IBM Education Assistance z/OS V2R1

Item: Heap Overlay Tolerance
Element/Component: Language Environment

Agenda

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Trademarks

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

Presentation Objectives

- Describe the new HEAPZONES runtime option and how it can be used to detect or tolerate heap overlays.

Overview

- **Problem Statement / Need Addressed**
  - A poorly written application, which causes small overlays in user heap storage, must continue to run until a fix is available.
  - During application test, the ability to detect these small overlays, even when there is no obvious application failure, is needed.

- **Solution**
  - Provide a new runtime option called HEAPZONES that can be activated to provide a heap check zone for each user heap element. The runtime option can also be used to notify the user of a storage overlay when an element is freed.

- **Benefit / Value**
  - Toleration of heap overlays in production environment.
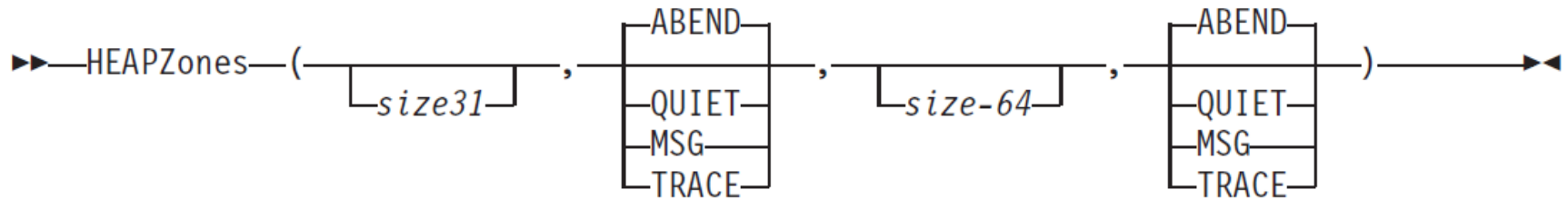 - Detection of heap overlays during application testing.

Usage & Invocation

- A new runtime option HEAPZONES will control user heap overlay toleration and checking.

  - A heap check zone is an extra piece of storage appended to a heap element during a storage allocation request.

  - The size of the check zone is controlled by the runtime option.

  - The runtime option controls checking and how much diagnostic information is provided when an overlay is found.

  - If checking is requested, the check zone is examined for overlays when the heap element is freed.

  - The runtime option affects heap pools as well as user heap.

  - The runtime option can **NOT** be specified at the system or region level.

Usage & Invocation

Syntax

```
▶▶──HEAPZones──(──────────────,──┬─ABEND──┬──,──────────────,──┬─ABEND──┬──)──────▶◀
                 └─size31─┘        ├─QUIET──┤     └─size-64─┘     ├─QUIET──┤
                                   ├─MSG────┤                     ├─MSG────┤
                                   └─TRACE──┘                     └─TRACE──┘
```

Usage & Invocation

- The first suboption controls the size of the check zone for all user heap storage which is below the 2G bar.

    - Check zone size is rounded up to the nearest multiple of 8 bytes.

    - The maximum size allowed for a check zone is 1024 bytes.

    - Specifying a value of 0 indicates no check zone is active.

Usage & Invocation

- The second suboption controls the validation of the check zone for all user heap storage which is below the 2G bar.

QUIET No validation.

MSG Validation when storage freed. Informational message if overlay detected.

TRACE Validation when storage freed. Informational message and CEEDUMP containing only a traceback if overlay detected.

ABEND Validation when storage freed. Informational message and abend U4042 reason code 3 if overlay detected.

Usage & Invocation

- The third suboption controls the size of the check zone for all user heap storage which is above the 2G bar.

    - Check zone size is rounded up to the nearest multiple of 8 bytes with a minimum size of 16 bytes.

    - The maximum size allowed for a check zone is 1024 bytes.

    - Specifying a value of 0 indicates no check zone is active.

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Usage & Invocation

- The fourth suboption controls the validation of the check zone for all user heap storage which is above the 2G bar.

QUIET	No validation.
MSG	Validation when storage freed. Informational message if overlay detected.
TRACE	Validation when storage freed. Informational message and CEEDUMP containing only a traceback if overlay detected.
ABEND	Validation when storage freed. Informational message and abend U4042 reason code 3 if overlay detected.

Presentation Summary

- New runtime option HEAPZONES can be used to detect heap overlays during application test or to tolerate heap overlays in a production environment.

Appendix

- Publications:

  - SA38-0683-00 z/OS Language Environment Programming Reference

  - GA32-0908-00 z/OS Language Environment Debugging Guide