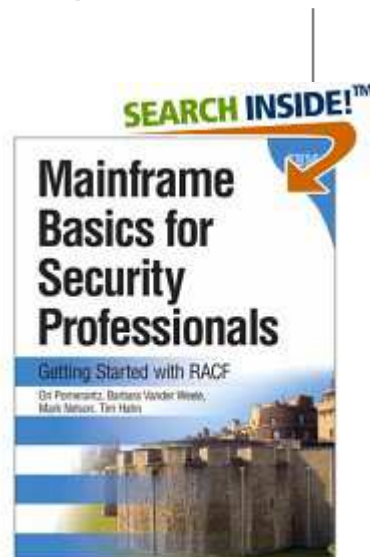# The RACF® Checks for the IBM® Health Checker for z/OS®

RACF-2010
Session RAA10
April 2010

Mark Nelson, CISSP®, CSSLP®
z/OS Security Server (RACF) Design and Development
IBM Poughkeepsie
markan@us.ibm.com

SEARCH INSIDE!™

Mainframe Basics for Security Professionals

Getting Started with RACF

Ori Pomerantz, Barbara Vander Weele, Mark Nelson, Tim Hahn

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at
www.ibm.com/legal/copytrade.shtml

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, or service names may be trademarks or service marks of others.

Agenda

- **History of the IBM Health Checker for z/OS**
- **Structure**
- **The Health Check**
- **The RACF Health Checks**
- **Check "Philosophy"**
- **Check Output**
- **Installation-Defined RACF Checks**
- **References**

The IBM Health Checker for z/OS

- **What is the IBM Health Checker for z/OS?**

  - **Originally a tool developed by IBM International Technical Support Organization (ITSO) to address common configuration and setup errors**
    - 15-20% of system outages attributed to setup and configuration
    - Implemented as a batch job, with 37 checks in 2003
    - Delivered as a web download

  - **With z/OS V1R7, the IBM Health Checker for z/OS was integrated into z/OS**
    - Implemented as a started task
    - 55 checks with z/OS V1R1; with z/OS V1R10 130+ checks!
    - Rolled back to z/OS V1R4 as a web download
    - Checks are shipped with components
    - Installations and vendors can write checks
    - Extensive SDSF support

Structure of the IBM Health Checker for z/OS

- **The IBM Health Checker for z/OS consists of:**
  - ▸ A managing address space (the "backbone")
  - ▸ The Health Checks
    - – Written by individual components (such as RACF, UNIX® System Services)
    - – ISVs and Installations can write their own checks
      - • Can be written in System REXX, stating with z/OS V1R9
  - ▸ A utility (HZSPRINT) for collecting check output

- **A check is identified by a:**
  - ▸ 1-32 character check name, examples of which are:
    - – CSV_APF_EXISTS
    - – GRS_CONVERT_RESERVES
    - – RACF_IBMUSER_REVOKED
  - ▸ 1-16 character check owner
    - – The owner for an IBM-supplied check begins with IBM, for example:
      - • IBMCSV, IBMGRS, and IBMRACF

The Health Check

- **Each check (usually) represents a single "best practice", which comes from:**
  - Product documentation
  - The z/OS System Test organization
  - The z/OS Service Team
  - The Parallel Sysplex Availability Checklist
  - ITSO Redbooks
  - Washington System Center Flashes

- **When migrating to a new release of z/OS, you can use the IBM migration checks to help you analyze your system and identify activities to complete when migrating.**

The Health Check…

- **Associated with each check is information about its execution:**
  - ▸ Execution state:
    - – ACTIVE or INACTIVE
  - ▸ How often the check runs
    - – ONETIME, hh:mm
  - ▸ The severity of the check, which influences how check output is issued
    - – HIGH, MEDIUM, LOW, NONE
  - ▸ WTOTYPE
    - – CRITICAL, EVENTUAL, INFORMATIONAL, HARDCOPY, NONE

- **Some checks accept parameters which direct the processing of the check or set thresholds**

- **Check information is set by the check writer, but can be changed by the installation by:**
  - ▸ Policy statements in the HZSPRMxx member of PARMLIB
  - ▸ MVS MODIFY Command (F HC ….)

