Practical Steps to Implement a New Resource Class

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About Joel Tilton

- 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

- Where to start
- Wherefore art thou SMF?
- My Country for an ICH408I?
- Real World Example: zEDC FACILITY Resource
- ISV Software has a solution
- Endless Possibility
- Security Analytics
- Not a replacement for SMF
- Summary

ABSTRACT

- Have you ever had to define RACF rules for a new resource class or a new piece of software when the info you needed to do it easily just wasn't available?
- In this presentation Joel describes the commonly used "standard" techniques and explains why they sometimes don't work.
- He then shows an improved technique using commonly available reporting/analytic tools and a real-life example of how he applied it in real life

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

My Country for an ICH408I

- So we can not find SMF
- We can not find ICH408I
- Thanks to some design that thinks the RACF profiles / SETR options should not be the decision makers for logging
  - Why on Earth do software developers ever think this is a good idea!
    - Oh wait some customers are annoyed by too much logging!
- Sometimes this is a good thing
  - SDSF
  - Imagine all the SAF calls made just to build your SDSF menu options
- But without any trail at all what do we do next?
- What do I grant access to?
  - READ UPDATE CONTROL ALTER ??????????????????
- Thoughts?

A Real World Example - zEDC

- FACILITY FPZ.ACCELERATOR.COMPRESSION
  - zEDC: hardware accelerated 100% CPU FREE DASD Compression
  - zEDC SAF check for problem state callers
- The profile didn't exist a year ago
- And then someone defined the profile with UACC(NONE) AUDIT(FAILURES(READ)) a few months ago
  - Which is "typical" but I'd like to do a one year analysis of all SAF checks for FPZ.ACCELERATOR.COMPRESSION
  - So I can set up the access to ensure everything that needs access has access
- Set AUDIT(ALL(READ)) and wait for the next ICH408I message? I think not……

Enter ISV Software

- IBM Security zSecure
  - Access Monitor a part of zSecure admin
  - http://www-03.ibm.com/software/products/en/zsecure-admin
- Vanguard Integrity Professionals
  - Vanguard Cleanup
  - https://www.go2vanguard.com/mainframe-security-software/administration/cleanup/

