VSE/POWER Update

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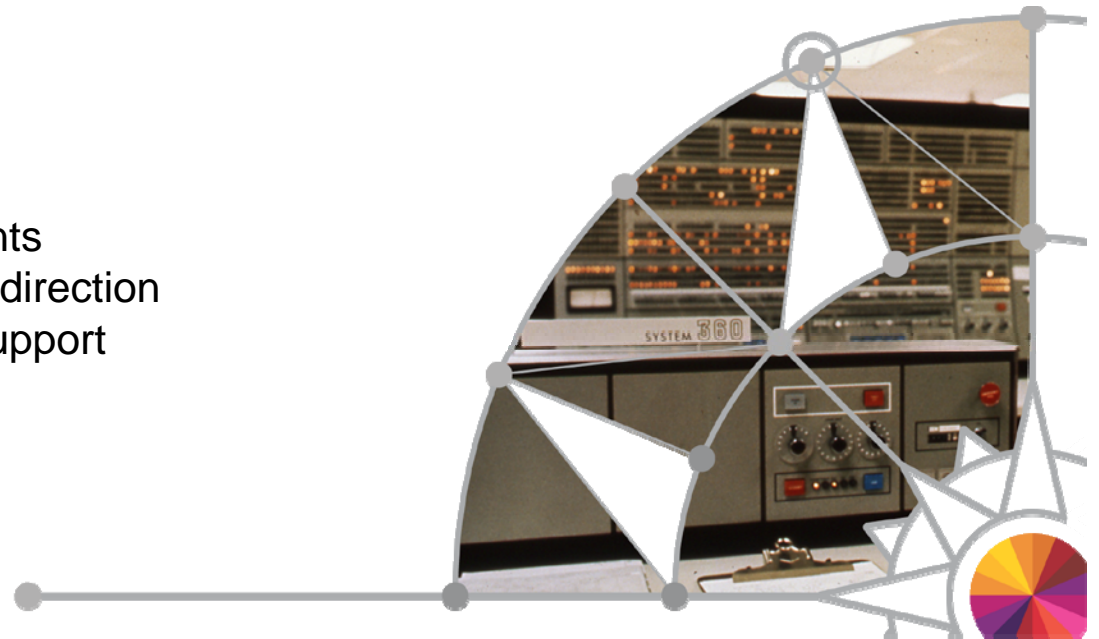
VSE/POWER Overview

- POWER 8.3 in z/VSE 4.3
    - Output Limitation Facility
    - OGM
    - PUNCH output redirection into AF library

- POWER 9.1 in z/VSE 5.1
    - New TKN attribute
   - POWER 5.1.1 Announcements

- POWER 9.2 in z/VSE 5.2
    - Overview of functional enhancements
    - Enhancement for PUNCH output redirection
    - eXtended Event Message (XEM) support

VSE/POWER 8.3 Release Information and Manuals

- Identification of VSE/POWER 8.3
  - MSHP Component identification number 5686-CF8-03-02C
  - SUBSID NOTIFY call with X'080300'
  - Character string C'02C' in each phase
  - PDISPLAY STATUS and SIR output show "VSE/POWER 8.3.0" plus APAR Level

- Manuals updated with z/VSE 4.3
  - VSE/POWER Administration & Operation 8.3, SC33-8314-03
  - VSE/POWER Application Programming 8.3, SC34-2601-00
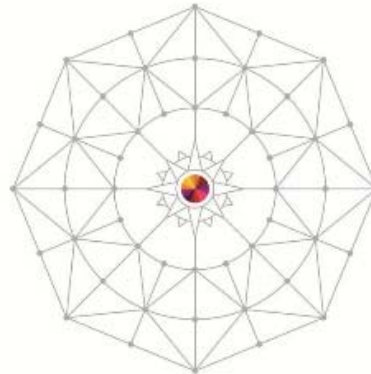
VSE/POWER 8.3 Output Limitation Facility **(WAVV200721)**

New **RBF** operand (Records Before Flush) cancels job(s), if their output exceeds specified amount of records. Programs running as subsystem, e.g. CICS, VTAM, are not canceled.