Health Checks…

- **The IBM Health Checker for z/OS is dynamic. That is, health checks:**

  ▶ Are separately packaged and shipped

  ▶ Do not have to be predefined

     – Check writers must merely register with the HZSADDCHECK MVS dynamic exit point

  ▶ Can be added after the startup of the Health Checker "backbone"

  ▶ Can have their characteristics changed by either MVS command or PARMLIB

  ▶ Do not execute if the IBM Health Checker for z/OS is not active

- **IBM is adding new checks in new releases and in the service stream**

  ▶ To get the most recent checks, use the Enhanced Preventative Service Planning (PLP) tool

Health Checks…

- **MVS components have shipped over 130 checks:**
  - Consoles
  - Contents Supervision
  - GRS
  - RACF
  - Resource Recovery Services (RRS)
  - SDUMP
  - z/OS UNIX System Services
  - Virtual Storage Management
  - Real Storage Management
  - XES/XCF

The RACF Health Checks…

- **RACF ships these Health Checks:**
  - ▶ **RACF_GRS_RNL**
    - – Checks to see if any of the RACF ENQ names are on a GRS resource name exclusion list which changes the scope of the RACF ENQ
    - – Defaults: Severity(High) Interval(08:00)

  - ▶ **RACF_SENSITIVE_RESOURCES**
    - – Looks at the current APF data sets, PARMLIB, the System REXX data sets, LINKLIST, and the RACF database data sets and flags those that are improperly protected
      - • Are not found on the indicated volume
      - • Are improperly protected
    - – Examines key system general resources
    - – Severity(High) Interval(08:00)

The RACF Health Checks…

- **Checks introduced with z/OS V1R8**
  - **RACF_IBMUSER_REVOKED**
    - Verifies that the user ID IBMUSER is revoked
    - Defaults: Severity(Medium), Interval(24:00)

  - **RACF_<class-name>_ACTIVE**
    - Verifies that the class <class-name> is active
      - Check is performed for FACILITY, OPERCMDS, TAPEVOL, TEMPDSN, TSOAUTH, UNIXPRIV
    - Defaults: Severity(Medium), Interval(24:00)

The RACF Health Checks…

- **Checks introduced with z/OS V1R10:**
  - ▸ **ICHAUTAB checks:**
    - For over 20 years, IBM has recommended not using the RACF Authorized Caller Table (ICHAUTAB)
    - RACF introduces a new check to verify that ICHAUTAB is not being used
      - **RACF_ICHAUTAB_NONLPA** raises a SEV(MED) exception if a non-LPA resident ICHAUTAB is found
      - Severity(Medium), Interval(24:00)
    - The existing **RACF_SENSITIVE_RESOURCES** raises a SEV(HIGH) exception if an LPA-resident ICHAUTAB is found

  - ▸ **The "installation-defined resource" check which allows you to define the resources that you want to check**

Check Output

- **The output of a check consists of:**

  ‣ Write to Operator messages (WTO)s, which are written with the routing codes and descriptor codes associated with the check

  ‣ Messages written to the Health Check message buffer, which can be:

    – Kept in storage (most recent check invocation only)
    – Written to a log stream

- **Check output can be processed with:**

    – SDSF, using the "CK" panels
    – Using the HZSPRINT utility

Check "Philosophy"

- **Checks which are not applicable to the current environment place themselves in a "not applicable" status and will not run unless triggered.**

- **Health Checks raise exceptions and make recommendations, _but they do not automatically take any actions_**
  - You must review the recommendation and ensure that it is appropriate for your environment

- **When an exception is found, Health Checks present the entire message information, including the "explanation", "systems programmer response", etc., along with pointers to relevant documentation.**

- **Checks which find no exception clearly state that no exception was found.**

Sample "No Exception" Output

```
 SDSF OUTPUT DISPLAY RACF_OPERCMDS_ACTIVE              LINE 0
 COMMAND INPUT ===>
******************************* TOP OF DATA ***************
CHECK(IBMRACF,RACF_OPERCMDS_ACTIVE)
START TIME: 04/08/2009 12:48:12.764702
CHECK DATE: 20051111   CHECK SEVERITY: MEDIUM
CHECK PARM: OPERCMDS


IRRH228I The class OPERCMDS is active.

END TIME: 04/08/2009 12:48:12.767783  STATUS: SUCCESSFUL
****************************** BOTTOM OF DATA *************
```

