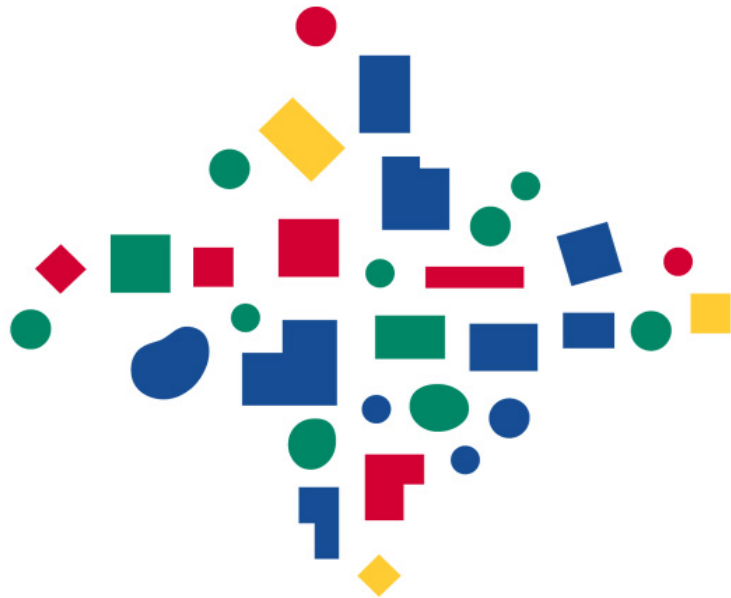

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PDS/E - Partitioned Data Set Extended

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GSE z/OS Working Group - Huizingen – 8th of June 2005

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1 - Introduction
2 - History
3 - PDS/E concepts/structure
4 - PDSE management
5 - Sharing/Serialization
6 - Performance
7 - Problem determination
8 - APAR overview
9 - Questions and Answers
10- Additional information

1 - Introduction

- Presentation based on REDBOOK SG24-6106-01
- Why this presentation ?
  - PDS/E for years now a troublesome topic
  - Hesitation to use it
  - More and more software products are delivering software in PDS/E format (C++, JAVA in USS)
  - More and more software products are using PDS/E for managing data
- Not in the scope of this presentation :
  - Allocation of PDSE (JCL, TSO, …)
  - Copy/Backup/Recovery through IEBCOPY, ADRDSSU, and so on

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2 - History

- **DFP 3.2 - PDS/E is born**
  - unlimited directory space, 123 extents, no compression necessary
- **DFSMS 1.1 - Extended sharing Program Objects**
  - PDS/E - program objects
  - PDS - loadmodules
- **DFSMS 1.4 - support for non-SMS datasets**
  - makes it easier to be used for system software
  - PDS/E in linklist
- **z/OS V1R3 - SMSPDSE (non-restartable address space)**
  - solve some ECSA problems in the past
  - for global connections such as handling PDS/E from linklist
  - SMXC and SYSBMAS still doing major PDSE processing
- **z/OS V1R6 - SMSPDSE1 restartable address space**
  - for non-global connections

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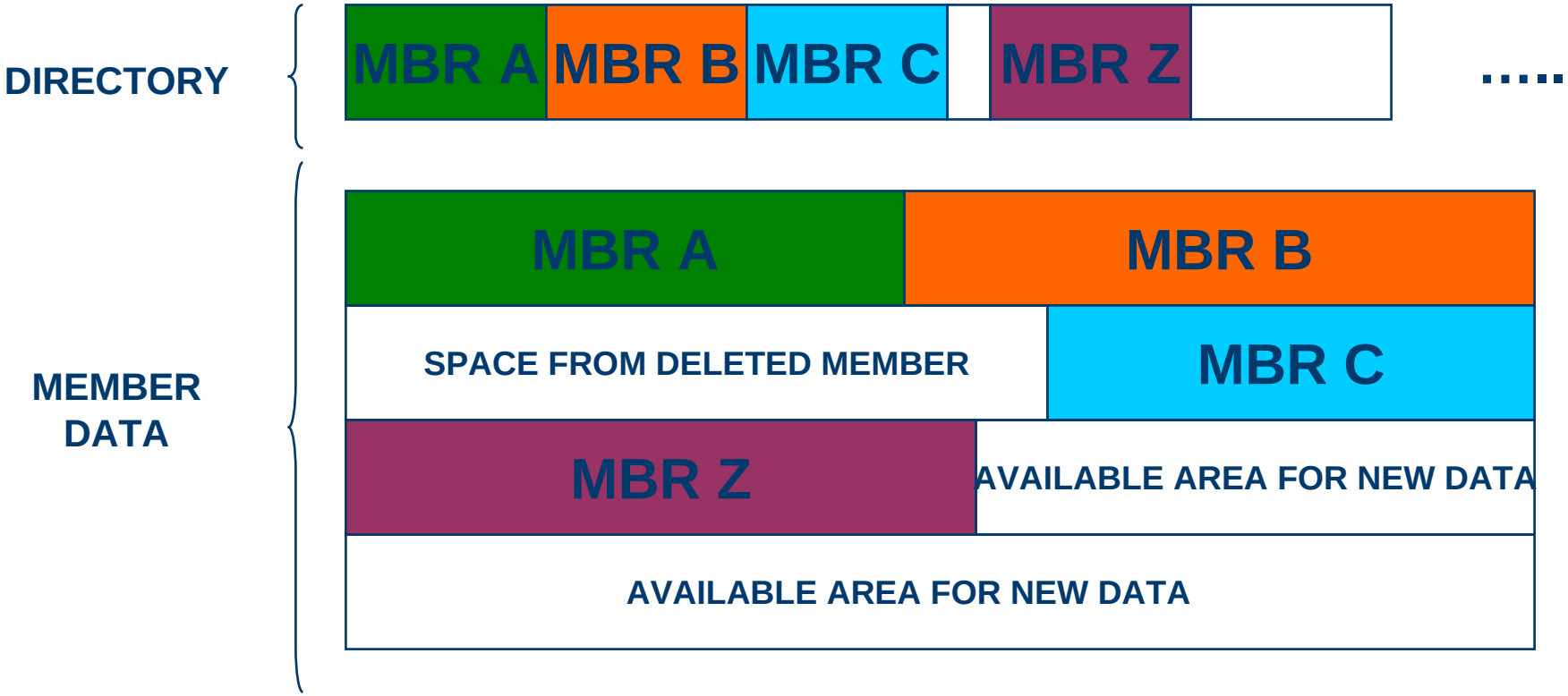
3 - PDS/E concepts/structure

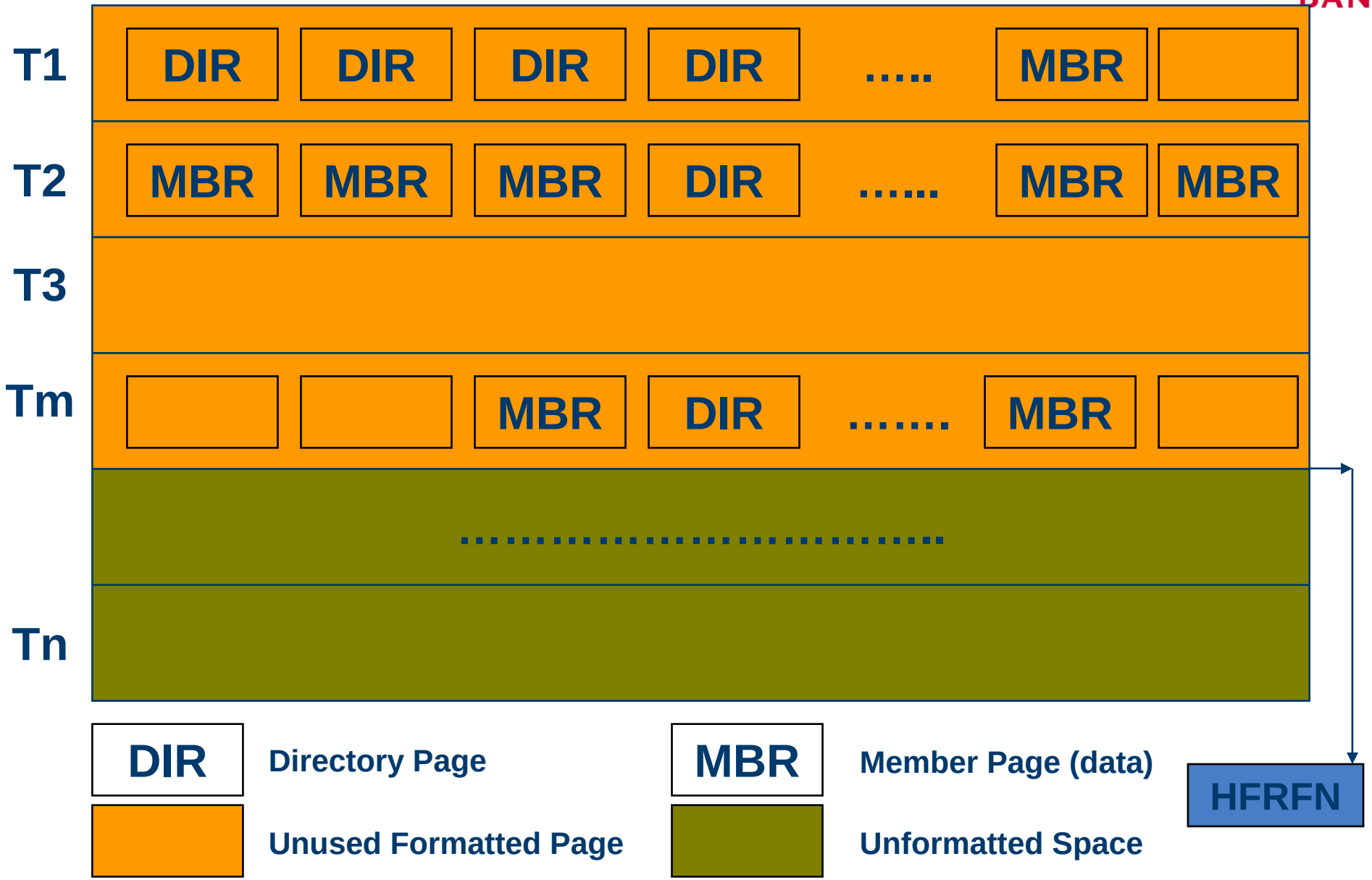
3.1 PDS structure



3.1 PDS structure (continued)

- **Directory characteristics (depending on type)**
  - Blocks of 256 bytes
  - Fixed size at allocation time
  - Membername, alias, TTR, member size, note list, module attributes, ..
- **Member data**
  - Space for individual members
  - Space from deleted or moved members not reused until compression