- **`SET RBF=nnnnnn`**
  - VSE/POWER auto start statement sets system value (recommended only for test system)
  - Each job is flushed whose LST or PUN output exceeds nnnnnn records

- **`* $$ JOB …,RBF=nnnnnn`**
  - Overwrites SET RBF=nnnnnn for VSE/POWER Job
  - Job is flushed if any LST or PUN output exceeds nnnnnn records

- **`* $$ LST …,RBF=nnnnnn or * $$ PUN …,RBF=nnnnnn`**
  - Overwrites SET RBF=nnnnnn and * $$ JOB …,RBF=nnnnnn
  - Job is flushed if output for specified spooled device exceeds nnnnnn records

- When RBF value is exceeded, internal **PFLUSH partition,HOLD cancels** job
  - Message 1Q5QI is displayed on console and appended to output exceeding limit
  - Additional output records can be spooled, e.g. LISTLOG messages
  - Flushed Job is held in RDR queue with the DISP=H or L
  - Output is created with temporary DISP=X to avoid automatic processing

- **RBF=0** (default) means that no limitation is applicable to the given output

VSE/POWER 8.3 OGM Support - Overview

As of z/VSE 4.2, VSE/POWER can generate the following notification messages for SAS (Spool Access Support) applications

– Job Completion Message 1Q5DI (JCM):
Informs that the job, submitted via SAS interface, has completed
– Job Generation Message 1Q5HI (JGM):
Informs that the job, submitted via SAS interface, has generated another job as punch output with DISP=I

With z/VSE 4.3, a new notification message has been added:

– **Output Generation Message 1Q5RI (OGM):**
Is generated each time when the job, submitted via SAS interface, has created LST or PUN entry, and this entry became ready for processing
– Like the existing 1Q5HI and 1Q5DI messages, the new 1Q5RI message is stored into the SAS messages queue, and can be retrieved by means of the GCM (Get Completion Message) service later on.

VSE/POWER 8.3 OGM Support - Benefits

With OGM support, a Job Scheduler application can control the job lifetime
- Job Completion
- Job Generation (DISP=I)
- Output Generation

Without OGMs, its more difficult to find all outputs generated by a job
- A job may produce various outputs
  - Multiple LST/PUN cards in the job
  - Output segmentation
- Outputs may have different names than the generating job (JNM=nnn in LST/PUN card)
- Outputs may have different job numbers than the generating job due to
  - Segmentation overflow (more than 127 segments)
  - Multiple LST/PUN cards in the job (1st LST & 1st PUN inherit job number from job)

OGMs now provide a way to retrieve all outputs generated by a Job, which has been submitted via SAS interface.

VSE/POWER 8.3 Enabling Output Generation Message

- To enable generating and queuing of the OGM, VSE/POWER offers new options in the function byte SPLGFB1.

- For example, if you want to request messages of all types (JGM, JCM and OGM) you must specify the new option SPLGF1QX:

  ```
  PWRSPL TYPE=UPD,SPL=OWNSPL,REQ=PUT,QUEUE=RDR
  MVI    SPLGFB1,SPLGF1QX  -> ALL
  ```

- If you want to queue the OGM only, you can specify the new option SPLGF1QO :

  ```
  PWRSPL TYPE=UPD,SPL=OWNSPL,REQ=PUT,QUEUE=RDR
  MVI    SPLGFB1,SPLGF1QO  -> OGM only
  ```

  Specify SPLGF1QP option to queue Job Completion and Output Generation messages or
  Specify SPLGF1QQ option to queue Job Completion and Job Generation messages

- OGM has the following main features:
  - It can be queued in the user queue(default), common queue, or both (the same as existing fixed format messages)
  - For segmented output it is issued for every segment
  - If duplication is active then it is issued for every duplicate
  - 'OGM queuing' characteristic is inherited for child jobs created as punch output with the DISP=I

VSE/POWER 8.3 OGM - Retrieving Fixed Format Message

- To retrieve fixed format messages VSE/POWER offers new options in the sub-request byte SPLGSRB of the SPL for the GCM service.

