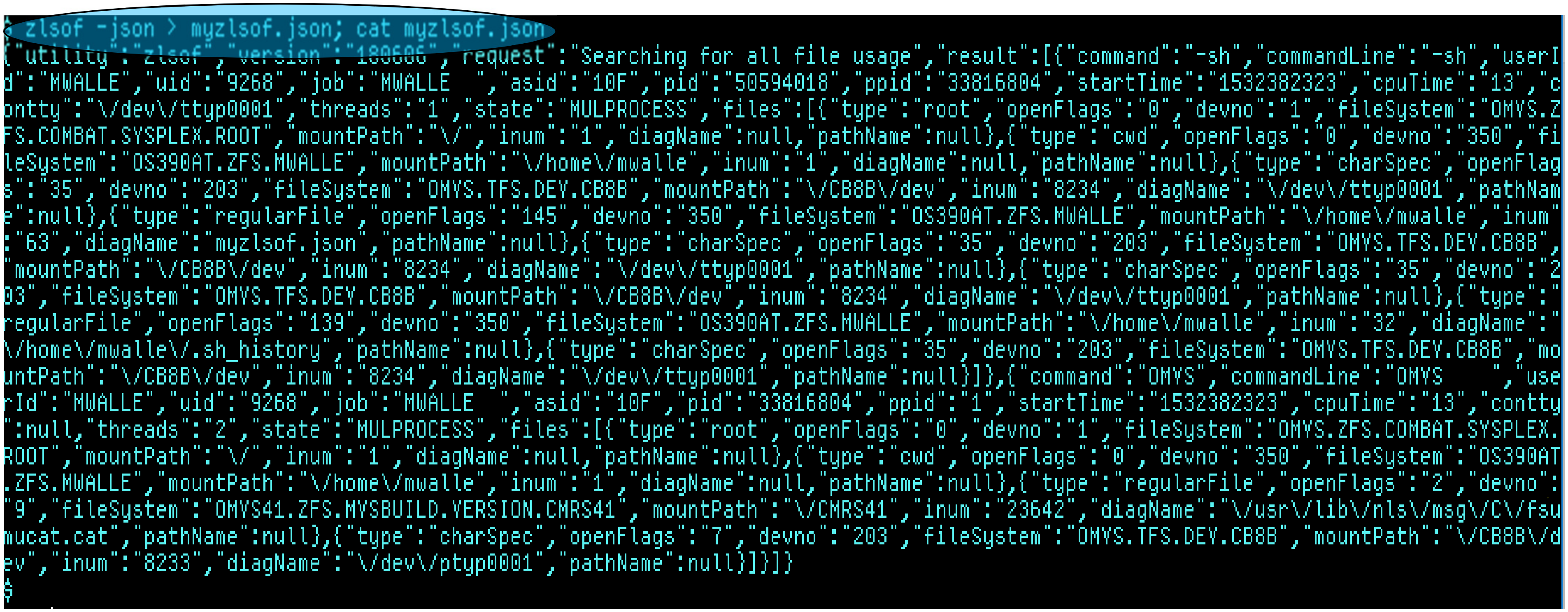
# z/OS UNIX: zlsof updates

Using new –json option:



```
$ zlsof -json > myzlsof.json; cat myzlsof.json
{"utility":"zlsof","version":"180606","request":"Searching for all file usage","result":[{"command":"-sh","commandLine":"-sh","userI
d":"MWALLE","uid":"9268","job":"MWALLE  ","asid":"10F","pid":"50594018","ppid":"33816804","startTime":"1532382323","cpuTime":"13","c
ontty":"\/dev\/ttyp0001","threads":"1","state":"MULPROCESS","files":[{"type":"root","openFlags":"0","devno":"1","fileSystem":"OMYS.Z
FS.COMBAT.SYSPLEX.ROOT","mountPath":"\/","inum":"1","diagName":null,"pathName":null},{"type":"cwd","openFlags":"0","devno":"350","fi
leSystem":"OS390AT.ZFS.MWALLE","mountPath":"\/home\/mwalle","inum":"1","diagName":null,"pathName":null},{"type":"charSpec","openFlag
s":"35","devno":"203","fileSystem":"OMYS.TFS.DEY.CB8B","mountPath":"\/CB8B\/dev","inum":"8234","diagName":"\/dev\/ttyp0001","pathNam
e":null},{"type":"regularFile","openFlags":"145","devno":"350","fileSystem":"OS390AT.ZFS.MWALLE","mountPath":"\/home\/mwalle","inum"
:"63","diagName":"myzlsof.json","pathName":null},{"type":"charSpec","openFlags":"35","devno":"203","fileSystem":"OMYS.TFS.DEY.CB8B",
"mountPath":"\/CB8B\/dev","inum":"8234","diagName":"\/dev\/ttyp0001","pathName":null},{"type":"charSpec","openFlags":"35","devno":"2
03","fileSystem":"OMYS.TFS.DEY.CB8B","mountPath":"\/CB8B\/dev","inum":"8234","diagName":"\/dev\/ttyp0001","pathName":null},{"type":"
regularFile","openFlags":"139","devno":"350","fileSystem":"OS390AT.ZFS.MWALLE","mountPath":"\/home\/mwalle","inum":"32","diagName":"
\/home\/mwalle\/.sh_history","pathName":null},{"type":"charSpec","openFlags":"35","devno":"203","fileSystem":"OMYS.TFS.DEY.CB8B","mo
untPath":"\/CB8B\/dev","inum":"8234","diagName":"\/dev\/ttyp0001","pathName":null}]},{"command":"OMYS","commandLine":"OMYS    ","use
rId":"MWALLE","uid":"9268","job":"MWALLE  ","asid":"10F","pid":"33816804","ppid":"1","startTime":"1532382323","cpuTime":"13","contty
":null,"threads":"2","state":"MULPROCESS","files":[{"type":"root","openFlags":"0","devno":"1","fileSystem":"OMYS.ZFS.COMBAT.SYSPLEX.
ROOT","mountPath":"\/","inum":"1","diagName":null,"pathName":null},{"type":"cwd","openFlags":"0","devno":"350","fileSystem":"OS390AT
.ZFS.MWALLE","mountPath":"\/home\/mwalle","inum":"1","diagName":null,"pathName":null},{"type":"regularFile","openFlags":"2","devno":
"9","fileSystem":"OMYS41.ZFS.MYSBUILD.VERSION.CMRS41","mountPath":"\/CMRS41","inum":"23642","diagName":"\/usr\/lib\/nls\/msg\/C\/fsu
mucat.cat","pathName":null},{"type":"charSpec","openFlags":"7","devno":"203","fileSystem":"OMYS.TFS.DEY.CB8B","mountPath":"\/CB8B\/d
ev","inum":"8233","diagName":"\/dev\/ptyp0001","pathName":null}]}]}
$
```

Shows data in JSON forma.

Very good for programs, but I'm human…

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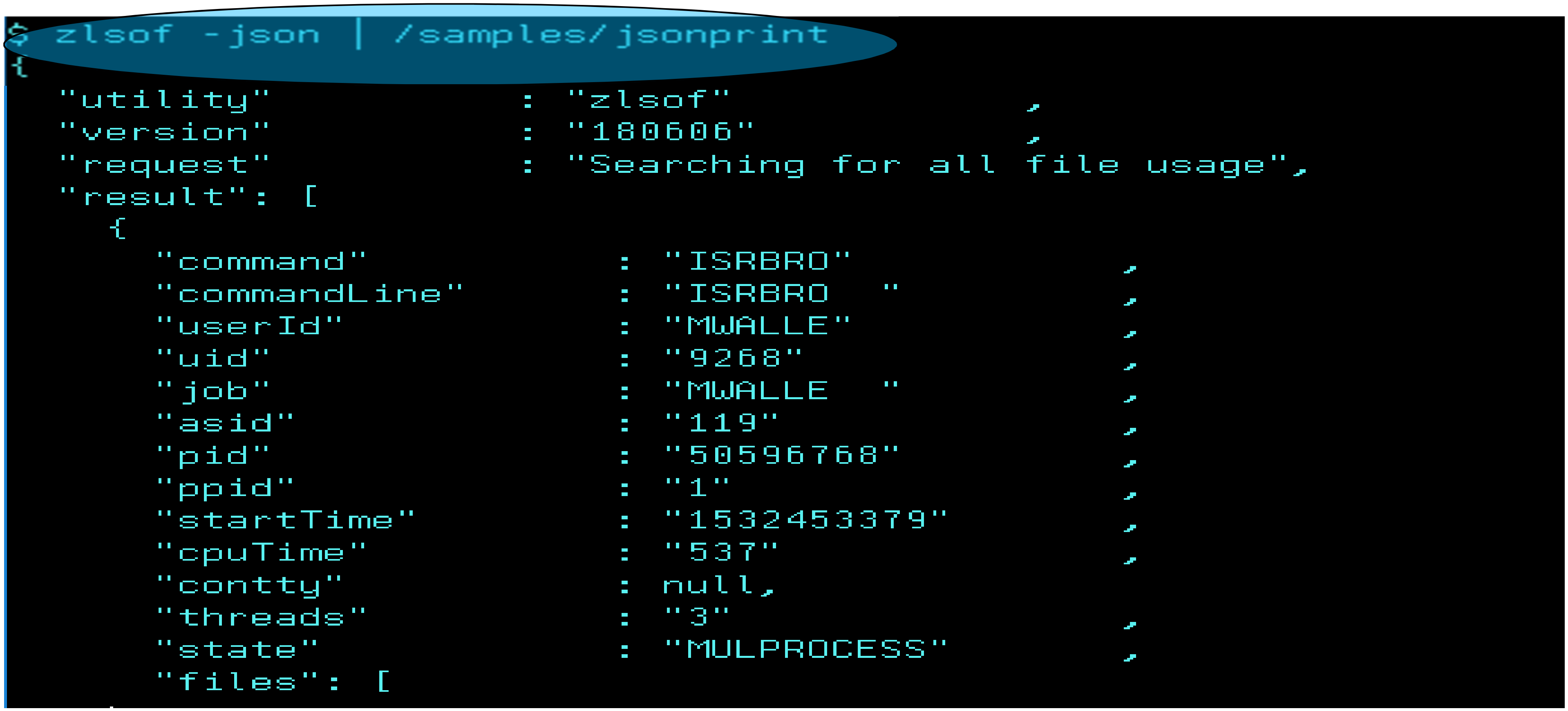
# z/OS UNIX: zlsof updates (with jsonprint)

Let's pair this with new "Client Web Enablement Toolkit" json pretty print capability in OA55438!



```
$ zlsof -json | /samples/jsonprint
{
  "utility"          : "zlsof"            ,
  "version"          : "180606"           ,
  "request"          : "Searching for all file usage",
  "result": [
    {
      "command"          : "ISRBRO"            ,
      "commandLine"      : "ISRBRO   "         ,
      "userId"           : "MWALLE"            ,
      "uid"              : "9268"              ,
      "job"              : "MWALLE   "         ,
      "asid"             : "119"               ,
      "pid"              : "50596768"          ,
      "ppid"             : "1"                 ,
      "startTime"        : "1532453379"        ,
      "cpuTime"          : "537"               ,
      "contty"           : null,
      "threads"          : "3"                 ,
      "state"            : "MULPROCESS"        ,
      "files": [
```

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# z/OS UNIX: zlsof updates

- **Considerations**:
  - Newer zlsof options opens up more opportunities to pull even more data into programs to help know who is using want, and what is in use by whom.
  - zlfsof can be invoked from shell, TSO/E, or as system REXX (`F AXR,ZLSOF`) command.
  - Client Web Enablement Toolkit's json pretty print REXX is found:
    - SYS1.SAMPLIB(HWTJSPRT) for TSO/E.
    - /samples/jsonprint (which is /samples/IBM/HWTJSPRT) for shell.

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# SDSF: snapshot

- **What**:
  - SNAPSHOT allows you to display the data from an SDSF tabular panel in a browse or edit session.
  - You can then use SDSF's Print function to print it, or ISPF  functions to copy it to a data set.
- **How to use, on any tabular panel:**
  - Format: `SNAPSHOT|SNAP (S|SB|SE|SV)`
- **Considerations**:
  - Nice if you wanted to do “fancier” ISPF commands, rather than simple sorting from the CK panel.

Thanks to Mike Shorkend for this suggestion!

