z/OS V2.5 IBM Education Assistant

Solution Name: Runtime Diagnostics Anomaly Diagnostic Reporting

Solution Element(s): BCP RTD

Agenda

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Trademarks

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

Objectives

- Discuss enhancements to Runtime Diagnostics
  - They allow you to more quickly identify anomalous behavior to enable recovery and improve decision-making regarding recovery steps so that the systems can be recovered quickly and accurately
  - These enhancements
    - Provide a way to specify which events Runtime Diagnostics should analyze.
    - Make the SERVERHEALTH event more reliable.
    - Remove the HIGHCPU event due to false behavior.
    - Allow additional critical, component messages to be found by Runtime Diagnostics.

Overview

- Who (Audience)
  - Systems operators, systems programmers
- What (Solution)
  - Improve decision-making when anomalous behavior occurs
- Wow (Benefit / Value, Need Addressed)
  - An IT operator can detect anomalous behavior in real-time, improve decision-making and automate triage processes, enabling her to proactively address potential problems before an availability-impacting event can develop.

Usage & Invocation

- The Runtime Diagnostics address space is started at IPL by default since V2R3.
- Runtime Diagnostics does analysis when requested
  - By using the **f hzr,analyze** command
  - By Predictive Failures Analysis (PFA)
- When using **f hzr,analyze** on a V2R5 system:
    - A new parameter can be used on the command to allow only certain events to be analyzed (see next slide).
    - SERVERHEALTH events will not be found until the address space with the WLM health setting less than 100 has been active for at least 5 minutes.
      - Address spaces often have WLM health values less than 100 until they are stable after being started.
    - HIGHCPU events will not be found.
      - Confusion resulted when the HIGHCPU event reported CPU > 100%
    - Additional, critical component messages will be found by Runtime Diagnostics.
      - See the Appendix for documentation which includes the list of messages found by Runtime Diagnostics.

Usage & Invocation continued

- The new Runtime Diagnostics EVENTS parameter
  - Only processes the events requested.
    - Can request one or more event types: EVENTS=(MSGS,ENQ)
    - Can request all events: EVENTS=ALL
  - Optional. ALL events analyzed if EVENTS not specified.
- Use cases
  1. I only want to do message analysis of all or multiple types of messages:
     a) **f hzr,analyze,events=(MSGS)** – Performs message analysis for CRITICALWTO, CRITICALWTOR, and OTHERWTOR
     b) **f hzr,analyze,events=(CRITICALWTOR,OTHERWTOR)** – Performs analysis for WTOR messages, but not WTO messages
  2. I used Runtime Diagnostics and saw a loop (or other) event. I want to dump the address space that's looping as quickly and as easily as possible without doing all the analysis that Runtime Diagnostics usually does.
     a) **f hzr,analyze,events=(LOOP),DEBUG=(LOOP)** – Looks for loop events and if found, dumps the address spaces that are looping and the HZR address space
  3. I think an address space is stuck. I want to see if there are any serialization issues with GRS latches and enqueues:
     a) **f hzr,analyze,events=(LATCH,ENQ,DEADLOCK)**

Interactions & Dependencies

- Software Dependencies
  - None
- Hardware Dependencies
  - None
- Exploiters
  - None

Upgrade & Coexistence Considerations

- To exploit this solution, all systems in the Plex must be at the new z/OS level: No
- List any toleration/coexistence APARs/PTFs: None
- When Runtime Diagnostics invokes itself on pre-V2R5 systems when “following the top blocker” of an enqueue:
  - SERVERHEALTH events are reported as follows:
    - SERVERHEALTH events found on systems prior to V2R5 do not have the “5 minute active” requirement.
    - Therefore, SERVERHEALTH events that are found on lower release systems and returned to the V2R5 system when following blockers will be issued by the V2R5 system even if the address space on the lower release system has not been active for 5 minutes.
  - HIGHCPU events found on lower release systems and returned to the V2R5 system when following blockers will not be issued as an event found on the other system.
  - Only event types that are included in the list of events to analyze via the new EVENTS parameters will be issued on the V2R5 systems from lower release systems.

Installation & Configuration

- None.

Summary

- Runtime Diagnostics is there when you need it most.
  - It analyzes problems in real-time.
  - It performs quick, comprehensive analysis similar to that of a very experienced system programmer.
- The enhancements in V2R5 allow you to more quickly identify anomalous behavior to enable recovery and improve decision-making regarding recovery steps so that the systems can be recovered quickly and accurately.

Appendix

- *z/OS Problem Management* SC23-6844
- Messages added for RTD processing:

Logger
- IXG062A
- IXG388E

Catalog
- IEC361I
- IEC365I
- IEC376W
- IEC392I
- IEC393I

Websphere
- BBOO0404E

RRS
- ATR157E
- ATR210E
- ATR249E
- ATR225D
- ATR226D
- ATR227D
- ATR228D
- ATR229D
- ATR230D
- ATR231D
- ATR232D
- ATR233D
- ATR234D
- ATRH014E
- ATRH016E