My Experiences Activating the FSEXEC Resource Class

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About Joel Tilton, CISSP

- Joel Tilton is a former employee of IBM, where he got his start with mainframes, who continues to champion mainframe security issues and solutions.
- Over 20+ years technical IT experience, the majority of which was gained in hands-on technical roles, performing a variety of duties in diverse and complex environments.
- The majority of Joel's experience is focused on IBM mainframe systems, where he performs as a Technician and Project Manager. Joel's specialist subject is IT Security, in particular z/OS and associated subsystems (CICS, DB2, MQ, zSecure, etc.) security with RACF.
- Joel is also an active member of the Tampa Bay RUG (RACF User Group) which meets jointly with the NY RUG. Joel has a true passion for security and the mainframe. Long live the mainframe!
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Disclaimers

- All products, trademarks, and information mentioned are the property of the respective vendors.
- Mention of a product does not imply a recommendation.
- Always test new profiles on a non-production system.
- Only you can prevent IPLs…
- The views expressed are his own personal views, and are not endorsed or supported by, and do not necessarily express or reflect, the views, positions or strategies of his employer

Agenda

- FSEXEC – Available with z/OS 2.2
- SETR CLASSACT & More
- Securing the Unknown
- Wherefore art thou SMF?
- Calls to FSEXEC in One Month
- What "thingy" typically calls FSEXEC ?
- Suggestion, Start Small
- RFEs
  - Because IBM developers need work! ☺
- Wrap Up

FSEXEC – How It Works

- Think of it as "Front Door" Access Check
  - Without access I'm stopped at the door by the bouncer
  - Do NOT Pass Go; Do Not Collect $200
- **Superuser, auditor, or read-only auditor privilege does NOT override FSEXEC denial of access.**
- RACLIST Required
- FSEXEC restriction does not apply to file systems mounted with the '-s nosecurity' option.
  - So verify how your file systems are mounted!
- https://www.ibm.com/support/knowledgecenter/en/SSLTBW_2.3.0/com.ibm.zos.v2r3.icha700/reaiazotfs.htm

Class Activation

- **SETR CLASSACT(fsexec) AUDIT(fsexec) GENERIC(fsexec) RACLIST(fsexec)**
  - GENERIC( ) means GENCMD( ) too
  - However NOGENERIC does not include NOGENCMD!
  - When in doubt always code GENERIC & GENCMD
    - Thanks to Julie Bergh for that tip!
- **RDEFINE RACGLIST FSEXEC OWNER( )**
  - IPL will **not** refresh in-storage RACF profiles
  - Ensure Sysplex Consistency for RACF
  - By Product…Performance Improvement
  - **SETR classact(RACGLIST) audit(RACGLIST)**
  - **SETR RACLIST(…) REFRESH**
    - Builds RACGLIST profiles

Securing the Unknown

- Everything is going great when we have
  - SMF
  - ICH408I
    - Well maybe not "great" when we get security violations
    - At least we have a "hint" of where is the problem
- But what would we do if none of these are available?
- There's always exits
  - But do we have the time or expertise?
- How do you secure a resource when you can't find any bread crumbs?