- For example, if user wants to retrieve JCM only he can specify the following SPL:

```
PWRSPL TYPE=UPD,SPL=OWNSPL,REQ=GCM
MVI    SPLGSRB,SPLGSRJC    -> JCM only
```

- In general there are the following selection criteria for messages retrieving:
  - Retrieve JGM only
  - Retrieve JCM only
  - Retrieve OGM only
  - Retrieve all messages
  - Retrieve all messages produced by the job with specified name
  - Retrieve all messages produced by the job with specified name + number

- Note that all messages should be retrieved, otherwise message queue will run full and new messages will be discarded

VSE/POWER 8.3 OGM - Increasing SAS message queue size

- With this new type of event message, the total number of the potentially generated messages increased.

- default size of the messages user queue is increased from 20 to 50,

- maximum size is increased from 99 to 255
  - which can be specified by the SET JCMQ= (VSE/POWER auto start statement).

- The size of the common message queue is taken now as size of the user queue multiplied by eight. Therefore, the
  - default value of common queue size is equal to 400,
  - maximal value of common queue size is equal to 2040.
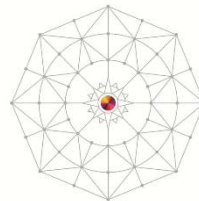
VSE/POWER 8.3 – OGM Restrictions

- The OGM is issued in the fixed format only, and can be retrieved by the GCM request of SAS interface only.

- The OGM is always queued in the message queue of the job's submitter only, and can not be sent to any another destination.

- In the selection criteria of the GCM request only one type of messages can be specified for retrieving (or all types of generated messages).

- The OGM is not issued for the punch output with DISP=I which produces the RDR entry actually. (but JGM maybe be created if selected)

- The message is not generated for output spooled to tape.

VSE/POWER 8.3 - PUNCH output redirection into AF library

In addition of spooling punch output either into punch or reader queue, punched output can now be catalogued as a VSE/AF library member and later on retrieved by an * $$ SLI statement.

New format 3 of the * $$ PUN JECL statement provides the possibility for redirecting punch output to a VSE/AF library member

S=Lib.Sublib

- Each spooled PUNCH device can be redirected independently

- The output is not placed in PUN queue but spooled into VSE/AF library member

- You need the appropriate access right to create or replace a member

- In-creation queue element shows re-direction

- Segmentation attempts are **rejected** with 1R9BI message

VSE/POWER 8.3 – Example of PUNCH output redirection

```
* $$ JOB JNM=COMPILE,DISP=D,CLASS=A
* $$ PUN MEM=PRECOMP1.C,S=PRD2.TEST,PUN=FED,REPLACE=YES <= redir. PUN output to lib. member
// JOB COMPILE TRANSLATE PROGRAM CSOURCE
// ON $CANCEL OR $ABEND GOTO ENDJ2
// OPTION NOLIST,NODUMP,DECK
// EXEC DFHEDP1$,SIZE=512K
* $$ SLI ICCF=(CSOURCE),LIB=(0019)
/*
// PAUSE
* $$ PUN PUN=FED                                      <= close library member & switch PUN back
// LIBDEF *,SEARCH=(PRD2.SCEEBASE,PRD2.DBASE)
// LIBDEF PHASE,CATALOG=PRD2.TEST
// OPTION ERRS,SXREF,SYM,CATAL,NODECK
   PHASE CSOURCE,*
   INCLUDE DFHELII
// EXEC EDCCOMP,SIZE=EDCCOMP,PARM='NATLANG(ENU)/LONGNAME'
* $$ SLI MEM=PRECOMP1.C,S=PRD2.TEST
/*
// EXEC EDCPRLK,SIZE=EDCPRLK,PARM='NATLANG(ENU)/UPCASE'
/*
// EXEC LNKEDT,SIZE=256K
/*
/. ENDJ2
// EXEC LIBR,PARM='A S=PRD2.TEST;DEL PRECOMP1.C;END'
/&
* $$ EOJ
```