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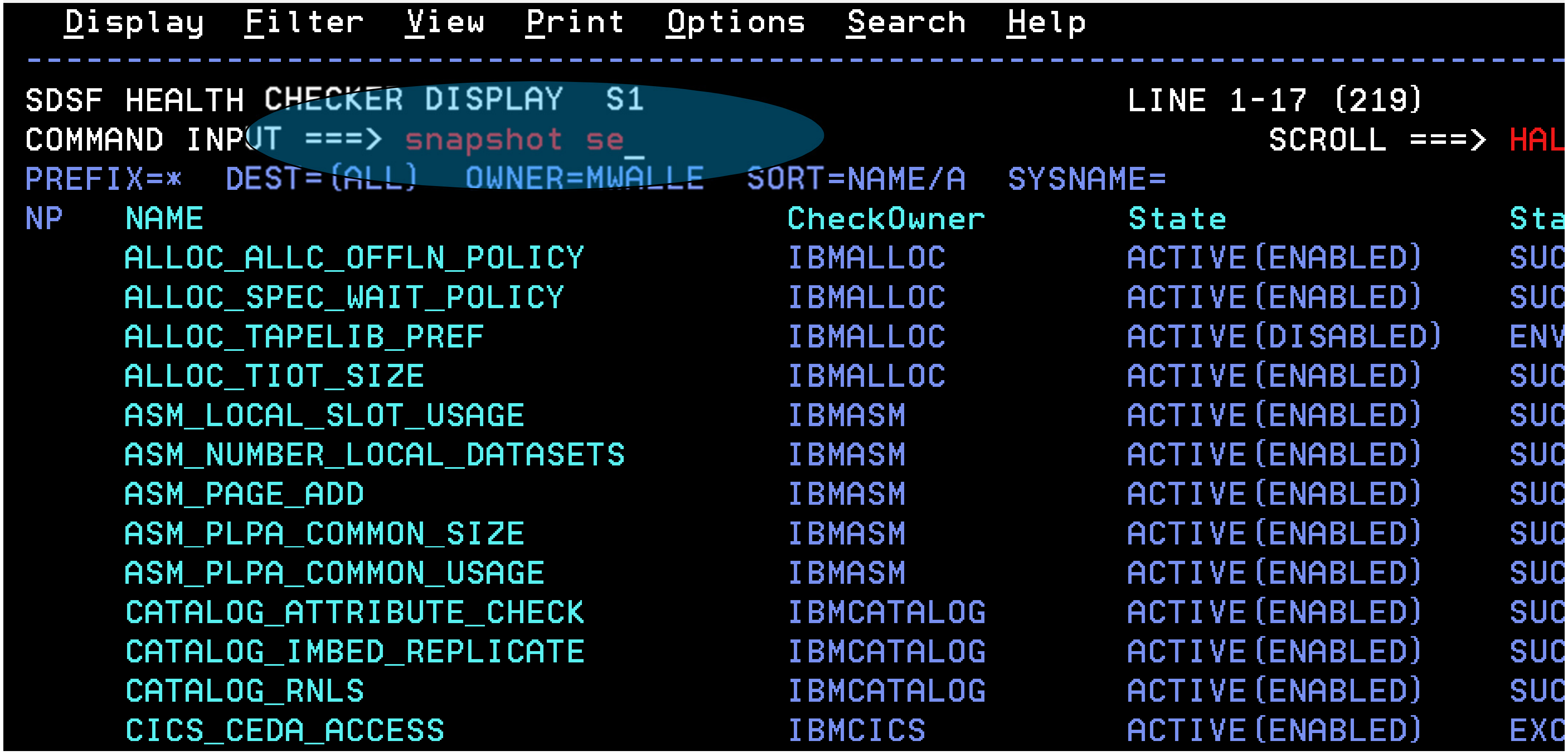
## SDSF: snapshot

**Scenario**: Find all the inactive z/OS migration health checks.

- **1) SNAPSHOT SE**



```
  Display  Filter  View  Print  Options  Search  Help
 -------------------------------------------------------------------------------
 SDSF HEALTH CHECKER DISPLAY  S1                          LINE 1-17 (219)
 COMMAND INPUT ===> snapshot se_                                 SCROLL ===> HAL
 PREFIX=*  DEST=(ALL)  OWNER=MWALLE  SORT=NAME/A  SYSNAME=
 NP   NAME                             CheckOwner        State                Sta
      ALLOC_ALLC_OFFLN_POLICY          IBMALLOC          ACTIVE(ENABLED)      SUC
      ALLOC_SPEC_WAIT_POLICY           IBMALLOC          ACTIVE(ENABLED)      SUC
      ALLOC_TAPELIB_PREF               IBMALLOC          ACTIVE(DISABLED)     ENV
      ALLOC_TIOT_SIZE                  IBMALLOC          ACTIVE(ENABLED)      SUC
      ASM_LOCAL_SLOT_USAGE             IBMASM            ACTIVE(ENABLED)      SUC
      ASM_NUMBER_LOCAL_DATASETS        IBMASM            ACTIVE(ENABLED)      SUC
      ASM_PAGE_ADD                     IBMASM            ACTIVE(ENABLED)      SUC
      ASM_PLPA_COMMON_SIZE             IBMASM            ACTIVE(ENABLED)      SUC
      ASM_PLPA_COMMON_USAGE            IBMASM            ACTIVE(ENABLED)      SUC
      CATALOG_ATTRIBUTE_CHECK          IBMCATALOG        ACTIVE(ENABLED)      SUC
      CATALOG_IMBED_REPLICATE          IBMCATALOG        ACTIVE(ENABLED)      SUC
      CATALOG_RNLS                     IBMCATALOG        ACTIVE(ENABLED)      SUC
      CICS_CEDA_ACCESS                 IBMCICS           ACTIVE(ENABLED)      EXC
```

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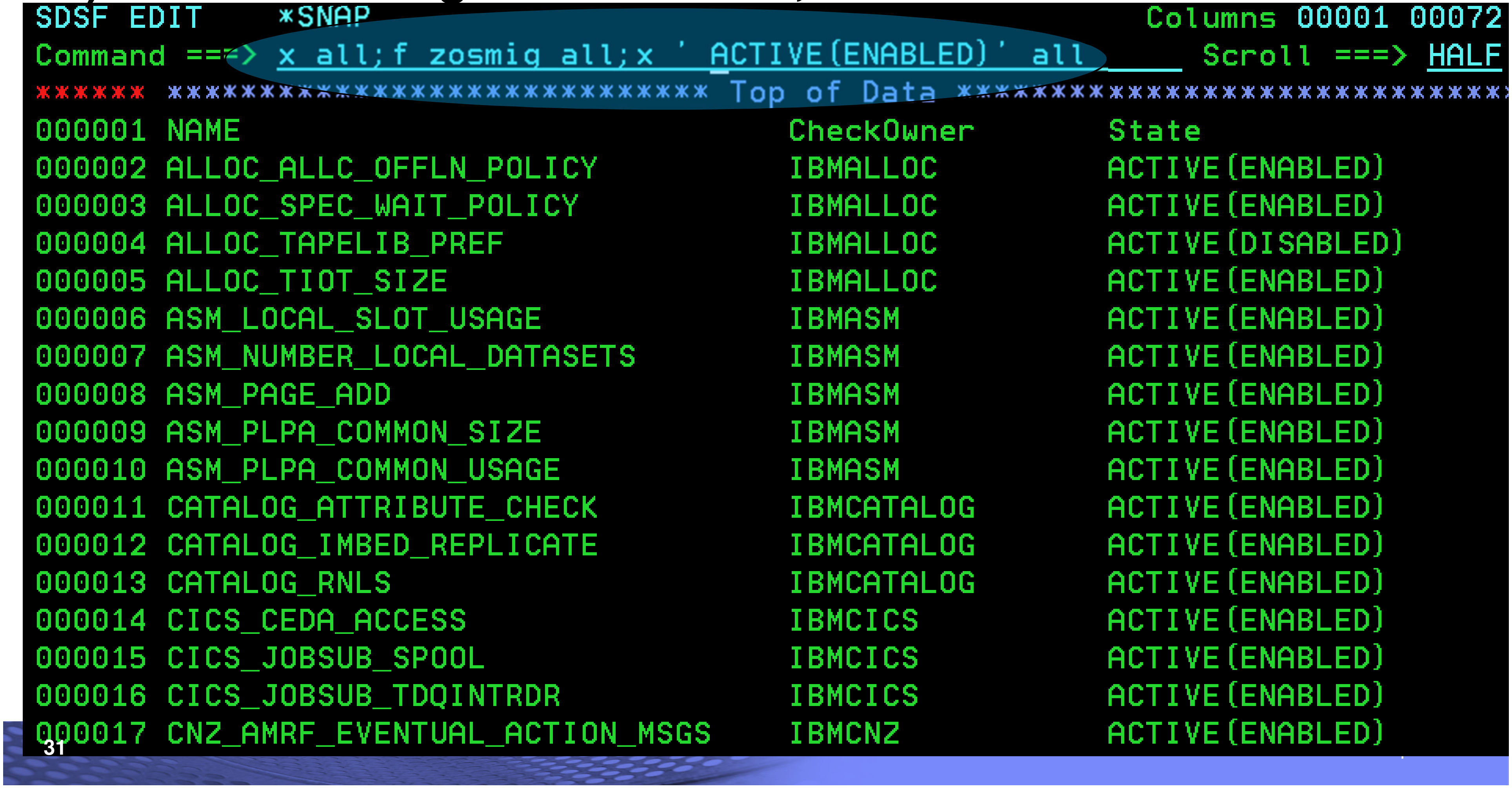
# SDSF: snapshot

**Scenario**: Find all the inactive z/OS migration health checks.

- **2) Search for migration checks; find those INACTIVE**

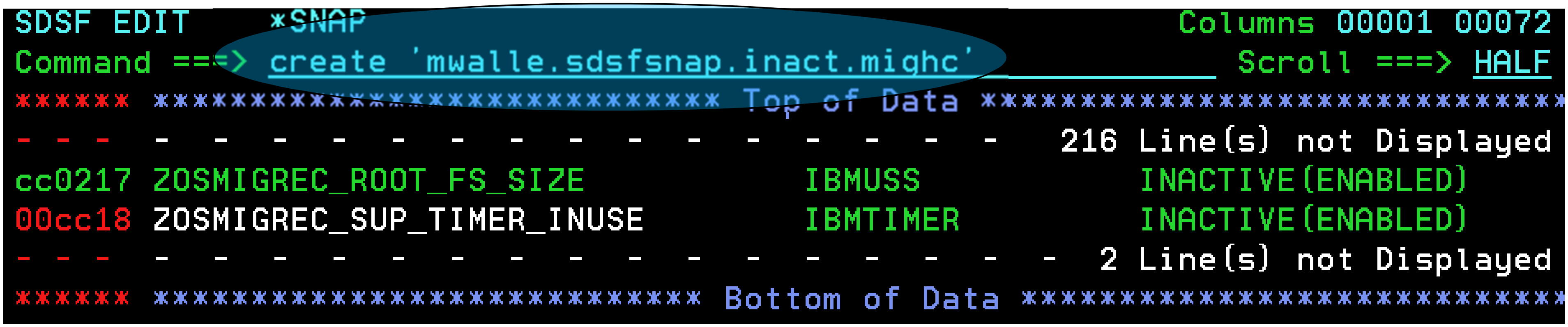


```
SDSF EDIT      *SNAP                                      Columns 00001 00072
Command ===> x all;f zosmig all;x ' ACTIVE(ENABLED)' all      Scroll ===> HALF
****** ***************************** Top of Data ******************************
000001 NAME                                 CheckOwner        State
000002 ALLOC_ALLC_OFFLN_POLICY              IBMALLOC          ACTIVE(ENABLED)
000003 ALLOC_SPEC_WAIT_POLICY               IBMALLOC          ACTIVE(ENABLED)
000004 ALLOC_TAPELIB_PREF                   IBMALLOC          ACTIVE(DISABLED)
000005 ALLOC_TIOT_SIZE                      IBMALLOC          ACTIVE(ENABLED)
000006 ASM_LOCAL_SLOT_USAGE                 IBMASM            ACTIVE(ENABLED)
000007 ASM_NUMBER_LOCAL_DATASETS            IBMASM            ACTIVE(ENABLED)
000008 ASM_PAGE_ADD                         IBMASM            ACTIVE(ENABLED)
000009 ASM_PLPA_COMMON_SIZE                 IBMASM            ACTIVE(ENABLED)
000010 ASM_PLPA_COMMON_USAGE                IBMASM            ACTIVE(ENABLED)
000011 CATALOG_ATTRIBUTE_CHECK              IBMCATALOG        ACTIVE(ENABLED)
000012 CATALOG_IMBED_REPLICATE              IBMCATALOG        ACTIVE(ENABLED)
000013 CATALOG_RNLS                         IBMCATALOG        ACTIVE(ENABLED)
000014 CICS_CEDA_ACCESS                     IBMCICS           ACTIVE(ENABLED)
000015 CICS_JOBSUB_SPOOL                    IBMCICS           ACTIVE(ENABLED)
000016 CICS_JOBSUB_TDQINTRDR                IBMCICS           ACTIVE(ENABLED)
000017 CNZ_AMRF_EVENTUAL_ACTION_MSGS        IBMCNZ            ACTIVE(ENABLED)
```

# SDSF: snapshot

**Scenario**: Find all the inactive z/OS migration health checks.

- **3) Save results**



```
SDSF EDIT     *SNAP                                            Columns 00001 00072
Command ===> create 'mwalle.sdsfsnap.inact.mighc'                 Scroll ===> HALF
****** ***************************** Top of Data ******************************
- - -  - - - - - - - - - - - - - - -   216 Line(s) not Displayed
cc0217 ZOSMIGREC_ROOT_FS_SIZE           IBMUSS           INACTIVE(ENABLED)
00cc18 ZOSMIGREC_SUP_TIMER_INUSE        IBMTIMER         INACTIVE(ENABLED)
- - -  - - - - - - - - - - - - - - - -   2 Line(s) not Displayed
****** **************************** Bottom of Data ****************************
```

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# PROGxx: LPA Volser

- **What**:  LPA statement in PROGxx (and SETPROG LPA and via CSVDYLPA) lets you identify the containing data set with volser

- **How to use:**
- LPA ADD MOD(xxx) DSNAME(ddd) **VOLUME(vvv)**
- SETPROG LPA,ADD,MOD=xxx,DSNAME=ddd,**VOLUME=vvv**

- **Considerations:** This appears STILL not to be documented. Sigh. Will try again to get that fixed.

z/OS V2R2 Enhancements

# Dynamic APF: SMF Record

- **What**:  SMF record type 90 subtype 37 upon post-IPL APF update (ADD or DELETE)
- **How to use:**

  PROGxx: `APF ADD …` or `APF DELETE ...`

  `SETPROG APF,ADD,...` or `SETPROG APF,DELETE,...`

  SMFPRMxx: indicate to collect type 90 subtype 37 record
- **Information in the SMF record:**
  - Function: Add, Delete, DynFormat, StatFormat
  - Was the update via SETPROG, SET PROG, CSVAPF
  - Parmlib member suffix for the SET PROG case
  - Data set name
  - Volser
  - Time of update (STCK)
  - Jobname
  - Command Scheduling Control Block (CSCB)'s CHKEY field
  - Console ID of issuer (-1 for CSVAPF)
  - Utoken of issuer

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# Dynamic APF: SMF Record (cont)

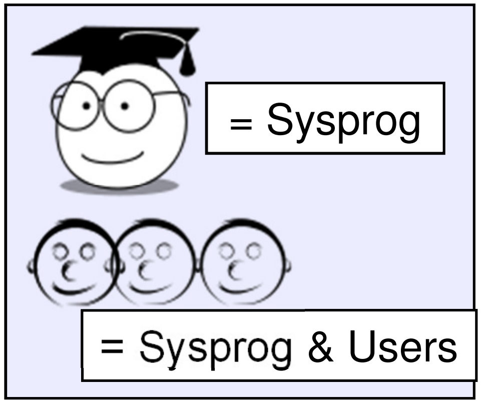
- **z/OS V2R3 improvements:**
  - The RACF UTOKEN is stored in its “unencrypted format”
  - The UserID within the UTOKEN is at offset x'98' in the data
  - The console name is provided at offset x'A8'
  - PROGxx supports **APFSMFALL**
    - When specified, the SMF record includes information about updates that are “already in the correct state”. Defaults to initial behavior of not placing “no change” cases in the SMF records
    - The record identifies this situation by a bit: SMF90T37_AlreadyAsNeeded – the x'01' bit in byte SMF90T37Flags (offset 1)

z/OS V2R1

# Little Enhancements

❖**DFSMSdfp and ICKDSF: Protection for initializing non-empty volumes**

❖**DFSMSdss: Renaming of VSAM physical data sets**



= Sysprog

= Sysprog & Users

# z/OS V2.1 with OA51084 and PI67283 (Sept 2016) and higher: **DFSMSdfp and ICKDSF: Protection for initializing non-empty volumes**

- **What:**
  - ICKDSF had keyword `NODSEXIST` on the INIT command. This as a default was desired.
    - Means: if there are data sets on the volume (besides the index data set and VVDS), then you will not be allowed to initialize the volume.
  - Now, DEVMAN support provides a system-wide value to be used for the ICKDSF default, via `DEVSUPxx`'s `ICKDSF_NODSEXIT=YES` or `NO`.
    - `YES` enables `NODSEXIST` to be defaulted for ICKDSF INIT.
      - Means: if device contains data sets, INIT is terminated. To override you have to now specify an ICKDSF `DSEXIST` keyword on the INIT.
    - `NO` disables `NODSEXIST` for ICKDSF INIT.
      - Means: if device contains data sets, INIT is not terminated.
- **Considerations:**
  - The NODSEXIST parameter will not be defaulted if an online INIT is attempted on a volume that has been initialized as a Data Facility Storage Management Subsystem (DFSMS) managed volume. If data sets other than the VTOC index data set or VVDS exist on a DFSMS managed volume, the command will be terminated.
  - If `ICKDSF_NODSEXIST=NO` or `YES` is specified, an IEA253I message is logged at IPL or after a `SET DEVSUP=`*`xx`* command is issued. There is no `F DEVMAN` command for this setting.