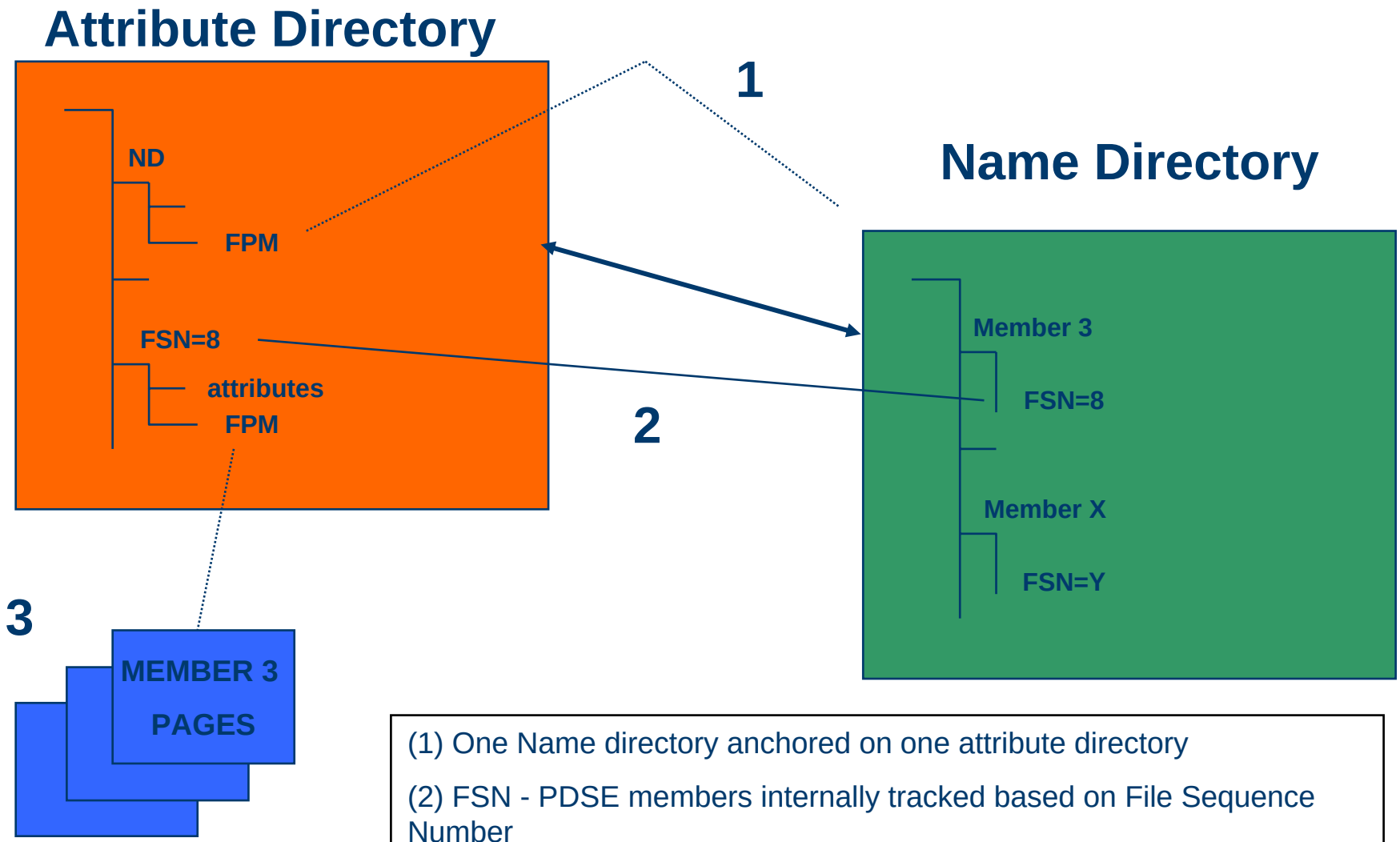
3.2 PDSE structure



3.2 PDSE structure (continued)

- **Characteristics**
  - 12 pages (4K) fit into one 3390-track
  - directory blocks added dynamically as number of members increase
  - unformatted space is dynamically formatted if needed
  - space from deleted members and freed directory pages dynamically reused
  - Number of formatted pages is stored in PDS/E dataset (HFRFN - High Formatted Relative Frame Number)

3.2 PDSE structure (directory pages)



(1) One Name directory anchored on one attribute directory

(2) FSN - PDSE members internally tracked based on File Sequence Number

(3) FPM – Fragment Parcel Map - connections to pages of member

3.2 PDSE structure (continued)
Index structure

- Attribute directory (B-tree) containing attribute information (creation date, last change date, size, …) about PDSE and its members
- Name directory (B-tree) provides connections between the members and the FSN (File sequence number)
- When directory pages (AD or ND) become full lower level pages are created
- Data pages contain the data of the individual members (data or program objects)
- Index search based on MLT (member location token) = not relative track address as for PDS but alias
  - X’000001’ -> to the directory
  - X’000002’ – X’07FFFF’ -> first record each member
  - X’100001’ – X’FFFFFF’ -> records within member

3.3 PDS versus PDS/E

	PDS	PDS/E
Space utilization	▪ Waste of Space ▪ No reuse	Reuse of space from deleted or moved members
Number of Tracks	Max. 65K tracks	> 65K tracks (limited 1 volume)
Directory Size	Fixed at allocation time	▪ Expandable (dynamic) ▪ Max. 522.236 members
Integrity	▪ Overwite directory (DCB) ▪ Only 1 member in output (overlay)	
Directory Search Time	▪ Inserts can take a long time (alaphabetic order on membername) ▪ High search time for large PDS datasets ▪ Device dependant (addressing structure closely related to physical DASD structure)	Index based
Sharing	Update needs exclusive control	Shared, simultaneous update
No of extents	16	123
Max. arch. Size	Limitted to no of tracks	16 Tb
Size of member	No limit	15.728.639 records

3.4 When to use PDS or PDS/E ?

- **PDS**
  - When using note lists (e.g. IMS ACBLIB)
  - Datasets used in MASTER JCL such as SYS1.LPALIB, SYS1.NUCLEUS, SYS1.SVCLIB, SYS1.PARMLIB
  - Debuggers that read loadmodules directly from PDS cannot do the same with PDSE
  - Very large PDSE used in ISPF can cause delays at OPEN because directory pages are not in storage
  - EXCP, EXCPVR and XDAP access methods do not support PDSE
- **PDSE**
  - If frequent compression is needed
  - If out of space abends often occurs
  - If large partitioned datasets are used (sequential versus indexed search)
  - Dataset (members) to be shared for output across multiple systems

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4 - PDSE Management

4.1 - PARMLIB definitions
4.2 - Address Spaces
4.3 - LPA
4.4 - SMS considerations
4.5 - Load Modules versus Program Objects

4.1 - PARMLIB definitions

- **Definitions in IGDSMSxx member**
  - **DSNTYPE(PDS|PDSE|HFS)**
    Default type at dataset allocation
  - **PDSESHARING(EXTENDED|NORMAL)**
    Normal = dataset level sharing
    Extended = member level sharing
  - **PDSE_RESTARTABLE(YES|NO)**
    Start (YES) SMSPDSE1 address space
  - **PDSE_LRUCYCLES(nnn|240)**
    PDSE1_LRUCYCLES(nnn|240))
    Max. no of times the BMF LRU routine allows unused buffers to remain unavailable for reuse
  - **PDSE_BMFTIME(nnn|15)**
    PDSE1_BMFTIME(nnn|15)
    Interval seconds for writing SMF type 42 (BMF statistics)

4.1 - PARMLIB definitions

- **Definitions in IGDSMSxx member**
  - **PDSE_LRUTIME(nnn|15)**
    PDSE1_LRUTIME(nnn|15)
    Number of seconds between each run of the BMF LRU routine
  - **PDSE_MONITOR(NO|YES[,interval|60[,duration|15]])**
    PDSE1_MONITOR(NO|YES[,interval|60[,duration|15]])
    Use (YES) the monitoring of PDSE (!V SMS, PDSE, ANALYSIS)
  - **PDSE_HSP_SIZE(nnn|256)**
    PDSE1_HSP_SIZE(nnn|256)
    Determine the size (MB) of hiperspace SYSBMFHS
    (0 do not use hiperspaces)

D SMS,OPTIONS

```
IGD002I 07:44:26 DISPLAY SMS 925
ACDS     = S1.PR.DC.PLXT.SMS.ACDS.CX
COMMDS   = S1.PR.DC.PLXT.SMS.COMMDS.CX
INTERVAL = 15              DINTERVAL = 150
SMF_TIME = YES             CACHETIME = 3600
CF_TIME = 3600             PDSE_RESTARTABLE_AS = YES
PDSE_BMFTIME = 3600        PDSE1_BMFTIME = 3600
PDSE_LRUTIME = 15          PDSE1_LRUTIME = 15
PDSE_LRUCYCLES = 240       PDSE1_LRUCYCLES = 240
LOCAL_DEADLOCK = 15        GLOBAL_DEADLOCK = 4
REVERIFY = NO              DSNTYPE = PDS
ACSDEFAULTS = NO           PDSESHARING = EXTENDED
OVRD_EXPDT = NO            SYSTEMS = 8
PDSE_HSP_SIZE = 256MB      PDSE1_HSP_SIZE   = 256MB
USE_RESOWNER = YES         RLS_MAX_POOL_SIZE = 100MB
RLSINIT = YES              RLSTMOUT = 0
Rls_MaxCfFeatureLevel = Z
…..
```

D SMS,OPTIONS (continued)

```
PDSE_MONITOR = (YES,0,0)  PDSE1_MONITOR = (YES,0,0)
DSSTIMEOUT = 0
GDS_RECLAIM = YES
IGD002I 07:44:26 DISPLAY SMS
TRACE    = OFF    SIZE = 128K     TYPE = ERROR
  JOBNAME = *    ASID = *
  TRACING EVENTS:
    MODULE = ON   SMSSJF = ON   SMSSSI = ON   ACSINT = ON
    OPCMD  = ON   CONFC  = ON   CDSC   = ON   CONFS  = ON
    MSG    = ON   ERR    = ON   CONFR  = ON   CONFA  = ON
    ACSPRO = ON   IDAX   = ON   DISP   = ON   CATG   = ON
    VOLREF = ON   SCHEDP = ON   SCHEDS = ON   VTOCL  = ON
    VTOCD  = ON   VTOCR  = ON   VTOCC  = ON   VTOCA  = ON
    RCD    = ON   DCF    = ON   DPN    = ON   TVR    = ON
    DSTACK = ON   UAFF   = ON
```

