

# How to Use SMF Data Set Support for Postprocessor Reports with z/OS V2R3 RMF Distributed Data Server

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# 1 Overview

With z/OS V2R3, the RMF Distributed Data Server introduces support to use pre-allocated SMF data from data sets or logstreams as input source for historical Postprocessor requests.

The RMF DDS Postprocessor HTTP API offers three new parameters: `smfdata`, `sortsmf` and `joboutdel` to be used with the `rmfpp.xml` request type. For example, a request for a RMF Postprocessor CPU activity report might look like this:

```
http://<hostname>:8803/gpm/rmfpp.xml?  
reports=CPU&sortsmf=YES&smfdata=IFASMF.PERF.SYSDPLEX&joboutdel=YES
```

Section 2 on p. 3 provides a detailed description of these new parameters. In section 6 on p. 8, new XML tags introduced with the SMF data set support are listed.

The usage of SMF data sets is also integrated into the RMF Data Portal. SMF data set names and YES/NO values for SORTSMF and JOBOUTDEL can be defined with new input fields in the “Explore” menu. (Supported browser versions are Internet Explorer 11 and with Firefox ESR 52.)

Section 7 on p. 9 lists screen shots of the new parts in the RMF Data Portal.

If you intend to use this new RMF DDS functionality, you have to switch to an extended GPMPPJCL job template which is provided in `SYS1:SERBPWSV(GPMPPJV2)`. You will find the template in section 3 on p. 4 for your reference.

Depending on your DDS configuration option `HTTP_NOAUTH()`, you must customize this job template. The rules for customization are explained in section 5 on p. 6. After you adapted the JCL to match your installation, you have to reference it in your GPMSEVERVE started task with the GPMPPJCL DD card.

Section 4 on p. 6 explains which steps you have to take in your SAF definition (e.g. RACF) to enable this new functionality of RMF DDS.

## 2 Postprocessor HTTP request parameters

The RMF Distributed Data Server HTTP API is extended with the following request parameters which are valid in the context of requests for historical Postprocessor reports:

- `&joboutdel`: Specify whether the held output of the PP job (which has to be held in order to read the PP output and to generate the XML response) should be deleted by the DDS after processing the PP job output.
- `&smfdata`: Specify one or multiple names of SMF data sets or logstreams.
- `&sortsmf`: Specify whether the input data has to be sorted before being processed by the Postprocessor.

### The *joboutdel* parameter

`joboutdel`=[YES | NO]

This parameter specifies whether the held output of the Postprocessor job should be deleted by the RMF Distributed Data Server after it has been processed successfully.

Default: NO

#### Examples:

`joboutdel=NO`

### The *smfdata* parameter

`smfdata`=smf\_data\_1[,smf\_data\_2,...,smf\_data\_k]

This parameter contains a list of names of SMF data sets or logstreams which are used as input for the generation of Postprocessor reports. The names must be fully qualified and valid z/OS data set names.

#### Examples:

`smfdata=RMF.SMFDATA.SYSA,RMF.SMFDATA.SYSB,RMF.SMFDATA.SYSC`

`smfdata=IFASMF.PERF.SYSDPLEX`

### The *sortsmf* parameter

`sortsmf`=[YES | NO]

This parameter specifies whether the SMF data which is defined with the `&smfdata` parameter is sorted before it is used as input for the generation of Postprocessor reports.

Default: NO

#### Examples:

`sortsmf=YES`

### 3 RMF Postprocessor job template in SYS1.SERBPWSV

A new Postprocessor job template GPMPPJV2 is added to SYS1.SERBPWSV (the name stands for "GPMPPJCL version 2"). This template has to be activated in the GPMSERVE procedure if exploiters of the RMF DDS (i.e. the GPMSERVE started task) want to use the new &SMFDATA parameter.

The GPMPPJV2 template contains some JCL comment cards with special strings. These are used by GPMSERVE as markers to enable GPMSERVE to generate a correct JCL together with the parameters supplied with the RMF DDS rmfpp.xml HTTP request. The marker lines must not be deleted from the JCL, otherwise the JCL is considered incorrect and the SMF data set functionality cannot be used.