Sample "Not Applicable to the Current Environment" Output

```
 SDSF OUTPUT DISPLAY RACF_GRS_RNL                      LINE 0        COLUMNS
 COMMAND INPUT ===>                                                  SCROLL =
****************************** TOP OF DATA ************************
CHECK(IBMRACF,RACF_GRS_RNL)
START TIME: 04/08/2009 12:48:12.575714
CHECK DATE: 20040703   CHECK SEVERITY: HIGH

IRRH201I The RACF_GRS_RNL check cannot be executed in a GRS=NONE
environment.

HZS1003E CHECK(IBMRACF,RACF_GRS_RNL):
THE CHECK IS NOT APPLICABLE IN THE CURRENT SYSTEM ENVIRONMENT.

END TIME: 04/08/2009 12:48:12.767433  STATUS: ENV N/A
**************************** BOTTOM OF DATA ***********************
```

Sample Check Exception Output:

```
START TIME: 11/10/2004 10:13:10.341622   IBMRACF, RACF_GRS_RNL
OWNER DATE: 20040703


                      RACF_GRS_RNL Report

 S Major     Minor               Type  QName     Rname              Type
 - --------  ------------------  ----- --------  -----------------  ----
 E SYSZRACF  SETROPTS            SERNL SYSZRACF  SETROPTS           SPEC
 E SYSZRAC2  IRRCRV05            SERNL SYSZRAC2  IRRCRV05           SPEC


 * High severity Exception *


 IRRH202E   One or more RACF ENQ names were found in a GRS Resource Name
     List.

   Explanation:
     The RACF RACF_GRS_RNL check has detected that a RACF resource
     is covered by an entry in the specified GRS resource name list
     (RNL). RACF resource names should not be in either the system
     inclusion RNL (SIRNL) or the system exclusion RNL (SERNL).

   System Action:
     The check continues processing. There is no effect on the system.
 …
  IBMRACF Reason: None of the RACF ENQ names should be in RNLs.
   Check parameters: N/A


 END TIME: 01/08/2005 20:47:54.819710       STATUS: EXCEPTION-HIGH
```

Updated SDSF Primary Option Panel

```
Display  Filter  View  Print  Options  Help
-------------------------------------------------------------------------------
HQX7720 ----------------- SDSF PRIMARY OPTION MENU -------------------------

DA      Active users                         INIT   Initiators
I       Input queue                          PR     Printers
O       Output queue                         PUN    Punches
H       Held output queue                    RDR    Readers
ST      Status of jobs                       LINE   Lines
                                             NODE   Nodes

LOG     System log                           SO     Spool offload
SR      System requests                      SP     Spool volumes
MAS     Members in the MAS
JC      Job classes                          RM     Resource monitor
SE      Scheduling environments              CK     Health checker
RES     WLM resources


Licensed Materials - Property of IBM


5694-A01 (C) Copyright IBM Corp. 1981, 2005. All rights reserved.
US Government Users Restricted Rights - Use, duplication or
COMMAND INPUT ===> ck                                      SCROLL ===> PAGE
 F1=HELP      F2=SPLIT      F3=END       F4=RETURN    F5=IFIND     F6=BOOK
 F7=UP        F8=DOWN       F9=SWAP      F10=LEFT     F11=RIGHT   F12=RETRIEVE
```