4.2 – Address Spaces

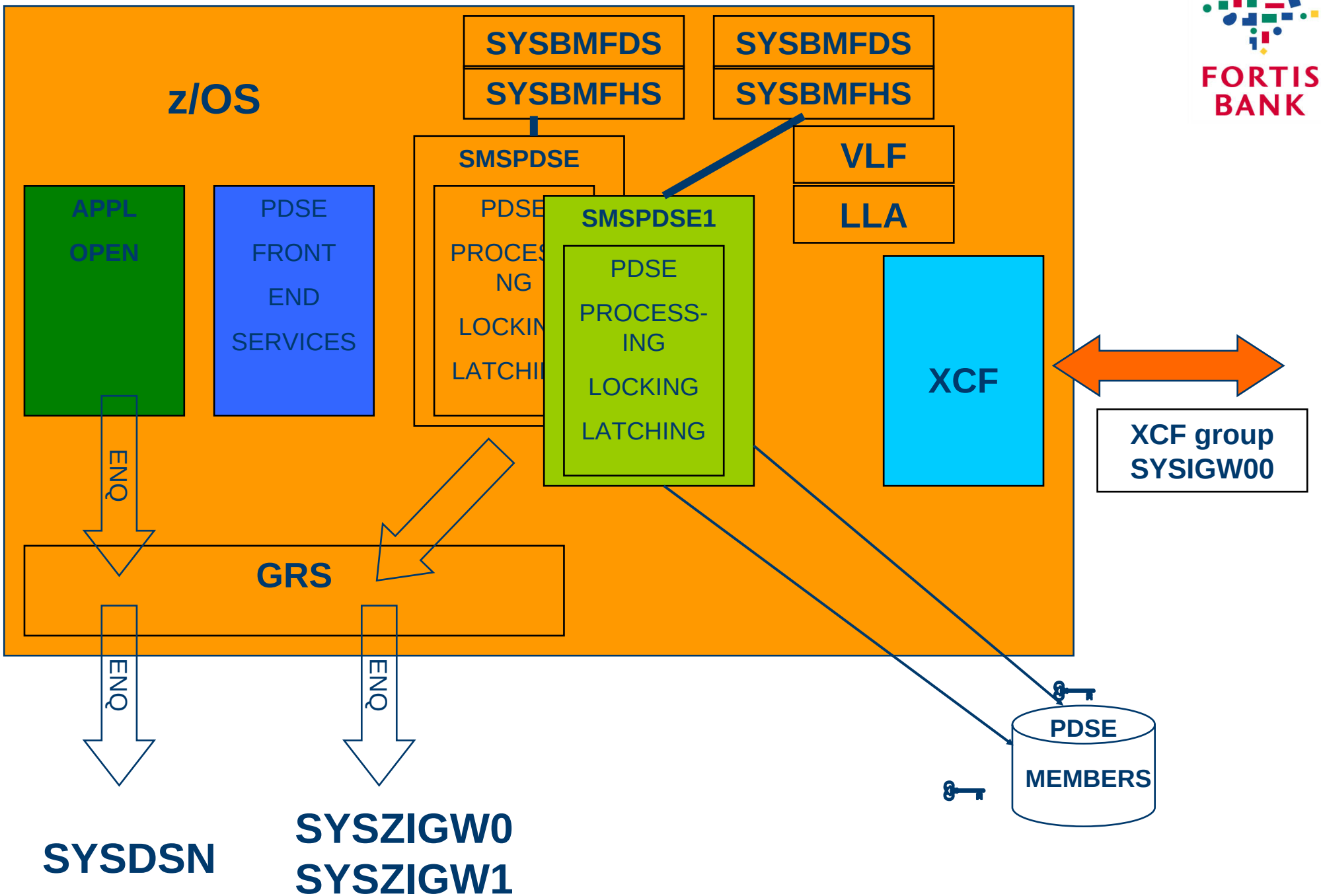
- SMSPDSE system address space
  - Non-restartable address space
  - Manage global connections especially for PDSE in LINKLIST concatenation
- SMSPDSE1 system address space
  - Started if PDSESHARING(EXTENDED) and PDSE_RESTARTABLE_AS(YES)
  - Manage non-global connections
  - At RESTART asid lost and some MB of ECSA

4.2 – Address Spaces

D A,SMSPDSE and D A,SMSPDSE1

```
IEE115I 15.39.15 2005.133 ACTIVITY 614
 JOBS     M/S    TS USERS    SYSAS    INITS   ACTIVE/MAX VTAM     OAS
00006    00111    00003      00049    00029    00003/00032       00058
 SMSPDSE  SMSPDSE           NSW  *   A=0008   PER=NO   SMC=000
                                     PGN=N/A  DMN=N/A  AFF=NONE
                                     CT=000.657S  ET=06.47.20
                                     WKL=SYSTEM   SCL=SYSTEM   P=1
                                     RGP=N/A      SRVR=NO  QSC=NO
                                     ADDR SPACE ASTE=7FB90200
                                     DSPNAME=SYSBMFDS ASTE=7F937800
                                     DSPNAME=SYSBMFHS ASTE=7F3F5000
IEE115I 15.39.42 2005.133 ACTIVITY 648
 JOBS     M/S    TS USERS    SYSAS    INITS   ACTIVE/MAX VTAM     OAS
00006    00112    00003      00049    00029    00003/00032       00058
 SMSPDSE1 SMSPDSE1          NSW  *   A=0009   PER=NO   SMC=000
                                     PGN=N/A  DMN=N/A  AFF=NONE
                                     CT=001.367S  ET=06.47.47
                                     WKL=SYSTEM   SCL=SYSTEM   P=1
                                     RGP=N/A      SRVR=NO  QSC=NO
                                     ADDR SPACE ASTE=7FB90240
                                     DSPNAME=SYSBMFDS ASTE=7F937880
                                     DSPNAME=SYSBMFHS ASTE=7F3F5080
```

PDSE – The global picture



4.3 LPA

- PDSE libraries in LPALSTxx not supported
- PDSE LPA libraries should be added by SETPROG command or through PROGxx member
- Not possible to refresh PDSE support modules after maintenance

4.4 SMS (storage class) considerations

- MSR value (milliseconds response time)
  - Performance objective for selecting candidate volumes, but also for caching PDSE members
- GSW (Garuanteed Sync. Write) value (YES|NO)
  - Return from BSAM CHECK macro before (unsynchronized) or after (synchronized) the data has been written to DASD

4.5 Load Modules versus Program Objects

- Load Modules (=linked object modules) can only be stored in PDS
- Program Objects (=enhanced loadmodules with extended capabilities) can only be stored in PDSE
- Load Module limitations
  - Max. 16 MB size
  - Length of used names limited to 8 char.
- Program Objects enhancements
  - Max. 1 GB size
  - Load of executable code needs no contiguous storage
  - Length of used names max. 1024 char.

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5 - Sharing and serialization

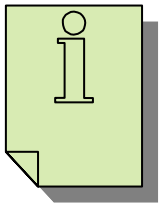
5.1 - Sharing PDS/PDSE

- Case 1 - PDS – Dataset level sharing – Single system
- Case 2 - PDSE – Dataset level sharing – Single system
- Case 3 - PDS – Member level sharing – Single system
- Case 4 - PDSE – Member level sharing – Single system
- Case 5 - PDS – Dataset level sharing – across systems
- Case 6 - PDSE – Dataset level sharing (NORMAL) – across systems
- Case 7 - PDSE – Member level sharing (EXTENDED) – across systems
- Notes :
  - Assume DISP=SHR, job 2 terminates first
  - Open OUTPUT creates a member (physically written with STOW)
  - Open UPDATE updates existing members
  - Different other possibilities depending on DISP= or used access methods like BSAM, BPAM, ….

5 – Sharing and serialization

5.1 - Sharing PDS/PDSE (case 1)

PDS – Dataset level sharing – Single system			
JOB 2 attempts PDS open in	**JOB 1 has PDS open in**		
	INPUT	**OUTPUT**	**UPDATE**
INPUT	OK	OK	OK
OUTPUT	OK	**213 – 30**	OK
UPDATE	OK	OK	OK



213-30 Error during OPEN macro processing
PDS is already open an has DCB open for output

5 – Sharing and serialization

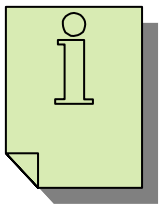
5.1 - Sharing PDS/PDSE (case 2)

PDSE – Dataset level sharing – Single system			
JOB 2 attempts PDSE open in	**JOB 1 has PDSE open in**		
	INPUT	**OUTPUT**	**UPDATE**
INPUT	OK	OK	OK
OUTPUT	OK	OK	OK
UPDATE	OK	OK	OK

5 – Sharing and serialization

5.1 - Sharing PDS/PDSE (case 3)

PDS – Member level sharing – Single system			
JOB 2 attempts PDS open in	**JOB 1 has PDS open in**		
	INPUT	**OUTPUT**	**UPDATE**
INPUT	OK	OK Member replaced by JOB 1. JOB 2 reads previous image of the data	OK JOB 2 can get inconsistent data
OUTPUT	OK Member replaced by JOB 2. JOB 1 reads previous image of the data	**213 – 30**	OK The member was replaced by the JOB 2
UPDATE	OK JOB 2 can get inconsistent data	OK Member replaced by JOB 1	**Unpredictable**

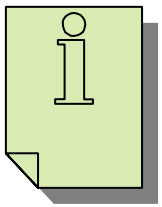


213-30 Error during OPEN macro processing
PDS is already open an has DCB open for output

5 – Sharing and serialization

5.1 - Sharing PDS/PDSE (case 4)

PDSE – Member level sharing – Single system			
JOB 2 attempts PDSE open in	**JOB 1 has PDSE open in**		
	INPUT	**OUTPUT**	**UPDATE**
INPUT	OK	OK Member replaced by JOB 1. JOB 2 reads previous image of the data	**IEC141I, RC=18**
OUTPUT	OK Member replaced by JOB 2. JOB 1 reads previous image of the data	**OK** **Member replaced by JOB1. Member from JOB 2 is lost.**	OK The member was replaced by the JOB 2. Updates from JOB 1 lost.
UPDATE	**IEC141I, RC=18**	OK Member replaced by JOB 1	**IEC141I, RC=18**



IEC141I,RC=18 Error during OPEN macro processing
dsname parameter specified a member that could not be found

5 – Sharing and serialization

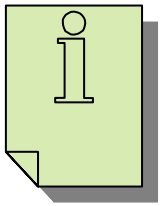
5.1 - Sharing PDS/PDSE (case 5)

