IBM Education Assistance for z/OS V2R2

Item: REGIONX support
Element/Component: Job Scheduler

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Agenda

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Presentation Objectives

The objective of this presentation is to familiarize you with the new **REGIONX=** keyword on the **JOB** and **EXEC JCL** statements.

We will discuss why **REGIONX** was created and how it is similar to and also different from the **REGION** keyword.

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Overview

Problem Statement / Need Addressed

- Customers and end-users want more control over their below-the-line and above-the-line storage requests.
- The current **REGION=** specification supports only a single storage specification, with hokey rules for dividing the request between below-the-line and above-the-line storage.
- An end-user can wind up with more below-the-line storage than they want and less above-the-line storage than they need.

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Overview, continued

- Solution
  - Provide a new **REGIONX=** JCL keyword that supports *two* storage specifications and allows the end-user to explicitly specify values for their below-the-line storage and above-the-line storage needs.
- Benefit / Value
  - May allow an installation to reduce the amount of below-the-line storage that must be available to process jobs.

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Usage & Invocation

- Syntax: **REGIONX=(***below,above***)**
  - *below* is in **K** or **M** units, less than 16384K or 16M
  - *above* is in **K**, **M**, or **G** units, less than 2G
  - up to 5 numeric digits plus a unit specification
  - 0K or 0M or 0G means “maximum”
- Support for the new **REGIONX** keyword is provided:
  - On the **JOB** statement
    - Including when a job is started by a START command
  - On the **EXEC** statement
    - Including procedure overrides
    - Including when a procedure is started by a START command

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Usage & Invocation, continued

- **REGIONX=** is mutually-exclusive with **REGION=** on the **JOB** statement
- **REGIONX=** is mutually-exclusive with **REGION=** on the **EXEC** statement

and

- **REGIONX=** specified on the **JOB** statement is mutually-exclusive with **REGION=** specified on the **EXEC** statement
- **REGION=** specified on the **JOB** statement is mutually-exclusive with **REGIONX=** specified on the **EXEC** statement

→ necessary to prevent having to arbitrarily split or combine values

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Usage & Invocation, continued

- If **REGION=** is specified on the JOB statement and on an EXEC statement, the JOB statement specification overrides the EXEC statement specification
- If **REGIONX=** is specified on the JOB statement and on an EXEC statement, the EXEC statement specification overrides the JOB statement specification
  - Allows storage requirements to be tailored to a particular job step while allowing the JOB statement specification to act as a default when REGIONX= is not specified on an EXEC statement
  - More intuitive

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Usage & Invocation, continued

REGIONX** defaulting is considerably more complex than that of **REGION:

- Either or both values can be defaulted
  - **REGIONX=** both values default
  - **REGIONX=(,)** both values default
  - **REGIONX=1M** above value defaults
  - **REGIONX=(1M)** above value defaults
  - **REGIONX=(1M,)** above value defaults
  - **REGIONX=(,1G)** below value defaults
- In the case of REGIONX on an EXEC statement, *either or both values can be defaulted to the REGIONX values on the JOB statement if it was specified*

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Usage & Invocation, continued

Because REGIONX is mutually-exclusive with REGION --

- *REGIONX can replace REGION, and*
- *REGION can replace REGIONX*

during EXEC statement procedure override processing

  - *Extremely powerful*
  - *But, can result in mutual-exclusivity conflicts with a REGION= or REGIONX= specification on the JOB statement*

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Usage & Invocation, continued

START command invocations:

- For a started job, a REGION= or REGIONX= specification on the START command can replace a REGION= or REGIONX= specification on the JOB statement
- For a started procedure, a REGION= or REGIONX= specification on the START command can replace a REGION= specification on the *JOB statement generated internally by START command processing*
- *Very powerful*
- *But, can result in mutual-exclusivity conflicts with a REGION= or REGIONX= specification on the procedure's EXEC statement(s)*

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Usage & Invocation, continued

IEFUSI - SMF Step Initiation Exit routine

- Sample exit written in Assembly Language provided to customers in SYS1.SAMPLIB as IEEUSI
- Customers must rename to **IEFUSI,** customize, assemble, link, and place into LPALIB to use

- Sample exit has been extensively re-commented
- Converted to relative branch addressing to simplify customer modifications

- Now handles REGION and REGIONX values
- Example 64-bit arithmetic performed on REGIONX above-the-line value

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Migration & Coexistence Considerations

- In general, REGIONX can be used anywhere that REGION is specified.
- Care must be taken to avoid mixing use of REGIONX and REGION
  - Procedure override processing allows REGIONX to override REGION (and vice-versa) but must be thought out
    - Can be surprised by mutual-exclusivity errors occurring between JOB and EXEC as a result of an override
  - Started jobs and started procedures may fail with JCL error due to mutual-exclusivity problems between JOB and EXEC
    - Hard to diagnose since START processing does not produce more specific error messages

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Migration & Coexistence Considerations, continued

- Customers that use an IEFUSI exit to adjust REGION values will have to make changes to their exits to handle REGIONX values
  - See the updated sample IEFUSI exit in SYS1.SAMPLIB (named IEEUSI) for suggestions

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Presentation Summary

- The new **REGIONX=** JCL keyword allows the end-user to explicitly specify values for their below-the-line storage and above-the-line storage needs
- **REGIONX=** may be used everywhere that **REGION=** may be specified
  - JOB statements
  - EXEC statements
  - START commands
- **REGIONX=** may be used to override a **REGION=** specification (and vice-versa)
  - EXEC statement overrides
  - Started job JOB statements
  - Started procedure EXEC statements
- Care must be taken to avoid mutual-exclusivity conflicts between JOB and EXEC statement usage

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Appendix

- Publications
  - *z/OS MVS JCL User's Guide* SA23-1386
    - REGIONX versus REGION
  - *z/OS MVS JCL Reference* SA23-1385
    - REGIONX
  - *z/OS MVS System Messages Volume 8* (IEF-IGD) SA38-0675
    - IEFI015I message
  - *z/OS MVS System Commands* SA38-0666
    - START command
  - *z/OS MVS Installation Exits* SA23-1381
    - IEFUSI exit
- SYS1.SAMPLIB
  - Updated IEEUSI (IEFUSI) sample exit

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