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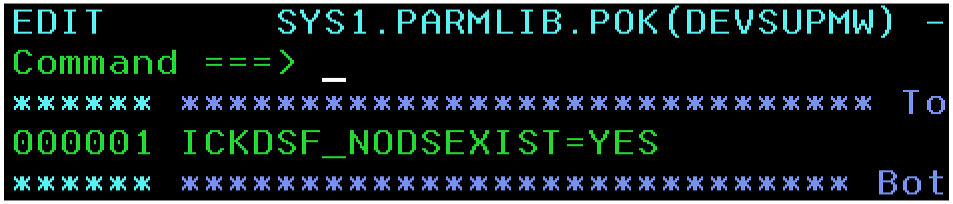
## z/OS V2.1 with OA51084 and PI67283 (Sept 2016) and higher:
## DFSMSdfp and ICKDSF: Protection for initializing non-empty volumes

### Use case #1:

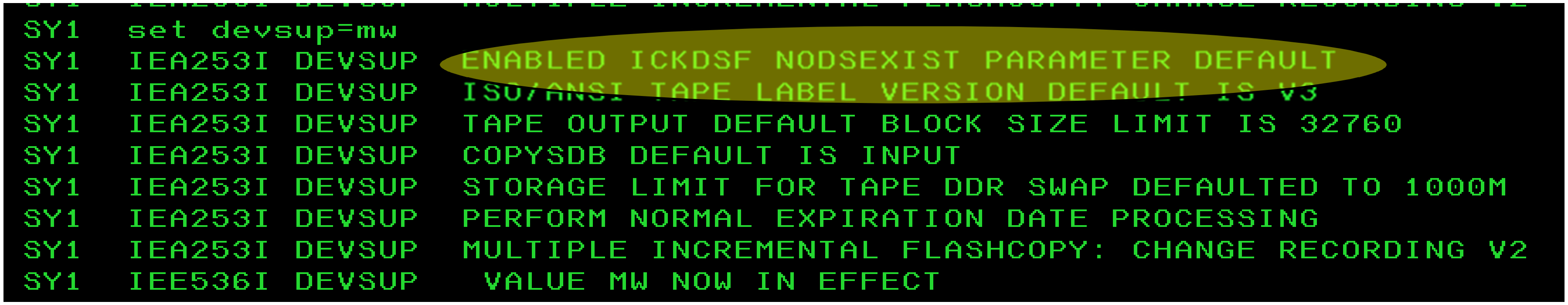
I want to initialize a volume and want system-wide default protection in case someone has put data sets on there that really shouldn't be lost. I don't want to have to go to a point-in-time backup which might be out of date.

1.Edit my DEVSUPxx to add `ICKDSF_NODSEXIST=YES`



```
EDIT        SYS1.PARMLIB.POK(DEVSUPMW) -
Command ===> _
****** ****************************** To
000001 ICKDSF_NODSEXIST=YES
****** ***************************** Bot
```

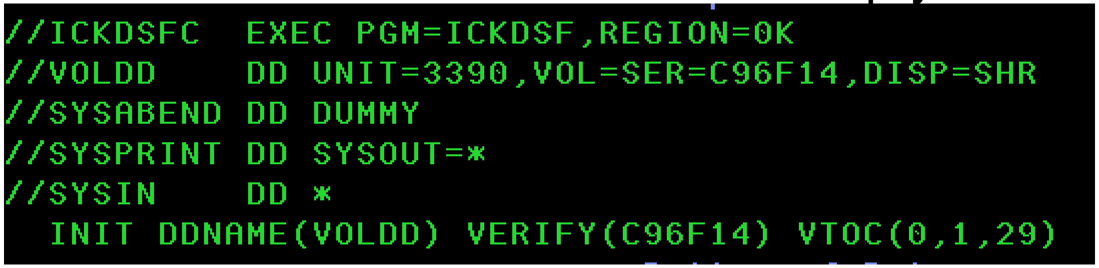
1.SET DEVSUP=xx



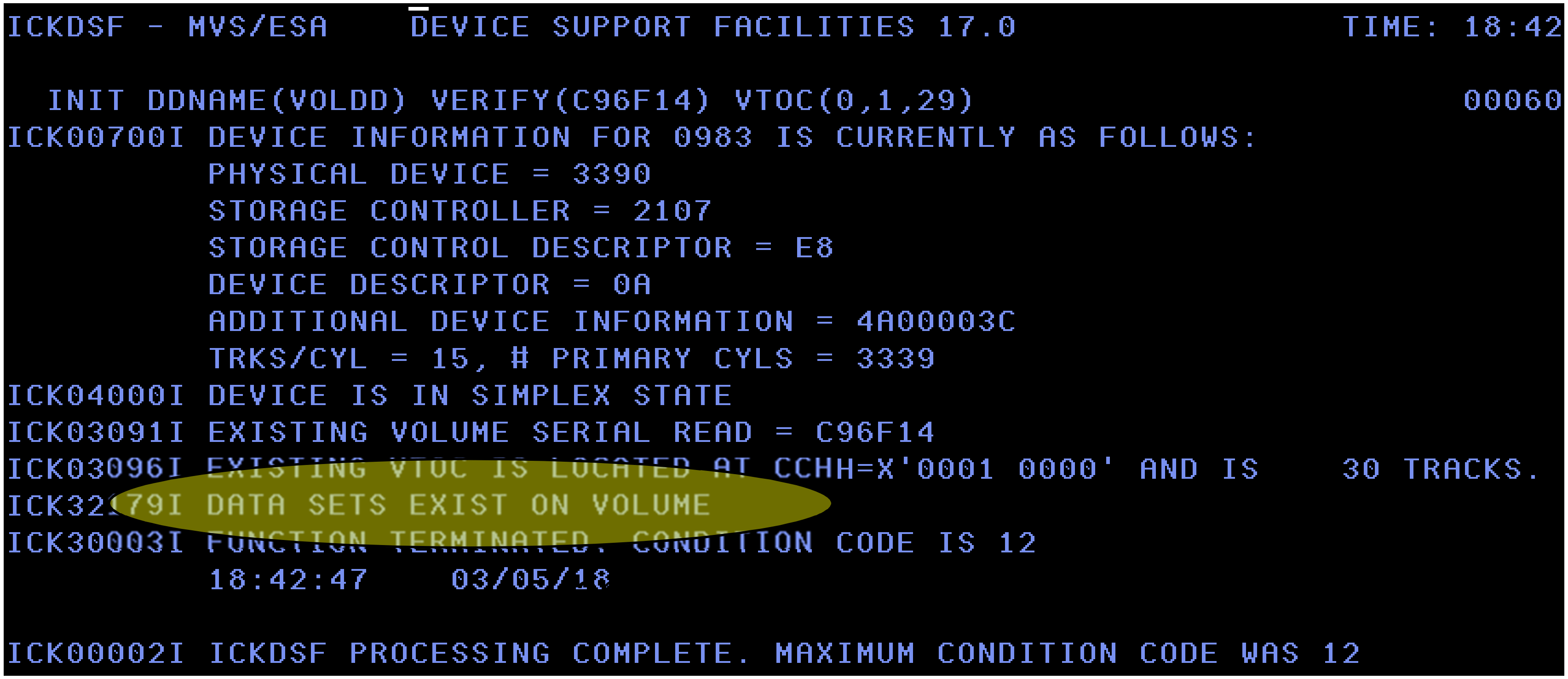
```
SY1   set devsup=mw
SY1   IEA253I DEVSUP  ENABLED ICKDSF NODSEXIST PARAMETER DEFAULT
SY1   IEA253I DEVSUP  ISO/ANSI TAPE LABEL VERSION DEFAULT IS V3
SY1   IEA253I DEVSUP  TAPE OUTPUT DEFAULT BLOCK SIZE LIMIT IS 32760
SY1   IEA253I DEVSUP  COPYSDB DEFAULT IS INPUT
SY1   IEA253I DEVSUP  STORAGE LIMIT FOR TAPE DDR SWAP DEFAULTED TO 1000M
SY1   IEA253I DEVSUP  PERFORM NORMAL EXPIRATION DATE PROCESSING
SY1   IEA253I DEVSUP  MULTIPLE INCREMENTAL FLASHCOPY: CHANGE RECORDING V2
SY1   IEE536I DEVSUP   VALUE MW NOW IN EFFECT
```

# z/OS V2.1 with OA51084 and PI67283 (Sept 2016) and higher:
# **DFSMSdfp and ICKDSF: Protection for initializing non-empty volumes**

3. Run ICKDSF to initialize a non-empty volume: failure = success!



```
//ICKDSFC   EXEC PGM=ICKDSF,REGION=0K
//VOLDD     DD UNIT=3390,VOL=SER=C96F14,DISP=SHR
//SYSABEND DD DUMMY
//SYSPRINT DD SYSOUT=*
//SYSIN     DD *
  INIT DDNAME(VOLDD) VERIFY(C96F14) VTOC(0,1,29)
```

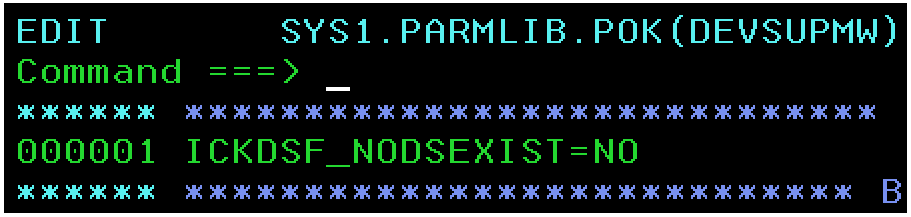


```
ICKDSF - MVS/ESA    DEVICE SUPPORT FACILITIES 17.0                  TIME: 18:42

  INIT DDNAME(VOLDD) VERIFY(C96F14) VTOC(0,1,29)                          00060
ICK00700I DEVICE INFORMATION FOR 0983 IS CURRENTLY AS FOLLOWS:
          PHYSICAL DEVICE = 3390
          STORAGE CONTROLLER = 2107
          STORAGE CONTROL DESCRIPTOR = E8
          DEVICE DESCRIPTOR = 0A
          ADDITIONAL DEVICE INFORMATION = 4A00003C
          TRKS/CYL = 15, # PRIMARY CYLS = 3339
ICK04000I DEVICE IS IN SIMPLEX STATE
ICK03091I EXISTING VOLUME SERIAL READ = C96F14
ICK03096I EXISTING VTOC IS LOCATED AT CCHH=X'0001 0000' AND IS     30 TRACKS.
ICK32179I DATA SETS EXIST ON VOLUME
ICK30003I FUNCTION TERMINATED. CONDITION CODE IS 12
          18:42:47    03/05/18

ICK00002I ICKDSF PROCESSING COMPLETE. MAXIMUM CONDITION CODE WAS 12
```

## z/OS V2.1 with OA51084 and PI67283 (Sept 2016) and higher:
## **DFSMSdfp and ICKDSF: Protection for initializing non-empty volumes**

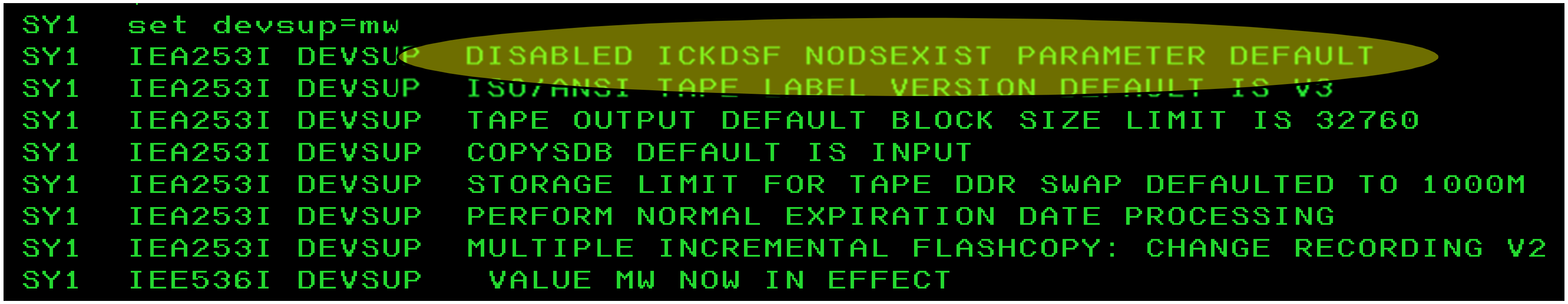
**Use case #2:**
I want to (system-wide setting) initialize a volume and I don’t care what might be on the volume. Anything there is fine to delete.