VSE/POWER 8.3 –Monitoring PUNCH output redirection

```
D CRE,PART,F5
AR 0015 1C39I COMMAND PASSED TO VSE/POWER
F1 0001 1R4BI    CREATE QUEUE  C I  LINES BUDBGP   QNUM   TASK     OWNER
F1 0001 1R4BI  PUNCH02   00316 A L     11   000001 01790  F5 FEE JOB=PUNCH02
F1 0001 1R4BI  PUNCH02   00316 A P     28 PRD2.CONFIG     F5 FED JOB=PUNCH02


D A
AR 0015 1C39I COMMAND PASSED TO VSE/POWER
...
F1 0001 1R48I   F5,FEC,H5,  PUNCH02 ,00316,H
F1 0001 1R48I   F6,FEC,M6,      INACTIVE,
F1 0001 1R48I   F7,FEC,N7,  TCPIP00 ,00304,7
...
F1 0001 1R48I   F3,FEE,,  VTAMSTRT,00302,A      21 LINES SPOOLED,QNUM=01803
F1 0001 1R48I   F2,FEE,,  CICSICCF,00303,A    2104 LINES SPOOLED,QNUM=01799
F1 0001 1R48I   F7,FEE,,  TCPIP00 ,00304,A    1502 LINES SPOOLED,QNUM=01797
F1 0001 1R48I   F5,FEE,,  PUNCH02 ,00316,A      11 LINES SPOOLED,QNUM=01790
F1 0001 1R48I   F5,FED,,  PUNCH02 ,00316,A      28 CARDS TO PRD2.CONFIG
F1 0001 1R48I  RDR,00C,A,
```

VSE/POWER 9.1 Release Information

VSE/POWER 9.1 Release Information, Manual and Migration

- z/VSE 5.1 contains VSE/POWER 9.1 (part of VSE/Central Functions 9.1)

- Identification of VSE/POWER 9.1
  - MSHP Component identification number 5686-CF9-03-51C
  - SUBSID NOTIFY call with X'090100'
  - Character string C'51C' in each phase
  - PDISPLAY STATUS and SIR show "VSE/POWER 9.1.0" plus APAR Level

- Manuals updated with z/VSE 5.1
  - VSE/POWER Administration & Operation 9.1, SC34-2625-00
  - VSE/POWER Application Programmer's Guide (5.1.1) SC34-2642-00
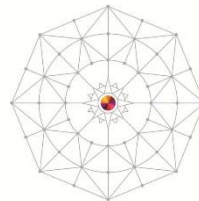
VSE/POWER 9.1 TKN (Token) Support (MR012710448)

New TKN (Token) attribute to link all spooled outputs of a job together

- To address with operator commands all spooled job outputs as an entity

- Unchangeable TKN value defined for each VSE/POWER job

  - **Explicitly** by new *$$ JOB operand TKN=hhhhhhhh (80000000 to FFFFFFFF)
    ```
    * $$ JOB JNM=MYJOB,CLASS=C,DISP=K,TKN=94A89182
    ```

  - **Implicitly** in range 00000001 to 7FFFFFFF (incremented for each job)
  - Once defined it can not be changed

- In Shared Spooling environment single counter in MasterRecord ensures unique TKN

- Shown in job start message 1Q47I

```
1Q47I   BG PAUSEBG 65267 FROM POWER511(SYSA),TIME=20:33:33,TKN=00000009
```

- Shown in PDISPLAY queue,...,FULL=YES
  ```
  pdisplay rdr,full=yes
  AR 0015 1C39I COMMAND PASSED TO VSE/POWER
  F1 0001 1R46I   READER QUEUE   P D C S  CARDS BU
  F1 0001 1R46I   PAUSEBG  65267 3 * 0        4    PART=BG FROM=(SYSA)
  F1 0001         D=07/01/2011 DBGP=000001 ORGDP=K
  F1 0001         QNUM=00008 T=11:53:48 TKN=00000009
  ```

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VSE/POWER 9.1 – TKN Usage Example

- Each output spooled by the job will inherit the TKN value

```
pdisplay cre,part,bg
AR 0015 1C39I COMMAND PASSED TO VSE/POWER
F1 0001 1R4BI    CREATE QUEUE  C I   LINES BUDBGP   QNUM  TASK    OWNER
F1 0001 1R4BI  PAUSEBG  65267 A P     37    000001 01858  BG FED JOB=PAUSEBG
                                                                 TKN=00000009
F1 0001 1R4BI  PAUSEBG  65267 A L     49    000001 01859  BG FEE JOB=PAUSEBG
                                                                 TKN=00000009
```