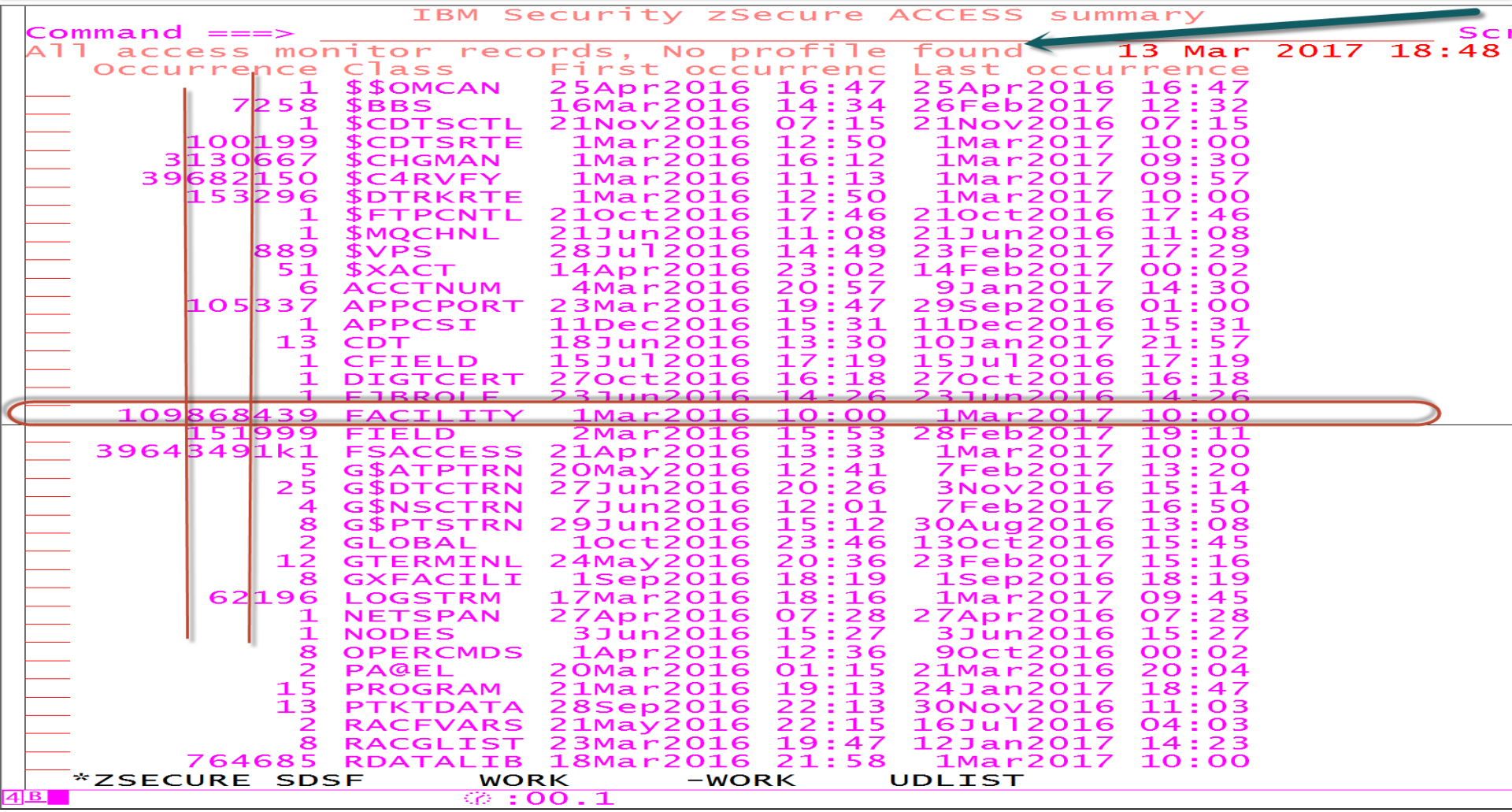
The Concept

- Utilize RACF exit points
  - ICHRCX02, ICHRDX02, ICHRFX04, ICHRIX02
  - Deployed by STC using Dynamic Exit Services
    - Code DIRECT BRANCH parm for best performance
  - Intercepts all AUTH, FASTAUTH & VERIFY events
- Catching the SAF call and buffering data at the time we call RACF
  - 32 – 16 MB Buffers – and now up to 32 – 1 GB Buffers!
- So we can find security calls today and not wait for SMF to generate assuming you can even get SMF (LOG=NONE)
  - I generally like at least 3 months of data; yearly roll ups available
- This gives us a real opportunity to do analytics

The Benefit

- I can now find Unknown Unknowns
- I would say we have actually solved the Unknown Unknown problem
- Using SAF & the RACF Exits you can find all calls ever made for all security decisions
  - No waiting for SMF to accumulate
  - No scanning through syslog for ICH408I
  - Software products make this data manageable
    - Some assembly required
    - Batch jobs, GDGs, not rocket science
    - And modern Virtual Tape Systems now do MIGRAT2 at MIGRAT1 speeds!
  - Only downside so far
    - RACROUTE REQUEST=LIST,GLOBAL=NO (Legacy…no benefit)

