Introduction

Hopefully you have some knowledge of the Health Checker and what it does. If not, then you will learn quickly. Basically, the Health Check is a Started Task and you are going to configure it, start it, and direct some operator commands to it, just like any other Started Task.

Have fun here and go back and try it on your own system!
Hardware and Software for this Lab

- Lenovo T500 Laptop w/8G of real, 2 Intel cores @3gz (located off site)
- Internal Hard drive ½ TB + external ESATA drive 1.0 TB (both 7200 RPM)
- OpenSuse 11.2 Linux as the laptop OS
- IBM zPDT software with one CP license
- z/VM 6.1
- Six z/OS V1R11 virtual machines for this LAB
Agenda

- Workstation Setup
  - TN3270 #1 MVS Console
  - TN3270 #2 TSO Terminal
- Edit Health Checker Started Task Procedure (HZSPROC)
- Allocate Health Checker persistent data set
- Setup Security rules
- Start the Health Checker address space
- Review the Checks
- Issue MVS commands
- Use SDSF Health Checker panels
Agenda

• Health Checker Log
• Temporarily altering a specific Health Check
• Permanently altering a specific Health Check
• Review the details of a specific Health Check
• Stopping the Health Checker address space
• References
• Questions for the author
Workstation Setup

- You have your own z/OS Virtual Machine - ZSHRx
  The x value will be given to you by the instructor. Write it down here: ____
- Make sure you have two 3270 sessions open on the workstation with a z/VM Logo
  - On the first z/VM session type ZSHRx for the userid and SHRx for the password
  - On the other z/VM session skip down to the command field and type DIAL ZSHRx
- The next slide will show what you should see
Workstation Setup

MVS Console

TSO Terminal

Application Developer System

/ / 0 0 0 0 0 0 0 0
/ / 0 0 0 0 0 0
/ / 0 0 0 0 0 0
/ / 0 0 0 0 0 0
/ / 0 0 0 0 0 0
/ / 0 0 0 0 0 0
/ / 0 0 0 0 0 0
/ / 0 0 0 0 0 0

System Customization - A0CD.21IS *

===> Enter "LOGON" followed by the TSO userid. Example "LOGON IBMUSER" or
===> Enter 'L' followed by the APPLID
===> Examples: "L TSO", "L CICS", "L IMS3270"

* Connected to remote server/host 192.168.251.5 using port 327 HP LaserJet 1020 on L8801
Health Checker Configuration

- On the TSO Terminal
  - Type TSO and hit Enter
- On the Logon Screen
  - ADCDMST is the USERID
  - SHRx is the Password, where x is the number given to you
- Copy members HZSALLCP, HZSPRINT, and HZSPROC from SYS1.SAMPLIB to USER.PROCLIB
Allocate the HZSPDATA dataset

- Edit member HZSALLCP in USER.PROCLIB
  - Change Line `//HZSPDATA 'system_name'` to `‘ADCD’`
  - The result should look like:

```
EDIT USER.PROCLIB(HZSALLCP) - 01.00 CHAR 'system_name' chan
```

- Submit the JOB and check the output with SDSF. SDSF can be accessed via the “M” option on the ISPF Primary Option Menu
Security Setup

- The RACF definitions for the Health Checker and SDSF have been built for you for this lab. Since the lab system is your own sandbox we are going to let the user ADCDMST do just about everything. For your systems back home you really need to review the security definitions carefully.
  - Submit member BATHCK in USER.PROCLIB to do the RACF definitions for the Health Checker
  - Review the output from BATHCK for success
  - Submit member BATSDSF in USER.PROCLIB to do the RACF definitions for SDSF. The EXEC issued by this job is based on member ISFRAC which can be found in ISF.SISFEXEC
  - Review the output from BATSDSF for success
Starting the Health Checker

• Use the MVS Console to start the Health Checker
Health Checker Messages on the Console

- Note the critical Health Checks are show in red. These indicate that these messages will remain on the console until deleted.
Displaying Check Details on the Console using the MVS Modify Command

- Let's look at the details for the first one by entering:

```
f hzsproc,display,checks,check=(IBMXCF,XCF_CDS_SPOF),details
```
More Modify Commands

- The reason for the check is that your Couple Datasets are all on the same volume. You may issue a D XCF,COUPLE command on the MVS console and see that the datasets are all on SBRES2.

