z/OS V2.5 IBM Education Assistant

Solution Name: DD control blocks above the bar

Solution Element(s): BCP - Device Allocation, Job Scheduler

Agenda

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Trademarks

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

Objectives

- In z/OS 2.5, we moved some control blocks that represent allocated DDs from 31-bit storage to 64-bit storage.
- This presentation will describe:
  - What blocks have moved.
  - What steps are necessary to exploit this function.
  - What to look for in z/OS 2.5

Overview

- Who (Audience)
  - System programmers, application developers
- What (Solution)
  - Dynamic allocation will begin to use 64-bit storage for allocation-related control blocks to relieve constraints on 31-bit storage.
- Wow (Benefit / Value, Need Addressed)
  - With less 31-bit storage needed to represent allocated DDs, more DDs can be allocated by a single address space.

Overview

- Dynamic Allocation (SVC 99) creates most of the structures that represent an allocated DD in 24-bit or 31-bit storage.
  - Some of these blocks are created according to the SWA setting, and some are always created in 31-bit storage.
  - The amount of storage that is needed to represent a DD varies.

- In z/OS 2.5, we investigated moving several DD-related control blocks into 64-bit storage.
  - There are some structures that are internal to Allocation that will be moved unconditionally. These represent a small portion of the overall 31-bit storage usage for a DD.
  - There are some other blocks that will be moved conditionally.

Overview

- There are SWA blocks called SWBs that are associated with DDs (as well as other JCL statements.) These represent information for many JCL keyword values.
- SWBs can conditionally be moved to 64-bit storage in some cases (see subsequent slides for enablement details.)
  - Only SWBs related to dynamically allocated (SVC 99) DDs will be eligible to move to 64-bit storage.
  - SWBs associated with batch JCL DDs will not be eligible to move.
  - SWBs associated with other statements (such as output descriptors) will not be eligible to move.
  - Jobs that have SWBs that are in 64-bit storage are not eligible for job restart or Checkpoint/Restart. Jobs that would benefit the most from 64-bit SWBs would be using other functions such as XTIOTs that make them not eligible for restart.
  - Other DD-related blocks (DSAB, SIOT, JFCB) are not moving.
- SWBs are not a programming interface and most applications do not reference SWBs directly, but use other services to reference them.
  - SVC 99 Dynamic Information Retrieval is one example of a service that extracts information from SWBs.
  - Callers of services that extract SWB information (such as SVC 99 Dynamic Information Retrieval) should not require changes.

Usage & Invocation

- There is an enablement switch in the ALLOCxx parmlib member that determines where SWBs are eligible to be placed:
  - SYSTEM SWBSTORAGE(SWA) will cause SWBs to be placed in 31-bit storage, as they have been in prior z/OS releases. This is the default.
  - SYSTEM SWBSTORAGE(ATB) will cause SWBs to be eligible to be placed in 64-bit storage. Individual applications must be updated to indicate that they can tolerate 64-bit SWBs, otherwise their SWBs will continue to be in 31-bit storage.
- This option can also be updated dynamically via the SETALLOC command.
  - Syntax:
    SETALLOC SYSTEM,SWBSTORAGE=SWA
    SETALLOC SYSTEM,SWBSTORAGE=ATB
  - Changing this setting will not affect jobs that are already running.
- The DISPLAY ALLOC,OPTIONS command will display the SWBSTORAGE value.

Usage & Invocation

- Applications that want to use 64-bit SWBs should invoke the following service:
  IEFDDSRV MODIFY,TYPE=FEATURE,SWBSTORAGE=ATB
  SYSTEM SWBSTORAGE(ATB) must be specified in ALLOCxx for this to have any effect.
- Typical return codes:
  - Return code X'00': function successfully enabled
  - Return code X'0C' reason code X'104": the installation did not enable the function (SYSTEM SWBSTORAGE(SWA) is in effect)
  - A complete list of return codes is documented in z/OS MVS Programming: Assembler Services Reference.
- The application will typically invoke IEFDDSRV once, early in its initialization.
  - Once SWBSTORAGE=ATB is enabled, it cannot be disabled.
- Applications that enable this typically have many DDs allocated at once.
  - Tens or hundreds of thousands of DDs.
  - Although not required, they will typically also use XTIOT and MEMDSENQMGMT.

Usage & Invocation

- Individual applications may have their own enablement/disablement switch or other requirements to use 64-bit SWBs.
- If you have applications that directly reference SWBs for DDs
  - SWBs are not considered programming interface information. Please contact us so we can understand why you are referencing SWBs directly.
  - Do not enable SWBSTORAGE(ATB).

Interactions & Dependencies

- Software Dependencies
  - None
- Hardware Dependencies
  - None
- Exploiters
  - Exploiters to come later, and will describe their own interactions and dependencies (if any.)

Upgrade & Coexistence Considerations

- To exploit this solution, all systems in the Sysplex must be at the new z/OS level: No
- Toleration/coexistence APARs/PTFs: None
- If you share the ALLOCxx parmlib member with pre-z/OS 2.5 systems:
  - The SWBSTORAGE keyword will not be recognized on pre-z/OS 2.5 systems, and will be treated as a syntax error and ignored.
  - This will not prevent IPL from completing.

Installation & Configuration

- No required steps, but you can enable the new ALLOCxx parmlib keyword if you choose.

Summary

- In z/OS 2.5, some control blocks that represent dynamically allocated DDs will be moved from 31-bit storage to 64-bit storage.
- A small amount of storage will be moved unconditionally.
- Additional storage will be moved conditionally, and application changes and parmlib changes are necessary to exploit this.

Appendix

- SA23-1370 z/OS MVS Programming: Assembler Services Reference, Volume 2 (IAR-XCT)
  - IEFDDSRV service information
- SA38-0666 z/OS MVS System Commands
  - SETALLOC, DISPLAY ALLOC command information
- SA38-0675 z/OS MVS System Messages, Vol 8 (IEF-IGD)
  - IEFA003I (DISPLAY ALLOC command output)
- SA23-1380 z/OS MVS Initialization and Tuning Reference
  - ALLOCxx syntax