Find ALL SAF Calls Easily



Easy Analysis for RC 04

```
                    IBM Security zSecure ACCESS summary
Command ===>
All access monitor records, No profile found      13 Mar
    Occurrence Class     First occurrenc Last occurrence
     109868439 FACILITY  1Mar2016 10:00  1Mar2017 10:00
    Occurrence Profile key used
     109868439
    Occurrence Intent    Type    RetAll AccRC
       2320868 READ      Fast             4
    Occurrence Resource
          1040 ERBSDS.MON3DATA
        186703 FPZ.ACCELERATOR.COMPRESSION
            21 IXCNOTE.$$TM.JES2
**************************** Bottom of Data ********
```

```
Command ===>          IBM Security zSecure ACCESS summary
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    Occurrence Profile key used
     109868439
    Occurrence Intent    Type    RetAll AccRC
       2320868 READ      Fast             4
    Occurrence Resource
        186703 FPZ.ACCELERATOR.COMPRESSION
    Occurrence Userid    Name
            93           MESSAGE BROKER
          1665           SCHEDULER ID
          8638           SCHEDULER ID
          1861           SCHEDULER ID
          1203           SCHEDULER ID
          1195           SCHEDULER ID
            75           SCHEDULER ID
           795           SCHEDULER ID
```
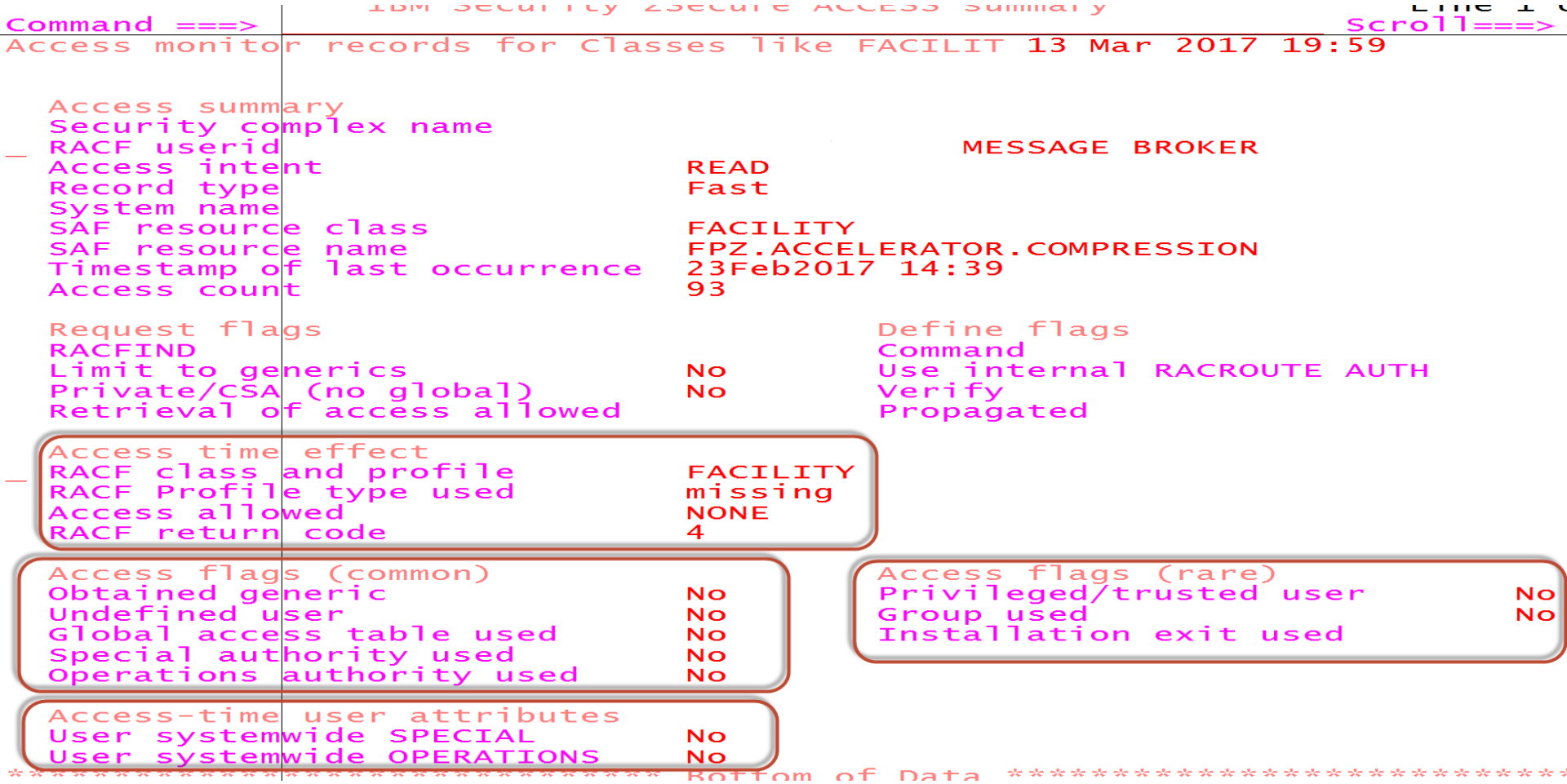

Lots of Useful SAF Flags



Imagine the Possibilities

- Live troubleshooting of security issues that have no SMF or ICH408I message
- C2PACMON will take a MODIFY command to release its "current" logging dataset
  - Then that data set from today's accumulated SAF calls can be analyzed
- Think about what that means…..
- Without any SMF or ICH408I I can troubleshoot security problems that I didn't know existed

Analyze & Quantify Security

- Senior Management Likes Numbers
- Quote how many calls there were to RACF
  - Break down by Class, UserID, Jobname
- Analyze volume of SAF calls
  - Why so many for XYZ class? Performance!
- Analyze why access is still in place if its not being used

Not a replacement for SMF

- These are security analytic tools
- Not a replacement for
  - SMF
  - Real time security monitoring by a SIEM
- They will help you:
  - Find things you did not know existed
  - Find new things to secure
  - Find existing profiles that perhaps need logging set
  - Clean up stale Access Entries.
    - If not used in more than a year why is it still there?

Summary

- Try not. Do…or do not. There is no try!
  - Master Yoda

- You've been show how to roll out RACF protection for a new resource class or piece of software when the standard techniques aren't sufficient
- You've also been shown the thought process behind the advanced techniques.
- We hope this adds a useful tool to your toolbox

Questions?