- Separation of the Couple Datasets is critical for a production system, but this is your sandbox with a limited number of dasd volumes available. Let's say you want to keep the check as a reminder, but don't want it to clutter up your console. You can change the check's WTO options so the message will not remain in red on the console.

- Issue the command:
  
  `f hzsproc,update,check=(IBMXCF,XCF_CDS_SPOF),wtotype=informational`

  *This won't take effect until the check runs again, but we can run it now by this command:*

  `f hzsproc,run,check=(IBMXCF,XCF_CDS_SPOF)`

- Take a look at the MVS Console now and you will see the check is no longer red.
Using SDSF to control Health Checker

- SDSF is the spool output processor on this system. You may use a different software product on your system back home. If you do, then check the documentation for that software to see how it supports the Health Checker.

- To access SDSF select the “M” option on the ISPF Primary Option Menu and then select “5” to enter SDSF.
SDSF CK Command

• Enter “CK” to view the Health Check Panel. This shows all of the active Health Checks.
• Press PF1 to get the Health Check Help Panel.
• Enter “2” to view the CK command syntax.
• Press ENTER to view the format of the CK command.

HELP: Health Checker Panel -- CK Command  Panel 2 of 3
COMMAND INPUT ===> _

Format:  CK (category|E|EH|EM|EL|EN|D|ALL)
with no parameters displays active checks.
category shows only checks for that category. The value can include * (any string of characters) or % (any single character).
E displays all exception checks, with these variations:
EH - exception-high
EM - exception-medium
EL - exception-low
EN - exception-none
D displays deleted checks.
ALL displays deleted as well as active checks.
Display only Checks with Exceptions using SDSF “CK E” Command

- Press PF3 to return to the previous panel.
- Enter “CK E” on the command line. This will list just the Health Checks with Exception Status.
SDSF CK Command / Syntax

• Enter “CK EH” to show only the Health Checks with high-severity Exceptions

<table>
<thead>
<tr>
<th>SDSF HEALTH CHECKER DISPLAY ADCD COMMAND INPUT ===</th>
<th>LINE 1-2 (2) SCROLL === PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP NAME RACF_SENSITIVE_RESOURCES XCF_CDS_SPOF</td>
<td>CheckOwner IBMACF IBMXCF</td>
</tr>
</tbody>
</table>

• Press PF1 to view the HELP Panel
• Enter “3” to get the syntax of the Action Characters

Action characters that can be entered in the NP column by authorized users are:

// Block repeat; type // on the first row and another // on the last row to be processed
= Repeat previous action character or overtype
+ Expand the NP column. (Use RESET to reset.)
A Activate
D Display
DL Display long
DP Display policies
DPO Display policies that are outdated and not applied
DS Display status
E Refresh
H Deactivate
SDSF Health Check Line Commands

- Enter “DL” on the line with XCF_CDS_XPOF. DL means “Display Long”
SDSF Display Check Details

You should see the following output. Note how this looks very much like the MVS Console output of:

```
f hzsproc.display.checks.check=(IBMXCF,XCF_CDS_SPOF),details
```

```
HZS0201 23.59.55 CHECK DETAIL 109
CHECK((IBMXCF,XCF_CDS_SPOF)
STATE: ACTIVE(ENABLED)  STATUS: EXCEPTION-HIGH
EXITRN: IXCHCADC
LAST RAN: 02/28/2011 23:10  NEXT SCHEDULED: 03/01/2011 00:10
INTERVAL: 1:00
EXCEPTION INTERVAL: SYSTEM
SEVERITY: HIGH
UTOTYPE: CRITICAL EVENTUAL ACTION
SYSTEM DESC CODE: 11
THERE ARE NO PARAMETERS FOR THIS CHECK
REASON FOR CHECK: Ensure that coupled data sets are configured without single points of failure.
MODIFIED BY: N/A
DEFAULT DATE: 20070730
ORIGIN: HZSDDDCK
LOCALE: HZSPROC
DEBUG MODE: OFF  VERBOSE MODE: NO
```
SDSF CK Command Scrolling

- On the command line Enter “CK EH” again to view those checks
- You can scroll to the right using to view more information about the checks. Press PF11 three times and you will see “TOTType” on the header line. Type “1” in the Command Input and press PF10 to scroll back one column and you should see this:

<table>
<thead>
<tr>
<th>SDSF HEALTH CHECKER DISPLAY</th>
<th>ACDX</th>
<th>COMMAND INPUT</th>
<th>ADXCNF</th>
<th>NAME</th>
<th>RACF SENSITIVE_RESOURCES</th>
<th>CRITICAL</th>
<th>WTOType</th>
<th>ModifiedBy</th>
<th>PolicyStatus</th>
</tr>
</thead>
<tbody>
<tr>
<td>XCF_CDS_SPIOF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Note the indication that our earlier MVS console Modify Command changed the WTOType
Temporary Check Alteration and Running using SDSF

- Press PF11 a few times while you look at the information that is displayed. Note that the green fields are input fields that you are allowed to change. Press PF10 to scroll back to the left until you return to the WTOType field. Overtype the INFO with CRITICAL and Press Enter.

- Just as in the MVS console command the WTOType has been changed, but it won’t take effect until the next time the check runs. You can run it now by typing an “R” in the NP field next to the check and Press Enter. Now look at the MVS Console and you will again see the messages for that Health Check in red.
Printing Health Check Results via a Batch JOB

- The HZSPRNT utility may be used to print the results of Health Checks with a batch job
- Go back and Edit USER.PROCLIB again
  - Select member HZSPRINT
  - Scroll down to the //HZSPRINT EXEC PGM=HZSPRNT line
  - You will several options to use; most are commented out
  - Let’s print all of the Health Checks that have Exceptions
  - Change the data to look like this:
    ```
    //HZSPRINT EXEC PGM=HZSPRNT,TIME=1440,REGION=0M,
    //    PARM=('CHECK(*,*)','EXCEPTIONS')
    ```
- Submit the job
- Review the output with SDSF
Making Permanent Modifications to Checks

- We are going to make the temporary change to the WTOTYPE that we make earlier a permanent change.
- Create a new member, HZSPRM01, in USER.PARMLIB with the following contents:

```
EDIT USER.PARMLIB(HZSPRM01) - 01.02
Command ==> Scroll ==> PAGE
******** ********************** Top of Data **********************
000001 ADDREPLACE POLICY STMT(POL1) UPDATE,
000002 CHECK(IBMXCF,XCF_CDS_SPOF),
000003 WTOTYPE(INFORMATIONAL),
000004 REASON('CHANGE WTO'),
000005 DATE('20110228')
******** ********************** Bottom of Data **********************
```
Making Changes to Checks Permanent: Adding new Parmlib Member

• Activate the new member using the Health Checker Modify Command on the MVS Console using this command:
  
  ```
f hzsproc,add,parmlib=01
  ```

• You should see the following response:

```
00- 22.07.22  F HZSPROC,ADD,PARMLIB=01
  22.07.22 STC00028  HZS0403I ADD PARMLIB PROCESSING HAS BEEN COMPLETED
  IEE612I CN=L700  DEVNUM=0700  SYS=ADCD

  IEE163I MODE= RD
```
Making Changes to Checks Permanent: Updating the Health Checker Proc

- To make the Health Checker use this new Parmlib Member in addition to the default HZSPRM00 member when the Health Checker is restarted, the PROC must be updated.
- Edit HZSPROC in USER.PROCLIB and change the HZSPARM value from 00 to (00,01). See below:

```assembly
000038  /******************************************************************/
000039  //HZSPROC  PROC HZSPRM='(00,01)'
000040  //HZSSTEP  EXEC  PGM=HZSINIT,REGION=OK,TIME=NOLIMIT,
000041  //       PARM='SET PARMLIB=&HZSPRM'
000042  //HZSPDATA  DD  DSN=SYS1.&SYSNAME..HZSPDATA,DISP=OLD
```

- Now let’s stop and restart the Health Checker to make sure the change is permanent.
Stopping the Health Checker

- On the MVS Console Enter “P HZSPROC”
- Watch the Health Checker wait for all the Checks to terminate prior to ending
Restart the Health Checker and Verify the Change

- On the MVS Console Enter “S HZSPROC”
- Wait a few seconds for the Checks to complete
- Let’s look at the details to verify that our change worked by entering:

