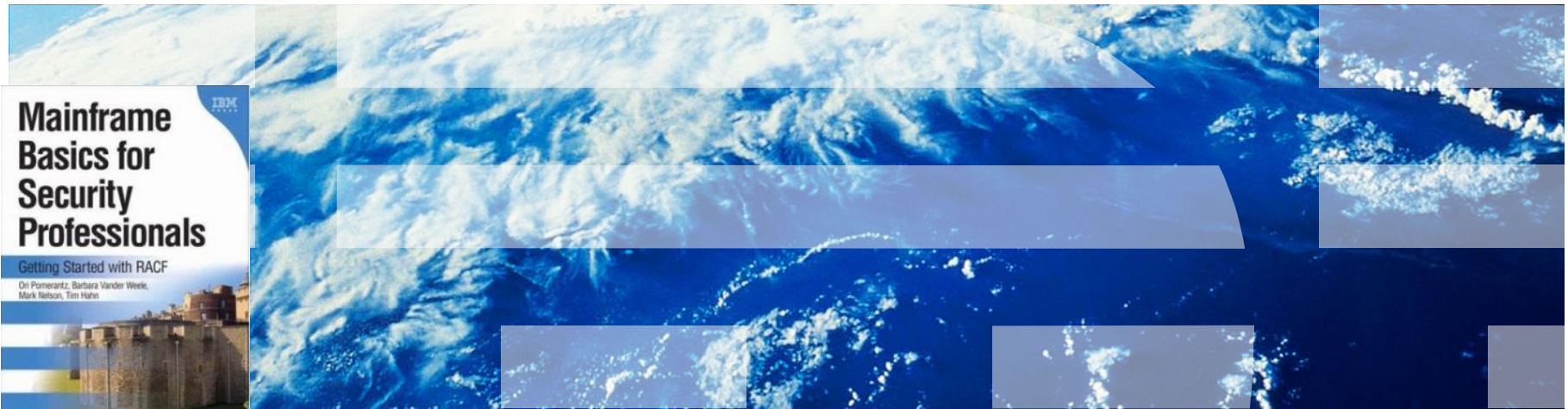


RACF® Users Group of New England (RUG-One) A Fresh Look at Erase-on-Scratch

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A Fresh Look at Erase-on-Scratch

- **What do you need to do to read residual data on a z/OS system that has not enabled erase-on-scratch?**
 - Authorized code that reads beyond the end-of-file (EOF) marker?
 - Complicated high-level language code with complicated file declarations?
 - Assembler code?
 - Common utilities?
 - Answer: Any of the above!

- **What is erase-on-scratch?**
 - A RACF and DFSMSdfp facility which causes the overwriting of the space occupied by a data set which has been deleted or for which space is being released (sometimes referred to as “scratched”)

A Fresh Look at Erase-on-Scratch...

- The **SETROPTS** options which control erase-on-scratch are:
 - **SETROPTS ERASE(ALL)**
 - Instructs DFSMSdfp to erase all scratched data sets, including temporary data sets, regardless of the erasure indicator in the data set profile
 - **SETROPTS ERASE(seclevel-name)**
 - Instructs DFSMSdfp to erase all scratched data sets that have a security level equal to or greater than seclevel-name
 - **SETROPTS SETROPTS ERASE or ERASE(NOSECLEVEL)**
 - RACF instructs DFMSsdsp to erase a scratched data set if the erasure indicator in the data set profile is on
 - **SETROPTS NOERASE**
 - No erase-on-scratch processing is to be performed, even if the data set erasure indicator is on in the data set profile

- **Caution:** SETROPTS LIST can displays the ERASURE status over multiple lines:
ERASE-ON-SCRATCH IS ACTIVE, CURRENT OPTIONS:
ERASE-ON-SCRATCH BY SECURITY LEVEL IS INACTIVE
vs.
ERASE-ON-SCRATCH IS ACTIVE, CURRENT OPTIONS:
ERASE-ON-SCRATCH FOR ALL DATA SETS IS IN EFFECT
ERASE-ON-SCRATCH BY SECURITY LEVEL IS INACTIVE

A Fresh Look at Erase-on-Scratch...

- **All settings other than SETROPTS ERASE(ALL) and SETROPTS NOERASE look at the data set erasure status of the data set. This can be set by:**
 - **The RACF data set profile:** `ALTDSD 'MARKN.*' ERASE` causes RACF to instruct DFSMSdfp to “overwrite” the DASD storage occupied by a data set which is being deleted or is having its storage released for data sets covered by this profile
 - **JCL:** `CROPS=RCK` on the AMP keyword on a DD statement for a VSAM data set

- **Who is using erase-on-scratch?**
 - The April 2013 RSH Consulting survey revealed:

• ERASE ALL:	13.6%
• ERASE SECLEVEL:	2.3%
• ERASE NOSECLEVEL:	22.7%
• NOERASE:	61.4%

- **What is preventing the more widespread adoption of erase-on-scratch?**
 - Fear of performance impacts!

A Fresh Look at Erase-on-Scratch...

- **There have been considerable changes since erase-on-scratch was introduced in RACF 1.7:**
 - Faster disk drives, control units, and paths to devices
 - Multiple paths to devices
 - Virtualization of devices
 - Data Space Release (DDSR) (which is no longer available)
 - Locate record with erase (LRE)
 - Up to 255 tracks in a single channel program (z/OS V2R1)
 - Up to 12,240 tracks in a single channel program (z/OS V2R2)

A Fresh Look at Erase-on-Scratch...

- **Frank Kyne performed erase-on-scratch testing that is documented in Cheryl Watson's "TUNING Letter - 2015 No. 1":**
 - Allocated data sets of 1, 100, 255, 25600, and 63000 tracks
 - Ran a separate job to delete each data set, varying erase-on-scratch on and off, on z/OS V1R13 and z/OS V2R1
- **Frank's results:**
 - Small reduction in elapsed time and EXCP counts for the smaller data set sizes (1, 100, 255)
 - Large reduction in elapsed time and EXCP counts for the larger data sets
 - For the 63,000 track data set, EXCPs dropped from 63,007 to 263
 - Elapsed times decrease between 1/3 and 2/3
- **Remember that z/OS V2R2 increases the upper limit on the number of tracks erased in a single CCW to 12,240 (from 255)!**

A Fresh Look at Erase-on-Scratch...

- **One thing to look for before enabling SETROPTS ERASE(ALL):**
 - **If you are using PPRC (“Peer to Peer Remote Copy”), IBM’s synchronous data mirroring technology, have you installed APAR OA46511?**
 - Introduced a new DEVSUPxx keyword (**EOSV2**) to allow the erasure of up to the z/OS maximum for tracks in a single channel program if the PPRC primary and backup data sets
 - Devices must be at a current microcode level
 - DS8100/DS8300: 64.36.89.0
 - DS8700: 76.31.70.0
 - DS8800: 86.31.86.0

A Fresh Look at Erase-on-Scratch...

- **Once you are on z/OS V2R1, perhaps it's time to revisit erase-on-scratch!**