PDS – Dataset level sharing – across systems			
JOB 2 attempts PDS open in	**JOB 1 has PDS open in**		
	INPUT	**OUTPUT**	**UPDATE**
INPUT	OK	OK	OK
OUTPUT	OK	**Abend**	OK
UPDATE	OK	OK	OK

5 – Sharing and serialization

5.1 - Sharing PDS/PDSE (case 6)

PDSE – Dataset level sharing (NORMAL) – across systems			
JOB 2 attempts PDSE open in	**JOB 1 has PDSE open in**		
	INPUT	**OUTPUT**	**UPDATE**
INPUT	OK	**213-70**	**213-70**
OUTPUT	**213-70**	**213-70**	**213-70**
UPDATE	**213-70**	**213-70**	**213-70**

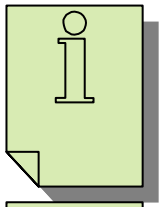


213-70 Error during OPEN macro processing
OPEN detected a cross system sharing conflict for PDSE

5 – Sharing and serialization

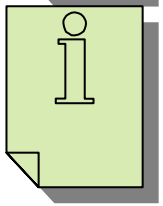
5.1 - Sharing PDS/PDSE (case 7)

PDSE – Member level sharing (EXTENDED) – across systems				
JOB 2 attempts PDSE open in	**JOB 1 has PDSE open in**			
	INPUT	**OUTPUT**	**UPDATE – not positioned to a member**	**UPDATE – positioned to a member**
INPUT	OK	OK JOB 2 reads old data, new data after last close	**OK**	**213-74**
OUTPUT	OK JOB 1 reads old data, new data after last close	**OK** **Contains data from last close**	OK	**213-74**
UPDATE	**213-70**	**213-70**	**213-70**	**213-70**



213-74 Error during OPEN macro processing

OPEN detected a member shareoption conflict for PDSE



213-70 Error during OPEN macro processing

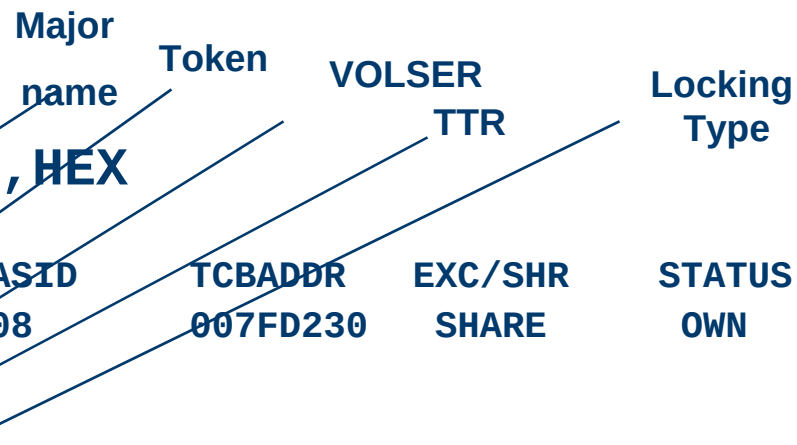
OPEN detected a cross system sharing conflict for PDSE

5 – Sharing and serialization

5.2 – Serialization

- **Mechanisms**
  - **LATCH**
    - used to maintain integrity of control blocks
    - Identify through V SMS,PDSE|PDSE1,ANALYSIS
  - **LOCKS**
    - Internal mechanism to serialize access to the PDSE internal structures
  - **ENQUEUS**
    - Major name SYSZIGW0 – open to a PDSE or a PDSE (directory) connected to a task
    - Major name SYSZIGW1 – used to negociate sharing protocols among systems in // sysplex
    - Major name SYSDSN – minor dsname

5.2 – Serialization




```
D GRS,RES=(SYSZIGW0,*),HEX
….
SYSNAME        JOBNAME          ASID     TCBADDR   EXC/SHR     STATUS
SYT1       SMSPDSE              0008     007FD230    SHARE       OWN
S=SYSTEMS SYSZIGW0 :ZZZ007 ::I
          EEEECCEF 0EEEFFF002C
          28299760 199900701B9
SYSNAME        JOBNAME          ASID     TCBADDR   EXC/SHR     STATUS
SYT1       SMSPDSE              0008     007FD230    SHARE       OWN
SYT2       SMSPDSE              0008     007FD230    SHARE       OWN
SYT2       SMSPDSE1             0009     007FD230    SHARE       OWN
SYT1       SMSPDSE1             00EC     007FD230    SHARE       OWN
S=SYSTEMS SYSZIGW0 :ZZZ007 ::I
          EEEECCEF 0EEEFFF002C
          28299760 199900702C9
SYSNAME        JOBNAME          ASID     TCBADDR   EXC/SHR     STATUS
SYT1       SMSPDSE              0008     007FD230    SHARE       OWN
SYT2       SMSPDSE              0008     007FD230    SHARE       OWN
SYT2       SMSPDSE1             0009     007FD230    SHARE       OWN
SYT1       SMSPDSE1             00EC     007FD230    SHARE       OWN
```

5.2 – Serialization

TTR in D GRS output = TTR=x'00022C'

```
 S=SYSTEMS SYSZIGW0 :ZZZ007 ::I
           EEEECCEF 0EEEFFF002C

           28299760 199900702C9
```

TT = x'0002' = 0 cylinders 2 tracks
R = x'2C'   = 44

```
1                              SYSTEMS SUPPORT UTILITIES---IEHLIST
-DATE: 2005.158  TIME: 14.44.59                                      PAGE    1
                 CONTENTS OF VTOC ON VOL ZZZ007  <THIS VOLUME IS N
0---------------DATA SET NAME---------------  SER NO  SEQNO  DATE
 SYS1.BBO.SBBOLD2                            ZZZ007      1  2004
0SMS.IND   LRECL  KEYLEN  INITIAL ALLOC  2ND ALLOC    EXTEND
     I         0           TRKS               0                    RECFM OPTCD BLKSIZE
                                                                     U      00    32760
0           EXTENTS  NO  LOW(C-H)   HIGH(C-H)                       C-H-R)  DSCB(C-H-R)
                      0   963  6      963 10                                 0   2  44
                                ----UNABLE TO CALCULATE EMPTY SPA
0
```

5.2 – Serialization

```
D GRS,RES=(SYSZIGW1,*)
ISG343I 15.01.22 GRS STATUS 533
S=SYSTEMS SYSZIGW1 CLM00002
SYSNAME        JOBNAME          ASID     TCBADDR   EXC/SHR     STATUS
SYB3       SMSPDSE              0008       007FD230   SHARE       OWN
SYB1       SMSPDSE              0008       007FD230   SHARE       OWN
SYB4       SMSPDSE              0008       007FD230   SHARE       OWN
SYB2       SMSPDSE              0008       007FD230   SHARE       OWN
```

```
D XCF,GROUP,SYSIGW00
IXC332I  15.10.46  DISPLAY XCF 358
 GROUP SYSIGW00:  IGWCLMR1SYT1      IGWCLMR1SYT2      IGWCLM01SYT1
                  IGWCLM01SYT2
```

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6 - Performance

6.1 Caching

	LLA	VLF	HSP	DATASP
PDSE-SMS PROGRAM OBJECT	YES	YES	OA08991 OA06884 With STORCLS	DIR pages when READ
PDSE-SMS DATA	NO	YES (REXX)	Member caching (MSR in STORCLS)	DIR pages when READ
PDSE-nonSMS PROGRAM OBJECT	YES	YES	NO	DIR pages when READ
PDSE-nonSMS DATA	NO	NO	NO	DIR pages when READ

6 - Performance

6.1 Caching

- **LLA (Library Lookaside)**
  - Same processing as for PDS
  - Directory pages of LLA managed PDSE libraries (those defined to LLA, e.g. CSVLLAxx) will be cached as long as they are defined to LLA
  - Directory pages of non-LLA managed PDSE libraries will only be cached during OPEN in the PDSE data space SYSBMFDS

6 - Performance

6.1 Caching

- **VLF (Virtual Lookaside Facility)**
  - Program Objects do not have to be fully loaded, but can be page by page, but then they take no advantage of VLF
  - Same processing as PDS if BINDER options FETCHOPT=(PACK,PRIME) used (load entire program object), but large program objects (up to 1 Gb) can lead to huge storage usage

6 - Performance

6.1 Caching

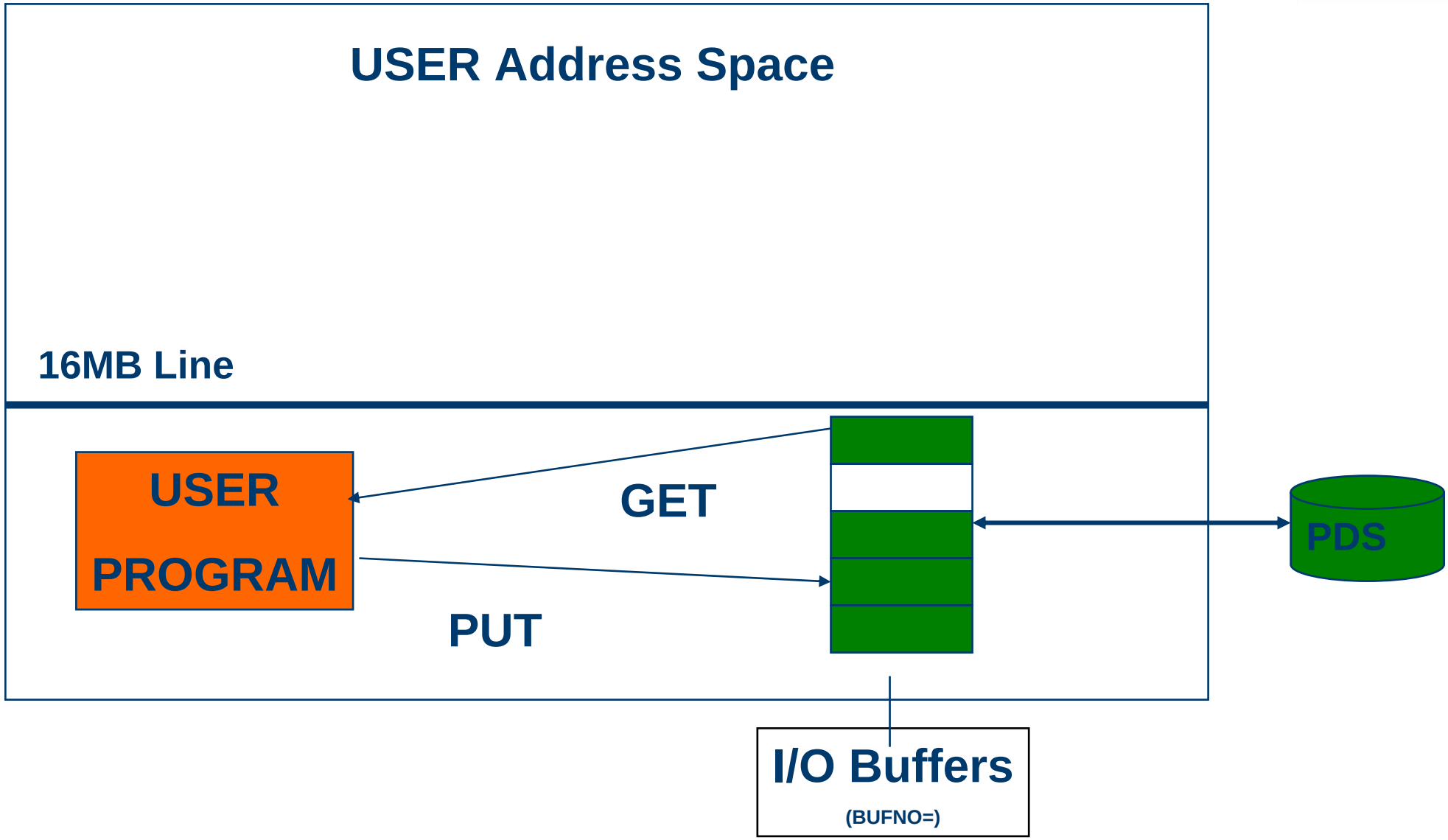
- **Data Space SYSBMFDS**
  - Directory pages are cached as they are read.
  - At open of PDSE, DFSMSdfp reads first five directory pages into the dataspace
  - Attribute and Name directories are implemented as B-tree in the dataspaces.

