# USS HC High CPU consuming PIDs

# REXX based HC routine HZSUPNCU

This utility has been created to identify USS processes that use up too much CPU. It is based on a control file to decide whether to include a specific process or accept it as a known and allowed exception.

- Verify USS processes do not use up too much CPU
- Activating and modifying the CK settings
  - `F HZSPROC,ADD|REPLACE,PARMLIB=UP`
  - `F HZSPROC,UPDATE,CHECK=(IBMUSS,`
    `USS_PROCESS_HIGH_CPU_USAGE),PARMS=('CPU>10%')`
- Some interesting enhancements have been added.

# The HZSPRMUP parmlib member

```
ADDREP CHECK(IBMUSS,USS_PROCESS_HIGH_CPU_USAGE)
       EXEC(HZSUPNCU)
       REXXHLQ(IBMUSER)
       REXXTSO(YES)
       REXXIN(NO)
       MSGTBL(*NONE)
       ENTRYCODE(0)
       ALLOWDYNSEV(YES)
       USS(NO)
       VERBOSE(NO)
       PARMS('CPU>5% NOCK=/etc/USSHC.nocheck ShowPP1procs=Y')
       SEVERITY(LOW)
       INTERVAL(00:05)
       DATE(20180830)
       REASON('A check to verify whether USS processes',
              'do use up too much CPU.')
```

- Above the contents of this member 'SYS1.PARMLIB(HZSPRMUP)'...

# The HC control file /etc/USSHC.nocheck

```
# ------------------------------------------------------------------ #
# Force checking (Y) or no checking (N)                              #
# ------------------------------------------------------------------ #

N     JOBNAME=TCPIP
N     CMD=GFSCINIT
N     OWNER=STC
Y     PATH=/usr/local/bin/bash
Y     CMD=sh
Y     PATH=/bin/tcsh
N     UID=7777
N     OTHERWISE
```

- A "Y" (YES) means the process is listed, on "N" (NO) it is not listed.
- The file is processed sequentially. Only lines starting with Y or N are used.
- As soon as a field test is a hit processing ends and the process is listed or not.
- A jobname is taken as a generic value. Owner (same as userid), UID and PATH must match exactly. A command must start with the words as specified with CMD.
- Using OTHERWISE with N you can finally drop a process to get listed – if not recognized to be a child process of CMD or PATH hit with Y.

# The HC control file /etc/USSHC.nocheck...

- There is an additional function provided if parameter "ShowPP1procs=Y" is set.
  - It is for a case such as when the user closes his PuTTY shell session while the command started there is protected against signal HUP.
  - This results in the fact that the command is now a direct child process of "1".
  - The original shell session command is no longer seen.
  - However, the session ID leader process still exists in a USS kernel table with status 1L (and cannot be killed!).
- If we hit this situation, we simply look whether our high CPU process has a session ID that is different from its own PID.
  - If so, we have a high chance that it is a process started from a shell session and someone closed the shell.
  - So we find such cases as high CPU consuming as well and do not loose them.

# SDSF Health Checker Display

```
SDSF HEALTH CHECKER DISPLAY  MCEVSF                      LINE 139-160 (209)
PREFIX=*  DEST=(ALL)  OWNER=*  SYSNAME=
ACTION=+,/,//,%,=,A,D,DD,DL,DP,DPO,DS,E,H,L,P,PF,R,S,SB,SBI,SBO,SE,SEI,SEO,U,X,
ACTION=XC,XD,XDC,XF,XFC,XS,XSC
NP   NAME                                CheckOwner       State               Statu
     USS_AUTOMOUNT_DELAY                 IBMUSS           ACTIVE(DISABLED)    ENV N
     USS_CLIENT_MOUNTS                   IBMUSS           ACTIVE(DISABLED)    ENV N
     USS_FILESYS_CONFIG                  IBMUSS           ACTIVE(ENABLED)     SUCCE
     USS_HFS_DETECTED                    IBMUSS           ACTIVE(ENABLED)     SUCCE
     USS_INETD_UNSECURE_SERVICES         IBMUSS           ACTIVE(ENABLED)     EXCEP
     USS_KERNEL_PVTSTG_THRESHOLD         IBMUSS           ACTIVE(ENABLED)     SUCCE
     USS_KERNEL_RESOURCES_THRESHOLD      IBMUSS           ACTIVE(DISABLED)    ENV N
     USS_KERNEL_STACKS_THRESHOLD         IBMUSS           ACTIVE(ENABLED)     SUCCE
     USS_MAXSOCKETS_MAXFILEPROC          IBMUSS           ACTIVE(ENABLED)     SUCCE
     USS_PARMLIB                         IBMUSS           ACTIVE(ENABLED)     EXCEP
     USS_PARMLIB_MOUNTS                  IBMUSS           ACTIVE(ENABLED)     EXCEP
     USS_PROCESS_HIGH_CPU_USAGE          IBMUSS           ACTIVE(ENABLED)     SUCCE
     USS_SUPERUSER                       IBMUSS           ACTIVE(ENABLED)     SUCCE
     VLF_MAXVIRT                         IBMVLF           ACTIVE(ENABLED)     EXCEP
```