The special strings are:

- `//*UID,`
- `//*LOGSTR-START,`
- `//*LOGSTR-END,`
- `//*SORT-START,`
- `//*SORT-END,`
- `//*SORTIN,`
- `//*MFPINPUT.`

The job template looks like the following:

```
//GPMDDSP JOB MSGCLASS=H,CLASS=A,MSGLEVEL=(1,1),REGION=256M,
//*UID USER=<uid>
/*JOBPARM SYSAFF=*
//*****
//*
//* NAME: GPMPPJV2
//*
//* DESCRIPTION: RMF POSTPROCESSOR JCL FOR THE RMF DISTRIBUTED DATA
//* SERVER HOST ADDRESS SPACE (GPMSERVE)
//*
//* COPYRIGHT: LICENSED MATERIALS - PROPERTY OF IBM
//* "RESTRICTED MATERIALS OF IBM"
//* 5650-ZOS
//* COPYRIGHT IBM CORP. 2017
//* STATUS=HRM77B0 (Z/OS V2R3 RMF)
//*
//*****
//*
//* NOTES:
//*
//* 1. YOU MAY CHANGE THE SPECIFICATIONS IN THE JOB AND EXEC CARDS
//* TO SUIT YOUR INSTALLATION, I.E. CHOOSE A DIFFERENT CLASS=,
//* MSGCLASS= OR REGION= PARAMETER OR ADD A NOTIFY=
//* PARAMETER.
//*
//* 2. PREPARE THE JOB CARD TO BE USED WITH THE SMFDATA PARAMETER:
//* A) IF GPMSERVE RUNS WITH "HTTP_NOAUTH(*)" OR
//* WITH ANY "HTTP_NOAUTH(<IP-ADDR>)" OPTION,
//* SPECIFY AN APPROPRIATE GENERAL USER= PARAMETER,
//* E.G. "//*UID USER=GPMUID".
//* B) IF GPMSERVE RUNS WITH AUTHORISATION (I.E. EITHER NO
//* "HTTP_NOAUTH" OPTION DEFINED OR "HTTP_NOAUTH()" SPECIFIED,
```

```

/**      LEAVE THE *UID LINE AS IS.                                     *
/**      C) IF YOU DO NOT PLAN TO USE THE SMFDATA PARAMETER AT ALL,   *
/**      STAY WITH THE TEMPLATE IN GMPJPJCL, DO NOT USE GMPJPJV2.   *
/**                                                                 *
/**      (SEE RMF USER'S GUIDE OR RMF WEB HOME PAGE FOR MORE       *
/**      INFORMATION ON SECURITY SETTINGS.)                          *
/**                                                                 *
/**      3. DO NOT CHANGE THE DD CARD SPECIFICATIONS FOR THE XML     *
/**      OUTPUT DATASETS. THE DDS NEEDS THESE SYSOUT DATA SETS TO *
/**      RESIDE ON SPOOL. BE SURE TO USE A 'MSGCLASS' WITH AN      *
/**      OUTPUT DISPOSITION OF 'HOLD'.                               *
/**                                                                 *
/**      4.A) DO NOT CHANGE THE LINES BEGINNING WITH                *
/**           /*LOGSTR-, /*SORT-, /*SORTIN, /*MFPINPUT              *
/**           BECAUSE THE DDS USES THEM TO GENERATE THE ACTUAL JCL. *
/**      B) DO NOT INSERT A COMMENT LINE RIGHT BEFORE THE /*UID LINE.*
/**                                                                 *
/**      CHANGE ACTIVITY:                                           *
/**      §80=SMFDS,HRM77B0,,KGE: SMF DATA SET SUPPORT              *
/**      *****                                                    *
/**      /*LOGSTR-START                                             *
/**      *****                                                    *
/**      RMF DATA EXTRACTING                                       *
/**      *****                                                    *
/**      /*RMFDUMP EXEC PGM=IFASMF DL                               *
/**      /*OUTDD1 DD DISP=(NEW,PASS),UNIT=SYSDA,SPACE=(CYL,(500,500)) *
/**      /*SYSPRINT DD SYSOUT=*                                     *
/**      /*SYSOUT DD SYSOUT=*                                       *
/**      /*SYSIN DD *                                              *
/**      /*LOGSTR-END                                              *
/**      /*SORT-START                                             *
/**      *****                                                    *
/**      RMF SORT PROCESSING                                       *
/**      *****                                                    *
/**      /*RMFSORT EXEC PGM=SORT                                    *
/**      /*SORTIN                                                 *
/**      /*SORTOUT DD DISP=(NEW,PASS),UNIT=SYSDA,SPACE=(CYL,(200,200)) *
/**      /*SORTWK01 DD DISP=(NEW,DELETE),UNIT=SYSDA,SPACE=(CYL,(200,200)) *
/**      /*SORTWK02 DD DISP=(NEW,DELETE),UNIT=SYSDA,SPACE=(CYL,(200,200)) *
/**      /*SORTWK03 DD DISP=(NEW,DELETE),UNIT=SYSDA,SPACE=(CYL,(200,200)) *
/**      /*SYSPRINT DD SYSOUT=*                                     *
/**      /*SYSOUT DD SYSOUT=*                                       *
/**      /*SYSIN DD *                                              *
/**      SORT FIELDS=(11,4,CH,A,7,4,CH,A,15,4,CH,A),EQUALS        *
/**      MODS E15=(ERBPPE15,36000,,N),E35=(ERBPPE35,3000,,N)      *
/**      /*SORT-END                                              *
/**      *****                                                    *
/**      RMF POSTPROCESSING                                       *
/**      *****                                                    *
/**      /*RMFPP EXEC PGM=ERBRMFPP                                  *
/**      /*MFPINPUT                                              *
/**      /*MFPMSGDS DD SYSOUT=*                                     *
/**      /*XPRPTS DD SYSOUT=*                                       *
/**      /*XPXSRPTS DD SYSOUT=*                                       *
/**      /*XPOVWRPT DD SYSOUT=*                                       *
/**      /*SYSOUT DD SYSOUT=*                                       *
/**      /*SYSIN DD *                                              *