1. Edit my DEVSUPxx to add `ICKDSF_NODSEXIST=NO`



```
EDIT        SYS1.PARMLIB.POK(DEVSUPMW)
Command ===> _
****** *****************************
000001 ICKDSF_NODSEXIST=NO
****** ****************************  B
```

1. `SET DEVSUP=xx`



```
SY1   set devsup=mw
SY1   IEA253I DEVSUP  DISABLED ICKDSF NODSEXIST PARAMETER DEFAULT
SY1   IEA253I DEVSUP  ISO/ANSI TAPE LABEL VERSION DEFAULT IS V3
SY1   IEA253I DEVSUP  TAPE OUTPUT DEFAULT BLOCK SIZE LIMIT IS 32760
SY1   IEA253I DEVSUP  COPYSDB DEFAULT IS INPUT
SY1   IEA253I DEVSUP  STORAGE LIMIT FOR TAPE DDR SWAP DEFAULTED TO 1000M
SY1   IEA253I DEVSUP  PERFORM NORMAL EXPIRATION DATE PROCESSING
SY1   IEA253I DEVSUP  MULTIPLE INCREMENTAL FLASHCOPY: CHANGE RECORDING V2
SY1   IEE536I DEVSUP   VALUE MW NOW IN EFFECT
```

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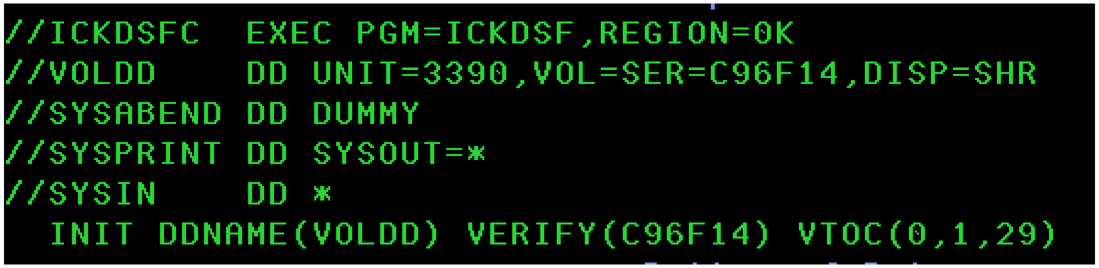
z/OS V2.1 with OA51084 and PI67283 (Sept 2016) and higher:

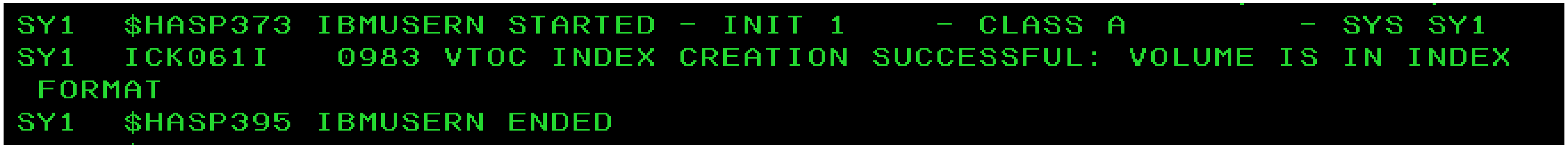
# DFSMSdfp and ICKDSF: Protection for initializing non-empty volumes

## Use case:

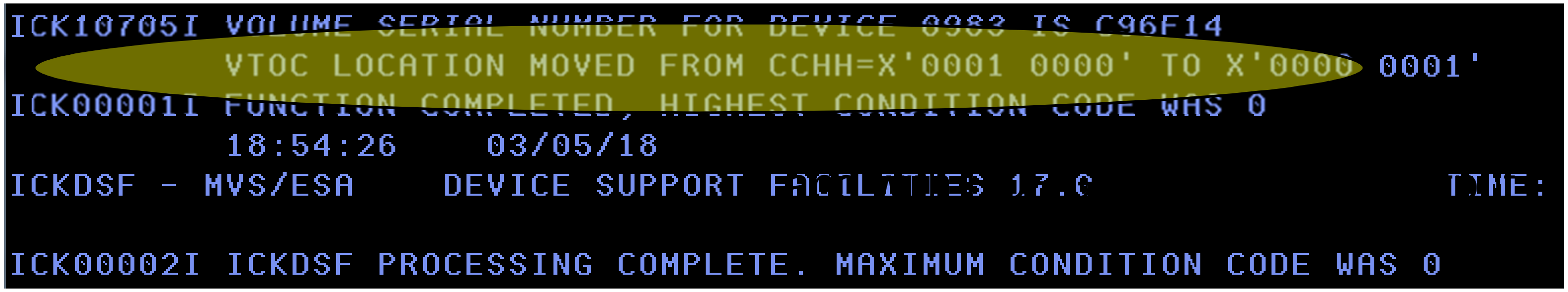
3. Run ICKDSF to initialize a non-empty volume: success = success!



```
//ICKDSFC   EXEC PGM=ICKDSF,REGION=0K
//VOLDD     DD UNIT=3390,VOL=SER=C96F14,DISP=SHR
//SYSABEND DD DUMMY
//SYSPRINT DD SYSOUT=*
//SYSIN     DD *
  INIT DDNAME(VOLDD) VERIFY(C96F14) VTOC(0,1,29)
```



```
SY1   $HASP373 IBMUSERN STARTED - INIT 1     - CLASS A          - SYS SY1
SY1   ICK061I    0983 VTOC INDEX CREATION SUCCESSFUL: VOLUME IS IN INDEX
 FORMAT
SY1   $HASP395 IBMUSERN ENDED
```



```
ICK10705I VOLUME SERIAL NUMBER FOR DEVICE 0983 IS C96F14
          VTOC LOCATION MOVED FROM CCHH=X'0001 0000' TO X'0000 0001'
ICK00001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 0
          18:54:26     03/05/18
ICKDSF - MVS/ESA    DEVICE SUPPORT FACILITIES 17.0                   TIME:

ICK00002I ICKDSF PROCESSING COMPLETE. MAXIMUM CONDITION CODE WAS 0
```

## z/OS V2.1:
# DFSMSdss: Renaming of VSAM physical data sets

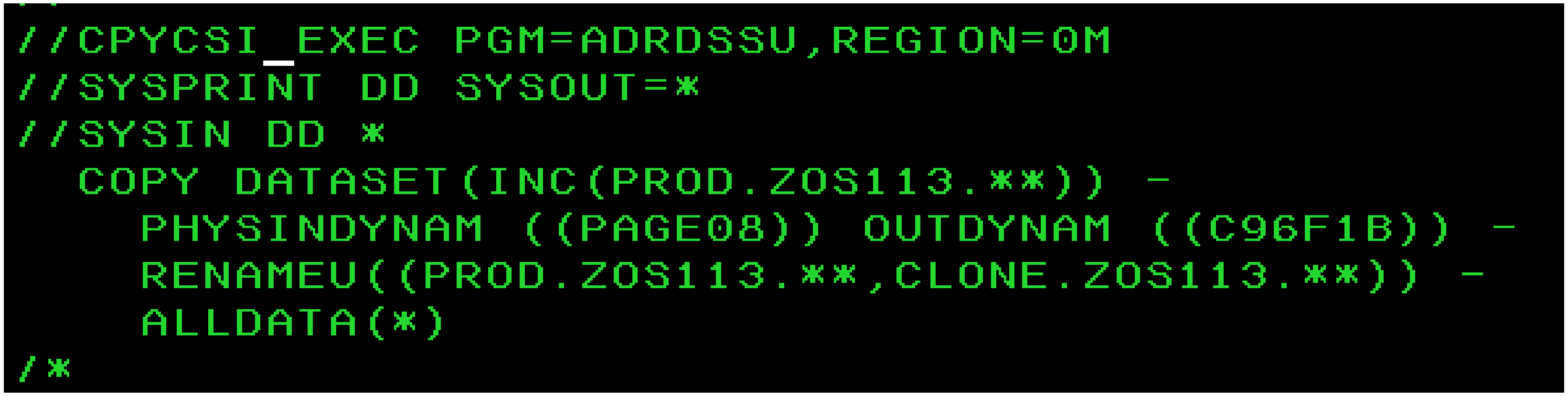
- **What:** Ability to rename a VSAM physical data set on a **COPY** or **RESTORE**.
  - Use **RENAMEUNCONDITIONAL** keyword for these operations in this case (not **RENAME)**
  - Prior to z/OS V2.1, a rename could be done only on non-VSAM physical data sets.
    - Also, as of z/OS V2.1, **RESTORE** supports **REPLACEU**, just as **COPY** did before.

- **How to use:**
  - When **PHYSINDYNAM** or is **PHYSINDD** used, you can now use **RENAMEU** for renaming a VSAM data set.
  - **REPLACEUNCONDITIONAL** keyword on the **COPY** or **RESTORE** command now works for physical VSAM data sets are *not* cataloged during physical processing within SMS or non-SMS environments.
  - The **CATALOG** keyword is ignored for VSAM data sets during physical restore. Use **IDCAMS DEFINE RECATALOG** to catalog the data sets after the physical restore.

## z/OS V2.1:
# DFSMSdss: Renaming of VSAM physical data sets

**Use case on z/OS R13:**

I want to copy (overlay) a VSAM data set physically and rename it, on the same system.



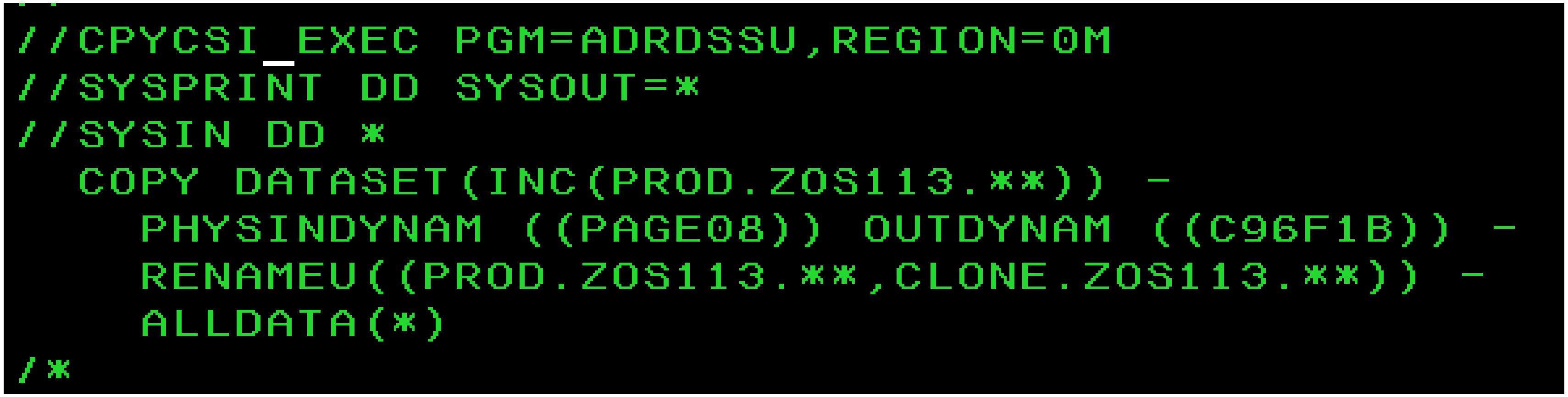
```
//CPYCSI EXEC PGM=ADRDSSU,REGION=0M
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
  COPY DATASET(INC(PROD.ZOS113.**)) -
    PHYSINDYNAM ((PAGE08)) OUTDYNAM ((C96F1B)) -
    RENAMEU((PROD.ZOS113.**,CLONE.ZOS113.**)) -
    ALLDATA(*)
/*
```

```
ADR332E (001)-PCVSM(01), CLUSTER PROD.ZOS113.CSI IN CATALOG
     PAGE08.CATALOG NOT PROCESSED. PHYSICAL DATA SET OPERATION
    DOES NOT SUPPORT RENAME OF VSAM DATA SETS
```

z/OS V2.1:

# DFSMSdss:  Renaming of VSAM physical data sets

## Same use case on z/OS V2.1:



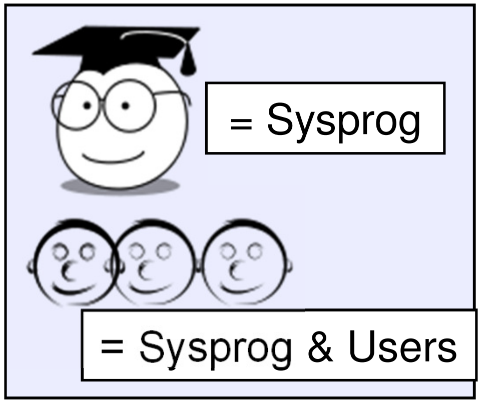
```
//CPYCSI EXEC PGM=ADRDSSU,REGION=0M
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
  COPY DATASET(INC(PROD.ZOS113.**)) -
    PHYSINDYNAM ((PAGE08)) OUTDYNAM ((C96F1B)) -
    RENAMEU((PROD.ZOS113.**,CLONE.ZOS113.**)) -
    ALLDATA(*)
/*
```

```
ADR395I (001)-PCVSM(01), DATA SET PROD.ZOS113.CSI.DATA ALLOCATED WITH
   NEWNAME CLONE.ZOS113.CSI.DATA, ON VOLUME(S): C96F1B
ADR395I (001)-PCVSM(02), DATA SET PROD.ZOS113.CSI.INDEX ALLOCATED WITH
  NEWNAME CLONE.ZOS113.CSI.INDEX, ON VOLUME(S): C96F1B
ADR418I (001)-PCVSX(01), THE FOLLOWING COMPONENTS FOR CLUSTER CLONE.ZOS113.CSI
   ON C96F1B MAY HAVE TO BE CATALOGED IN CATALOG  PAGE08.CATALOG
                  COMPONENT CLONE.ZOS113.CSI.DATA
                  COMPONENT CLONE.ZOS113.CSI.INDEX
ADR454I (001)-DDDS (01), THE FOLLOWING DATA SETS WERE SUCCESSFULLY PROCESSED
                  CLUSTER NAME   PROD.ZOS113.CSI
                  COMPONENT NAME PROD.ZOS113.CSI.DATA
                  COMPONENT NAME PROD.ZOS113.CSI.INDEX
```

z/OS R13 (and others)

## Little Enhancements

### ❖ MVS: Digging around in D LOGGER,C



= Sysprog

= Sysprog & Users

## z/OS R13 and others:
## MVS: Digging around in D LOGGER,C

**What:** You’ve probably used logstreams for a long time, and yet you might not have noticed or understood:

- some of extensive information you can get on the `D LOGGER,C` response.
- some of the options you can put on the command (and exploit in Logger)

**How to use:**

- `D LOGGER,C` with `LSN=`*`logstream_name`* and with `,D`
  - Then notice some “newer” information on `IXG601I`.