SDSF Check Selection Panel

```
 Display  Filter  View  Print  Options  Help
 -------------------------------------------------------------------------------
 SDSF HEALTH CHECKER DISPLAY  RACFR17                        LINE 11-27 (50)
 NP    NAME                            CheckOwner      State                Status
       CNZ_TASK_TABLE                  IBMCNZ          ACTIVE(ENABLED)      SUCCES
       CSV_APF_EXISTS                  IBMCSV          ACTIVE(ENABLED)      EXCEPT
       CSV_LNKLST_NEWEXTENTS           IBMCSV          ACTIVE(ENABLED)      SUCCES
       CSV_LNKLST_SPACE                IBMCSV          ACTIVE(ENABLED)      EXCEPT
       GRS_CONVERT_RESERVES            IBMGRS          ACTIVE(DISABLED)     ENV N/
       GRS_EXIT_PERFORMANCE            IBMGRS          ACTIVE(ENABLED)      SUCCES
       GRS_MODE                        IBMGRS          ACTIVE(DISABLED)     ENV N/
       GRS_SYNCHRES                    IBMGRS          ACTIVE(ENABLED)      SUCCES
       RACF_GRS_RNL                    IBMRACF         ACTIVE(DISABLED)     ENV N/
 S     RACF_SENSITIVE_RESOURCES        IBMRACF         ACTIVE(ENABLED)      EXCEPT
       RSM_AFQ                         IBMRSM          ACTIVE(ENABLED)      SUCCES
       RSM_HVSHARE                     IBMRSM          ACTIVE(ENABLED)      SUCCES
       RSM_MAXCADS                     IBMRSM          ACTIVE(ENABLED)      SUCCES
       RSM_MEMLIMIT                    IBMRSM          ACTIVE(ENABLED)      EXCEPT
       RSM_REAL                        IBMRSM          ACTIVE(ENABLED)      EXCEPT
       RSM_RSU                         IBMRSM          ACTIVE(ENABLED)      SUCCES
       SDUMP_AUTO_ALLOCATION           IBMSDUMP        ACTIVE(ENABLED)      EXCEPT
 COMMAND INPUT ===>                                         SCROLL ===> PAGE
  F1=HELP      F2=SPLIT      F3=END       F4=RETURN     F5=IFIND      F6=BOOK

  F7=UP        F8=DOWN       F9=SWAP      F10=LEFT      F11=RIGHT     F12=RETRIEVE
```

SDSF Browse Check Output Panel

```
 Display  Filter  View  Print  Options  Help
 -------------------------------------------------------------------------
 SDSF OUTPUT DISPLAY RACF_SENSITIVE_RESOURCES       LINE 0        COLUMNS 02- 81
 COMMAND INPUT ===>                                           SCROLL ===> PAGE
 ****************************** TOP OF DATA ******************************
 CHECK(IBMRACF,RACF_SENSITIVE_RESOURCES)
 START TIME: 10/05/2005 14:49:19.609483
 CHECK DATE: 20040703  CHECK SEVERITY: HIGH


                         APF Dataset Report


 Data Set Name                            Vol    UACC Warn ID*  User
 ---------------------------------------- ------ ---- ---- ---- ----
 ASM.SASMMOD1                             ZDR17B Read No   ****
 ATC.V2R1M4.AUTHLIB                       DRVPSL
 CBC.SCBCCMP                              ZDR17B
 CBC.SCCNCMP                              ZDR17B None No   ****
 CBC.SCLBDLL                              ZDR17B None No   ****
 CBC.SCLBDLL2                             ZDR17B None No   ****
 CEE.SCEERUN                              ZDR17B None No   ****
 CEE.SCEERUN2                             ZDR17B None No   ****
 CRAIGJ.VTAMLIB                           D94RF2 Read No   ****
 F1=HELP      F2=SPLIT      F3=END      F4=RETURN    F5=IFIND     F6=BOOK

 F7=UP        F8=DOWN       F9=SWAP     F10=LEFT     F11=RIGHT    F12=RETRIEVE
```

SDSF Browse Check Output Panel …

```
 Display  Filter  View  Print  Options  Help
 -------------------------------------------------------------------------
 SDSF OUTPUT DISPLAY RACF_SENSITIVE_RESOURCES      LINE 87      COLUMNS 02- 81
 COMMAND INPUT ===>                                    SCROLL ===> PAGE
                        RACF Dataset Report

S Data Set Name                             Vol    UACC Warn ID*  User
- --------------------------------------- ------ ---- ---- ---- ----
   RACFDRVR.RACF317                          RDB317 None No   ****

* High Severity Exception *

IRRH204E The RACF_SENSITIVE_RESOURCES check has found one or
more potential errors in the security controls on this system.

  Explanation:  The RACF security configuration check has found one or
    more potential errors with the system protection mechanisms.

  System Action:  The check continues processing. There is no effect on
    the system.


  Operator Response:  Report this problem to the system security administrator and
the and the system auditor.
```

