Revisiting Your Naming Conventions for z/OS

Session RAB15
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Worldwide Information Security Community of Practice

I'm a member of the WWISCP.

And, I am in my 33rd year with IBM. 38 in the industry.

How do you know when it's broken?

- Your enterprise may be living with a naming convention (or lack of same) which most customers moved away from in the early 1980s.

  - **Does** "T.*" **and** "P.*" **or** "TEST.*" **and** "PROD.*" **look familiar?**

  - If so: **You may be on the verge of a significant headache!**
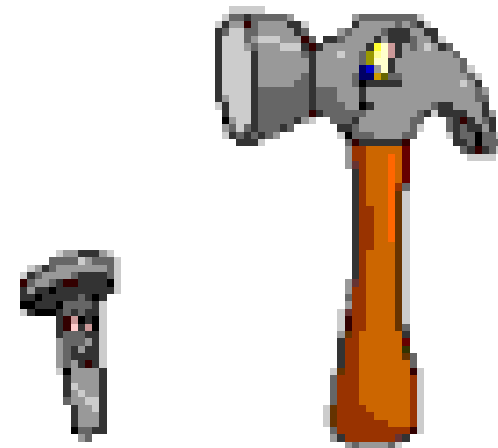
How do you know when it's broken?

- **If the pattern used today causes excessive administrative headaches** for

  - security,

  - systems management,

  - data management,

  - performance management (more focused as opposed to the "workload at large"),

  - disaster recovery, and

  - other disciplines

  Then it's time to address a *new convention* that relieves the headaches!

Establish a naming standard that will carry over to JCL and be informative.

- Consider a Data Set Name that resembles the following:

  An EXAMPLE… (only an example)

  - **HLQ.CreatingJobName.CreatingJobStep.CreatingDDName.description**

  - **A name of this format will identify the source of the file and include a brief description of the file's function.**

    - *JOBName***:** The JOBNames should be in ascending order so the precedence of the JOB flow is readily apparent. It should begin with the HLQ. (Yes I know it's redundant!)

    - *JOBStep name***:** The JOB Steps should also be in ascending order, leaving room for insertions.

    - *Program name***:** This should have a suffix which identifies the program's function. Recognize that where software packages are acquired, this may not be possible to enforce. It should begin with the HLQ. (Yes I know it's redundant!)

Questions to consider in selecting your naming convention

- **Can you look at a DSN and tell:**

  – where the file was created,

  – what program created it and

  – its general content or format?

- **Can you tell what application family it belongs to?**

- **How do you know who is authorized to alter the program (emergency change, change control…)?**

Questions to consider in selecting your naming convention

- **Can you migrate to the new standard as an evolutionary process?**

  – As JOBs and PROGRAMs get re-worked, that's a good time to make changes.

  – There will be a requirement to keep the old master files and such for a while. If practical, rename those which are disk resident. Hopefully, the ones on tape can just be scratched in a few months.

Guidelines

```
HLQs With Excessive Fully Qual. Generic Profiles
HLQ                          Count
-------              ---------------
MX                             726
AC                             443


HLQs With Excessive Generic Profiles

HLQ                          Count
-------              ---------------
MX                            4762
AC                            2240
MJ                            1706
IM                            1195
M1071                          920
M1072                          920
M1RE                           910
AF                             864
AX                             855
M1202                          696
M1201                          695
M1021                          689
M1022                          689
MR                             573
CB                             452
CMX                            379
A1071                          305
A1072                          305
A1RE                           296
M1151                          286
M1152                          285
```

A few lines from two ICETOOL reports.

The reports are truncated for space here.

Guidelines

Samples of questionable practices.

ROB.*.**	Protects ROB.something.anything but not ROB.something
ROB.*.ISPF.ISPPROF	These are all for TSO and will work BUT, TSO in addition to other IBM or 3rd party products presume the HLQ to be the User-ID. Working any other way requires additional profiles in RACF and repeated modification to the environment so that this sort of naming convention can be accomodated. Also, this convention causes excessive RACF activity.
ROB.*.SPF*.*.**	
ROB.*.SPFTEMP1.CNTL	
ROB.*.SRCHFOR.LIST	
ROB.*.STR*.*.**	The xxx*.*.** or *.** do not protect the qualifer that stops at the * before the **
ROB.A	We could not locate this data set.
ROB.AABI.%%%%.*.**	These two are almost *identical*
ROB.AABI.*.**	

Guidelines

- **There will always be exceptions**

- **Nothing is forever**

- **You may have several generations of naming conventions active today**

  – Mergers

  – Standard Changes without consideration of migration

  – It could just be chaos!