  `f hzsproc,display,checks,check=(IBMXCF,XCF_CDS_SPOF),details`

```
22.25.30  f hzsproc,display,checks,check=(IBMXCF,XCF_CDS_SPOF),details
22.25.30  STC00028  HZS02011  22.25.30  CHECK DETAIL  498
CHECK(IBMXCF,XCF_CDS_SPOF)
  STATE: ACTIVE(ENABLED)  STATUS: EXCEPTION-HIGH
  EXITRIN: IXCHHADC
  LAST RAN: 03/01/2011 21:56  NEXT SCHEDULED: 03/01/2011 22:56
  INTERVAL: 1:00
  EXCEPTION INTERVAL: SYSTEM
  SEVERITY: HIGH
  DETATYPE: INFORMATIONAL
  SYSTEM DESCRIPTOR: 12
  THERE ARE NO PARAMETERS FOR THIS CHECK
  REASON FOR CHECK: Ensure that couple data sets are configured
  without single points of failure.
  MODIFIED BY: STMTR(121)
  REASON FOR UPDATE: CHANGE WTO
  DEFAULT DATE: 20070730 USER DATE: 20110228
  ORIGIN: HZSADDCK
  LOCALE: HZSPROC
  DEBUG MODE: OFF  VERBOSE MODE: NO
  AT CUI 70A  DEVMODE=A2BA X98-A2DCC
```
Free Time

- If you have time go back to the HZSPRINT output and look at the RACF Sensitive Resource Check. This type of check contains reports in addition to the normal check output. These are important checks that show potential integrity exposures.

- Feel free to look at some of the other Health Checks.
Reference: BATHCK JOB

EDIT USER.PROCLIB(BATHCK) - 01.00

Command ==> 
Scroll ==> PAGE

****** ***************************** Top of Data *****************************

000100 //BATHCK JOB (),
000200 // CLASS=A,
000300 // MSGCLASS=X,
000400 // MSGLEVEL=(1,1),
000500 // NOTIFY=&SYSUID,
000600 // TIME=1440
000610 */
000620 /* SETUP AUTHORIZATIONS FOR HEALTH CHECKER
000630 */
000640 //S1 EXEC PGM=IKJEFT01
000800 //SYSPRINT DD SYSOUT=* 
000900 //SYSTSPRT DD SYSOUT=* 
001000 //SYSTEM DD DUMMY
001100 //SYSUADS DD DSN=SYS1.UADS,DISP=SHR
001200 //SYSLBC DD DSN=SYS1.BRODCAST,DISP=SHR
001300 //SYSTSN DD *
001400 RDEFINE XFACILIT HZS.** UACC(NONE)
001500 PERMIT HZS.** CLASS(XFACILIT) ID(ADCDMST) ACCESS(CONTROL)
001600 PERMIT HZS.** CLASS(XFACILIT) ID(IBMUSER) ACCESS(CONTROL)
001700 SETROPTS REFRESH RACLST(XFACILIT)

****** ***************************** Bottom of Data *****************************
EDIT USER.PROCLIB(BATSDSF) - 01.02

Command ===> Scroll ===> PAGE

Top of Data ****************************

000100 //BATSDSF JOB (),
000200 // CLASS=A,
000300 // MSGCLASS=X,
000400 // MSGLEVEL=(1,1),
000500 // NOTIFY=&SYSUID,
000600 // TIME=1440
000610 //*
000620 //* SETUP AUTHORIZATIONS FOR SDSF
000630 //*
000700 //S1 EXEC PGM=IKJEFT01
000800 //SYSPRINT DD SYSOUT=* 
000802 //SYSTSPRT DD SYSOUT=* 
000803 //SYSTSIN DD *
000804 EX 'ADCDMST.EXEC(ISFRAC)' L

Bottom of Data ****************************
Reference List

• IBM Health Checker for z/OS User’s Guide
• Exploiting the IBM Health Checker for z/OS Infrastructure (IBM Red paper – see www.redbooks.ibm.com)
• Configuring the z/OS UNIX Health Checks and Exploiting UNIX REXX Functions (a very good introduction to the Health Checker in general – see Share proceedings from 2008 San Jose)
• Lots more on Google
Follow Up

If you have any questions and you wish to contact me:

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I will be happy to try to answer any questions!