SDSF Browse Check Output Panel …

```
 Display  Filter  View  Print  Options  Help
-------------------------------------------------------------------------------
SDSF OUTPUT DISPLAY RACF_SENSITIVE_RESOURCES       LINE 105      COLUMNS 02- 81
COMMAND INPUT ===>                                              SCROLL ===> PAGE

 System Programmer Response:  Examine the report that was produced by
   the RACF check. Any data set which has an "E" in the "S" (Status)
   column has excessive authority allowed to the data set. That
   authority may come from a universal access (UACC) or ID(*) access
   list entry which is too permissive, or if the profile is in WARNING
   mode. If there is no profile, then PROTECTALL(FAIL) is not in
   effect. Any data set which has a "V" in the "S" (Status) field is
   not on the indicated volume. Remove these data sets from the list
   or allocate the data sets on the volume. Any data set which has an
   "M" in the "S" (Status) field has been migrated.

   The APF_LIBS check provides additional analysis of the non-RACF
   aspects of your APF list.

   If the "S" field contains an "E" or is blank, then blanks in the
   UACC, WARN, and ID(*) columns indicate that there is no RACF
 F1=HELP       F2=SPLIT       F3=END        F4=RETURN     F5=IFIND      F6=BOOK

 F7=UP         F8=DOWN        F9=SWAP       F10=LEFT      F11=RIGHT     F12=RETRIEVE
```

SDSF Browse Check Output Panel …

```
 Display  Filter  View  Print  Options  Help
 -------------------------------------------------------------------------
 SDSF OUTPUT DISPLAY RACF_SENSITIVE_RESOURCES        LINE 120     COLUMNS 02- 81
 COMMAND INPUT ===>                                            SCROLL ===> PAGE

    If the "S" field contains an "E" or is blank, then blanks in the
    UACC, WARN, and ID(*) columns indicate that there is no RACF
    profile protecting the data set. Data sets which do not have a RACF
    profile are flagged as exceptions, unless SETROPTS PROTECTALL(FAIL)
    is in effect for the system.

    If a valid user ID was specified as a parameter to the check, that
    user's authority to the data set is checked. If the user has an
    excessive authority to the data set, that is indicated in the USER
    column. For example, if the user has ALTER authority to an
    APF-authorized data set, the USER column contains ">Read" to
    indicate that the user has more than READ authority to the data set.

 Problem Determination:  See the RACF System Programmer's Guide and
    the RACF Auditor's Guide for information on the proper controls for
    your system.

 F1=HELP       F2=SPLIT      F3=END       F4=RETURN     F5=IFIND      F6=BOOK

 F7=UP         F8=DOWN       F9=SWAP      F10=LEFT      F11=RIGHT     F12=RETRIEVE
```

SDSF Browse Check Output Panel …

```
 Display  Filter  View  Print  Options  Help
 ------------------------------------------------------------------------------
 SDSF OUTPUT DISPLAY RACF_SENSITIVE_RESOURCES        LINE 138     COLUMNS 02- 81
 COMMAND INPUT ===>                                            SCROLL ===> PAGE
  Source:
    RACF System Programmer's Guide
    RACF Auditor's Guide


  Reference Documentation:
    RACF System Programmer's Guide
    RACF Auditor's Guide


  Automation:  None.


  Check Reason:  Sensitive resources should be protected.


 END TIME: 10/05/2005 14:49:49.545336  STATUS: EXCEPTION-HIGH
 ***************************** BOTTOM OF DATA *****************************




    F1=HELP      F2=SPLIT      F3=END       F4=RETURN    F5=IFIND     F6=BOOK
    F7=UP        F8=DOWN       F9=SWAP      F10=LEFT     F11=RIGHT    F12=RETRIEVE
```