What are the strong points of what you have today?

- **Does it just need a tweak?**

- **Let's hear your side**
  - where you think it's working well
  - where it's not working well – Why?

(I'll record the comments as we go. If you want, I'll consolidate them and make it available to anyone of YOU who request it.)

There is no single solution that suits everyone.

Migration considerations and techniques

- **Clean Up the existing RACF DBs**

  – Eliminate redundant profiles,

  – Streamlining the RACF DB.

  – That will make it easier to identify profiles that cover existing data sets, easing the transition to the (potential) new environment.

  – Avoid ID(*)... There are better ways.

Changing the Naming Convention

- **Should be done over a period of 6-8 years.**
  - Time frame most applications receive significant maintenance.
  - As significant work is done to the applications, especially when the file structure is changed, the new naming convention must be fully implemented.

- **At the end of the six to eight year period, 90% of the applications will be on the new standard.**
  - The remaining ones can be fixed in short order.

Faster Alternative

- **Build a clone of the current environment in a single image.**

- **Port work to that image for conversion.**

- **Use PROCs for the JCL with SET and other JECL cards to standardize the JCL. (Many variables to manage all situations.)**

- **Port the JCL back with a one time override for the "Balance Forward Master."**

Gain Senior Management Support

- **Gain senior management commitment to the proposed project.**

- **This support and approval should come from the CIO, CFO, CTO, and ISO.**

- **That commitment should provide multi-year funding, multi-year support as a priority**

- **Executive instructions to all of ISD to make this effort a priority.**

Project Kickoff

- **Organize a small committee with representation from each of the ISD Systems Support components represented and leaders from Application Development**

- **Conduct a thorough planning session to determine the best naming convention and implementation technique suitable for your installation.**

- **Begin implementation with an application family that is complicated enough to gain adequate experience but well enough contained that the size of the effort is quantifiable.**

- **Create a schedule and execute against that schedule to create a model for the next application to be migrated.**

- **You want all aspects of ISD to "buy into" the project.**

Additional Industry BEST PRACTICES

- **Critical RACF Best Practices that will improve performance**

- **If you are partitioned:**

  – Potentially eliminate the partitioning of the RACF DB.

  – You may find the I/O rate to the RACF DBs is in the single digits.

- **The KISS Philosophy works.**

- **Facilitates rapid adherence to legislative requirements**

  – GLBA

  – SOX

  – COBITT

  – EU Requirements including ISO-17799-2

  – And others yet to come

RACF Naming Conventions Table or Exit

- **Allows internal names to RACF to be different from the actual (true) file name.**

- **Gives you a temporary "Band-Aid" by re-arranging or altering a DSN to facilitate the "cleanup" part of the project.** (Maybe all you need is the "Band-Aid"!)

- **It can easily drive your admin's crazy.**

  – They will get the RACF name back rather than the true name.

  – They must administer by the RACF name.

  – Consider using DBSYNC or equivalent for creating the new profiles, with a lot of accurate editing. You can also use ICETOOL (in SAMPLIB) to generate all sorts of good information. Record mappings in RACF SPL.

June 13, 2007

Naming Conventions Table Sample

* RACF NAMING CONVENTION TABLE   (NCT)

*

*   THIS TABLE IS USED TO APPLY THE NAMING CONVENTIONS WHEN RACF

*   PROCESSES DATA SET NAMES. DURING RACHECK PROCESSING, FOR

*   ACCESS TO DATA SETS WITH CERTAIN HIGH LEVEL QUALIFIERS (NVS, VSM,

*   TAP'), THE NAME IS MODIFIED TO CREATE A NEW HLQ OF FORMAT NVSX,

*   VO1X, OR TAPX, WHERE ''X'' IS THE FIRST CHARACTER OF THE SECOND

*   QUALIFIER OF THE DSN. THIS IS DONE SO THAT RACF DOES NOT LOAD

*   ALL OF THE GENERIC PROFILES WITH A HLQ OF NVS, VSM, OR TAP INTO

*   THE ADDRESS SPACE'S ELSQA FOR AUTHORIZATION CHECKING.

*

****

*   THE MECHANISM WE USE SO THAT A SECURITY ADMINISTRATOR OR USER

*   WILL BYPASS THE NCT IS FOR THAT USER TO LOGON TO TSO WITH A

*   CERTAIN CURRENT CONNECT GROUP. WE USED NCTBYP AS THAT GROUP.