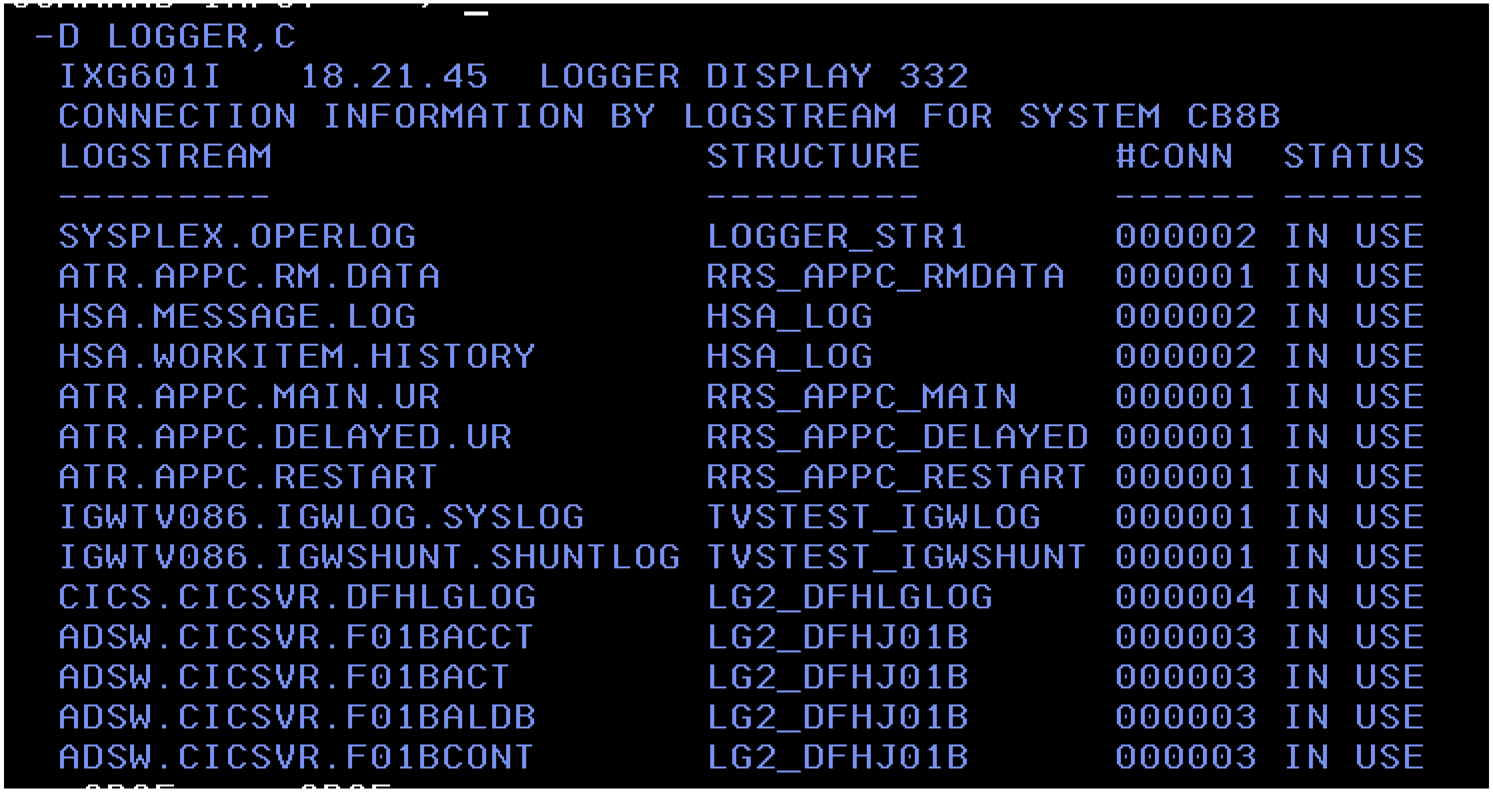
**Considerations:**

- Additional information was added (specifically for functions like zAware), but this information is also useful for other functions as well.

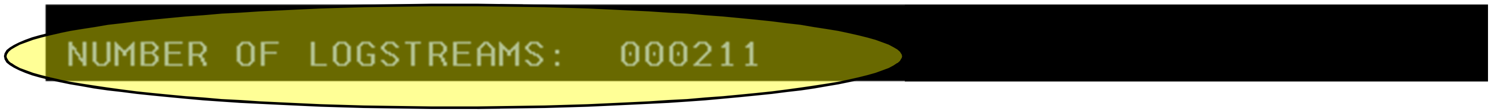
z/OS R13 and others:

# MVS: Digging around in D LOGGER,C

## Use case: What are all my logstreams?



```
 -D LOGGER,C
  IXG601I   18.21.45  LOGGER DISPLAY 332
  CONNECTION INFORMATION BY LOGSTREAM FOR SYSTEM CB8B
  LOGSTREAM                  STRUCTURE        #CONN  STATUS
  ---------                  ---------        ------ ------
  SYSPLEX.OPERLOG            LOGGER_STR1      000002 IN USE
  ATR.APPC.RM.DATA           RRS_APPC_RMDATA  000001 IN USE
  HSA.MESSAGE.LOG            HSA_LOG          000002 IN USE
  HSA.WORKITEM.HISTORY       HSA_LOG          000002 IN USE
  ATR.APPC.MAIN.UR           RRS_APPC_MAIN    000001 IN USE
  ATR.APPC.DELAYED.UR        RRS_APPC_DELAYED 000001 IN USE
  ATR.APPC.RESTART           RRS_APPC_RESTART 000001 IN USE
  IGWTV086.IGWLOG.SYSLOG     TVSTEST_IGWLOG   000001 IN USE
  IGWTV086.IGWSHUNT.SHUNTLOG TVSTEST_IGWSHUNT 000001 IN USE
  CICS.CICSVR.DFHLGLOG       LG2_DFHLGLOG     000004 IN USE
  ADSW.CICSVR.F01BACCT       LG2_DFHJ01B      000003 IN USE
  ADSW.CICSVR.F01BACT        LG2_DFHJ01B      000003 IN USE
  ADSW.CICSVR.F01BALDB       LG2_DFHJ01B      000003 IN USE
  ADSW.CICSVR.F01BCONT       LG2_DFHJ01B      000003 IN USE
```



```
 NUMBER OF LOGSTREAMS:  000211
```

Number of logstreams on this command response.

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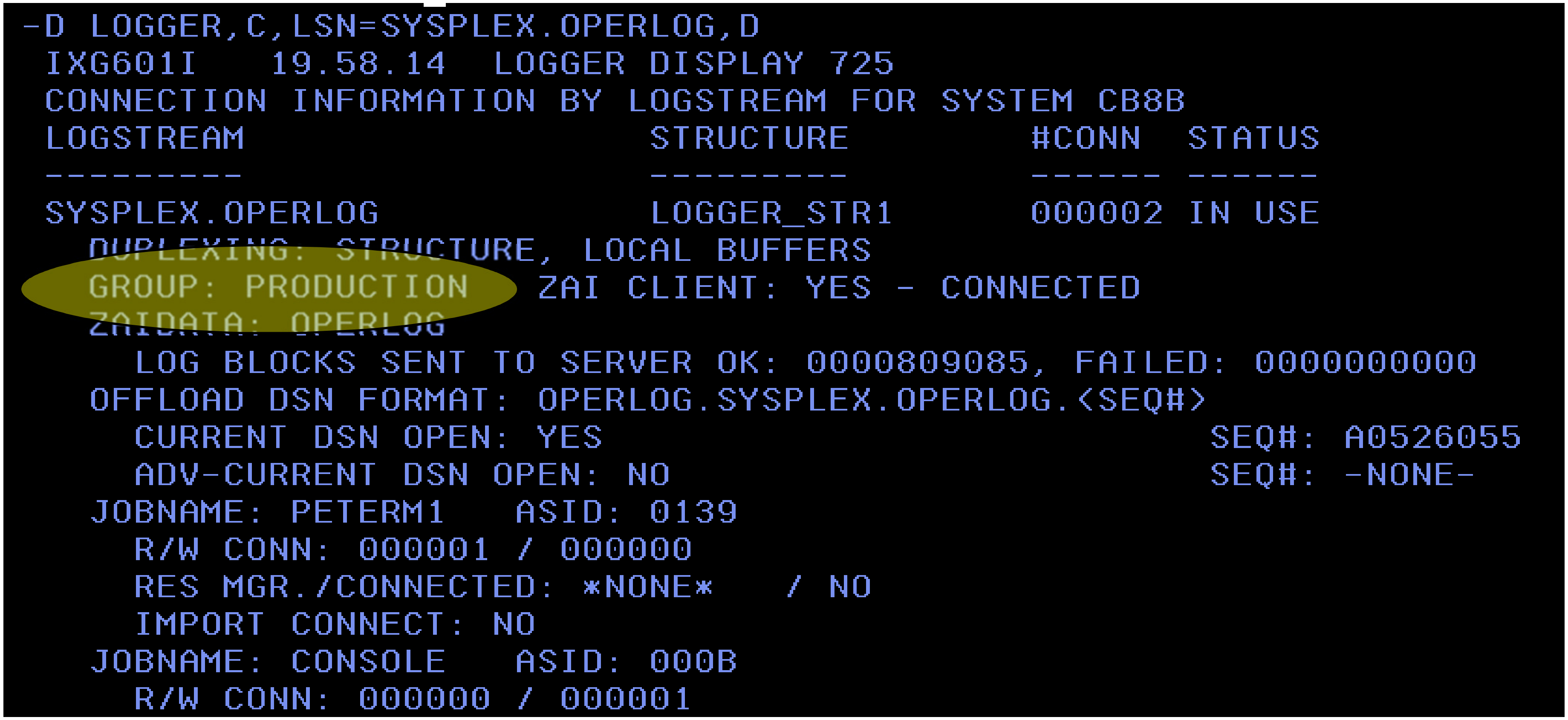
z/OS R13 and others:

# MVS: Digging around in D LOGGER,C

**Use case:  For my one of my logstreams, more details:**



```
-D LOGGER,C,LSN=SYSPLEX.OPERLOG,D
 IXG601I   19.58.14  LOGGER DISPLAY 725
 CONNECTION INFORMATION BY LOGSTREAM FOR SYSTEM CB8B
 LOGSTREAM                  STRUCTURE        #CONN  STATUS
 ---------                  ---------        ------ ------
 SYSPLEX.OPERLOG            LOGGER_STR1      000002 IN USE
   DUPLEXING: STRUCTURE, LOCAL BUFFERS
   GROUP: PRODUCTION   ZAI CLIENT: YES - CONNECTED
   ZAIDATA: OPERLOG
     LOG BLOCKS SENT TO SERVER OK: 0000809085, FAILED: 0000000000
   OFFLOAD DSN FORMAT: OPERLOG.SYSPLEX.OPERLOG.<SEQ#>
     CURRENT DSN OPEN: YES                           SEQ#: A0526055
     ADV-CURRENT DSN OPEN: NO                        SEQ#: -NONE-
   JOBNAME: PETERM1   ASID: 0139
     R/W CONN: 000001 / 000000
     RES MGR./CONNECTED: *NONE*   / NO
     IMPORT CONNECT: NO
   JOBNAME: CONSOLE   ASID: 000B
     R/W CONN: 000000 / 000001
```

Since R8:  ability to group the logstream into PRODUCTION or TEST.

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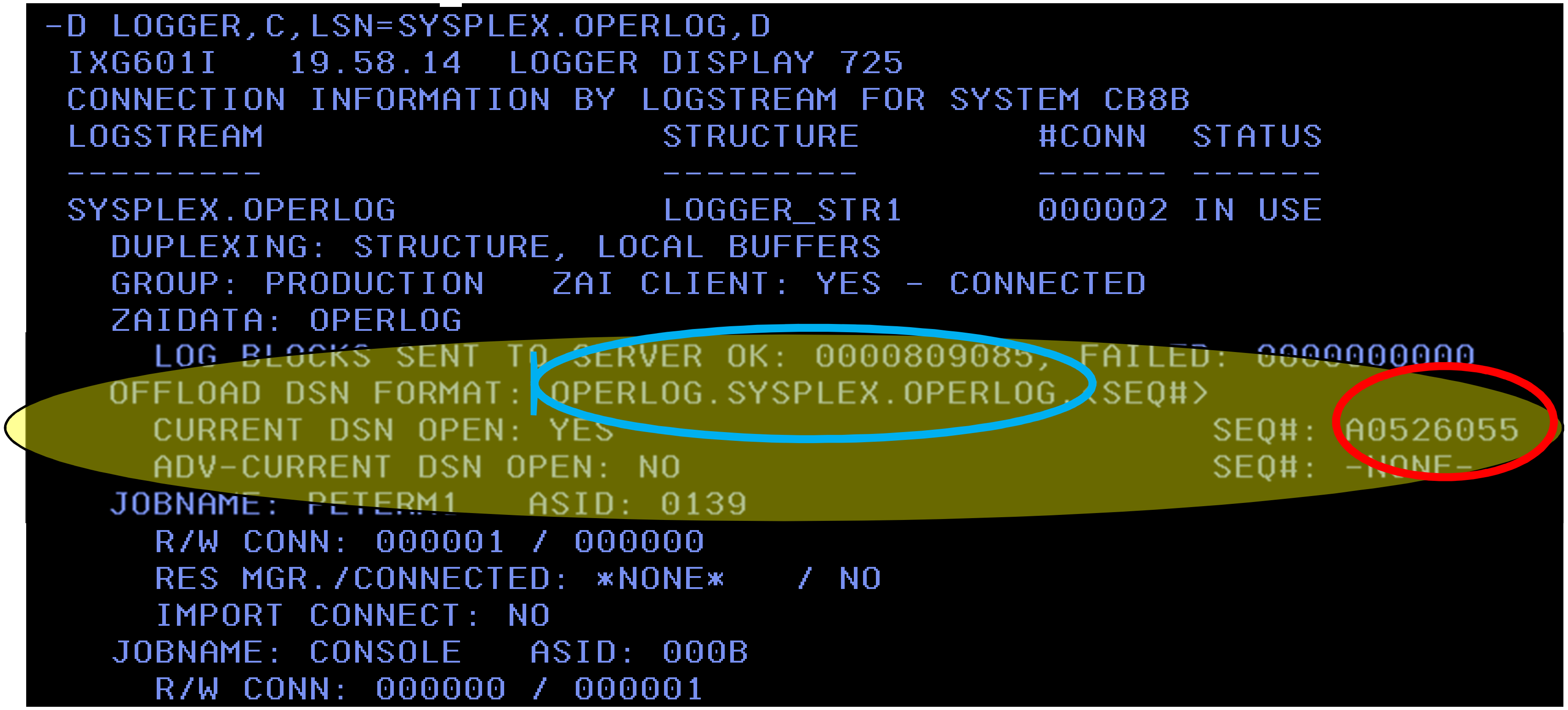
## z/OS R13 and others:

