IBM Education Assistance for z/OS V2R2

Item: Deadline Scheduling
Element/Component: JES2

Agenda

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Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.

Presentation Objectives

- In this presentation, we will introduce new job scheduling functions implemented in JES2 V2R2
    - Hold job until a specified time and date
    - Run job by a specified time and date
    - Run job with another address space

Overview

- Problem Statement / Need Addressed
    - Missing basic job scheduling controls in JES2
    - Desire to keep JESes in synch with basic batch functions

- Solution
    - New JCL keywords on SCHEDULE JCL statement:
        - keep a job in a held state until a specified time (HOLDUNTL=)
        - specify a desired time for a job to start (STARTBY=)
        - specify that a job should run on the same system where a reference job is currently executing (WITH=)
    - HOLDUNTL and STARTBY are sometimes collectively referred to as "deadline scheduling"

- Benefit / Value
    - JCL external to help schedule job execution

Usage & Invocation - HOLDUNTL

- To hold a job until a specified time:

    `// SCHEDULE HOLDUNTL=<time>`

- `<time>` can be specified in several ways:

    `HOLDUNTL='+hh:mm'`

    - A delta time from when the job entered the system.
    - This time is not subject to time offset changes.

    `HOLDUNTL=('hh:mm',mm/dd/yyyy)`

         or

    `HOLDUNTL=('hh:mm',yyyy/ddd)`

    - A specific time in a future, when job should be released.
    - Date is optional.
    - This is local system time and is subject to time offset changes.

Usage & Invocation – HOLDUNTL (cont.)

- When optional date part of a specific time is omitted, then if the target time has passed on the current day, the time is considered to refer to the next day

- If target time is in the past, job is not held

- The target time for a job can be displayed via JES2 command or retrieved via Extended Status SSI, e.g.:

  ```
  $dj19,holduntl
  $HASP890 JOB(SCHTEST)    HOLDUNTL=(2015.029,13:55:00)
  ```

- Of course, the job can be manually released at any time

Usage & Invocation - STARTBY

- To specify a target time for job to start:

  ```
  // SCHEDULE STARTBY=<time>
  ```

- <time> can be specified in several ways:

  ```
  STARTBY='+hh:mm'
  ```
  - A delta time from when the job entered the system.
  - This time is not subject to time offset changes.

  ```
  STARTBY=('hh:mm',mm/dd/yyyy)
  ```
     or
  ```
  STARTBY=('hh:mm',yyyy/ddd)
  ```
  - A specific time in a future for a job to start.
  - Date is optional.
  - This is local system time and is subject to time offset changes.

Usage & Invocation – STARTBY (cont.)

- When optional date part of a specific time is omitted, then if the target time has passed on the current day, the time is considered to refer to the next day

- The target time for a job can be displayed via JES2 command or retrieved via Extended Status SSI, e.g.:

```
$dj19,startby
$HASP890 JOB(SCHTEST)    STARTBY=(2015.029,13:55:00)
```

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Usage & Invocation – STARTBY (cont.)

- STARTBY specification does not mean that JES2 **must** start the job by the STARTBY time.
    - JES2 will do its best effort to gradually move a job to the top of the execution queue to give the job a better chance to be selected for the execution.
    - Actual selection for execution is still controlled by all the usual considerations – system affinity, availability of initiators etc.

- STARTBY function can be viewed as a more intelligent flavor of priority aging

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Usage & Invocation – HOLDUNTL vs STARTBY

- Both HOLDUNTL and STARTBY can be set for the same job to indicate the job execution window. e.g.

```
// SCHEDULE HOLDUNTL='+01:00',STARTBY='+02:00'
```

  indicates that the job will be executed between one and two hours from the job submission time (if resources are available during that time to run the job)

- If both HOLDUNTL and STARTBY are specified, they must use compatible time formats – either both use delta time specification or both use point in time specification

Usage & Invocation – PROMO_RATE

▪ STARTBY function is controlled on a job class level by a new job class attribute PROMO_RATE (job promotion rate)

▪ PROMO_RATE controls how much a job can be moved up the execution queue in one STARTBY aging cycle (1 minute)

▪ Default value PROMO_RATE=0 means that STARTBY function is disabled for the job class

▪ PROMO_RATE can be changed at any time, e.g.:

```
$TJOBCLASS,PROMO_RATE=3
```

Usage & Invocation – WITH

- To specify that job must be executed on the same system where another reference job is currently active:

  ```
  //    SCHEDULE  WITH=<jobname>
  ```

- WITH specification is an additional limitation on where a job can run.
  - If WITH is specified, the job will not be eligible for execution until the reference job is active.
  - In addition, the job can only be executed on the same system where the reference job is active.

- Job having a WITH specification can be submitted before or after the reference job becomes active or even submitted.
  - It is recommended to submit a job after the reference job becomes active.
    - Additional processing if job with WITH submitted first.

Interactions & Dependencies

- STARTBY specification is mutually exclusive with JOBGROUP keyword
    - Cannot combine STARTBY with dependent job control
    - WITH and HOLDUNTL can be combined with dependent jobs

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Presentation Summary

- In this presentation, new job scheduling functions implemented in JES2 V2R2 were discussed:
    - HOLDUNTL=
    - STARTBY=
    - WITH=

Appendix

- Publications
  - *z/OS V2R2.0 JES Application Programming* – SA32-0987
  - *z/OS V2R2.0 JES2 Commands* – SA32-0990
  - *z/OS V2R2.0 JES2 Initialization and Tuning Guide* – SA32-0991
  - *z/OS V2R2.0 JES2 Initialization and Tuning Reference* – SA32-0992
  - *z/OS V2R2.0 JES2 Installation Exits* – SA32-0995
  - *z/OS V2R2.0 JES2 Macros* – SA32-0996
  - *z/OS V2R2.0 JES2 Messages* – SA32-0989
  - *z/OS V2R2.0 MVS JCL Reference* - SA23-1385
  - *z/OS V2R2.0 MVS Using the Subsystem Interface* – SA38-0679