6 - Performance

6.1 Caching

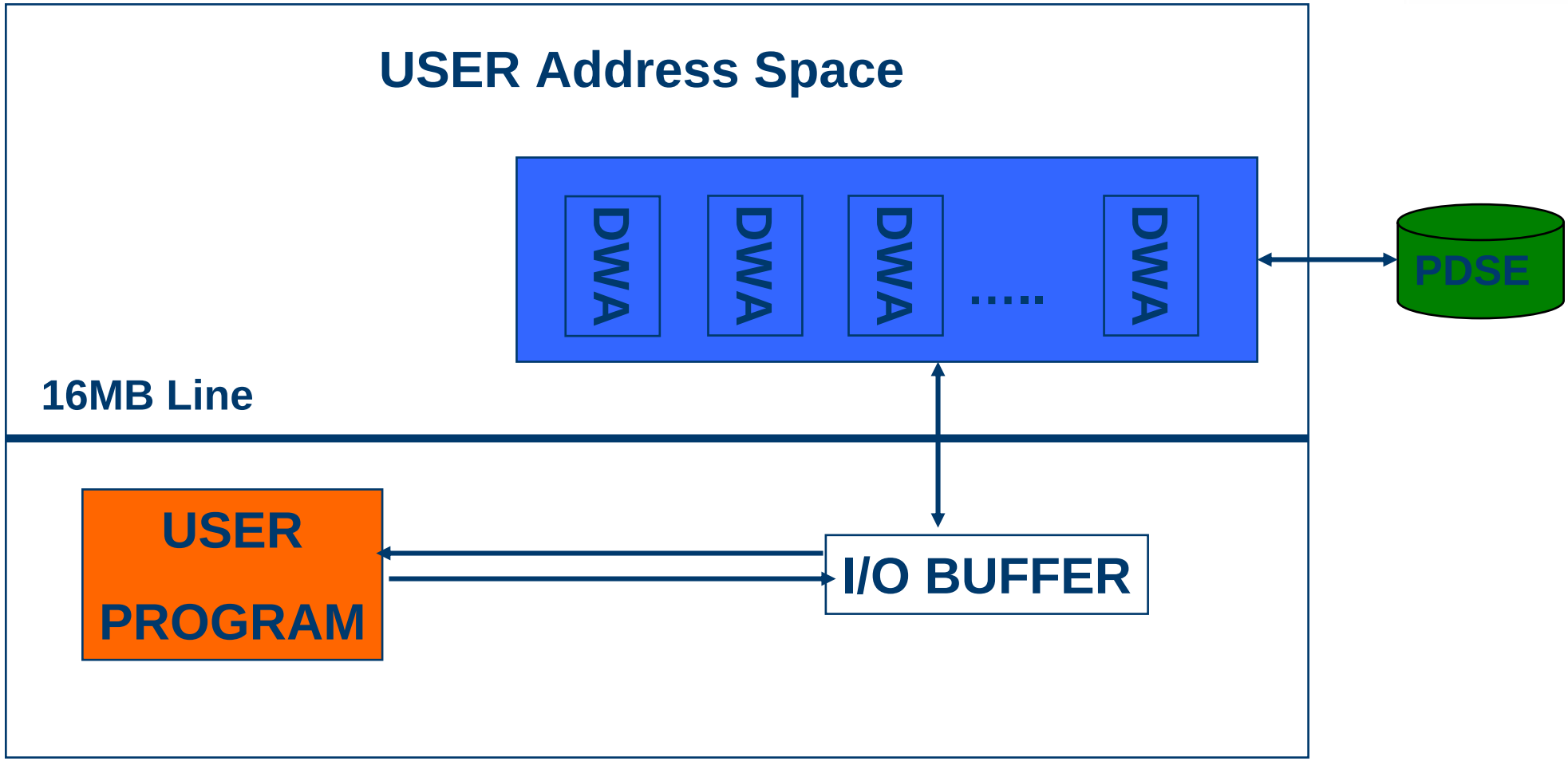
- **Hiperspace SYSBMFHS**
  - Member pages of high performance PDSE are cached in hiperspace SYSBMFHS, created at DFSMS subsystem initialization
  - DFSMSdfp BMF first looks in the shared hiperspace before doing I/O to read PDSE member page. If it is not found the member page is read from disk and stored in the hiperspace
  - BMF uses LRU (Least Recently Used) algorithm to remove the oldest pages from the Hiperspace

6 - Performance
6.2 Buffering (PDS)



6 - Performance

6.2 Buffering (PDSE)



6 - Performance

6.2 Buffering (PDSE)

- **DWA (Data Work Area)**
  - created by DFSMSdfp buffer manager
  - One DWA for each open DCB
  - Size based on MSR (Millisecond Response value in Storage Class) - objective < 999ms)
    - **LOW** (MSR = 999 ms)

      size = BLKS * BUFNO (QSAM) or NCP (BSAM)
    - **MEDIUM** (MSR < 50 ms)
      size = size DWA low +50 %
    - **HIGH** (MSR < 9 ms)
      size = size DWA low + 100%

    If non-SMS managed PDSE - **MEDIUM**

6 - Performance

6.3 Pending delete considerations

- **BLDL service makes a connection for each member and will remain till CLOSE. Member is only deleted from name directory, control blocks, data and member attributes kept in storage**
- **Detection : high % utilization (dataset information)**
- **This prevents member to be deleted physically**
- **For large PDSE unnecessary storage can be held**
- **Possible problems :**
  - storage shortage (878-80A)
  - abends x37
  - Abends PDSE (0F4)
  - PDSEs no longer accessible
  - performance impact

6 - Performance

6.3 Pending delete considerations (continued)

- Solution : BLDL with NOCONNECT option, but then application program is responsible for serialization

- Cleanup of pending delete is initiated after OPEN of PDSE

6 - Performance

6.4 Performance Monitoring

- **SMF records**
  - Type 14,15 (dataset input, output processing)
  - Type 42 (subtype 1,2 and 6) - BMF statistics !
- **RMF or other monitoring software**
  - DASD activity reports, virtual storage usage statistics
- **IDCAMS Listdata**
  - failing cache hit, extents, ..

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7 - Problem determination

- **Some definitions first**
  - **LATCH**
    serialization object to maintain integrity of the control blocks
  - **LOCK**
    Internal mechanism to serialize access to the PDSE internal structures
  - **DIB**
    CB used by PDSE processing to represent a dataset
  - **HL1B**
    CB used for the serialization
  - **XCM**
    subcomponent of PDSE used for communication with XCF
  - **VSGT**
    Token = volser+TTR (format-1 DSCB)

7. Problem determination

- **Available tools**
  - **VARY SMS,PDSE|PDSE1**

    V SMS,PDSE1,ACTIVATE[,COMMONPOOLS(NEW|REUSE)]

    V SMS,PDSE1,RESTART[,QUIESCE(n|3)
    [,COMMONPOOLS(NEW|REUSE)])

    V SMS,PDSE[1],ANALYSIS [,DSNAME(dsname)
    [,VOLSER(volser)]] [,RETRIES(n|1500)]

    V SMS,PDSE[1],FREELATCH(latchaddr,asid,tcbaddr)
    [,RETRIES(n|1500)]

    V SMS,PDSE[1],MONITOR [,ON|OFF|RESTART]
    [,interval,duration]
  - **D SMS**

    D SMS,PDSE[1],LATCH(aaaaaaaa),DETAILED|SUMMARY
    D SMS,PDSE[1],MODULE(mmmmmmmm)

7 - Problem determination

- **Available tools**

VARY SMS,PDSE|PDSE1

```
02:03:33 IGW031I PDSE ANALYSIS  Start of Report(SMSPDSE )
02:03:33 ---------data set name---------------------- -----vsgt-------
02:03:33 N2.PP.CA.PLXC.TEMPSCD$.CTMBLT$$.W0D.T5154V00 01-BLC051-003D12
02:03:33 ++ Unable to latch DIB:7F6E5240
02:03:33    Latch:7FF6E5A8 Holder(0192:007CFD40)
02:03:33    Holding Job:DTW0TRAD
02:03:33    CallingSequence:IGWDADCD IGWDBPAR IGWFARR3
02:03:33 ++ Lock GLOBAL FORMATWRITE EXCLUSIVE
02:03:33    held for at least 32 seconds
02:03:33    Hl1b:7FF6E460 HOLDER(0192:007CFD40)
02:03:33    Holding Job:DTW0TRAD
02:03:33 PDSE ANALYSIS  End of Report(SMSPDSE )
```

Latch held during OPEN (no other OPEN/CLOSE possible)

(should be very short unless waiting for another system)