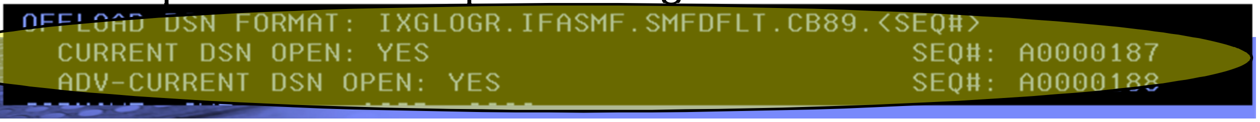
## MVS: Digging around in D LOGGER,C

### Use case:  For my one of my logstreams, more details:



```
-D LOGGER,C,LSN=SYSPLEX.OPERLOG,D
 IXG601I   19.58.14  LOGGER DISPLAY 725
 CONNECTION INFORMATION BY LOGSTREAM FOR SYSTEM CB8B
 LOGSTREAM                  STRUCTURE        #CONN  STATUS
 ---------                  ---------        ------ ------
 SYSPLEX.OPERLOG            LOGGER_STR1      000002 IN USE
   DUPLEXING: STRUCTURE, LOCAL BUFFERS
   GROUP: PRODUCTION   ZAI CLIENT: YES - CONNECTED
   ZAIDATA: OPERLOG
     LOG BLOCKS SENT TO SERVER OK: 0000809085, FAILED: 0000000000
   OFFLOAD DSN FORMAT: OPERLOG.SYSPLEX.OPERLOG.<SEQ#>
     CURRENT DSN OPEN: YES                            SEQ#: A0526055
     ADV-CURRENT DSN OPEN: NO                         SEQ#: -NONE-
   JOBNAME: PETERM1    ASID: 0139
     R/W CONN: 000001 / 000000
     RES MGR./CONNECTED: *NONE*    / NO
     IMPORT CONNECT: NO
   JOBNAME: CONSOLE    ASID: 000B
     R/W CONN: 000000 / 000001
```

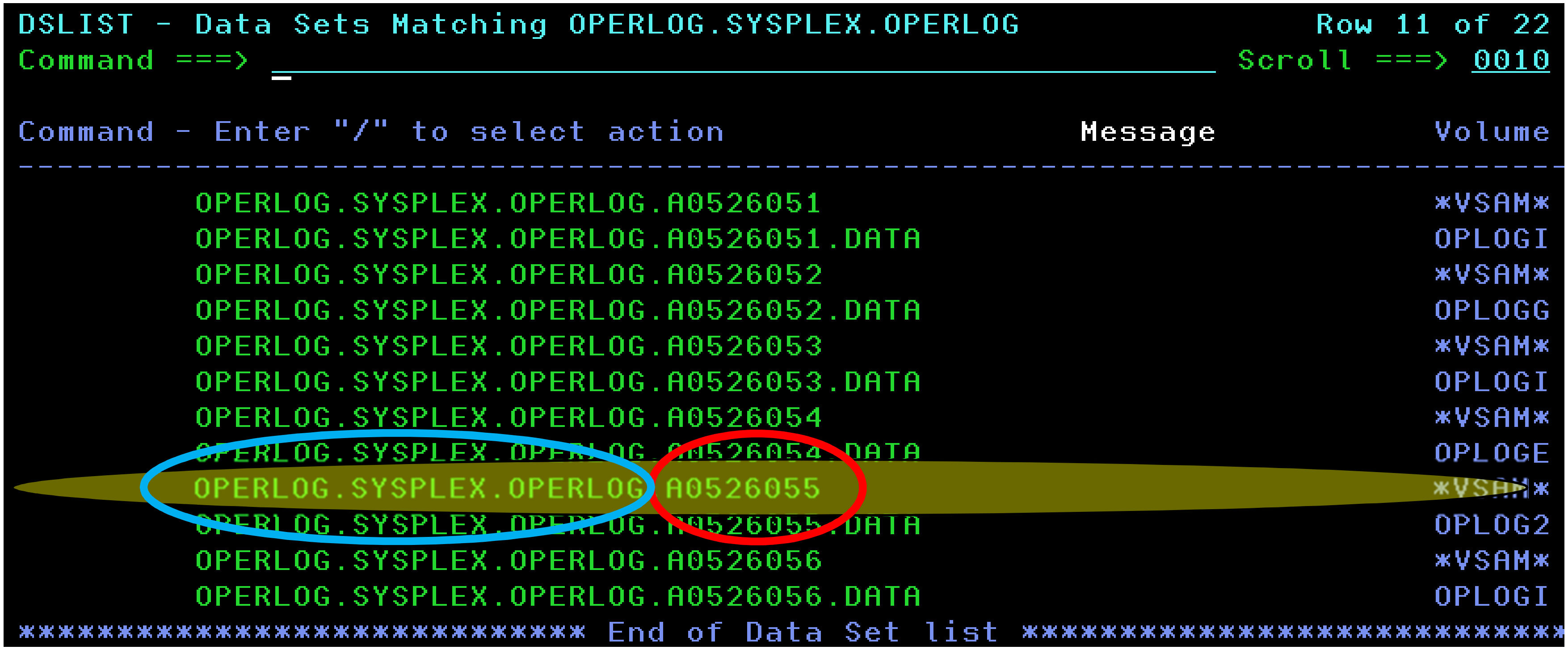
- “OFFLOAD DSN FORMAT”  use this to know where the logstream will be offloaded.
- CURRENT is YES (this system above) has the SEQ# DSN open for offload.
- Since V2.2:  ADV-CURRENT is NO (this system above) does not have the first advanced-current offload data set open for offload processing.



```
OFFLOAD DSN FORMAT: IXGLOGR.IFASMF.SMFDFLT.CB89.<SEQ#>
  CURRENT DSN OPEN: YES                          SEQ#: A0000187
  ADV-CURRENT DSN OPEN: YES                      SEQ#: A0000188
```

# z/OS R13 and others:
# MVS: Digging around in D LOGGER,C

## Use case: For my one of my logstreams, more details:



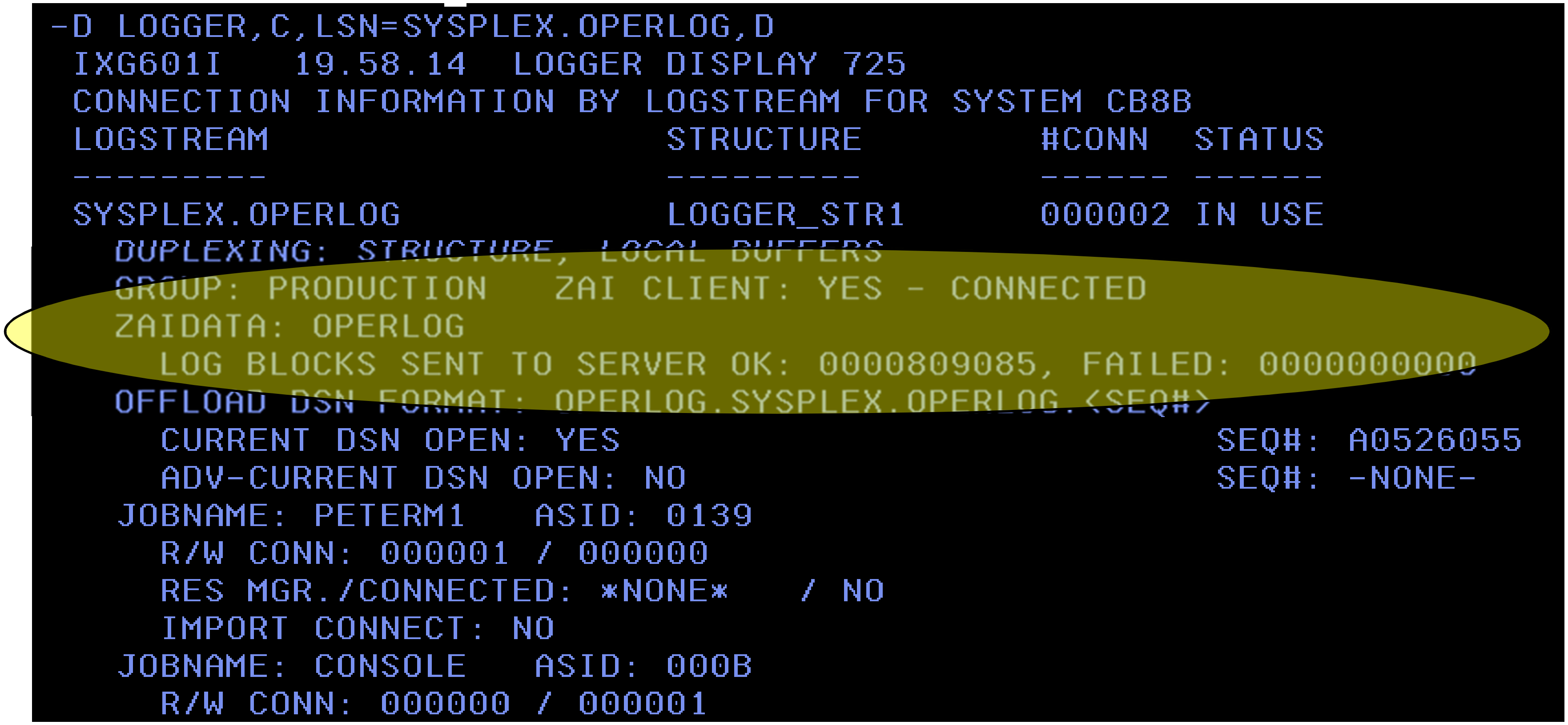
```
DSLIST - Data Sets Matching OPERLOG.SYSPLEX.OPERLOG                Row 11 of 22
Command ===> _                                                 Scroll ===> 0010

Command - Enter "/" to select action                   Message           Volume
-------------------------------------------------------------------------------
         OPERLOG.SYSPLEX.OPERLOG.A0526051                                 *VSAM*
         OPERLOG.SYSPLEX.OPERLOG.A0526051.DATA                            OPLOGI
         OPERLOG.SYSPLEX.OPERLOG.A0526052                                 *VSAM*
         OPERLOG.SYSPLEX.OPERLOG.A0526052.DATA                            OPLOGG
         OPERLOG.SYSPLEX.OPERLOG.A0526053                                 *VSAM*
         OPERLOG.SYSPLEX.OPERLOG.A0526053.DATA                            OPLOGI
         OPERLOG.SYSPLEX.OPERLOG.A0526054                                 *VSAM*
         OPERLOG.SYSPLEX.OPERLOG.A0526054.DATA                            OPLOGE
         OPERLOG.SYSPLEX.OPERLOG.A0526055                                 *VSAM*
         OPERLOG.SYSPLEX.OPERLOG.A0526055.DATA                            OPLOG2
         OPERLOG.SYSPLEX.OPERLOG.A0526056                                 *VSAM*
         OPERLOG.SYSPLEX.OPERLOG.A0526056.DATA                            OPLOGI
***************************** End of Data Set list ****************************
```

- SEQ A0526055 is the current offload dsn.
- SEQ A0526056 is the first advanced-current offload dsn, but it’s not open (yet).

z/OS R13 and others:

## MVS: Digging around in D LOGGER,C

### Use case:  For my Operlog, more details:



```
-D LOGGER,C,LSN=SYSPLEX.OPERLOG,D
 IXG601I   19.58.14  LOGGER DISPLAY 725
 CONNECTION INFORMATION BY LOGSTREAM FOR SYSTEM CB8B
 LOGSTREAM                  STRUCTURE        #CONN  STATUS
 ---------                  ---------        ------ ------
 SYSPLEX.OPERLOG            LOGGER_STR1      000002 IN USE
   DUPLEXING: STRUCTURE, LOCAL BUFFERS
   GROUP: PRODUCTION   ZAI CLIENT: YES - CONNECTED
   ZAIDATA: OPERLOG
     LOG BLOCKS SENT TO SERVER OK: 0000809085, FAILED: 0000000000
   OFFLOAD DSN FORMAT: OPERLOG.SYSPLEX.OPERLOG.<SEQ#>
     CURRENT DSN OPEN: YES                           SEQ#: A0526055
     ADV-CURRENT DSN OPEN: NO                        SEQ#: -NONE-
   JOBNAME: PETERM1   ASID: 0139
     R/W CONN: 000001 / 000000
     RES MGR./CONNECTED: *NONE*   / NO
     IMPORT CONNECT: NO
   JOBNAME: CONSOLE   ASID: 000B
     R/W CONN: 000000 / 000001
```

- Since R13 and zEC12 for zAware (ZAI).  The “LOG BLOCKS SENT” is important to know you are actually sending information zAware.
- “FAILED” with 0’s is nice to know.

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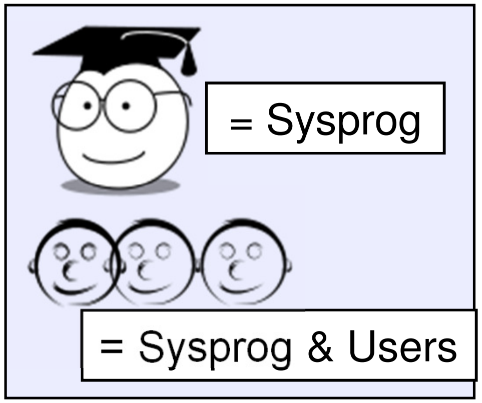
Older than the hills

# Little Enhancements

❖**ServerPac: Full System Replace vs. Software Upgrade**

❖**DFSMS: REFUCB in DEVSUPxx**



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## Older than the hills:
## **ServerPac: Full System Replace vs. Software Upgrade**

**What:** Our system-replace entitled offering, ServerPac, has two methods for what you want restored. You must pick one:

1.Full System Replace: everything you need to IPL a complete new image: *system software* (target, dlibs, CSIs), and *operational data sets* (master cat, page data, spool, …)

1.Software Upgrade: only the *system software .* You provide your own operational data sets.