Naming Conventions Table Sample

```
ICHNCONV DEFINE,NAME=CHECK1
ICHNCONV SELECT,COND=((RACGPID),NE,'NCTBYP')
ICHNCONV END,NEXT='SUCCESS'
*

*   CHECK2 - BYPASS NCT IF NOT NVS, VSM, OR TAP.
*   IN OTHER WORDS, WE ARE ONLY INTERESTED IN NVS, VSM, AND TAP
*   WE ALSO ARE INTERESTED IN NVSX, VSMX, AND TAPX WHERE "X" MAY
*   BE ANY CHARACTER.
*

ICHNCONV DEFINE,NAME=CHECK2
ICHNCONV SELECT,COND=((GQ,1,1,3),NE,'NVS',AND)
ICHNCONV SELECT,COND=((GQ,1,1,3),NE,'VSM',AND)
ICHNCONV SELECT,COND=((GQ,1,1,3),NE,'TAP')
ICHNCONV END,NEXT='SUCCESS'
```

Naming Conventions Table Sample

```
*    CHECK4 - DETERMINE IF THIS IS AN EXTERNAL OR INTERNAL NAME.
*

  ICHNCONV DEFINE,NAME=CHECK4
  ICHNCONV SELECT,COND=((GQ,1,4,4),NE,' ') IF HLQ IS 3 CHARACTERS,
  ICHNCONV END,NEXT=INTERNAL    GO TO PROCESS AN INTERNAL NAME
*

*    CHECK4A - FAIL IF FIRST CHAR OF 2ND QUALIFIER IS A GENERIC
*       THIS ENSURES THAT WE DO NOT PLACE A GENERIC IN THE NEW HLQ
*       NOTE - WE ARE PROCESSING AN EXTERNAL NAME HERE
*

  ICHNCONV DEFINE,NAME=CHECK4A
  ICHNCONV SELECT,COND=((GQ,2,1,1),EQ,'*',OR)  DON'T ALLOW GENERICS
  ICHNCONV SELECT,COND=((GQ,2,1,1),EQ,'%')     DON'T ALLOW GENERICS
  ICHNCONV END,NEXT='ERROR'  FAIL IF GENERIC IN 1ST CHAR OF 2ND QUAL
```

Naming Conventions Table Sample

```
*    EXTERNAL - WE TAKE AN EXTERNAL NAME AND CONVERT TO INTERNAL NAME

*    THIS CONVENTION CREATES A NEW INTERNAL (TRANSFORMED) DS NAME.

*    IN THIS CONVENTION (EXTERNAL), THE RACHECK, RACDEF, AND LISTDSD

*    POST-LOCATE EVENTS WILL BE PROCESSED BY THE NCT.  ALL OTHER

*    EVENTS WILL EXIT THE NCT.

*

  ICHNCONV DEFINE,NAME=EXTERNAL

  ICHNCONV SELECT,COND=((EVENT,,1,1),NE,X'01',AND) RACHECK

  ICHNCONV SELECT,COND=((EVENT,,1,1),NE,X'02',AND) RACDEF (ALL)

  ICHNCONV SELECT,COND=(EVENT,NE,X'0602',AND) LISTDSD DA POSTLOCATE

  ICHNCONV SELECT,COND=(EVENT,NE,X'0603')     LISTDSD ID/PREFIX POST

  ICHNCONV END,NEXT='SUCCESS'
```

Naming Conventions Table Sample

```
*   EXT2INT - CHANGE NAME FROM EXTERNAL NAME TO INTERNAL NAME
*   FOR RACHECK, RACDEF, AND LISTDSD POST-LOCATE EVENTS.
*
 ICHNCONV DEFINE,NAME=EXT2INT
 ICHNCONV ACTION,SET=((UQ,1,1,3),(GQ,1,1,3))
 ICHNCONV ACTION,SET=((UQ,1,4,4),(GQ,2,1,1))
 ICHNCONV ACTION,SET=(QUAL,(UQ,1))
 ICHNCONV END,NEXT='SUCCESS'
```