Format lock (formatting unformatted space

7 - Problem determination

- **Available tools**

V SMS,PDSE1,RESTART

```
10:13:07 00EA V SMS,PDSE1,RESTART
10:13:07 000B IGW036I VARY SMS,PDSE1,RESTART COMMAND ACCEPTED.
10:13:07 000B IGW057I WAITING FOR SMSPDSE1 SHUTDOWN.
10:13:07 000B IGW055I SMSPDSE1 SHUTDOWN IN PROGRESS.
10:13:07 000B IGW999I XQUIESCE Started
10:13:07 000B IGW062I SMSPDSE1 IS QUIESCING.
10:13:11 000B IGW065I SMSPDSE1 QUIESCE COMPLETE.
10:13:12 0009 STC SMSPDSE1
10:13:12 000B IGW058I SMSPDSE1 SHUTDOWN COMPLETE.
10:13:12 000B IGW059I SMSPDSE1 IS BEING ACTIVATED.
10:13:13 000B IGW040I PDSE IGWLGEDC Connected
10:13:13 000B IGW040I PDSE Connecting to XCF for Signaling
10:13:13 000B IGW040I PDSE Connected to XCF for Signaling
10:13:13 000B IGW040I PDSE Posting initialization
10:13:13 000B IGW043I PDSE MONITOR IS ACTIVE
10:13:13 000B ++ INVOCATION INTERVAL:60 SECONDS
10:13:13 000B ++ SAMPLE DURATION:15 SECONDS
10:13:13 000B IGW061I SMSPDSE1 INITIALIZATION COMPLETE.
10:13:13 000B IGW066I SMSPDSE1 IS RECONNECTING ALL USERS.
10:13:29 0001 IEE712I VARY SMS PROCESSING COMPLETE
10:13:29 000B IGW069I SMSPDSE1 RECONNECT PHASE COMPLETE.
10:13:29 000B IGW070I SMSPDSE1 WILL RESUME ALL USER TASKS.
10:13:29 000B IGW999I XQUIESCE Stopping
10:13:29 000B IGW999I Reconnect Completed Normally
```

7 - Problem determination

- **Available tools**
  - **D GRS**
    to identify enqueus on SYSDSN, SYSZIGW0 and SYSZIGW1
  - **PHATOOL**
    inspect PDSE for internal structure integrity
  - **svcdump**, SLIP, SMF, syslog, LOGREC

7 - Problem determination

- PDSE Errors and possible diagnosis

Error	Diagnosis
0F4-rc-rsn 0C4	▪SVC dump SMSPDSE, SMSPDSE1, *MASTER* and eventual user address spaces ▪SYSLOG, LOGREC, address space SYSOUT
LATCH LOCK	▪V SMS,PDSE|PDSE1,ANALYSIS ▪SVC dump SMSPDSE, SMSPDSE1, *MASTER* and eventual user address spaces ▪SYSLOG, LOGREC, address space SYSOUT
PDSE corruption	▪SVC dump SMSPDSE, SMSPDSE1, *MASTER* and eventual user address spaces ▪DFSMSdss physical dump
Performance	▪SVC dump SMSPDSE, SMSPDSE1, *MASTER* ▪SMF recordtypes 42 (1;2;6) ▪PDSE CTRACE

7 - Problem determination

- **Checklist before restarting SMSPDSE1 in case of hang situation**

V SMS,PDSE|PDSE1,ANALYSIS	▪Identify cause ▪Take an svc dump if necessary
Try to cancel the task holding LATCH or LOCK	▪CANCEL jobname,A=Xasid
Try to free the LATCH or LOCK	▪V SMS,PDSE|PDSE1, FREELATCH(latchaddr,ASID,TCB)
Try to restart the SMSPDSE1 address space	▪V SMS,PDSE1,RESTART ▪V SMS,PDSE1, RESTART, QUIESCE(nn),COMMONPOOLS(REUSE)

7 - Problem determination

- **V SMS,PDSE1,ANALYSIS**
  - **Errors detected**
    - **Control Block Broken**
      Invalid control block was encountered
    - **H1LB latch held**
      Prevents locks for the dataset being gotten or released
    - **DIB Hash table latch held**
      Prevents open/close of a subset of PDSEs or PDSE1s
    - **Directory or Format Write Lock Held or Waiting**
      Detects that a job holds or waits for a directory write lock or format write for a long time
    - **Contention message to another system oustanding**
      Another system is failing to perform its role in sharing of PDSE across the sysplex
    - **XCM latch held**
      When this latch is not released, no cimmunication possible with XCF
    - **Latch broken**
      The data structures for a latch have been overlaid
    - …..

7 - Problem determination

- **PHATOOL (PDSE and HFS Analysis tool)**
  - Request the tool by opening IBM PMR
  - JCL

```
//*-------------------------------------------------*
//TOOLIT  EXEC PGM=IGWPIT
//STEPLIB  DD DSN=S0.SY.CA.SYSTEM.APF,DISP=SHR
//SYSPDSE  DD DISP=SHR,DSN=G.U74123.SBBOLPA.PDSE
//*SYSABEND DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
```

  - Execution Parameters
    - **EXTMAP -** shows allocation of pages in the PDSE
    - **CHECK -** verifies that physical structure is OK
    - **DUMP -** provides an hexadecimal dump

7 - Problem determination

- **PHATOOL (PDSE and HFS Analysis tool)**
  - **EXTMAP - PDSE allocation MAP**

```
IGWT001 PIT VERSION UDZ11HS 08.01 ** VOLSER = TSB510  **  DSN = G.U74123.SBBOLPA
 EXTMAP
Extent Associations:
Cyl  Head   Records:
00B2 0000   < VDF >  < BMF >  < AD >   n0000003 n0000003 < AD >   < AD >   < AD >   < AD >   < AD >   BBOCWBAL BBOCWSMP
00B2 0001   BBODASRS BBODASRS BBODASRS BBODASRS BBODASRS BBODASRS BBODASRS BBODASRS BBODASRS BBODASRP BBODASRP BBODENFL
00B2 0002   BBOGSRLP BBOGSRLP BBOGSRLP BBOGSRLP BBOGSRLP BBOGSRLP BBOGSRLP BBOOBIND BBOOBIND BBOOBIND BBOOBIND BBOOBIND
00B2 0003   BBOOBOAM BBOOBOAM BBOOBOAM BBOOENCL BBOOOPIP BBOOUBND BBOOUBND BBOOUBND BBOOSCHD BBOOSCHD BBOOSCHD BBOOSRQA
00B2 0004   BBOOTTIP BBOOTTIP BBOOTTIP BBOOTTIP BBOOWORK BBOOWORK BBOOWORK BBORADMP BBORFRR  BBORLCRM BBORLEXT BBORLEXT
00B2 0005   < AD >   < Free > BBO3SSFP < Free > BBOSSRVA BBOSSRVA BBOSSRVA BBOSSRVA BBOSSRVA BBOSSRVA BBORMCDP BBORMCDP
00B2 0006   BBORPTRC BBORRMGR BBORRMGR BBORRMGR BBORRMGR BBORSDMP BBORTSRB BBORTSS5 BBOSSACE BBOSSACE BBOSSACE BBOSSITU
00B2 0007   BBOSSITU BBOSSITU BBOSSITU BBOSSITU BBOSSITU BBOSSITU BBOSSMET BBOSSMET BBOSSRPW BBOTETCD BBOTRNX  BBOTWIDP
00B2 0008   BBOUSHQD BBO3CTXP BBO3CTXP BBO3CTXP BBO3PCBA BBO3PCBT BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD
00B2 0009   BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD
00B2 000A * BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD BBORTRCD < Free > < Free > < Free > < Free > < Free > < Free >
00B2 000B   <NOTFMT> <NOTFMT> <NOTFMT> <NOTFMT> <NOTFMT> <NOTFMT> <NOTFMT> <NOTFMT> <NOTFMT> <NOTFMT> <NOTFMT> <NOTFMT>
```

PHATOOL (PDSE and HFS Analysis tool)

DUMPT - PDSE hexadecimal dump

```
IGWT001 PIT VERSION UDZ11HS 08.01 ** VOLSER = TSB510  **  DSN = G.U74123.SBBOLPA
 DUMPT ALL

IGWT002 RPN 00000000 OF  VDF     CCHHR = 00B2000001
PAGE 0001  of VDF
0000 C9C7E6E5 C4C64040 00001000 01000000   00000000 00000000 00000000 0000002A  *IGWVDF  ........................*
0020 00000000 01E3E2C2 F5F1F000 150CC1C4   40404040 40404040 02A00600 14F00000  *.....TSB510...AD        .....0..*
0040 00000000 00000000 00000000 00000000   00000000 BD10C427 4520EE07 E2E8C2F1  *.....................¨.D.....SYB1*
0060 40404040 00000007 00000000 00010200   00000000 00010500 00000000 00010600  *    ............................*
0080 00000000 00010700 00000000 00010800   00000000 00010900 00000000 00013C00  *..............................*
00A0 00000000 00000000 00000000 00000000   00000000 00000000 00000000 00000000  *..............................*
00C0 TO NEXT LINE SAME AS ABOVE
0FE0 00000000 00000000 00000000 00000000   00000000 00000000 00000000 0000A55A  *............................v]*
 Number of AD VPT_VFNs: 00000007

VPT.VFN:  000000000001 02      00000000
VPT.VFN:  000000000001 05      00000001

……..
IGWT003 BMF HFRFN PAGE   CCHHR =  00B2000002

0000 00000083 00000000 00000000 00000000   00000000 00000000 00000000 00000000  *...c............................*
0020 00000000 00000000 00000000 00000000   00000000 00000000 00000000 00000000  *..............................*
0040 TO NEXT LINE SAME AS ABOVE
0FE0 00000000 00000000 00000000 00000000   00000000 00000000 00000000 0000A55A  *............................v]*
    High Formatted RPN: 00000083


IGWT002 RPN 00000000 OF ATTRIBUTE DIRECTORY     CCHHR = 00B2000003

0000 3401E3E2 C2F5F1F0 00150CC1 C4404040   40404040 4002A000 1814F000 00E00200  *..TSB510...AD        .....0.....*
0020 00000000 00000000 00000000 0401FFC0   0EF10F6E 00000000 00000000 00000000  *.............F..1.>............*
```

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8 - APAR overview (1)

