

# IBM Education Assistance for z/OS V2R2

Item: HIS without USS / MODIFY hisproc,BEGIN updates

Element/Component: BCP Hardware Instrumentation Services



## Agenda

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## Trademarks

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## Presentation Objectives

- Describe the removal of the requirement for z/OS UNIX System Services to be active in order to collect counter-set data.
  - V2R1 via OA43366
  - V2R2 base
- Describe updates to the syntax of the MODIFY hisproc,BEGIN command
  - V2R2 base



## Overview – HIS without USS

### ▪ Problem

- Collecting counter-set data by Hardware Instrumentation Services requires z/OS UNIX System Services be active so that counter-set data can be written to z/OS UNIX files. The counter-set data is also written to SMF type 113 records. Not all installations have z/OS UNIX System Services active, or want to go through the setup required for counter-set data collection to z/OS UNIX files. In many cases recording SMF type 113 records for counter-set data is sufficient.

### ▪ Solution

- Add a parameter to the MODIFY hisproc,BEGIN command to specify whether counter-set data should be written to z/OS UNIX files.

### ▪ Benefit / Value

- z/OS UNIX System Services is removed as a prerequisite for collection of HIS counter data.



## Usage & Invocation – HIS without USS

- CNTFILE=NO indicates “don't write counter-set data to USS files.”
- Issue the MODIFY hisproc,BEGIN command with the parameters CTRONLY,CNTFILE=NO, along with other desired parameters for data collection (which counter-sets, title of run, etc). e.g.

F HIS,B,TT='Run 1',CTRONLY,CNTFILE=NO,CTR=COMPLETE

- For installations without z/OS UNIX System Services active, or the prerequisite setup done to support recording HIS output to z/OS UNIX files, CTRONLY is necessary so that no sampling takes place. **Sampling still requires z/OS UNIX files for output.**
- For compatibility, CNTFILE has a default of YES.



## Usage & Invocation – HIS without USS

- HIS015I (DISPLAY HIS output) updated to display current setting of CNTFILE.

- DISPLAY HIS example (v2r1):

```
SY1  d his
SY1  HIS015I 11.15.25 DISPLAY HIS 962
HIS      002C ACTIVE
COMMAND: MODIFY HIS,B,TT='Run 1',CTRONLY,CNTFILE=NO,CTR=COMPLETE
[ ... snip ... ]
COMMAND PARAMETER VALUES USED:
  TITLE=   Run 1
  PATH=    .
  COUNTER SET= BASIC,PROBLEM-STATE,CRYPTO-ACTIVITY,EXTENDED,ZOS
  DURATION= NOLIMIT
  CTRONLY
  DATALOSS= IGNORE
  STATECHANGE= SAVE
  SMFINTVAL= 15 (MINUTES)
CNTFILE= NO
HISSERV STATUS: ACTIVE
[ ... snip ... ]
```

- V2R2 DISPLAY HIS example shown later in this presentation





## Overview – MODIFY hisproc,BEGIN syntax updates

### ▪ Problem

- As features have been added to HIS over the years the structure of the F hisproc,BEGIN command has become more complex. The current structure:
  - does not cleanly allow for the addition of new function to HIS without the BEGIN command becoming more complicated and potentially confusing.
  - does not support sampling without counter-set collection

### ▪ Solution

- Restructure the F hisproc,BEGIN command such that it is more hierarchical in nature: high level switches added to indicate which forms of instrumentation the HIS profiler is to collect

### ▪ Benefit / Value

- Additional flexibility.
- New function can be added without additional 'base syntax' changes.





## Overview – MODIFY hisproc,BEGIN syntax updates

- The syntax updates described in this section are **V2R2 only**.
  - Exception is the CNTFILE parameter, already discussed.
- The existing syntax is still supported.



