JES2 $ACTIVATE Considerations

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What is $ACTIVATE?

- **$ACTIVATE**:
  - Changes the format of the checkpoint data set to support new JES2 function
    - ‣ In R4, creates and formats the JQX and BERT areas of checkpoint, and expands the RSO to 32K entries
    - ‣ Future releases may support additional levels of activation
  - Prior to R4, it took a **COLD START** to accomplish this!

$ACTIVATE

- The following R4 functions are not available until a **$ACTIVATE** has been done
  - WLM initiators
  - Scheduling environments
  - Remotes over **9999**
  - **$T SPOOLDEF,SPOOLNUM**
  - **Lnnn.JT** work selection by LIMIT
  - Many new **$DJ**/**$TJ** keywords, including
    - WLM-related keywords (**SRVCLASS=**, etc.)
    - **AGE**/**HOURS**/**DAYS** filters
    - Job completion information **(CC=)**
  - **SDSF** Job Class (JC) display

When can $ACTIVATE be done?

JES2 $

- **$ACTIVATE** can be done when:
  - All active MAS members are R4 or higher
    - ▸ Pre-R4 members can no longer enter MAS
  - The checkpoint dataset is large enough
    - ▸ New BERT and JQX structures must be created, RSO expanded
  - The member issuing the command has access to all checkpoint volumes
    - ▸ If duplex not accessible, can't check its size.
  - As of **OW32920**, **$D ACTIVATE** will display whether a $ACTIVATE can be done

$D ACTIVATE

- Possible ouputs of **$D ACTIVATE**
  - $HASP895 JES2 CHECKPOINT LEVEL IS NOW OS/390 RELEASE 4 OR LATER
  - $HASP895 JES2 CHECKPOINT LEVEL IS NOW PRE-OS/390 RELEASE 4. A TOTAL OF nnnn 4K RECORDS ARE REQUIRED FOR $ACTIVATE.
    - CKPT1 IS TOO SMALL BY nnnn 4K RECORDS
    - CKPT1 IS NOT ACCESSIBLE
    - CKPT2 IS TOO SMALL BY nnnn 4K RECORDS
    - CKPT2 IS NOT ACCESSIBLE
    - ALL INUSE=YES DATASETS ARE ACCESSIBLE AND LARGE ENOUGH
    - $ACTIVATE WILL FAIL/SUCCEED IF ISSUED FROM THIS MEMBER

- **$D ACTIVATE** does not check release levels of other members (but **$ACTIVATE** does!)

$ACTIVATE

- If all members not at R4 or higher, $ACTIVATE fails with
  - `$HASP003 RC=(73), ALL MEMBERS ARE NOT AT THE REQUIRED PRODUCT/SERVICE LEVEL.`
- Other errors (ckpt too small or not accessible) are also detected by $ACTIVATE
  - Response is **$HASP895** message, same as $DACTIVATE

$ACTIVATE
(continued)

- Checkpoint size can be checked via **$DCKPTSPACE** command
  - Prior to **OW41901**:
    - ‣ `$HASP852 CKPTSPACE  BERTNUM=64100, BERTFREE=60247, BERTWARN=80, RECORDS=(INUSE=3588,CKPT1 MAX=4100, CKPT2 MAX=3600)`
  - After **OW41901**:
    - ‣ `$HASP852 CKPTSPACE  BERTNUM=64100, BERTFREE=60247, BERTWARN=80, CKPT1=(CAPACITY=4100,UNUSED=512), CKPT2=(CAPACITY=3600,UNUSED=12)`

Undoing a $ACTIVATE

- As of **OW32920** a $ACTIVATE can be undone by:
  - Bringing down all active members
  - Warm or Hot starting with **PARM=(WARM,UNACT)**
- This works unless:
  - The number of spool volumes has been increased above the cold started value via **$TSPOOLDEF,SPOOLNUM**
  - The JQE size does not match the number of spool volumes
  - An INUSE=YES CKPTn dataset is not accessible (MODE=DUPLEX,DUPLEX=OFF)

JOBCLASS Changes

- MAS Scope ($CAT is in ckpt after $ACTIVATE)
- All attributes may be modified via **$TJOBCLASS(x)** command
- Init deck changes ignored on warm/hot start
- **$DOGCAT** service to obtain CAT from checkpoint
  - CAT may be obtained in READ or UPDATE mode
  - Services include
    - **FETCH**
    - **FETCHNEXT**
    - **RETURN**

$DOGJQE

- **$DOGJQE** service created to obtain a copy of a JQE plus extensions ("**JQA**"):
  - Can obtain in READ or UPDATE mode
  - Services include:
    - ▸ **FETCH**   ▸ **SETACCESS**
    - ▸ **FETCHNEXT** ▸ **QUERYLOCK**
    - ▸ **RETURN**   ▸ **GETJQEADDR**
    - ▸ **CKPT**   ▸ and other services
  - Real JQE is locked while JQA exists in UPDATE mode; RETURN releases lock
    - ▸ Must be used to serialize updates
    - ▸ Lack of serialization can result in **$Q14** abend, but only after **$ACTIVATE**

$DOGJQE in $EXITs

- As of **OW29813**, $EXITs which are passed a JQE do not need to be sensitive to type passed
  - Read-mode JQA
  - Update-mode JQA
  - Real JQE
- On entry to $EXIT:
  - Use **$DOGJQE ACTION=FETCH** to obtain JQE in mode required.
- On return from $EXIT:
  - Use **$DOGJQE ACTION=RETURN** to bracket the fetch
  - JQE/JQA that was passed to exit remains in same mode it was passed

$DOGJQE example

```
X40RTN   $ENTRY BASE=(R12),SAVE=YES       Linkage
          LR    R2,R1              Get XPL address
         $DOGJQE ACTION=(FETCH,UPDATE),
                JQE=X040JQE      Get JQA in update mode
          LR    R3,R0              Get JQA address


...
*       Change JQE/JQA fields
...


X40RET   $DOGJQE ACTION=RETURN,
                CBADDR=(R3)      Return update JQA
         $RETURN
```

$QJQE

- **$QJQE** can be used to run various class queues by providing one of the following:
  - **TYPE=** (queue type, e.g. $HARDCPY)
  - **CLASS=** (execution class queue)
  - **CAT=** (execution class queue head)
  - **SRVCLASS=** (service class queue)
  - **WSC=** (service class queue head)
- JQEs can be obtained either
  - **MODE=READ** - read mode JQAs obtained
  - **MODE=REAL** - real JQEs used (performance)
- Chaining/Looping logic generated by macro
- Knowledge of chaining fields not required

$DOGCAT and $DOGJQE

- **$DOGCAT**, **$DOGJQE**, and **$QJQE** can all be used outside the JES2 main task (USER and SUBTASK environments)
  - Use **DSERV=** parameter on macro
    - ‣ Use **SSI 71** to obtain a checkpoint version
    - ‣ Pass DSERV to service
    - ‣ Use **SSI 71** to return version
  - CKPT version maintenance left to caller to ensure consistency of data over multiple calls
- **Tip**: In $EXIT 6, DCNVCAT in DTE points to a read-mode CAT.

Compatibility

- OS/390 Release 10 **DOES NOT** support coexistence with PRE-R4 mode
  - Must be **$ACTIVATE**'d prior to migration
- Migration path to R10 from JES2 R3 or prior:
  - Migrate to intermediate level of JES2 which supports running in both modes (R4, R5, R7, R8)
  - **$ACTIVATE**
  - Migrate to R10 via **WARM START**

  ... or ...
  - Spool offload, **COLD START** R10, reload
- Similar considerations will apply for future forms of $ACTIVATE