APAR	Impact	HDZ11F0 DFSMS 1.3	HDZ11G0 DFSMS 1.4	HDZ11H0 DFSMS 1.5	HDZ11J0 DFSMS 1.6	
OA02108	P	UA02551	UA02552			STORAGE CREEP IN INITIATOR ADDRESS SPACE
OA02318	P	UA01544	UA01545			ORPHANED SP231 KEY5 STORAGE PROCESSING PDSE
OA08818	P		UA14144	UA14145	UA14146	PDSE INDEX MANAGER SERVICEABILITY ENHANCEMENT
OA10426	P				UA16502	LLA REFRESH HIGH CPU UTILIZATION DURING MEMBER DISCONNECT PROCESSING
OA04438	I/F/P	UA07194	UA07195	UA07196	UA07197	LOOP FOLLOWING DYNAMIC LNKLST UPDATE TO LNKLST SET CONTAINING A PDSE
OA01902	I/F	UA03628	UA03629			ABEND0C4 PIC11 in IGWBLMIO +B14 at HDZ11F0 base
OA08297	I/F		UA13325	UA13326	UA13327	ABENDA78-18 IN LOAD MODULE IGWFVSM0, CSECT IGWFVFRM
OA09091	I/F				UA16309	ABEND0C4 IN IGWDQINI+3416 AFTER ISSUING VARY SMS,PDSE1,RESTART
OA11390	I/F				AA11390	ABEND0F4 S0F4 RC24 RSN250A1E0C IGWFVXPL+0BEC UA14147 LEVEL
OA01566	I	UA00149	UA00120			ABEND622 FOR TSO USER RESULTS IN HANG INVOLVING A PDSE
OA02407	I	UA01540	UA01541			ABEND0C4-4 IGWDRFLC+095A UW99418 LEVEL
OA03985	I	UA04312	UA04313			HANG DUE TO SYSZTIOT ENQ CONTENTION
OA04918	I	UA06269	UA06270	UA06271		WAIT064 RC9 IGWDQTAI+02F4 UW95684 LEVEL
OA05053	I	UA06772	UA06773	UA06774		WRITING PAST END OF SYSBMFHS HIPERSPACE
OA05591	I	UA07518	UA07519	UA07520		PDSE HANG WITH 100% CPU UTILIZATION
OA06136	I	UA08555	UA08556	UA08557		STORAGE GROWTH IN SUBPOOL 255 WITH IRB CONTROL BLOCKS NOT BEING FREED. PROBLEM IS UNAFFECTED BY OA04724.
OA07808	I		UA10447	UA10448	UA10449	ABEND0F4, RC 24, RSN 1D075170 JCDM_CHECK_CPYS_FAILED DURING EOM
OA08384	I				UA13353	ABEND0C4 PIC11 IN IGWDQCRS +X'430'
OA09057	I		UA14003	UA14004	UA14005	ABEND0F4 RSN1F031236 WITH OA05320 AND OA07953

8 - APAR overview (2)

OA09057	I		UA14003	UA14004	UA14005	ABEND0F4 RSN1F031236 WITH OA05320 AND OA07953
OA09175	I				UA14182	ABEND0C4 AT IGWDRRD3+0ADA
OA09390	I				UA14935	ABEND0C4 IN IGWLGMOT+114C (HDZ11J0 BASE), RC0,RSN=00000010
OA09611	I		UA15096	UA15097	UA15098	ABEND0E0 S0E0 RC29 IGWLSCCB+28CA HDZ11G0 BASE
OA09865	I		UA15405	UA15406	UA15407	ABEND0F4 IN IGWBCRLX RSN070E0059 FOLLOWED BY MSGIGW007E SMS DEACTIVATED
OA11183	I			UA17449	UA17450	RECURRING ABEND0C4 LOOP IN IEAVTSSM, HUGE SUMLISTL, PARTIAL DUMP FLAGS IN SDRSN, ABEND0F4 IN PDSE
OA04569	F/D			UA05369		DFSMSHSM SYSROUTE OF APARS TO Z/OS V1R5
OA09662	F/D				UA14939	ABEND0F4 RC24 RSN150BC008 IN IGWBIEX1 +X'A58'
OA01701	F	UA00619	UA00620			WAIT040 AT IPL DUE TO ABEND0F4 IN IGWIITAS RSN14059C6E
OA01865	F	UA00833	UA00834			ABEND0C4 RC38 IN IEWLQRLC RUNNING Z/OS 64 BIT MODE D/T2064 ABEND0E0 RC38 IN IEWLQRLC RUNNING OS/390 2.10 IN 64 BIT MODE
OA01878	F	UA00895	UA00896			ABENDB78 WHEN IGWFVGTM ISSUES GETMAIN REQUEST
OA02564	F	UA02260	UA02261			ABEND0F4 RC24 RSN16165493 IN IGWBVLP1 X'1AA6' ACCESSING A PDSE IN Z/OS 1.4 .
OA03009	F	UA02526	UA02527			FLASHCOPY HANG WHEN COPYING PDSE
OA05026	F			UA05921		HANG IN PDSE PARTIAL RELEASE
OA07117	F	UA09831	UA09832	UA09833		ABEND0C4 IN IGWLGMSG+2504 R1H0
OA07794	F		UA11291	UA11292		IGW042A PDSE END OF MEMORY PROCESSING STALLED RESULTING FROM A DIB LATCH HANG AFTER A TASK RECEIVED S622 TERMINATION.
OA08338	F				UA12322	ABEND0C4 IGWDPRSP+296C RESTORING CONNECT TOKEN
OA08886	F	UA14007	UA14008	UA14009	UA14010	XRC HIGH CPU LOOP OR HANG WHILE ACCESSING STATE DATASET
OA09105	F		UA14936	UA14937	UA14938	ABEND073 RC08 IN IGWGVSMR +X'442'
OA09131	F		UA14917	UA14918	UA14919	ABEND0F4 RC24 RSN15060027 PDSE PIN FAILURE DUE TO RSM MISHANDLING DIRTY 64BIT VALUE .

8 - APAR overview (3)

OA09361	F		UA14753	UA14754	UA14755	ABEND0F4 RC24 RSN070A0021 IN IGWBVLP1+0516 (UA03482)
OA09372	F				UA14620	IGWBPDX1+07C8,DATE=08/27/04,ABND=0C4
OA09525	F		UA15783	UA15784	UA15785	ABEND S0F4-1D07516F FROM IGWDBAPR+1FA4 DURING EOM PROCESSING.
OA10222	F		UA15980	UA15981	UA15982	CICS/VR V3.3 ADDRESS SPACE FAILS TO COME UP AFTER IPL
OA10607	F		UA16636	UA16637	UA16638	ABEND0F4 IN IGWIMAIN+1206 (UA15414) RC24 RSN=1451A030 OCCURS WHEN TRYING TO UPDATE A PDSE.
OA10607	F		UA16636	UA16637	UA16638	ABEND0F4 IN IGWIMAIN+1206 (UA15414) RC24 RSN=1451A030 OCCURS WHEN TRYING TO UPDATE A PDSE.
OA10751	F				UA17644	ABEND0F4 S0F4 RC24 RSN250A1E0C IGWFVXPL+0C3C UA10558 LEVEL
OA01795	D	UA00771	UA00772			PDSE member count mismatch
OA04506	D	UA05670	UA05671	UA05672		ABEND0F4 RSN145AA033 IN IGWISRCH+06B6
OA04540	D			UA05007		DFSMSDSS SYSROUTE OF APARS TO Z/OS V1R5
OA04649	D	UA05966	UA05967	UA05968		ABEND0F4 IN IGWDRRRC+X'16B4',RC=00000020,RSN=1C0752 EE
OA09123	-		UA15402	UA15403	UA15404	PDSE PROGRAM OBJECT LIBRARIES NOT BEING CACHED IN HIPERSPACE
OA09226	-		UA14757	UA14758	UA14759	NO DUMP PRODUCED IF IGWBVLP1 DETECTS A BAD BARB TOKEN
OA09240	-		UA14413	UA14414	UA14415	ABEND0C4 IN IGWFVFRM+338 DURING CANCEL OF PDSE CREATE-FILE_NAMED
OA09252	-				UA15000	ABEND0C4 IN IGWFVSMR+0658 (UA12416). RECOVERY STACK FVSA POINTER IS ZERO.
OA09301	-		UA14603	UA14604	UA14605	ABEND0C4-04 IN IGWDADCD+19B8 AT UA09338
OA09310	-		UA14275	UA14276	UA14277	ABEND0C4-4 IN IGWBVRP1+086A
OA09612	-		UA14975	UA14976	UA14977	ABEND0F4 S0F4 RC24 RSN130A1212 IGWLH1AB+2850 UA06928
OA09617	-		UA15414	UA15415	UA15416	SERVICE ENHANCEMENT TO ASSIST WITH PROBLEM DETERMINATION
OA09728	-		UA15359	UA15360	UA15361	ABEND0F4 RC0C RSN0F055AA2 IGWDDRCF +X'1DEE' FOLLOWED BY MSGIEC036I 002-88
II12221						Information on support for unmanaged HFS and PDSE

8 - APAR overview (4)

II13335						DFSMS 1.6 HDZ11F0 Current PDSE maintenance
II13336						Z/OS DFSMS 1.3 HDZ11G0 Current PDSE maintenance
II13875						Z/OS DFSMS 1.5 HDZ11H0 Current PDSE maintenance
II13967						Z/OS DFSMS 1.6 HDZ11J0 Current PDSE maintenance
OA04639		UA07844	UA07845	UA07846		VARIOUS 0F4 ABENDS IN BMF DESERV IMF CDM COMPONENTS ACCESSING PDSE DATA SETS (SEE ALSO OA06148 OA06588 OA06725)
OA04711		UA09079	UA09094	UA09080		ABEND0C4-4 S0C4-4 IGWLECAN+15B8 UW99417 LEVEL
OA05320		UA07338	UA07339	UA07340		ABEND0F4 RC0C RSN1F031236 IGWLSCCB+3976 HDZ11G0 BASE
OA05402		UA06927UA06772	UA06928	UA06929		PDSE HANG ON DIB LATCH AFTER TASK OR MEMTERM
OA05449		UA13158	UA13159	UA13164	UA13212	S0C4 IN IGWDRAI1+02F2 AT UW99418, AREA POINTED TO BY R7 HAS BEEN FREED
OA05473		UA06927	UA06928	UA06929		ABEND0C4 IN IGWDSDDC+470(UW99418)
OA05572		UA07344	UA07345	UA07346		ABEND30D (HANG IN EOM) AFTER ABEND 0F4 IN IGWBDDS2
OA05613		UA07347	UA07348	UA07349		PDSE MONITOR TURNED OFF/INACTIVE BUT IGW038A MESSAGES CONTINUE
OA05719		UA06927	UA06928	UA06929		ABEND0F4 RC=0000000C RSN=0507000E IGWBFMIB+03DE ABEND0F4 RC=00000024 RSN=0705003B IGWBDDS2+0678
OA05753		UA07717	UA07718	UA07719		ABEND0C4-11 S0C4 RC11 IGWDDCR3+0928 UA03482 LEVEL
OA06006		UA06927	UA06928	UA06929		DIB LATCH NOT FREED AFTER CANCEL OF JOB
OA06228		UA08760	UA08761	UA08762		SMSVSAM ABEND0F4 RSN66F52058 IN IGWLNR30
OA06308		UA09270	UA09271	UA09272		POOR PERFORMANCE DURING PDSE-TO-PDSE COPY WHEN THE SOURCE PDSE IS VERY LARGE OR HAS A HIGH NUMBER OF MEMBERS.

