IBM Education Assistance for z/OS V2R1

Item: CALLRTM TYPE=SRBTERM
Element/Component: BCP Recovery Termination Manager

Material is current as of March 2013

Agenda

- Trademarks
- Presentation Objectives
- Overview
- Usage & Invocation
- The RCVY SRBT System Trace Record
- Installation
- Appendix

Trademarks

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

Presentation Objectives

- Understand the new CALLRTM TYPE=SRBTERM service
- Recognize a CALLRTM TYPE=SRBTERM in the System Trace

Overview – Need Addressed: Terminate preemptable SRBs

- TCBs typically lose control and are re-dispatched many times. CALLRTM TYPE=ABTERM is used to terminate a TCB the next time that it loses control
- Traditionally, SRBs did not lose control and would always run to completion. So CALLRTM could not be used to terminate them
- With the advent of preemptable SRBs (including Preemptable, Client and Enclave SRBs), we have SRBs that lose control and are re-dispatched like TCBs. These SRBs may also run longer than intended
- PURGEDQ can be used to terminate SRBs which have not run yet, or that are stopped/suspended. But it waits for running SRBs. Also, it can not readily be used to target a specific SRB

Overview – Solution: CALLRTM TYPE=SRBTERM

- A new form of CALLRTM, CALLRTM TYPE=SRBTERM, may be used to terminate a specific running or stopped/suspended preemptable SRB
- The target preemptable SRB is uniquely identified with an SrbIdToken. The SrbIdToken is provided by IEAMSCHD using a new keyword (SRBIDTOKEN=)
- Like TCBs, preemptable SRBs may temporarily protect themselves from CALLRTM TYPE=SRBTERM by holding a lock or using STATUS SET,MC,PROCESS. FRRs for preemptable SRBs are always protected from CALLRTM TYPE=SRBTERM
- CALLRTM TYPE=SRBTERM is processed asynchronously – the target preemptable SRB may terminate after control is returned to the caller

Overview – Benefit: Preemptable SRBs can be terminated

- If the target preemptable SRB has not actually started running yet, it will be caught by RTM's PURGEDQ and its RMTR will receive control

- If the target preemptable SRB is stopped or suspended, it will be caught by RTM's PURGEDQ and will be abended with the completion and reason codes and RETRY= option in the SRBTERM request instead of the usual PURGEDQ ABEND47B

- If the target preemptable SRB is running, it will eventually be caught and abended with the SRBTERM completion and reason codes and RETRY= option by one of the following places:
  - The External FLIH during normal interrupt processing
  - SETLOCK release for a local lock (only if there are waiters)
  - STATUS when resetting Process Must Complete

Usage & Invocation – invoking CALLRTM TYPE=SRBTERM

- CALLRTM TYPE=SRBTERM requires the SRBIDTOKEN= and COMPCOD= parameters. Supported optional parameters are REASON=, RETRY= (default 'YES'), and SYSTEM= (default 'YES').

- This form of CALLRTM requires a 144-byte workarea address in GPR 13. Like CALLRTM TYPE=ABTERM, the workarea is not used as a standard savearea by RTM. GPR 13 is the only required input register

- Minimum authorization: Key 0, Supervisor state
- Dispatchable unit mode: Task or SRB
- Cross Memory mode: Any PASN, any SASN, any HASN
- Amode: 31 (amode 24 is not supported)
- ASC mode: Primary or Secondary

Usage & Invocation – invoking CALLRTM TYPE=SRBTERM

- Interrupt Status: Enabled or Disabled
- Locks: May be held, but are not required
- Control Parameters: For callers in Primary ASC mode, must be in the Primary address space. For callers in Secondary ASC mode, must be in the Secondary address space

- Output registers (64-bit – the high halves of 2-14 are preserved):
  - 0-1 used as work registers
  - 2-5 unchanged
  - 6 used as a work register if you specify REASON=
  - 7-13 unchanged
  - 14 used as a work register
  - 15 return/reason code

Usage & Invocation – additional information

- The high order bit of the reason code is defined as having a special meaning for SRBTERMs. When the issuer of CALLRTM turns this bit on, it is a signal that the issuer believes that an SVCDUMP will not be required for this abend
  - Recovery routines can examine the high order bit of the reason code (when SDWASRBT is on) as an aid in the decision about whether to capture an SVCDUMP
  - RTM does not do anything special for this bit – it is just a convention that we are putting into place for this new form of CALLRTM

- As with other forms of CALLRTM, a record is written to the System Trace to describe the CALLRTM TYPE=SRBTERM invocation

Return codes

- CALLRTM TYPE=SRBTERM returns a return and reason code in GPR 15 in the form xxxxxxyy, where 'yy' is the return code and 'xxxxxx' is the reason code. The following return and reason codes are in hex:

  – **00000000**
  Meaning: The SRBTERM request was processed successfully and the SRB will be terminated at the next opportunity.
  Action: None.

  – **00000104**
  Meaning: The SRBIDTOKEN is no longer valid. This return code implies that the target SRB has already terminated.
  Action: None.

Return codes

- continued:
  - **00000204**
    Meaning: An SRBTERM request with RETRY=YES was issued against an SRB for which a previous SRBTERM request with RETRY=NO is still being processed. The older RETRY=NO SRBTERM will be honored rather than the new RETRY=YES SRBTERM.
    Action: None.
  - **00000108**
    Meaning: The SRBIDTOKEN contains data that is not valid.
    Action: Ensure that the SRBIDTOKEN parameter points to a valid token which was returned by the IEAMSCHD service.

Return codes

- continued:
  - **00000110**
    Meaning: System error. The target SRB will terminate if it is running but may not terminate if it is suspended or stopped.
    Action: If the SRB does not terminate, reissue the SRBTERM request a reasonable number of times. If the SRB still does not terminate, report this error to IBM support.
  - **00000210**
    Meaning: System error. The target SRB will not be terminated.
    Action: Report this error to IBM support.

The RCVY SRBT System Trace record

```
01 0023 005E77B0 *RCVY  SRBT      89800CDE  86456000 00000014 00000000  000
                                            00000000 042A6800 00000000  000
```

- '89800CDE' is the address of the program that invoked CALLRTM
- '86456000' is the requested completion code (system abend 456 in this example) with flags in the high order byte
- '00000014' is the requested reason code
- '00000000' is the return code from RTM for this invocation
- '00000000 042A6800 00000000 00000021' is the SrbIdToken that was specified. For debugging purposes, note that the second word contains the address of the target SRB's WEB control block
- The right side of this record was truncated for clarity. It contains the standard things in a RCVY record – locks held, cross-memory information, and a timestamp

Installation

- The full version of this support is currently in V2R1
- For V1R13, this support was provided via APAR OA39392 in October 2012

Appendix

- Documentation updates were included in the enablement APAR, OA39392. They include:
  - Update the IEAMSCHD service described by the z/OS MVS Authorized Assembler Services Reference (SA22-7610) to include the SrbIdToken parameter
  - Update the CALLRTM service described by the z/OS MVS Authorized Assembler Services Reference (SA22-7609) to include the TYPE=SRBTERM parameter
  - A new section about terminating preemptable SRBs in the 'Using a service request block (SRB)' chapter of the z/OS MVS Authorized Assembler Services Guide (SA22-7608)
  - Information about using CALLRTM TYPE=SRBTERM in the 'Invoking RTM' chapter of the z/OS MVS Authorized Assembler Services guide (SA22-7608)
  - A description of the RCVY SRBT System Trace record in the z/OS MVS Diagnosis: Tools and Service Aids (GA22-7589)