Naming Conventions Table Sample

```
*    INTERNAL - TAKE AN INTERNAL NAME AND DO SOME PROCESSING
*   DEPENDING ON THE CONDITION, WE MAY KEEP THE INTERNAL NAME OR WE
*   MAY CONVERT IT TO THE EXTERNAL NAME FORMAT
*      - IF THIS IS A RACHECK, EXIT (DO NOT CHANGE NAME)
*      - IF THIS IS A RACDEF, EXIT (DO NOT CHANGE NAME)
*      - FOR MOST RACF COMMANDS, DO NOT CHANGE NAME.  THE COMMANDS
*       THAT WE DO NOT CHANGE ARE: ADDSD, ALTDSD, DELDSD, PERMIT,
*       AND SEARCH.
*      - FOR LISTDSD, IT ALL DEPENDS....
*                                         PRE-LOCATE    POST-LOCATE
*      FOR LD DA('NVSA.AR.*.**')          DON'T CHNG    CHANGE
*      FOR LD DA('NVSA.AR.*.**') DSNS   DON'T CHNG    CHANGE
*      FOR LD DA('NVS.AR.DATA')  GEN    * N/A*         * N/A*
* (NOTE - WE WON'T BE HERE FOR ABOVE FORM OF LISDSD)
  ICHNCONV DEFINE,NAME=INTERNAL
  ICHNCONV SELECT,COND=(EVENT,NE,X'0602',AND) LISTDSD DA POSTLOCATE
  ICHNCONV SELECT,COND=(EVENT,NE,X'0603')    LISTDSD ID/PREFIX POST
  ICHNCONV END,NEXT='SUCCESS'
```

Naming Conventions Table Sample

```
*   INT2EXT - INTERNAL TO EXTERNAL
*   AT THIS POINT, WE SHOULD ONLY BE PROCESSING LISTDSD POST EVENTS
*   FOR LISTDSD POST-LOCATE, WE MUST CHANGE NAME FROM INTERNAL
*   FORMAT TO EXTERNAL FORMAT / NOTE: DSNAME WILL NOT DISPLAY
*   CORRECTLY. UNFORTUNATELY, THE PROFILE NAME THAT IS DISPLAYED WILL
*   BE THE EXTERNAL NAME.  HOWEVER, THE PROFILE CONTENTS WILL BE
*   DISPLAYED CORRECTLY.  AND, IF WE ISSUE THE DSNS KEYWORD, THE LIST
*   OF COVERED DATA SETS WILL BE DISPLAYED AND WILL BE CORRECT.
*

ICHNCONV DEFINE,NAME=INT2EXT
ICHNCONV ACTION,SET=((UQ,1,4,4),' ')    MOVE BLANK CHAR TO 4TH POS
ICHNCONV END,NEXT='SUCCESS'
*

ICHNCONV FINAL
END
```

System Library Considerations

The next few slides discuss System Library considerations. Some ideas are presented and it is recognized that there are "special cases" and names from vendors (including IBM) that do not fit the example. You will have to expand the concept to include those libraries.

System Library Considerations

Consider HLQ.*.xxxx where "*" represents a UserID or GROUP name.

If Qual2 = UserID

Or

If Qual2 = GROUP

Then

Swap Qual1 with Qual2

To Produce

Qual2.Qual1.xxxx

Make certain
LIST-OF-GROUPS
Is ACTIVE.

System Library Considerations

Consider SYS1.Axxxx representing a DLIB.

If Qual1 = "SYS1"

And

SubString(Qual2,1,1) = "A"

Then

Change Qual1 to DLIB

To Produce

DLIB.Axxxx.xxxx

There
Are
exceptions

System Library Considerations

Consider SYS1.Axxxx representing a DLIB.

Don't forget
A PROFILE with ALTER Access
for SYSPROGs
When PGM=SMPE

Naming Convention Implementation

- **An aggressive implementation plan is necessary to properly relieve the constraint on**

  - RACF,

  - Catalogue,

  - JES2 and

  - other system functions.

The Advantages of a Good Long Term Solution

- **The implementation of a reasonable, best practices Naming Standard through an aggressive Implementation plan will carry your installation's ISD far into the foreseeable future.**

- **To avoid future issues, it is essential that your installation's ISD continue to monitor and evolve with best practices.**

References

- Parallel Sysplex Application Migration GC28-1863

- SC26-7407: The z/OS Planning book Migration guide to SMS; "DFSMS: Implementing System-Managed Storage" Good ideas for subsystems.

- Numerous "panic performance" engagements
  - *"Help. We're broken!"*
  - *Lots of RMF and GTF data*
  - *Piles of RACTRACE*
  - *Even some JMF reports!!! (for you JES3 fans)*

- Informal studies and recommendations by IBM RACF, Catalog Management, DASDM, JES2, JES3, and other design teams. *(The information is <u>proprietary</u> and not customer available.)*

DISCUSSION
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