z/OS Console Messages from Health Checks

```
   *RACFR17 *HZS0015E PROBLEM WITH HZSPDATA DATA SET:
    *DD NOT DEFINED
    *RACFR17 *10 HZS0013A SPECIFY THE NAME OF AN EMPTY HZSPDATA DATA SET
     $HASP003          SPECIFICATION
     RACFR17  $HASP646 12.0000 PERCENT SPOOL UTILIZATION
     RACFR17  HZS0001I CHECK(IBMCSV,CSV_APF_EXISTS):
     CSVH0957E Some problem(s) were found with data set(s) in the APF list.
     *RACFR17 *HZS0003E CHECK(IBMRACF,RACF_SENSITIVE_RESOURCES):
     *IRRH204E The RACF_SENSITIVE_RESOURCES check has found one or
     *more potential errors in the security controls on this system.
00   RACFR17  $HASP003 RC=(52),                                          C
     $HASP003 RC=(52),S1-999  - NO SELECTABLE ENTRIES FOUND MATCHING
     $HASP003          SPECIFICATION
     RACFR17  $HASP003 RC=(52),                                          C
     $HASP003 RC=(52),T1-999  - NO SELECTABLE ENTRIES FOUND MATCHING
     $HASP003          SPECIFICATION
     RACFR17  $HASP650 Q,Q=W      INVALID OPERAND OR MISPLACED OPERAND
     RACFR17  $HASP893 VOLUME(SPOOL1)                                    C
     $HASP893 VOLUME(SPOOL1)  STATUS=ACTIVE,SYSAFF=(ANY),TGNUM=175,
     $HASP893                      TGINUSE=21,TRKPERTGB=3,PERCENT=12
     RACFR17  $HASP646 12.0000 PERCENT SPOOL UTILIZATION

  IEE612I CN=C3E0S17  DEVNUM=03E0 SYS=RACFR17
```

Getting Check Output Using HZSPRINT

- **The HZSPRNT utility extracts check output from either the in-storage buffers or the logstream**
  - ▶ PARM= allows filtering based on check owner and check name:

```
//MARKNHC3 JOB 'D5202P,?','M.NELSON',MSGLEVEL=(1,1),NOTIFY=&SYSUID,
//          CLASS=A,MSGCLASS=H,REGION=19M
//RACFCKS  EXEC PGM=HZSPRNT,PARM='CHECK(IBMRACF,*)'
//SYSOUT    DD SYSOUT=*,DCB=LRECL=256
```

  - ▶ … shows all of the checks which have "IBMRACF" as the owner

Getting Check Output Using HZSPRINT…

```
***********************************************************************
*                                                                     *
* HZSPRINT (HBB7730-06024)  2009/04/10 11:23                          *
*                                                                     *
* HZSU001I Check messages                                             *
* Sysplex: LOCAL     System: SY1                                      *
*                                                                     *
* Filter: CHECK(IBMRACF,*)                                            *
*                                                                     *
***********************************************************************


***********************************************************************
*                                                                     *
* Start: CHECK(IBMRACF,ZOSMIGV1R9_RACF_PASSWRD_ENVELOPE)              *
*                                                                     *
***********************************************************************

***********************************************************************
*                                                                     *
* No messages exist                                                   *
*                                                                     *
***********************************************************************

***********************************************************************
*                                                                     *
* End:   CHECK(IBMRACF,ZOSMIGV1R9_RACF_PASSWRD_ENVELOPE)              *
*                                                                     *
***********************************************************************
```