- The CK display after activating the new health checker…

# Listing the CK contents via SDSF Browse (sb)

```
CHECK(IBMUSS,USS_PROCESS_HIGH_CPU_USAGE)
SYSPLEX:    SANDBOX   SYSTEM: SC70
START TIME: 03/14/2019 16:24:42.821187
CHECK DATE: 20180830  CHECK SEVERITY: LOW-DYNAMIC
CHECK PARM: CPU>5% NOCK=/etc/USSHC.nocheck


UPNCU008I There are no USS processes consuming just now too much CPU.

END TIME: 03/14/2019 16:24:42.960902  STATUS: SUCCESSFUL
```

- The HC information shows that the check is successful at the moment.

# SDSF HC Display when a Problem occurs

```
SDSF HEALTH CHECKER DISPLAY  MCEVSF                    LINE 139-160 (209)
PREFIX=*  DEST=(ALL)  OWNER=HERI  SYSNAME=
ACTION=+,/,//,%,=,A,D,DD,DL,DP,DPO,DS,E,H,L,P,PF,R,S,SB,SBI,SBO,SE,SEI,SEO,U,X,
ACTION=XC,XD,XDC,XF,XFC,XS,XSC
NP   NAME                              CheckOwner      State              Statu
     USS_AUTOMOUNT_DELAY               IBMUSS          ACTIVE(DISABLED)   ENV N
     USS_CLIENT_MOUNTS                 IBMUSS          ACTIVE(DISABLED)   ENV N
     USS_FILESYS_CONFIG                IBMUSS          ACTIVE(ENABLED)    SUCCE
     USS_HFS_DETECTED                  IBMUSS          ACTIVE(ENABLED)    SUCCE
     USS_INETD_UNSECURE_SERVICES       IBMUSS          ACTIVE(ENABLED)    EXCEP
     USS_KERNEL_PVTSTG_THRESHOLD       IBMUSS          ACTIVE(ENABLED)    SUCCE
     USS_KERNEL_RESOURCES_THRESHOLD    IBMUSS          ACTIVE(DISABLED)   ENV N
     USS_KERNEL_STACKS_THRESHOLD       IBMUSS          ACTIVE(ENABLED)    SUCCE
     USS_MAXSOCKETS_MAXFILEPROC        IBMUSS          ACTIVE(ENABLED)    SUCCE
     USS_PARMLIB                       IBMUSS          ACTIVE(ENABLED)    EXCEP
     USS_PARMLIB_MOUNTS                IBMUSS          ACTIVE(ENABLED)    EXCEP
     USS_PROCESS_HIGH_CPU_USAGE        IBMUSS          ACTIVE(ENABLED)    EXCEP
     USS_SUPERUSER                     IBMUSS          ACTIVE(ENABLED)    SUCCE
     VLF_MAXVIRT                       IBMVLF          ACTIVE(ENABLED)    SUCCE
```

- Here is the CK display when there is at least one process using up much CPU...

# Listing the CK contents in this case

```
CHECK(IBMUSS,USS_PROCESS_HIGH_CPU_USAGE)
SYSPLEX:    SANDBOX   SYSTEM: SC70
START TIME: 03/14/2019 16:56:07.204916
CHECK DATE: 20180830  CHECK SEVERITY: LOW-DYNAMIC
CHECK PARM: CPU>5% NOCK=/etc/USSHC.nocheck

       PID       PPID Jobname  Owner    ASIDX   CPU% Workload SrvClass
           UnixCmd...
---------- ---------- -------- -------- ----- ------ -------- --------
  50528318          1 HERING5  HERING   006A   28.37 SYSTEM   SYSSTC1
           rexx.cpu

* Low Severity Exception *

UPNCU007E There are 1 USS processes consuming just now much CPU.

  Explanation:  You should have a look to these USS processes that use
    up much CPU.

  System Action:  You can use "RESET jobname,A=asid,SRVCLASS=newclass"
    to lower the importance or "F BPXOINIT,FORCE=processid" to kill the
    process. In rare cases you may need to use "CANCEL jobname,A=asid".

  Check Reason:  A check to verify whether USS processes do use up too
    much CPU.

END TIME: 03/14/2019 16:56:07.365385  STATUS: EXCEPTION-LOW
```

- The HC data shows that the check is not successful in this situation.

# Basic information shown in the operlog...

```
HZS0001I CHECK(IBMUSS,USS_PROCESS_HIGH_CPU_USAGE): 414
UPNCU007E There are 1 USS processes consuming just now much CPU.
```

- This is the message as shown in syslog/operlog ...
  - with a color according to the severity.