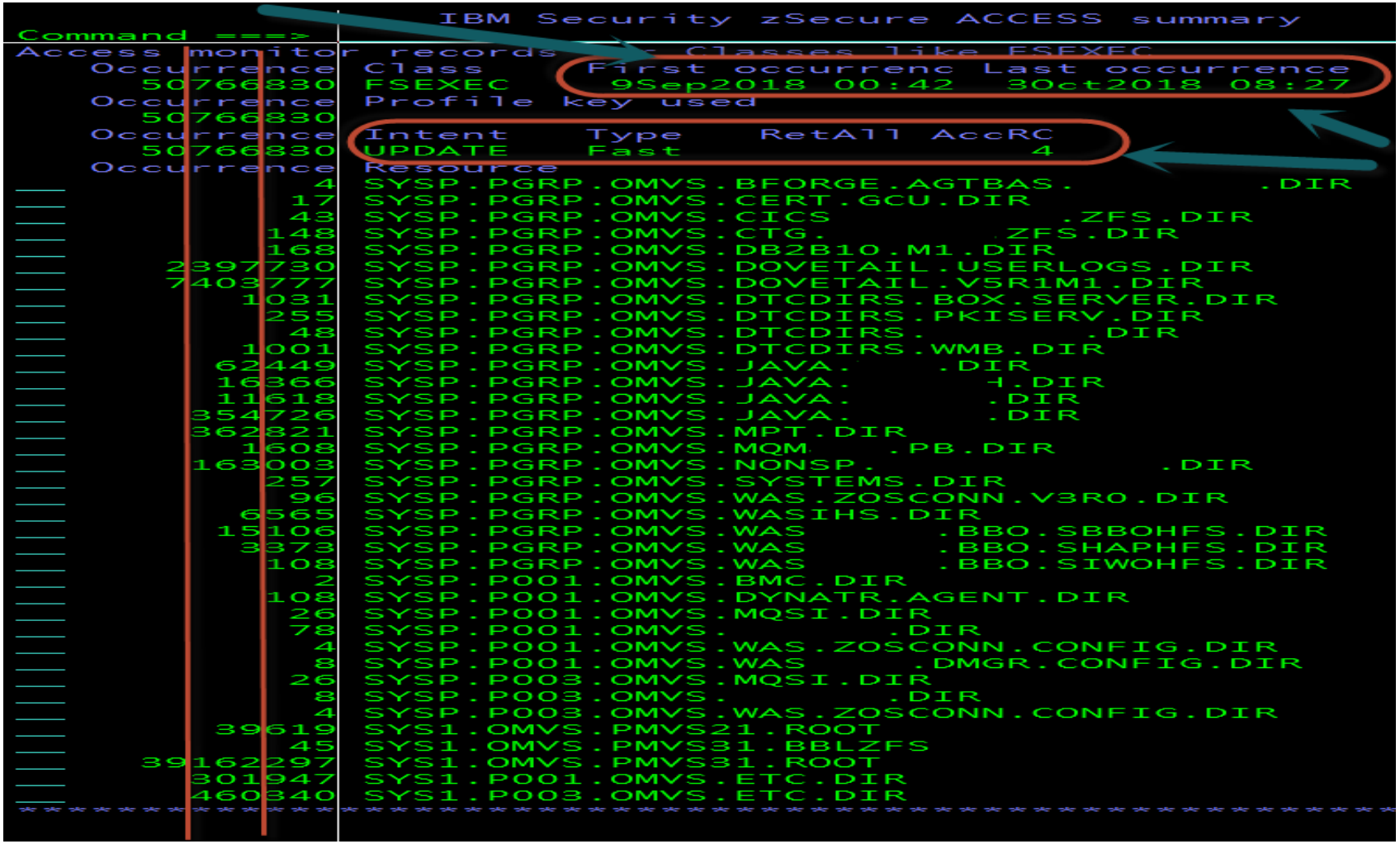
Wherefore art thou SMF?

- Where oh where has my SMF gone?
- AUDIT(ALL(READ)) but still don't get SMF?
  - RACROUTE … LOG=NONE
    - Alas the software has decided the security engineer doesn't get to control logging! ☹
- Never give up, never surrender!
- PMR IBM to death of course ☺
  - I Love the smell of Sev 2 PMRs in the morning!
  - But IBM takes time to build fixes ☹
  - So PMR is the "long game"

Wherefore art thou SMF?

- If you really want a Nor'easter of SMF….
- SETR LOGOPTIONS(ALWAYS(class_name))
  - Check with your systems programmer first!
  - And still duck if SMF starts dumping like crazy…
  - I still remember the day when some did this:
    - RALT PROGRAM ** AUDIT(ALL(READ))
      - BONUS QUESTION: Why did that cause pain?
      - HINT: SYS1.TCPIP.SEZALOAD

50,766,830 FSEXEC Calls – 1 Month



So Who Typically Accesses FSEXEC?

- Batch UserIDs
- Every SFTP UserID
- Started Tasks
- Anything Using z/OS UNIX
- That's a BIG access list in some cases

Suggestion – Start Small

- Start with securing of /tmp & /var/tmp
  - A First Step
  - Prevent Trojan Horses
- Interestingly enough that means
  - Creating a new moint point
- Profiles in FSEXEC are the underlying name of MVS dataset name that contains the mounted zFS file system
- Based on analysis, can't really set up a profile just for /tmp today
  - /tmp is a part of / i.e. root file system
- Befriend the managers of your systems programmers!

RFEs – Please Vote

- To my knowledge, no caching
- Reduce CPU time for UNIX file security especially if you have FSACCESS on (116261)
  - Uncommitted Candidate ➔ 20 Votes
  - 20 Votes

UNIXPRIV SUPERUSER.FILESYS.DIRSRCH

- Users with READ access to SUPERUSER.FILESYS.DIRSRCH profile in the UNIXPRIV class can list files in a directory
- Security improvement
  - So having access to the data itself is no longer necessary?
  - Should those of us administering permission bits only need READ to SUPERUSER.FILESYS.DIRSRCH *instead of* SUPERUSER.FILESYS ?
  - It Depends. Your Mileage May Vary.
- Available with z/OS 2.2

Summary

- Turning on FSEXEC is not hard
- Trying to secure individual UNIX directories will be the challenge
  - /tmp only? Need to change to its own mount point
- 50 million calls to RACF in a month
  - 39 million for root file system
- Start small and grow
- Vote for RFEs!
- Your Mileage May Vary

Questions?