```

## 4 RACF security considerations

As long as the Postprocessor job submitted by the RMF DDS does not contain a USER parameter in its JOB card, the submitted Postprocessor job runs under the authority of the user ID which has been assigned to the GPMSEERVE started task, e.g. the user `GPMSEERVE`. This is the case if you use the template `GPMPJCL` which has been provided in pre-V2R3 releases of z/OS.

Consequently, a Postprocessor job which accesses SMF data sets or logstreams can only run successfully if the `GPMSEERVE` user ID has read access to these SMF data sets. As it is unlikely that system environments will fulfill this strong requirement, we now support a USER parameter with the jobcard.

Example:

```
//GPMDDSPP JOB  MSGCLASS=H,CLASS=A,MSGLEVEL=(1,1),REGION=256M,USER=BUID
```

This ensures that user ID `BUID` submits the Postprocessor job `GPMDDSPP` and the job is using the security authorities of `BUID`. Now the Postprocessor job may access any SMF data the user `BUID` is allowed to read.

In order for this mechanism to work, the `GPMSEERVE` user ID needs permission to submit jobs on behalf of `BUID` and it needs `UPDATE` access to the job output on the JES spool. The following example shows RACF commands which allow these actions:

```
RDEFINE SURROGAT BUID.SUBMIT UACC(NONE) OWNER(BUID)
PERMIT BUID.SUBMIT CLASS(SURROGAT) ID(GPMSEERVE) ACCESS(READ)
SETROPTS RACLIST(SURROGAT) REFRESH
```

```
RDEFINE JESSPOOL nodename.BUID.GPMSEERVE.** UACC(NONE) OWNER(BUID)
PERMIT nodename.BUID.GPMSEERVE.** CLASS(JESSPOOL) ID(GPMSEERVE) ACCESS(UPDATE)
SETROPTS RACLIST(JESSPOOL) REFRESH
```

In order to use the job deletion functionality implemented with the new `joboutdel` parameter, a RACF profile in the JESJOBS class has to be defined like in the following example for the user `BUID` and the Postprocessor job `GPMDDSPP` started by `GPMSEERVE`:

```
RDEFINE JESJOBS PURGE.nodename.BUID.GPMDDSPP UACC(NONE)
PERMIT PURGE.nodename.BUID.GPMDDSPP CLASS(JESJOBS) ID(BUID) ACC(ALTER)
```

## 5 Customizing GPMPJV2 for variants of HTTP\_NOAUTH

Access to the RMF DDS may be restricted by means of the `HTTP_NOAUTH` option. Depending on your setting of this option in `GPMSEERVE`, there are the following variants of customizing the JOB card in the PP JCL template:

### 5.1 DDS running with HTTP\_NOAUTH(\*)

You must provide a universal user ID `gpmuid` with the USER parameter of the JOB card:

```
//GPMDDSPP JOB  MSGCLASS=H,CLASS=A,MSGLEVEL=(1,1),REGION=256M,
//*UID      USER=gpmuid
```

The user ID `gpmuid` which is used here has to be 'universal' in the sense that it can be used by all users of the DDS. The user ID `gpmuid` may be empty, in which case the Postprocessor job runs under the authority of the GPMSEVE started task user ID. When submitting a Postprocessor job, the DDS will expand this JCL to

```
//GPMDDSP JOB  MSGCLASS=H, CLASS=A, MSGLEVEL=(1,1), REGION=256M,  
//          USER=gpmuid
```

