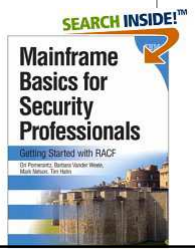
IBM Systems and Technology Group

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

RACF-2011
Session RAA3
June 2011



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

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…

- **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…

- **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/
- **Exploiting the IBM Health Checker for z/OS Infrastructure**
  - http://www.redbooks.ibm.com/abstracts/redp4590.html?Open
- **IBM Education Assistant**
  - http://www.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 found 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