Getting Check Output Using HZSPRINT…

```
***********************************************************************
*                                                                     *
* Start: CHECK(IBMRACF,RACF_UNIXPRIV_ACTIVE)                          *
*                                                                     *
***********************************************************************
CHECK(IBMRACF,RACF_UNIXPRIV_ACTIVE)
START TIME: 04/10/2009 11:20:34.596129
CHECK DATE: 20051111   CHECK SEVERITY: MEDIUM
CHECK PARM: UNIXPRIV


* Medium Severity Exception *

IRRH229E The class UNIXPRIV is not active.

  Explanation:  The class is not active. IBM recommends that the
    security administrator at your installation activate this class and
    define in it the profiles to properly protect your system.

  System Action:  The check continues processing. There is no effect on
    the system.

  Operator Response:  Report this problem to the system security
    administrator and the system auditor.

  System Programmer Response:  None.

  Problem Determination:  See the RACF Auditor's Guide and the RACF
    Systems Programmer's Guide.

  Source:
    RACF System Programmer's Guide
    RACF Auditor's Guide

  Reference Documentation:
    RACF System Programmer's Guide
    RACF Auditor's Guide

  Automation:  None.

  Check Reason:  IBM recommends activating this class

END TIME: 04/10/2009 11:20:34.930525   STATUS: EXCEPTION-MED
```

Authorization Checking

- **The IBM Health Checker for z/OS performs authorization checks in the XFACILIT class**

  - The eXtended FACILITy class

    - Member class for the GXFACILI class
    - Resource name of up to 246 characters
    - Shared POSIT value with the FACILITY class

  - The resource names that are checked, depending on the type of output which is being accessed are:

    - READ authority to HZS.sysname.QUERY
    - READ authority to HZS.sysname.check-owner.QUERY
    - READ authority to HZS.sysname.check-owner.MESSAGES
    - READ authority to HZS.sysname.check-owner.check-name.MESSAGES

  - See "Setting up security for the HZSPRNT utility" in the "IBM Health Checker for z/OS User's Guide" for details.

Installation

- **The steps for installing the IBM Health Checker for z/OS are:**

  1. Allocate the HZSPDATA data set

     – HZSPDATA is used to save data between executions of a check

  2. Create the RACF definitions

     – Assign the Health Checker started task a user ID which has UID(0), HOME('/') and PROGRAM('bin/sh')
       - With z/OS V1R12, you can use BPX.SUPERUSER instead of UID(0)
     – Give the user ID above UPDATE authority to the HZSPDATA data set and READ authority to the PARMLIB data sets
     – If you are using a log stream for the check output define the LOGSTRM resources required to allow the Health Checker to connect and write to the log stream.

  3. Start the Health Checker address space

Installation-Defined RACF Health Checks in z/OS V1R10

- **The current RACF checks examine key elements of the z/OS infrastructure, but:**

  ▸ The checks look at the resources IBM thinks are important

    – Unless you wrote your own check you can't examine the protection of your data resources

- **With z/OS V1R10, you can check the protection of the resources you want simply by defining profiles and registering your check with the IBM Health Checker for z/OS**

Installation-Defined RACF Health Checks…

- **Defining your own resource check takes these three steps:**

  1. Defining a RACF profile in the new RACFHC general resource class. This profile contains the list of resources that you want to check

  2. Define a PARMLIB entry that defines your check using the IBM Health Checker for z/OS Dynamic Registration

  3. Activate your PARMLIB entry

Installation-Defined RACF Health Checks…

- **The RACFHC class contains profiles which have the resources you want to check. The RDEFINE command to add a profile is:**

```
RDEFINE RACFHC MY_RESOURCE_LIST
    ADDMEM(DATASET/PROD.VALUABLE.DATA/ZDR17B/NONE
        DATASET/SEC.FILING.FORMS//NONE
        RACFHC/MY_RESOURCE_LIST//NONE)
```

- **The ADDMEM field defines the resources that you want checked. The format is:**

  `className/resourceName/volume/maximumPublicAccess`

  - `className` is any valid RACF class
  - `resourceName` is a resources name within the class
  - `Volume` is the volume serial for a DATASET resource, otherwise no value should be specified
  - `maximumPublicAccess` is the access level which if exceeded results in an exception. Valid values are NONE, READ, UPDATE, and CONTROL.