**Consideration:** You can restart your ServerPac if you pick the undesired one, and start from “I”nstallation again, not “R”eceive.

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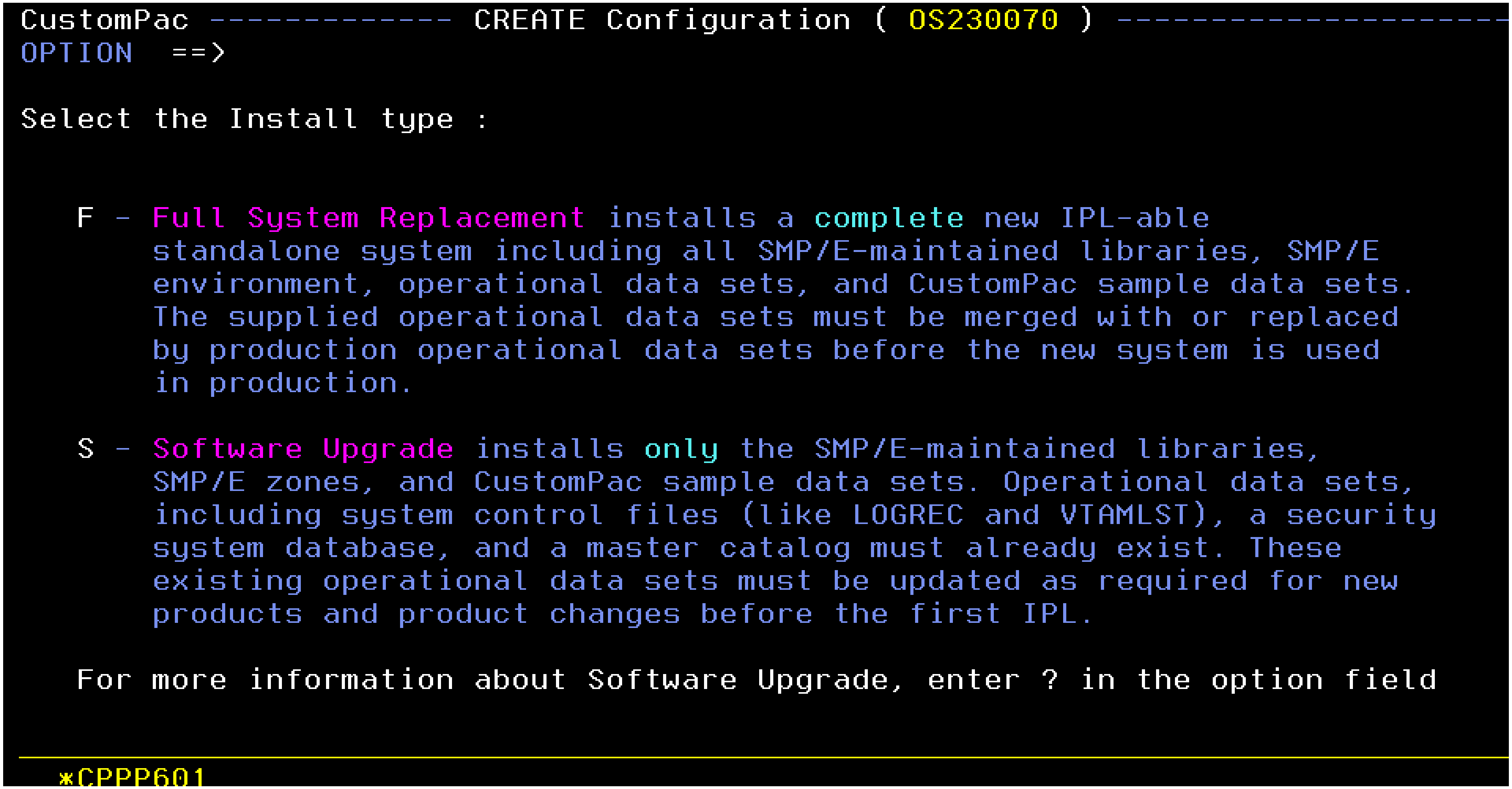
# Older than the hills:

## **ServerPac:** Full System Replace vs. Software Upgrade



```
CustomPac -------------- CREATE Configuration ( OS230070 ) ---------------------
OPTION  ==>

Select the Install type :


   F - Full System Replacement installs a complete new IPL-able
       standalone system including all SMP/E-maintained libraries, SMP/E
       environment, operational data sets, and CustomPac sample data sets.
       The supplied operational data sets must be merged with or replaced
       by production operational data sets before the new system is used
       in production.

   S - Software Upgrade installs only the SMP/E-maintained libraries,
       SMP/E zones, and CustomPac sample data sets. Operational data sets,
       including system control files (like LOGREC and VTAMLST), a security
       system database, and a master catalog must already exist. These
       existing operational data sets must be updated as required for new
       products and product changes before the first IPL.

   For more information about Software Upgrade, enter ? in the option field


  *CPPP601
```

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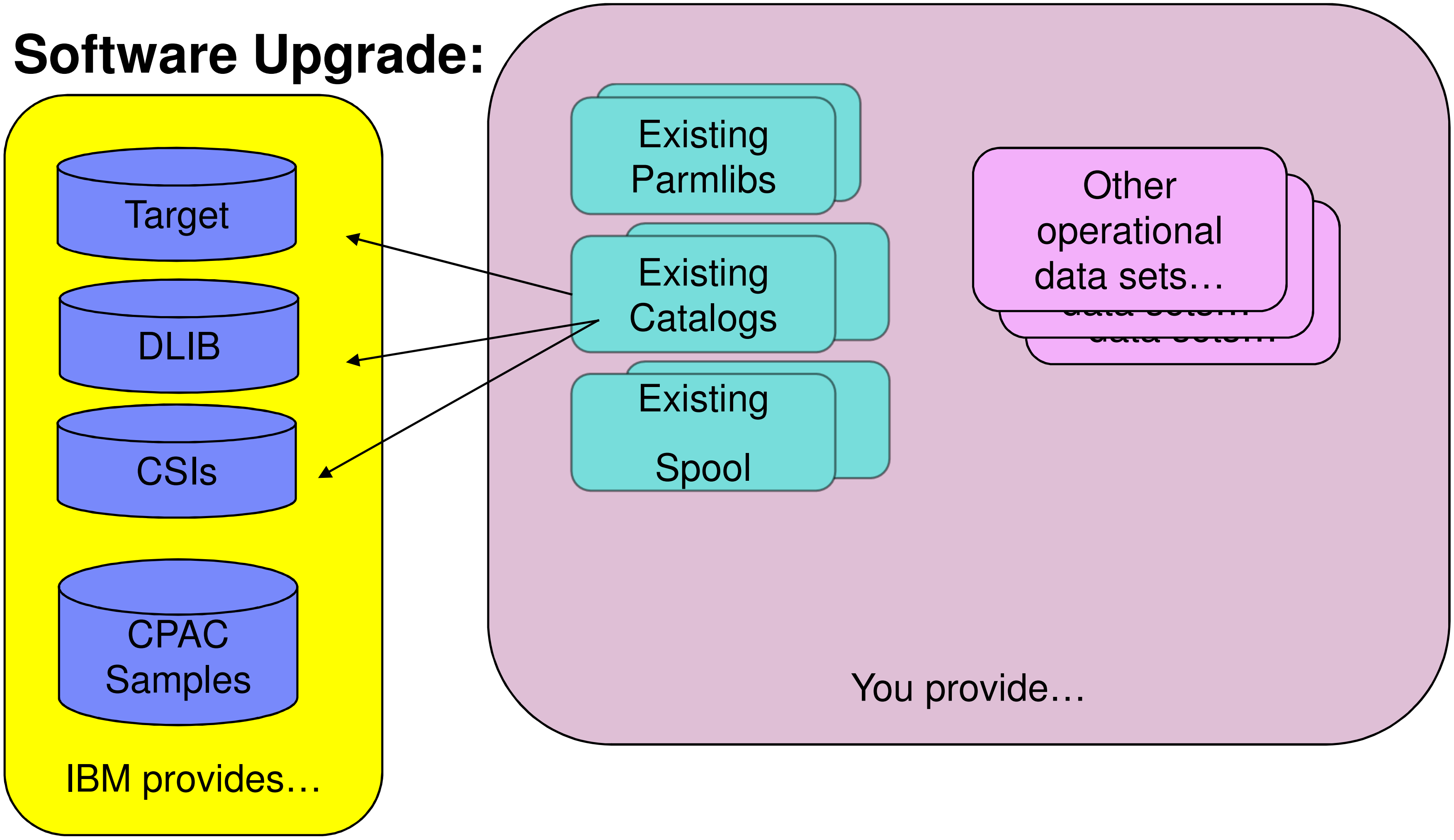
# Older than the hills:

## ServerPac: Full System Replace vs. Software Upgrade

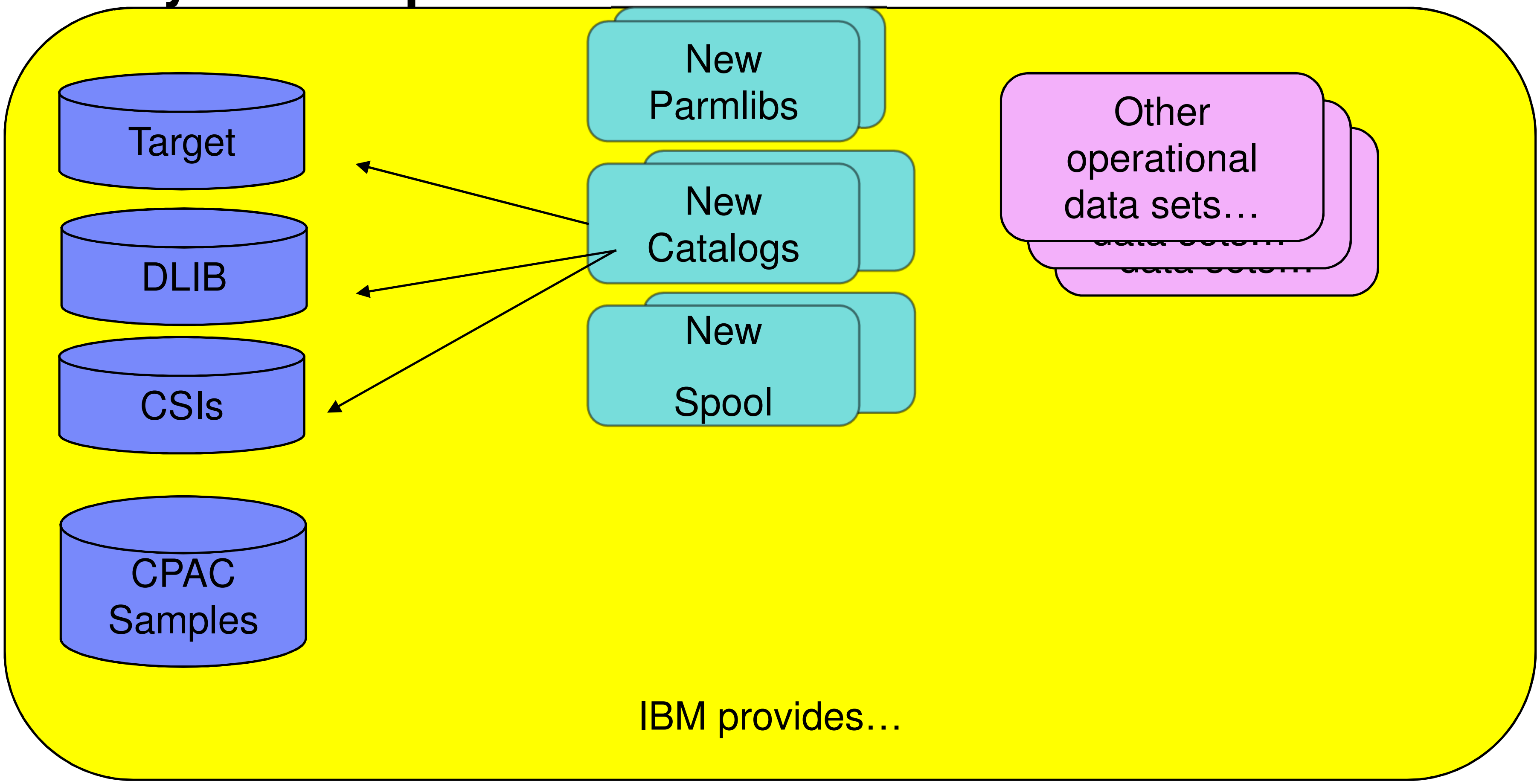
### Software Upgrade:



# Older than the hills:

# ServerPac: Full System Replace vs. Software Upgrade

## Full System Replace:



Target

DLIB

CSIs

CPAC Samples

New Parmlibs

New Catalogs

New Spool

Other operational data sets…

IBM provides…

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Older than the hills:

# **ServerPac: Full System Replace vs. Software Upgrade**

## Software Upgrade

- Only gives you the minimum of what you need (SMP/E installed products, a small number of customized samples). Uses less space.
- You are responsible for making sure your operation data sets are compatible with the new software.
- Uses your existing catalog(s), which means incoming data sets need to be integrated into your catalog structure. VERIFY job can take some time coordinate.

## Full System Replace

- Often gives you operational data sets you discard. If you need an entirely new environment, this is a good choice. Takes more space.
- Provided operational data sets will work with the new software.
- New, empty, and clean catalogs. Easy to catalog all incoming data sets.

Both options can base on a saved configuration when installing the new software, which is a huge time saver after you have a good saved configuration!

# Older than the hills:

## DFSMSdfp:  REFUCB in DEVSUPxx

**What:** You can change the VTOC location or the volser, such as after an `INIT`, `REFORMAT`, `COPY` or `RESTORE`.

- However, before the volume can be accessed on another system, the UCBs on the remote system have to be refreshed.
- You can do this UCB refresh *automatically* via `DEVSUPxx`'s `REFUCB`.
  - This function helps to maintain  VTOC integrity with shared DASD.