- Same TKN value for output when job is released multiple times, e.g. CICS, VTAM, TCPIP (DISP=K | L)

- New **CTKN** operand for operator commands to select spool entries with same TKN value

- New „**ALL**,CTKN=hhhhhhhh" to address all entries in all queues (RDR|LST|PUN|XMT)
  - Available for PALTER, PDELETE, PDISPLAY, PHOLD, PRELEASE
    No further selection operands allowed to force entity

```
phold all,ctkn=00000009
AR 0015 1C39I COMMAND PASSED TO VSE/POWER
F1 0001 1R88I  OK : 2 ENTRIES PROCESSED BY PHOLD ALL,CTKN=00000009
```

- PNET and POFFLOAD backup & restore preserve existing TKN values

VSE/POWER 9.1- TKN – Usage by JCL PWR command

- JCL PWR command submits PRELEASE and PHOLD commands to VSE/POWER

- // PWR PHOLD|PRELEASE command with CTKN=POWERJOB for PUN or RDR or LST
  - VSE/POWER replaces POWERJOB with TKN value of active job
  - Addresses already created queue entries only
  - Changes DISPosition for output created

- // PWR PHOLD|PRELEASE ALL,CTKN=POWERJOB
  - address all output created and in creation
  - Changes DISPosition for output created + output in creation ! (D → H & K → L)
  - Useful to prevent job output being printed / punched when job fails
  - Example with conditional JCL:

```
* $$ JOB JNM=ACNTJOB,CLASS=C,DISP=D
* $$ LST JNM=OUTPUT1,LST=00E,CLASS=W,DISP=D,UINF='USER INFORMATION'
* $$ LST JNM=ACCOUNT1,LST=FEE,CLASS=Z,DISP=D
* $$ PUN JNM=CHECKS,PUN=FED,DEST=(OTHERNOD,PUNCH01)
// JOB ACNTJOB
// ON $ABEND GOTO ERR01              for abnormal termination go to ERR01
// EXEC PGM1
// GOTO $EOJ                         skip abnormal term. handling
/. ERR01                            handle abnormal termination
// PWR PHOLD ALL,CTKN=POWERJOB       hold all output with same TKN as job
/&
* $$ EOJ
```

VSE/POWER 9.1 in z/VSE 5.1 Refresh by DY47302

IPWSEGM Supports Duplicates for LST and PUN Output (MR0920106734**)**

- Output duplication allows multiple VSE/POWER tasks to access a single image of spooled data.

- VSE/POWER has supported creation of duplicate output since z/VSE 4.1 using
  * $$ LSTDUP and * $$ PUNDUP JECL statements, or by PCOPY operator command

- NOW **output duplication** is also **available via IPWSEGM** **(program-driven)**

- Programs that spool output can now request duplication for the next output segment using the new operand DUP=YES for statements * $$ LST and * $$ PUN supplied by IPWSEGM

Enhanced Dynamic Access to VSE/POWER Job Attributes

- **TKN** can now be extracted from MAPPOWJB DSECT using **GETFLD FIELD=POWJOB**

VSE/POWER 8.3 | 9.1 | 9.2 - Functional Enhancements by APAR

- DY47464 | DY47467 | integrated

  Improved messages 1QAFD & 1QAFI to prevent spool file corruption

  (only 1 active system per SYSID is allowed)
  ```
  1QAFI  SHARING SYSTEM SYSID=n INDICATED AS ACTIVE ON CPU-ID xxxxxxxxxxxxxxxx
         BUT REQUESTING WARM START ON ACTUAL CPU-ID yyyyyyyyyyyyyyyy
  1QAFD  ENSURE SYSID=n IS INACTIVE ON CPU-ID xxxxxxxxxxxxxxxx,
         THEN ALLOW WARM START BY 'YES', ELSE 'NO'
  ```

- - | DY47474 | integrated

  New search operand CEXPMOM=NULL for PALTER, PDISPLAY, PDELETE, PHOLD & PRELEASE (MR0524121941)

  To select output without expiration moment (no EXPDAYS, no EXPHRS)

  New POFFLOAD LOAD|SELECT operand KEEP=EXPMOM (MR0215104838)