Installation-Defined RACF Health Checks…

- **In addition to defining resources in the ADDMEM value, you can specify one or more IBM-defined report sets. These report sets are:**

  - IRR_APFLIST: APF data set list

  - IRR_LINKLIST: Current link list data set list

  - IRR_PARMLIB: Current PARMLIB data set list

  - IRR_RACFDB: Data sets which comprise the RACF data base

  - IRR_SYSREXX: System REXX data set

  - IRR_ICHAUTAB: ICHAUTAB entries

- **Sample profile definition for a pre-defined set of resources**

```
RDEFINE RACFHC MY_SYSTEM_STUFF
    ADDMEM(DATASET/SYS1.SAMPLIB//READ
    IRR_APFLIST
    IRR_RACFDB)
```

Installation-Defined RACF Health Checks…

- **A Health Checker PARMLIB statement is used to define your check, set its characteristics (such as the interval, severity), and associate the check with the RACFHC profile which contains the resources you want checked**

```
ADD CHECK(USER01,MY_INSTALLATION_HEALTH_CHECK)
    CHECKROUTINE(IRRHCR00)
    MESSAGETABLE(IRRHCM00)
    ENTRYCODE(100)
    PARM('USER(USER01)  RESOURCELIST(MY_RESOURCE_LIST)')
    DATE(yyyymmdd)
    REASON('My sensitive resources')
    GLOBAL
    ACTIVE
    SEVERITY(HIGH)
    INTERVAL(08:00)
```

Installation-Defined RACF Health Checks…

- **The final step is to activate your check. After adding it to a member (HZSPRMMN in this example) activate the PARMLIB entry using the MVS modify command for the Health Checker address space:**

```
F HC,ADD,PARMLIB=MN
```

- **Your check is now registered with the IBM Health Checker for z/OS!**

```
Display  Filter  View  Print  Options  Help
---------------------------------------------------------------------
SDSF HEALTH CHECKER DISPLAY  RACFR1B                    LINE 38-53 (92)
NP   NAME                              CheckOwner      State             Status
     MY_INSTALLATION_HEALTH_CHECK      USER01          ACTIVE(ENABLED)   EXCEPT
     PDSE_SMSPDSE1                      IBMPDSE         ACTIVE(ENABLED)   EXCEPT
     RACF_FACILITY_ACTIVE              IBMRACF         ACTIVE(ENABLED)   SUCCES
     RACF_GRS_RNL                      IBMRACF         ACTIVE(DISABLED)  ENV N/
```

Installation-Defined RACF Health Checks…

```
CHECK(USER01,MY_INSTALLATION_HEALTH_CHECK)
START TIME: 02/27/2008 16:16:22.678052
CHECK DATE: 20070425   CHECK SEVERITY: HIGH
CHECK PARM: USER(USER01)   RESOURCELIST(MY_RESOURCE_LIST)


                  Resource List from MY_RESOURCE_LIST

S Resource Name                      Class    Vol    UACC Warn ID*  User
- -------------------------------- -------- ------ ---- ---- ---- ----
V PROD.VALUABLE.DATA                 DATASET  ZDR17B
E SEC.FILING.FORMS                   DATASET  FNC001 None Yes  ****
V PUBLIC.REPORTS                     DATASET  REGVOL
  MY_RESOURCE_LIST                   RACFHC          None No   ****

* High Severity Exception *

...
...
...
```

References

- **IBM Health Checker for z/OS User's Guide (SA22-7994)**
  - ‣ http://www.ibm.com/servers/eserver/zseris/zos/hchecker/

- **IBM Education Assistant**
  - ‣ http://www-01.ibm.com/software/info/education/assistant/

- **The IBM Health Checker for z/OS web site**
  - ‣ http://www.ibm.com/systems/z/os/zos/hchecker/

- **A list of all of the IBM-supplied checks** can be foun at:
  - ‣ http://wwwibm.com/systems/z/os/zos/hchecker/check_table.html

- *"An apple a day…. keeps the PMRs away! An overview of the IBM Health Checker for z/OS"*
  - ‣ z/OS Hot Topics, Issue 13, August 2005, available at http://www.ibm.com/servers/eserver/zseries/zos/bkserv/hot_topics.html

- "*RACF and the IBM Health Checker for z/OS*"
  - ‣ ibid

- *"Personalize your RACF Checking with the IBM Health Checker for z/OS"*
  - ‣ z/OS Hot Topics, Issue 19, August 2008, available at http://www.ibm.com/servers/eserver/zseries/zos/bkserv/hot_topics.html