z/OS 3.2 IBM Education Assistant

Solution Name: JES Resource Group Action Enablement

Solution Element(s): JES2

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Agenda

- Trademarks

- Objectives

- Overview

- Usage & Invocation

- Interactions & Dependencies

- Upgrade & Coexistence Considerations

- Installation & Configuration

- Summary

- Appendix

Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.
- Additional Trademarks:
  - None

Objectives

- In this presentation, we will describe enhanced capabilities of JES2 Resource Group feature.

Overview

- ## Who (Audience)

  - JES2 system administrators managing JES2 resources.

- ## What (Solution)

  - In 3.1, JES2 allowed to configure job resource groups and to monitor usage of JES2 resources at the resource group level.
    In 3.2, JES2 adds capability to define and enforce a limit on consumption of JES2 resources at the resource group level.

- ## Wow (Benefit / Value, Need Addressed)

  - Allows to control cumulative usage of JES2 resources by a group of related jobs.

  - Allows peaceful co-existence of multiple workloads within the same JES2 configuration.

Overview (2)

- JES2 allows to specify a limit of resource consumption at the resource group level and to define an action that will be taken when some job associated with the resource group attempts to exceed this limit.

- Supported JES2 resource types are:
    - JES2 SPOOL space
    - JES2 output groups
    - JES2 job control structures
    - JES2 BERTs (Block Extension Reuse Tables)
      (BERTs are important JES2 resource. JES2 uses BERTs to store various operational data about jobs and output groups.)

- Supported actions are **NONE, WAIT or FAIL.**

Usage & Invocation

- New keywords are provided on the RESGROUP initialization statement and RESGROUP commands to define limits and related actions:

```
$T RESGROUP(x),RESOURCE( TG   ) = (LIMIT = n ,ACTION = NONE       )
                         JOE                           WAIT
                         JQE                           FAIL
                         BERT
```

- Here "x" is a resource group name, and "n" is resource usage limit as percentage of total available (1% - 100%)

- Valid values for RESOURCE keyword:
  - **TG**   - JES2 SPOOL space (Track Groups)
  - **JOE**   - JES2 output groups (Job Output Elements)
  - **JQE**   - JES2 job control structures (Job Queue Elements)
  - **BERT**   - JES2 BERTs (Block Extension Reuse Tables)

Usage & Invocation (2)

- Valid values for ACTION keyword:
  - **NONE** - JES2 will issue a warning message when some job attempts to exceed resource group limit but will not prevent it from consuming more resources
  - **WAIT** – in addition to messages, JES2 will suspend the request to allocate affected resource to offending job until more resources become available to the resource group
  - **FAIL** – in addition to messages, request for resource allocation will fail. Depending on the state of the job and the type of resource request, this may cause the job to fail or may cause affected JES2 function to fail.

Usage & Invocation (3)

- Example of a resource group command:

```
$tresgroup(rg1),res(tg)=(limit=10,action=fail)
        $HASP1800 RESGROUP(RG1)
$HASP1800 RESGROUP(RG1)          RESOURCE(TG)=(CURRENT=0,
$HASP1800                        PERCENT=0.0000,LIMIT=10,
$HASP1800                        ACTION=FAIL),
$HASP1800                        RESOURCE(JQE)=(CURRENT=0,
$HASP1800                        PERCENT=0.0000,LIMIT=100,
$HASP1800                        ACTION=NONE),
$HASP1800                        RESOURCE(JOE)=(CURRENT=0,
$HASP1800                        PERCENT=0.0000,LIMIT=100,
$HASP1800                        ACTION=NONE),
$HASP1800                        RESOURCE(BERT)=(CURRENT=0,
$HASP1800                        PERCENT=0.0000,LIMIT=100,
$HASP1800                        ACTION=NONE)
```

Usage & Invocation (4)

- This command sets SPOOL resource limit (resource type TG) for jobs in resource group RG1 to 10% and sets related action to FAIL.

- Settings for other resources are left at default values. For resource groups, default resource limit is 100 (effectively no limit) and default action is NONE.

Usage & Invocation (5)

- Reminder - assigning a job to a resource group is achieved via setting ResGroup attribute of a job in a JES2 policy of type JobCreate

- For example:

```
{   "policyName":      "JC1",
    "policyVersion":  1,
    "policyType":      " JobCreate ",
    "definitions":
      [ {   "condition" : " jobowner = 'DEPT5' ",
            "actions"  :
              [ {    "action"    : " ModifyJob ",
                     "attribute" : " ResGroup ",
                     "value"     : " 'RG1' "           } ]
        }
      ]
}
```

Interactions & Dependencies

- Software Dependencies

  - None

- Hardware Dependencies

  - None

- Exploiters

  - JES2 administrators managing resources in JES2 MAS.
  - SDSF displays information about resource groups on SDSF panels.

Upgrade & Coexistence Considerations

- To exploit this solution, all systems in the Plex must be at the new z/OS level:
  - No

- Down-level members of JES2 MAS must have JES2 compatibility APAR OA65446 installed.

- Down-level members will have limited functionality:
  - Resource groups cannot be created by members before 3.1 level. Also, jobs submitted on such members cannot be assigned to resource groups.
  - However, resource group resource usage counters are maintained properly by all members.
  - Resource limits and actions can only be configured and enforced by members at 3.2 level. Therefore, jobs processed by down-level members can cause resource group resource limits to be exceeded. This will, of course, impact members at 3.2 level.

Installation & Configuration

- To benefit from resource group function, some configuration must be performed:
  - Resource groups must be created and configured with desired resource limits and associated actions.
  - A policy with type JobCreate must be defined to assign jobs to resource groups based on some combination of job attributes relevant to installation.

Summary

- In this presentation we discussed 3.2 enhancements to JES2 resource group feature – enforcement of resource usage limits at the resource group level.

Appendix

- Related publications
  - z/OS 3.2 JES2 Commands
  - z/OS 3.2 JES2 Initialization and Tuning Guide
  - z/OS 3.2 JES2 Initialization and Tuning Reference
  - z/OS 3.2 JES2 Installation Exits
  - z/OS 3.2 JES2 Messages
  - z/OS 3.2 MVS Using the Subsystem Interface