**How:**

- Try it out with `F DEVMAN,ENABLE(REFUCB)`
- Code it in `DEVSUPxx` with `ENABLE(REFUCB)`
- See what you have with `F DEVMAN,REPORT`

**Consideration:**

- All systems in the sysplex should have REFUCB enabled.
- If DEVMAN doesn't do the REFUCB, you will need to manually do the vary offline and online again, *on every system in the sysplex.*
- Default for DEVSUPxx REFUCB until V2.2 was DISABLE(REFUCB).  As of z/OS V2.2, it is ENABLE(REFUCB).
- IBM Health Check for z/OS `DMO_REFUCB` reminds you kindly to enable.

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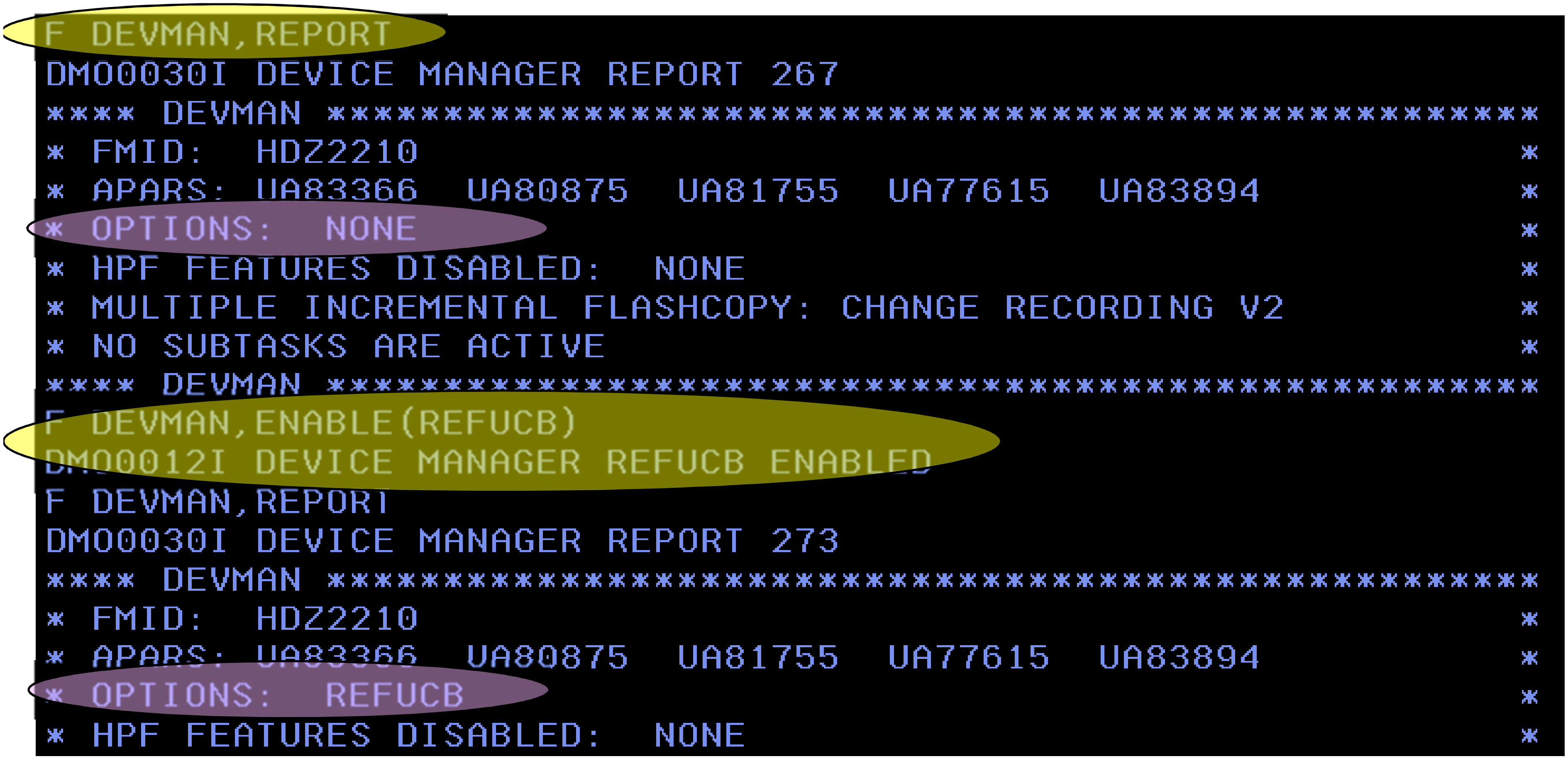
## Older than the hills:
## **DFSMSdfp:** REFUCB in DEVSUPxx

### Dynamically, on my z/OS V2.1 system:



```
F DEVMAN,REPORT
DM00030I DEVICE MANAGER REPORT 267
**** DEVMAN *****************************************************
* FMID:   HDZ2210                                               *
* APARS:  UA83366  UA80875  UA81755  UA77615  UA83894           *
* OPTIONS:  NONE                                                *
* HPF FEATURES DISABLED:  NONE                                  *
* MULTIPLE INCREMENTAL FLASHCOPY: CHANGE RECORDING V2           *
* NO SUBTASKS ARE ACTIVE                                        *
**** DEVMAN *****************************************************
F DEVMAN,ENABLE(REFUCB)
DM00012I DEVICE MANAGER REFUCB ENABLED
F DEVMAN,REPORT
DM00030I DEVICE MANAGER REPORT 273
**** DEVMAN *****************************************************
* FMID:   HDZ2210                                               *
* APARS:  UA83366  UA80875  UA81755  UA77615  UA83894           *
* OPTIONS:  REFUCB                                              *
* HPF FEATURES DISABLED:  NONE                                  *
```

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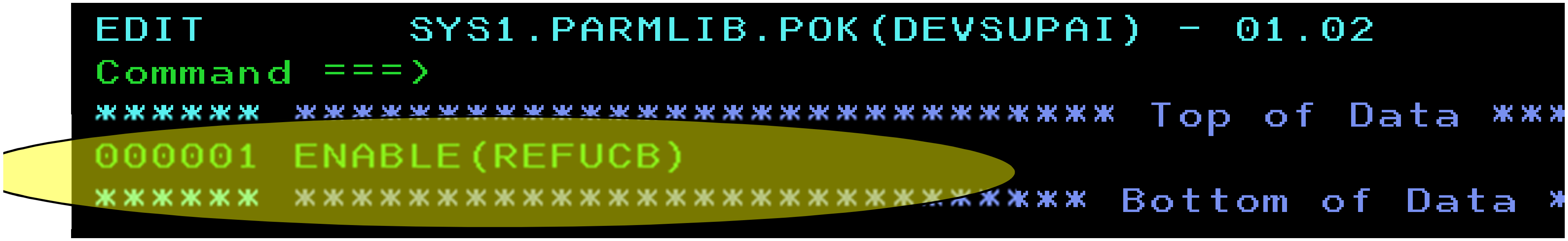
Older than the hills:

# DFSMSdfp: REFUCB in DEVSUPxx

## Hardened, on my z/OS V2.1 system:



```
EDIT        SYS1.PARMLIB.POK(DEVSUPAI) - 01.02
Command ===>
****** ***************************** Top of Data ***
000001 ENABLE(REFUCB)
****** **************************** Bottom of Data *
```

Remember: As of z/OS V2.2, you can remove this, as ENABLE is the default.

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# Summary of What We Might Want to Share:

- ***System Programmer & User Items*:**
  - z/OS UNIX (V2.2): TRNG for /dev/random
  - z/OS UNIX (V2.2): zlsof and jsonprint
  - SDSF (V2.2): snapshot

- ***System Programmers' Items*:**
  - RACF (V2.3): IRRPRMxx
  - z/OS UNIX (V2.3): BPXWMIGF facility
  - PROGxx (V2.2): LPA Volser
  - Dynamic APF (V2.2): SMF 90-37
  - DFSMSdfp and ICKDSF (V2.1): Protection for initializing non-empty volumes
  - DFSMSdss (V2.1): Renaming of VSAM physical data sets
  - MVS (R13+): Digging around in D LOGGER,C
  - ServerPac: Full System Replace vs. Software Upgrade
  - DFSMS: REFUCB in DEVSUPxx

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# *z/OS Summary Enhancements – Edition 2018B*

- z/OS V2.3:
  - ✓ RACF: **IRRPRMxx** Parmlib that specifies dsn and range tables.
  - ✓ z/OS UNIX: **BPXWMIGF facility** Your solution if appl avail is critical.
- z/OS V2.2:
  - ✓ z/OS UNIX: **TRNG for /dev/(u)randow** helps with simplificiation
  - ✓ z/OS UNIX: **updates to zlsof, and adding jsonprint** see more and use with programs
  - ✓ SDSF: **snapshot** on tabular panels, find information fast
  - ✓ PROGxx: **LPA Volser** lets you identify the containing data set with volser!
  - ✓ Dynamic APF: **SMF 90-37** upon post-IPL APF update
- z/OS V2.1:
  - ✓ DFSMSdfp and ICKDSF: **Protection for initializing non-empty volumes** Helpful.
  - ✓ DFSMSdss: **Renaming of VSAM physical data sets** Great rename ability now.
- z/OS R13+
  - MVS: **D LOGGER,C** Handy information, and shows newer Logger functions well
- Older than the hills:
  - ✓ ServerPac: **Full System Replace vs. Software Upgrade** Pick the better one for you.
  - ✓ DFSMS: **REFUCB in DEVSUPxx (was in R13)** Let z/OS do this for you automatically!

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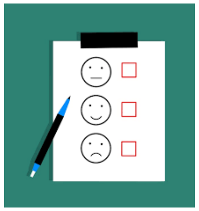
# We want your feedback!

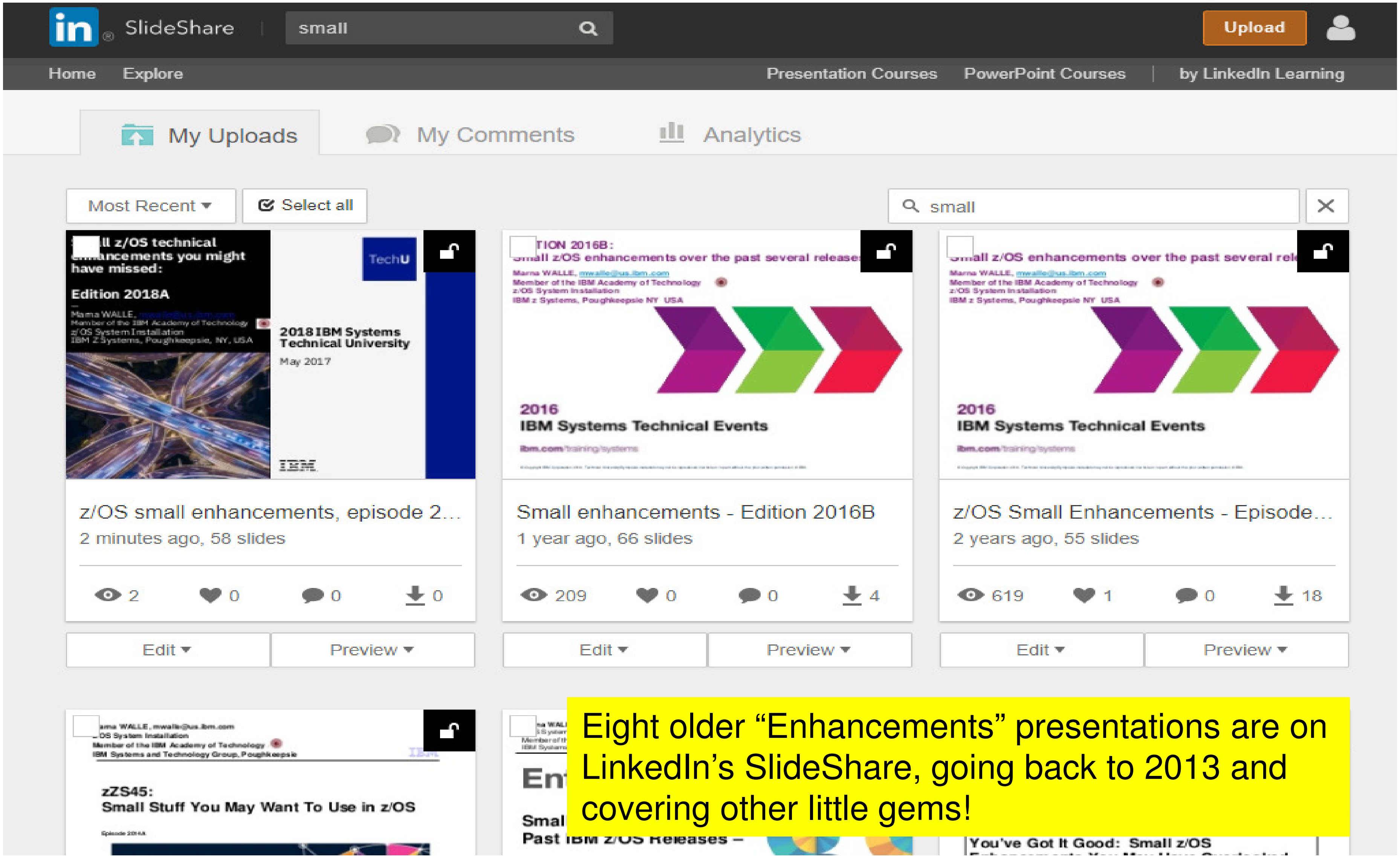
- Please submit your feedback online at ….
  - ➢http://conferences.gse.org.uk/2018/feedback/BM

- Paper feedback forms are also available from the Chair person

- This session is BM



# *z/OS Little Enhancements - A history*



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…ll z/OS technical enhancements you might have missed:
Edition 2018A
2018 IBM Systems Technical University
May 2017
TechU
…TION 2016B:
…mall z/OS enhancements over the past several release…
2016
IBM Systems Technical Events
zZS45:
Small Stuff You May Want To Use in z/OS
Past IBM z/OS Releases –
You've Got It Good: Small z/OS

Eight older "Enhancements" presentations are on LinkedIn's SlideShare, going back to 2013 and covering other little gems!

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