IBM Education Assistance for z/OS V2R2

Line item: Allocation Two Million Open Datasets
Element/Component: Job Scheduler

Material current as of May 2015

Agenda

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Trademarks

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

Presentation Objectives

The objective of this presentation is to familiarize you with the new Scheduler Work Area (SWA) management infrastructure and other changes needed to support more concurrent data set opens by DB2

Overview

Problem Statement / Need Addressed

- To accommodate the growth of very large customers, DB2 needs to be able to have up to 2M data sets concurrently open
- Each open data set requires a minimum of 4 control blocks to be created in the Scheduler Work Area (SWA)
- A control block in SWA is represented by a SWA Virtual Address (SVA) *token* and currently the SVA format allows only 1M blocks to be represented in SWA – not enough for 2M open data sets
- Resolving an SVA to an above-the-line SWA virtual address takes longer and longer as the number of SWA blocks being managed grows, greatly elongating data set open (and close) processing time

Overview

Problem Statement / Need Addressed

- In addition, the blocks themselves consume above the line private storage.
- Serialization on the Allocation structures (SYSZTIOT) is not granular enough, reducing parallelism

Overview, continued

Solution

Use all of the bits in an SVA and redefine how they are interpreted (change from using them as an offset to using them as a index)

- Directly index to the appropriate SVA to SWA block address look-up table
- Move the SWA management infrastructure (but not SWA itself) into above-the-BAR storage
- Move Allocation's SYSDSN management blocks above the bar
- Restructure SYSZTIOT to shorten exclusive hold time

Benefit / Value

- Be able to represent up to 8M SWA blocks
- Be able to translate SVAs to SWA addresses *much* faster
- Provide 31-bit Virtual Storage Constraint Relief (VSCR)
- Reduce elapsed time to open 200K DB2 data sets, improve parallelism

Usage & Invocation

- Usage is automatic and transparent
- The **IEFQMREQ** and **SWAREQ** services (see the *z/OS MVS Authorized Assembler Services Reference*) will use the new infrastructure
- In Allocation,
  - Any program can see improved allocation times, provided:
    - It uses these SVC99 options: S99DXACU (unauth),
      -or-
      S99TIOEX + S99DSABA + S99ACUCB (auth)
    - It provides its own DD names instead of system-generated
    - There are multiple tasks invoking SVC99 in parallel
  - Note that functions provided in prior releases can also be used to improve allocation performance:
    - S99DASUP
    - MEMDSENQMGMT

Interactions & Dependencies

- Software Dependencies
  - In a mixed z/OS V2R1 / z/OS V2R2 sysplex environment, customers must make sure that the following APARs are installed on their z/OS V2R1 systems if they intend to use the JES2 INTERPRET=JES function
    - OA45946 (MVS)
    - OA46874 (JES2)
- Hardware Dependencies
  - None
- Exploiters
  - All internal and external users of the **IEFQMREQ** and **SWAREQ** services
  - DB2 will exploit the greater numbers of open data sets available.

Migration & Coexistence Considerations

- There are no migration actions
- In a mixed z/OS V2R1 / z/OS V2R2 sysplex environment, customers must make sure that OA45946 and OA46874 are installed on their z/OS V2R1 systems if they intend to use the JES2 INTERPRET=JES function

Installation

- In a mixed z/OS V2R1 / z/OS V2R2 sysplex environment, customers must make sure that OA45946 and OA46874 are installed on their z/OS V2R1 systems if they intend to use the JES2 INTERPRET=JES function

Presentation Summary

- Enhancements to the Scheduler Work Area infrastructure will allow many more control blocks to be represented in SWA
  - Removes one of the constraints that prevents DB2 from having up to 8M data sets concurrently open
- The SWA management infrastructure (but not SWA itself) has been moved out of 31-bit storage, providing Virtual Storage Constraint Relief
- The translation of a SWA Virtual Address *token* to an actual virtual address in SWA is considerably faster
  - Reduces the time required to open or close large numbers of data sets
- Enhancements to Allocation will allow multi-tasking programs and subsystems like DB2 to open more concurrent data sets.