8 - APAR overview (5)

OA06428		UA08767	UA08763	UA08764		ABEND0C4 RC4 IGWLHOBT+1C3C UA00383 LEVEL
OA06541			UA10391	UA10392	UA10393	ABEND0F4 IGWCDGTN + X'7C6' RSN270B0409 COPYING PDSE TO LOAD MODULE THAT CONTAINS 109 OR MORE ALIASES
OA06567		UA09349	UA09338	UA09339		CSECT=IGWDLBAP+09E0,DATE=07/24/03,ABND=0C4,RC=00000000,RSN=00000004
OA06628		UA12636	UA12637	UA12638	UA12639	S0F4 RC24 RSN150A001A IGWBITX1+1A74 UW99417 LEVEL
OA06629		UA09826	UA09827	UA09828		ABEND0F4 RC24 RSN1B010005 IGWBPRD1+2040 UW99418 LEVEL
OA06726				UA10244	UA10245	ABEND0F4 IN IGWBEXT1+A1E, RC=20,RSN=05090035
OA06774		UA09524	UA09525	UA09526		ABEND0E0 IN IGWLSLAR
OA06884		UA10646	UA10647	UA10648	UA10649	PDSE PROGRAM OBJECT LIBRARIES NOT BEING CACHED IN HIPERSPACE
OA06891			UA13297	UA13298	UA13299	NF - TRAP SETTING OF LSDERR IN LSDVLD
OA07060			UA10447	UA10448	UA10449	ABEND0F4, RC=24, RSN=1D075170 JCDM_CHECK_CPYS_FAILED DURING EOM
OA07108		UA10865	UA10866	UA10867	UA10868	PDSE EXTEND GETS IEC911I 315-00,JOB,STEP,DD,00000014,200B0033
OA07171		UA10555	UA10556	UA10557	UA10558	ABEND0F4 RC24 RSN6131FBC6 IN SMSVSAM ADDRESS SPACE WHEN ERASING MANY RECORDS FROM A VSAM DATA SET WITH RLS ACCESS.
OA07210			UA10469	UA10470	UA10471	PDSE ANALYSIS COMMAND DOES NOT PROCESS DIB_GLOBAL_LATCH
OA07272			UA10959	UA10960	UA10961	S0C4 RC4 IGWSDMPP+0872 UW94347 LEVEL
OA07313					UA11290	ABEND0C4 IN IGWLHT00+0D84
OA07364			UA12293	UA12294	UA12295	ABEND0C4 IN IGWAMCS4+194
OA07381			UA10713	UA10714	UA10715	BRLM FIXES FOUND AFTER CODE CUTOFF
OA07438		UA10767	UA10775		UA10768	ABEND0C4 IN IGWLGMSG+2504 R1H0
OA07548			UA13170	UA13171	UA13172	NEW FUNCTION
OA07691		UA11141				S0C4 RC4 IGWSDMPP+0872 UW94347 LEVEL
OA07788			UA12172	UA12173	UA12174	ABEND0C4 IN IGWDQEMS+1C10 (UA09628) DURING TASK TERMINATION
OA07829					UA12768	ABEND078-4 IN IGWFARN0 WHILE FREEING A TLAB

8 - APAR overview (6)

OA07881			UA12095	UA12096	UA12109	LOOP CREATING SRE'S (SUSPEND RESUME ELEMENTS)
OA07887			UA12680	UA12681	UA12682	ABEND073 RC08 SETLOCK OBTAIN ISSUED IN IGWFI86D +X'A2'
OA07897					UA12529	ABEND0C4 IN IGWBSTRT+0B46
OA07906			UA11660	UA11661	UA11662	IEW2675S copying from PDS to PDSE with FREE=CLOSE
OA07928			UA11329	UA12582	UA12583	ABEND0F4 RC8 RSN1451A414 IN IGWDLBAP (OA07313) +676.
OA07954			UA12633	UA12634	UA12635	LOOP IN IGWDDCR3 CALLING IGWIMAIN
OA08046			UA14926	UA14927	UA14928	LOOP IN IGWDDCR3 CALLING IGWIMAIN
OA08075			UA12299	UA12300	UA12301	MSG IGW01211T DOES NOT CONTAIN MEMBER NAME
OA08127		UA13507	UA13508	UA13509	UA13510	AFTER OA05111, EXPECTED ATRIBUTES ARE NO LONGER RETURNED
OA08214					UA12322	ABEND0C4 IGWDPRSP+296C RESTORING CONNECT TOKEN
OA08266			UA13066	UA13067	UA13068	ABEND0C4 IN IGWFTRER +X'154' DURING RECOVERY OF AN ABEND
OA08274				UA12392	UA12393	DFSMS SSF INTERNAL MACRO CHANGE
OA08302			UA13554	UA13555	UA13556	ABEND073 RC08 SETLOCK ISSUED FROM IGWFI86D +X'A2' WHILE HOLDING THE CML LOCK.
OA08336			UA14467	UA14468	UA14469	SERVICEABILITY APAR TO CAPTURE CORRECT DATA WHEN AN ABEND0F4 RC24 RSN271B0409 IGWCDGTL+04AC DURING REFRESH LLA
OA08413			UA13717	UA13718	UA13719	ABEND0C4 PIC11 IN IGWDADCD +1096 (UA06928). S0C4 OCCURS BECAUSE REG9 IS NOT A VALID POINTER TO THE DUB.
OA08453				UA12961	UA12962	INCONSISTENT RESPONSES FROM THE V SMS,PDSE,ANALYSIS COMMAND
OA08668		UA13098				ABEND0F4, RC=24, RSN=1D075170 JCDM_CHECK_CPYS_FAILED DURING EOM
OA08679		UA14262	UA14263	UA14264	UA14265	MULTIPLE S0F4 RC18 RSN150BC008 IGWBIEX1+0A4E UW99418 LEVEL LEADS TO SMSPDSE OUT OF PRIVATE STORAGE
OA08715		UA13672	UA13673	UA13674	UA13675	S0C4 PIC10 IN IAXPI+05B0 - UW87408 LEVEL
OA08722			UA13342	UA13343	UA13344	S0F4 RC14 RSN2504C003 IGWDARDA+1DA0 UA10391 LEVEL

8 - APAR overview (7)

OA08836		UA13631	UA13632	UA13633	UA13634	ABEND0C4 PIC4 RC4 IGWLSLAR+0124 HDZ11G0 BASE LEVEL
OA08909		UA13671				LOOP IN IGWDDCR3 CALLING IGWIMAIN
OA08914			UA13875	UA13876	UA13877	ABEND0F4 RCC RSN0D015B1B IGWDPRSP+0432 UW99417 LEVEL
OA08929			UA14147	UA14148	UA14149	ABEND0F4 FROM IGWFVGTM+03FA AT UA00120, RSN=2504C001
OA08941			UA14972	UA14973	UA14974	ADD SUPPORT FOR DISPLAY PDSE LATCH
OA08991		UA14335	UA14336	UA14337	UA14338	HIGH CPU UTILIZATION OCCURS WITH UA10647
OA09044					UA14412	S0F4 RC24 RSN0414F039 IGWFARR5+0540 HDZ11J0 BASE LEVEL
OA09525			UA15783	UA15784	UA15785	ABEND S0F4-1D07516F FROM IGWDBAPR+1FA4 DURING EOM PROCESSING
OA09544			UA15099	UA15100	UA15101	ABEND0F4 RC20 IN IGWBEXT1 +X'A32' RSN05090035
OA09560			UA16100	UA16101	UA16102	IEBCOPY PDS PDSE CASE UPPER LOWWER MIXED
OA09744			UA16020	UA16021	UA16033	INCONSISTENT RETURN CODE FROM IEBCOPY FOR MEMBER NOT FOUND
OA09787					UA16012	ABEND0F4 IN IGWBCRLX RSN070E0059 FOLLOWED BY MSGIGW007E SMS DEACTIVATED **(IPL)**
OA09839			UA15379	UA15380	UA15381	ABEND0F4 RSN0F14516D IN IGWDDCR3 +X'5B4'
OA10020			UA16142	UA16143	UA16144	TSO USER ATTENTION OUT OF TASK RESULTS IN DIB / IUB LATCH HANG
OA10040			UA16530	UA16531	UA16532	ABEND0F4 IN IGWDADCD WITH RSN01055AA1
OA10071			UA16096	UA16097	UA16098	LOOP IN IGWIFELE LEADS TO HANG ON PDSE LIBRARY
OA10072			UA16272	UA16273	UA16274	ABENDA78 SA78 RC18 IGWAMRT0+092C UA12295 LEVEL
OA10091						SMF type 42 records may not be written for PDSEs
OA10127			UA16753	UA16754	UA16755	ABENDB78 RC18 IN CSECT IGWFVGTM
OA10294					UA16371	ABEND0C4-10 IN IGWDQEMS+1B7C,MAINTID=OA09252
OA10323			UA16080	UA16081	UA16082	HIGH CPU UTILIZATION OCCURS WITH UA10647.

8 - APAR overview (8)

OA10400			UA16494	UA16495	UA16496	ABEND0C4-11 IN IGG05530+050 BECAUSE PDSE DOES NOT CLEAR THE EOV WORKAREA ON SECOND CALL TO DADSM EXTEND
OA10429			UA16326	UA16327	UA16328	S0C4 RC4 ABEND0C4 PIC4 IGG019SZ+1602 HDZ11G0 BASE LEADS TO HANG
OA10431			UA16629	UA16630	UA16631	ABEND0F4 IN IDAVRBF4 RSN61609D08 FOLLOWED BY ABEND0F4 IN IGWLHRES+4A6 RSN130E1606
OA10584			UA16598	UA16599	UA16600	AB0F4 RC24 RSN0A082018 IGWFHEN2+1C2E
OA10763					UA16876	ABEND0F4 S0F4 RC24 RSN01055B1B IGWDADCD+19A4 HDZ11J0 LEVEL
OA10878			UA16975	UA16976	UA16977	AUX STORAGE SHORTAGE CAUSED BY PDSE BUFFERS IN SYSBMFDS
OA10898						
OA11068			UA17502	UA17503	UA17506	HIGH CPU USAGE WITH DEFAULT HIPERSPACE VALUES AFTER THE PTF FOR APAR OA06884.

Legend Impact

- I IPL
- F Functionloss
- P Performance
- D Dataloss

9 - Questions and Answers ?

10 - Additional information

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