  To preserve expiration moment during restore DY47509 | DY47510 | DY47519

  Show number of queue entries restored by POFFLOAD LOAD|SELECT
  ```
  1Q2AI  OFFLOADING LOAD|SELECT SUCCESSFULLY COMPLETED ON cuu,
         TOTAL ENTRIES=mmmmmmmmmm
  ```

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VSE/POWER 8.3 | 9.1 | 9.2 - Functional Enhancements by APAR

- - | DY47520 | tbd

  Add output creation date = end of spooling time for correct age handling of outputs from long running jobs

  New search operands ENAGE and ENDAYS for PALTER, PDISPLAY, PDELETE, PHOLD & PRELEASE to select queue entries by end of spooling time

  ➔ CRAGE & CRDAYS are not affected

- - | DY47524 | tbd

  Show correct number of records for large outputs and extend RBF to 9 digits

VSE/POWER 9.2 Release Information, Manual and Migration

- z/VSE 5.2 contains VSE/POWER 9.2 (part of VSE/Central Functions 9.2)

- Identification of VSE/POWER 9.2
  - MSHP Component identification number 5686-CF9-03-52C
  - SUBSID NOTIFY call with X'090200'
  - Character string C'52C' in each phase
  - PDISPLAY STATUS and SIR show "VSE/POWER 9.2.0" plus APAR Level

- Manuals updated with z/VSE 5.2
  - VSE/POWER Application programming 9.2, SC34-2642-00
  - VSE/POWER Administration & Operation 9.2 (available soon)

- FSU from z/VSE 4.3 / 5.1 to z/VSE 5.2 converts VSE/POWER spool files to 9.2 level
  - POFFLOAD BACKUP,ALL before FSU for possible restore of previous level
  - WARMSTART existing Queue & Data File (see messages 1Q0HI & 1Q0HD)
    - In case of return to z/VSE 4.3/5.1, cold start on old system is required
  - Shared Spooling requires all systems on same Version & Release
    - For FSU only one system must be active

- VSE/POWER can migrate spool files from VSE/ESA 2.7 onwards to current level

- Migrate spooled data between different releases by POFFLOAD and/or PNET

VSE/POWER 9.2 – New Functions in z/VSE 5.2

- Control blocks IPWDPA, IPWDTC and PWRSPL extended for future use
  - Backward compatible for User Exits and SAS Applications
  - New PWRSPL level SPLGVM40
  - Recompile of Application / Exit recommended

- Deletion for VSE/AF sublibrary member after * $$ SLI processing (WAVV201107)

- eXtended Event Message (XEM) support to monitor VSE/POWER queues

VSE/POWER 9.2 - Delete VSE/AF sublibrary member after * $$ SLI

- z/VSE 4.3 introduced Redirection of spooled PUN to VSE/AF sublibrary
  - * $$ PUN MEM=membername.type,S=lib.sublib,PUN=cuu,REPLACE=NO|YES
  - Useful for compile jobs with pre-compile st...
    - * $$ PUN into member1, * $$ SLI to rea...
    - * $$ PUN into member2, * $$ SLI to read me...
    - Member(s) are left in sublibrary

- Now deletion of VSE/AF sublibrary member is offered (WAVV201107)
  - With * $$ SLI MEM=membername.type,S=lib.sublib,DEL=YES
  - Executed by VSE/POWER after successful SLI insertion
  - Uses the Authorization associated with executing partition
  - Batch Security is required to prevent misuse !

- New/Changed Messages
  - 1QCEI membername.type DELETED IN lib.sublib
  - 1QC9I MACRO LIBRM 'macro_name' FAILED, ...
  - 1QCFI SLI PROCESSOR COULD NOT FIND member.type FOR DELETION
  - 1QC4I macro_name MACRO FAILED FOR MEMBER member.type,...