## MODIFY hisproc,BEGIN syntax updates

- Additions to syntax in **bold**, “deprecated” parameters in ***bold red italics***

```
(... global parameters unchanged, i.e. TITLE, DURATION, etc ...)
[ ,SMP={YES|NO} ]
    [ , {SAMPTYPE | ST}=samptype | PERSIST | NONE]
    [ , {BUFCNT | BUF}={bufcnt | PERSIST }
    [ , {SAMPFREQ | SF}=freq | PERSIST ]
[ ,CNT={YES|NO} ]
    [ , {CNTSET | CTRSET | CTR }={COMPLETE |
        SOFTWARE |
        HARDWARE |
        (ctr1,ctr2,...ctrn)}]
    [ , {CNTINTVAL | CI | SMFINTVAL | SI }={SYNC | intv}]
    [ , {CNTFILE={YES|NO} ]
[ ,MAP={YES|NO} ]
    [ , {MAPASID | MAS}={ALL | (asid1,asid2,...asidn)}]
    [ , {MAPJOB | MJOB}=(job1,job2,...jobn)]
    [ , {MAPVERBOSE | MAPV}]
[ , {CNTONLY | CTRONLY | MAPONLY}]
```



## MODIFY hisproc,BEGIN syntax updates

Examples:

```
F HIS,BEGIN,TITLE='RUN 1',SMP=YES,CNT=NO,ST=BASIC
```

```
F HIS,BEGIN,TITLE='RUN 2',SMP=NO,CNT=YES,CNTSET=(PROB,CRYPTO)
```

CNTONLY means the same thing as existing parameter CTRONLY:

```
F HIS,BEGIN,TITLE='RUN WITHOUT USS',CNTONLY,CNTFILE=NO
```

CTRONLY still works:

```
F HIS,BEGIN,TITLE='RUN WITHOUT USS 2',CTRONLY,CNTFILE=NO
```



## MODIFY hisproc,BEGIN syntax updates

- Parameters now split up into their respective high level option
  - DDNAME,TITLE,DURATION,STATECHANGE,DATALOSS,PATH
    - Global parameters, no changes here
  - (new) SMP=YES|NO – Whether the HIS profiler should collect sampling data
    - New behavior, if you specify SMP=NO sampling data will not be collected
  - (new) CNT=YES|NO – Whether the HIS profiler should collect counter-set data
    - CNTINTVAL=SYNC|1-60 (SMFINTVAL still accepted)
    - CNTSET=COMPLETE|HDWR|SFWR|(ctrsetList) (CTRSET still accepted)
    - (new) CNTFILE=YES|NO – whether to write counter-set data to USS files
  - (new) MAP=YES|NO – Whether the HIS profiler should collect map data
- If high level switch is “NO”, no underlying parameters are allowed to be specified.
- Defaults: SMP=YES,CNT=YES,MAP=NO
- CNTONLY equivalent to SMP=NO,CNT=YES,MAP=NO
  - CTRONLY still accepted, is an alias of CNTONLY
- MAPONLY equivalent to SMP=NO,CNT=NO,MAP=YES



## MODIFY hisproc,BEGIN syntax updates

- Why do counter-set options now use CNT and not CTR in their names?
  - CTR= is already being used as an alias for CTRSET, so we had to use something else.
  - CNT is consistent with the naming convention of USS counter-set output files.



## Message changes – HIS015I (DISPLAY HIS output)

Display now grouped by high level function (new lines in **BOLD**, removed lines in ~~strikethrough~~):

### **SMP=YES | NO**

```
BUFCNT= bufcnt (PAGES/PROCESSOR) | PERSIST | DEFAULT
SAMPTYPE= samptype-values | PERSIST | DEFAULT | NONE
SAMPFREQ= freq (SAMPLES/MINUTE) | PERSIST | DEFAULT
```

### **CNT=YES | NO**

```
COUNTER SET= ctrset-values
```

```
SMFINTVAL= smfintval
```

```
CNTINTVAL= cntintval
```

```
CNTFILE=YES | NO
```

### **MAP=YES | NO**

```
MAPASID= xxxx
```

```
MAPJOB= zzzz
```

```
CTRONLY
```

```
MAPONLY
```



## Message changes – HIS015I (DISPLAY HIS output – example 1)

```

SY1  d his
SY1  HIS015I 09.39.28 DISPLAY HIS 013
HIS      002E ACTIVE
COMMAND: MODIFY HIS,BEGIN,TITLE='RUN 1',SMP=YES,CNT=NO,ST=BASIC
START TIME: 2015/02/02 09:39:25
END TIME:   ----/--/-- --:--:--
COMPLETION STATUS: -----
FILE PREFIX: SYSHIS20150202.093925.
LOST SAMPLES: 0
COMMAND PARAMETER VALUES USED:
  TITLE=  RUN 1
  PATH=    .
  DURATION= 10 (MINUTES)
  DATALOSS= IGNORE
  STATECHANGE= SAVE
  SMP= YES
  BUFCNT= DEFAULT
  SAMPTYPE= BASIC
  SAMPFREQ= DEFAULT
  CNT= NO
  MAP= NO
HISSERV STATUS: ACTIVE
EVENT
  AUTHORIZED= BASIC,PROBLEM-STATE,CRYPTO-ACTIVITY,EXTENDED,ZOS
  ENABLED= NONE
SAMPLE
  AUTHORIZED= BASIC
  ENABLED= BASIC
  BUFCNT= 9 (PAGES/PROCESSOR)
  SAMPFREQ= 800000 (SAMPLES/MINUTE)
PROFILER
  NAME      START      QUERY      SAMPLE  S  F
  HISPROF   2015/02/02 09:39:25  --:--:--.-----  -----  S
    
```





## Message changes – HIS015I (DISPLAY HIS output – example 2)

```

SY1  d his
SY1  HIS015I 09.46.22 DISPLAY HIS 023
HIS      002E ACTIVE
COMMAND: MODIFY HIS,BEGIN,TITLE='RUN WITHOUT USS',CNTONLY,CNTFILE=NO
START TIME: 2015/02/02 09:46:18
END TIME:   ----/--/-- --:--:--
COMPLETION STATUS: -----
COUNTER VERSION NUMBER 1: 1   COUNTER VERSION NUMBER 2: 3
COMMAND PARAMETER VALUES USED:
  TITLE=  RUN WITHOUT USS
  PATH=    .
  DURATION= NOLIMIT
  DATALOSS= IGNORE
  STATECHANGE= SAVE
  SMP= NO
  CNT= YES
  COUNTER SET= BASIC,PROBLEM-STATE
  CNTINTVAL= 15 (MINUTES)
  CNTFILE= NO
  MAP= NO
HISSERV STATUS: ACTIVE
EVENT
  AUTHORIZED= BASIC,PROBLEM-STATE,CRYPTO-ACTIVITY,EXTENDED,ZOS
  ENABLED= BASIC,PROBLEM-STATE
SAMPLE
  AUTHORIZED= BASIC
  ENABLED= NONE
  BUFCNT=    9 (PAGES/PROCESSOR)
  SAMPFREQ= 800000 (SAMPLES/MINUTE)
PROFILER
  NAME      START          QUERY          SAMPLE  S  F
  HISPROF   2015/02/02 09:46:18  00:00:00.000015  -----
  
```



## Message changes – new message HIS035I

- It is syntactically possible to (inadvertently) attempt to start a data collection run without any profiling requested, i.e. CNT=NO,SMP=NO,MAP=NO. So, a new message is required:

HIS035I NO PROFILING REQUESTED.

Explanation: The MODIFY hisproc,BEGIN command indicated options that result in no data collection.

System Action: The system does not process the command issued.

Operator Response: Reissue the command and ensure that at least one type of profiling is requested.

System Programmer Response: None

Problem Determination: None



## Interactions & Dependencies

- Software Dependencies
  - HIS without USS:
    - No software dependencies for z/OS V2R2.
    - Function rolled back to z/OS V2R1 as part of APAR OA43366.
  - MODIFY hisproc,BEGIN syntax changes:
    - No software dependencies for z/OS V2R2
    - Not rolled back to z/OS V2R1
- Hardware Dependencies
  - None
- Exploiters
  - None



## Presentation Summary

- CNTFILE=NO allowed on MODIFY hisproc,BEGIN to specify that counter-set data is not to be written to a z/OS UNIX file:
  - V2R2
  - V2R1 with OA43366
    - HIS015I (DISPLAY HIS output) displays CNTFILE setting.
  
- Description of syntax updates to MODIFY hisproc,BEGIN command
  - V2R2 only
  - Message changes:
    - HIS015I (DISPLAY HIS output)
    - HIS035I (new)



## Appendix

- Updated Publications
  - MVS System Commands (SA38-0666)
    - Chapter 1
      - “Setting up hardware event data collection”
      - “Accessing the output from a hardware event data collection run”
    - Chapter 4 (MODIFY hisproc,BEGIN)
  - MVS System Messages Volume 6 (GOS-IEA) (SA38-0673)
    - HIS015I
    - HIS035I (V2R2 only)