VSE/POWER 9.2 - PUNCH Redirection Example

Using PUNCH output re-direction for compile jobs with pre-compile steps

```
* $$ JOB JNM=COMPILE,DISP=D,CLASS=A
* $$ PUN MEM=PRECOMP1.C,S=PRD2.TEST,PUN=FED,REPLACE=YES <= redir. PUN output to lib. member
// JOB COMPILE TRANSLATE PROGRAM CSOURCE
// OPTION NOLIST,NODUMP,DECK
// EXEC DFHEDP1$,SIZE=512K
* $$ SLI ICCF=(CSOURCE),LIB=(0019)
/*
* $$ PUN PUN=FED                               <= close library member & switch PUN back
// LIBDEF *,SEARCH=(PRD2.SCEEBASE,PRD2.DBASE)
// LIBDEF PHASE,CATALOG=PRD2.TEST
// OPTION ERRS,SXREF,SYM,CATAL,NODECK
   PHASE CSOURCE,*
   INCLUDE DFHELII
// EXEC EDCCOMP,SIZE=EDCCOMP,PARM='NATLANG(ENU)/LONGNAME'
* $$ SLI MEM=PRECOMP1.C,S=PRD2.TEST,DEL=YES      <= include created library member and
/*                                                          request deletion
// EXEC EDCPRLK,SIZE=EDCPRLK,PARM='NATLANG(ENU)/UPCASE'
/*
// EXEC LNKEDT,SIZE=256K
/*
/&
* $$ EOJ

Removed: // EXEC LIBR,PARM='A S=PRD2.TEST;DEL PRECOMP1.C;END'
```

VSE/POWER 9.2 - Introduction to XEM Support (SAS Interface)

- As of VSE/POWER 9.2, a new XEM (stands for eXtended Event Message) support has been introduced as an extension of the JCM/JGM/OGM support.

- XEMs cover a much wider set of events compared to JCMs/JGMs/OGMs. Thus while only a few JCMs/JGMs/OGMs are issued, many XEMs can be produced.

- VSE/POWER generates new Fixed Format message 1Q5XI for a requesting application if:

  - A new queue entry has been created within a VSE/POWER queue or spooled to a tape.
  - An existing queue entry has been altered in a VSE/POWER queue.
  - An existing queue entry has been deleted from a VSE/POWER queue (moved into DEL queue).

- XEM can be used e.g. for auditing, scheduling or archiving VSE/POWER queues
  - VSE Connector delivers a new example called PowerEventProcessor in source in the samples directory. It shows how the new XEM support can be used.

VSE/POWER 9.2 - XEM Overview

- An application program initializes XEM by means of a special SAS request (as opposed to JCMs/JGMs/OGMs created only for a job submitted via the SAS with specific options)

- VSE/POWER puts a generated XEM in a separate message queue (not used for keeping another F.F. Messages)

- Every XEM application is provided with its own message queue
    - An application program can specify selection criterion for messages queuing
    - There is no selection criterion for messages retrieving
    - If message queue is full, a new extended event message is discarded and lost for the application (indicated in RC/FDBK code and on console by warning)

- VSE/POWER returns queued messages as batches. Messages are returned in FIFO order. The slot of a retrieved message becomes available for a new message

- XEM is provided with extended Get Completion Message service (GCM-XEM):
    - an application invokes this extended service for initializing message queuing, retrieving queued messages and closing

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VSE/POWER 9.2 - When XEM is generated

- XEMs are generated whenever VSE/POWER creates, changes or deletes queue entries

- A new queue entry is created in a VSE/POWER queue or spooled to tape, for example:
  - Spooling and segmenting output
  - Receiving a job via reader or SAS application
  - Duplicating an entry (* $$ LSTDUP, * $$ PUNDUP, PCOPY)

- An existing queue entry is altered in a VSE/POWER queue, e.g.:
  - Processing of entry (with initial DISP=K), for example: printing or punching an output, getting an entry via SAS interface (or by GETSPOOL macro), sending it via PNET.
  - Specific operator commands issuance: PRELEASE, PHOLD and PCANCEL, PALTER and PFLUSH (externally or internally).

- An existing queue entry is deleted from RDR | LST | PUN | XMT queue (moved into the DEL queue), for example:
  - An output (DISP=D) is printed or punched.
  - A job (DISP=D) is executed or canceled (PCANCEL operator command issued).
  - PDELETE command is issued.

VSE/POWER 9.2 - When XEMs are NOT generated / Restrictions

- Creation and deletion of internal queue entries, e.g. queue displays requested by SAS application, is ignored by XEM support

- Deletion of a queue entry 'in creation' , e.g. due PURGE=nn, is ignored by XEM support

- Alteration by SAS application for Browse is ignored

- Generated XEMs are not routed to other systems of a shared spooling complex nor to other PNET nodes

- XEMs are generated for master and duplicate queue entries but without indication whether the queue entry is master or duplicate

VSE/POWER 9.2 - XEMs Details

- Only an application ID (APPL operand of XPCCB macro) is used to address the message queue for keeping eXtended Event Messages.

- User ID (USERID operand of PWRSPL macro) is ignored by XEM support.

- The output of the PDISPLAY A,SAS operator command always shows *XEM* as the user ID for status of the SAS task which uses the XEM service.

- Storage for XEM queue is reserved when the application starts the XEM service, and is released when the application stops service.

- When storage of any application message queue is released, all not retrieved messages are discarded for this application.

VSE/POWER 9.2 - XEM Capacity and Storage Consumption

- 4 KB of real (fixed) storage of the VSE/POWER partition for XEM Control Block.

- 512 KB as a message queue for each XEM application
  - 256 byte slot for one message, 2048 XEM slots per application
  - Resides in GETVIS-31 area of VSE/POWER partition

- Up to 32 applications can use XEM service concurrently.
  - Extend ALLOCation for VSE/POWER partition accordingly

- VSE/POWER notifies about excesses of XEM capacity by means of:
  - Return / feedback codes in the verification SPL.
  - Messages 1Q3KI and 1Q4AI displayed on the system console.
  - Outputs of the PDISPLAY STATUS command.
  - Number of lost messages within XPCCB.

VSE/POWER 9.2 – Using the GCM-XEM service

- To start XEM service, an application issues the the GCM-XEM-START request:
  - specify queuing criterion within flag byte SPLXFLG1 for queuing event messages:
    - RDR entry type only (option SPLX1XRD)
    - LST entry type only (option SPLX1XLS)
    - PUN entry type only (option SPLX1XPN)

- To retrieve XEMs, an application issues the GCM-XEM-OPEN request:
  - XEM are returned within a 4KB reply buffer (includes up to 16 messages)
  - When the buffer is full or the time interval (explicitly specified or default) has expired

- To stop XEM service, an application issues the the GCM-XEM-STOP request
  - All not returned messages are canceled for the application

VSE/POWER 9.2 - Retrieving eXtended Event Messages

- As opposed to JCMs/JGMs/OGMs retrieving, XEMs are returned to an application:
  - In a 4KB reply buffer (includes up to 16 messages).
  - When the buffer is full or the time interval (explicitly specified or default) has expired.

- To retrieve XEMs, an application issues the GCM-XEM-OPEN request:
  - Specify SEND buffer type within XPCCB as SPL.
  - Set up a message reply buffer in the XPCCB.
  - Set up an SPL with the new option SPLGF1XM, for example:
    ```
    PWRSPL TYPE=UPD,REQ=GCM
    MVI SPLGFB1,SPLGF1XM
    ```
  - Optionally, specify a time interval within the SPLXWAIT field to overwrite the default value of 10 seconds.

- VSE/POWER indicates result of the GCM-XEM-OPEN request processing by return and feedback codes of XPCCB (and additionally by feedback-2 code).

- For retrieving unreturned messages, an application can issue the GCM-MORE subrequest, or repeat the GCM-XEM-OPEN request with the same or another time interval.

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VSE/POWER 9.2 - Stopping the GCM-XEM Service

- To stop XEM service, an application issues the the GCM-XEM-STOP request:
  - Specify SEND buffer type within XPCCB as SPL.
  - Set up an SPL with the new option SPLGF1XT, for example:
    ```
    PWRSPL TYPE=UPD,REQ=GCM
    MVI SPLGFB1,SPLGF1XT
    ```

- When XEM service is stopped:
  - Queuing messages for the application is terminated.
  - Storage of message queue is released.
  - All not returned messages are canceled for the application.

- VSE/POWER indicates result of the GCM-XEM-STOP request processing by return and feedback codes of XPCCB (and additionally by feedback-2 code)

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