## 5.2 DDS running with HTTP\_NOAUTH()

This setting of the HTTP\_NOAUTH option is also the default, if you do not specify it in your GPMSEVE PARMLIB member. Leave the `//*UID` line in GPMPPJV2 unchanged in this case:

```
//GPMDDSP JOB  MSGCLASS=H, CLASS=A, MSGLEVEL=(1,1), REGION=256M,  
//*UID      USER=<UID>
```

Using this variant of HTTP\_NOAUTH, every user of the DDS has to authorise himself with his own user ID `userid`. The DDS expands this template to

```
//GPMDDSP JOB  MSGCLASS=H, CLASS=A, MSGLEVEL=(1,1), REGION=256M,  
//          USER=userid
```

## 5.3 DDS running with HTTP\_NOAUTH(<ip-addr>)

This setting of the HTTP\_NOAUTH option allows users who access the RMF DDS with a matching IP address to use the DDS without authorisation, all other users must identify themselves with user ID and password. You must provide a universal user ID `gpmuid` with the USER parameter of the JOB card:

```
//GPMDDSP JOB  MSGCLASS=H, CLASS=A, MSGLEVEL=(1,1), REGION=256M,  
//*UID      USER=gpmuid
```

- If a user with a matching IP address uses the DDS, then this case is equivalent to the HTTP\_NOAUTH(\*) case from section 5.1. The template is expanded by the DDS to

```
//GPMDDSP JOB  MSGCLASS=H, CLASS=A, MSGLEVEL=(1,1), REGION=256M,  
//          USER=gpmuid
```

- If a user with another IP address uses the DDS, then this case is equivalent to the HTTP\_NOAUTH() case from section 5.2. The user has to authorise himself with user ID `userid` and the template is expanded by the DDS to

```
//GPMDDSP JOB  MSGCLASS=H, CLASS=A, MSGLEVEL=(1,1), REGION=256M,  
//          USER=userid
```





## Message element

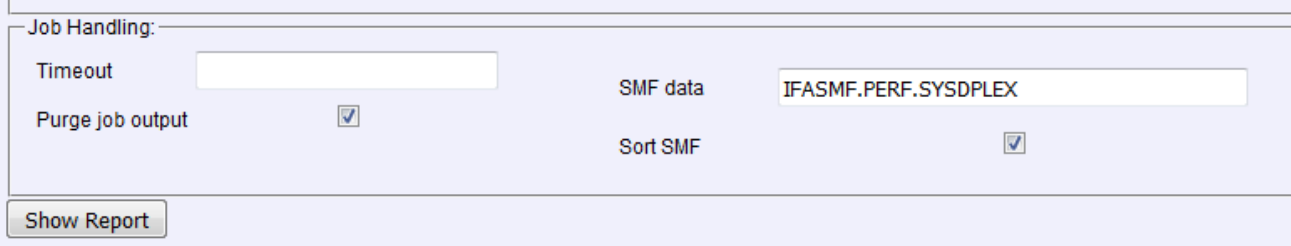
The <message> tag is now also available at the top level of the ddsml schema.

### Example:

```
<ddsml xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xsi:noNamespaceSchemaLocation="include/ddsml.xsd">
  <server>
    <name>RMF-DDS-Server</name>
    <version>ZOSV2R3</version>
    <functionality>3211</functionality>
    <platform>z/OS</platform>
  </server>
  <smf-input>
    <file>IFASMF.PERF.SYSDPLEX</file>
  </smf-input>
  <message id="GPM0748W">
    <description>Incomplete action or Postprocessor data (Reason: Job could
      not be purged (probably a RACF problem))</description>
    <severity>2</severity>
  </message>
  <postprocessor>
    <metric id="CPU">
      <description>CPU Activity Report</description>
      <type>Interval</type>
    </metric>
    <version><smf-data>z/OS V2R2</smf-data><rmf-report>z/OS V2R3</rmf-
      report></version>
    <resource><resname>SYSE</resname><restype>SYSTEM</restype>
    ...
  </postprocessor>
</ddsml>
```

## 7 Example screen shots from RMF Data Portal

Screen shot from RMF Data Portal showing input fields for the new parameters:



Job Handling:	
Timeout	<input type="text"/>
Purge job output	<input checked="" type="checkbox"/>
SMF data	<input type="text" value="IFASMF.PERF.SYSDPLEX"/>
Sort SMF	<input checked="" type="checkbox"/>

Screen shot with SMF data set information and ERB messages from RMF Postprocessor:

1. When sections are hidden

Display Controls for RMF Postprocessor Report

Report Data Selection:

- 08/17/2017-11.59.33 SYSE CPU
- 08/17/2017-11.59.33 SYSF CPU
- 08/17/2017-12.14.33 SYSE CPU
- 08/17/2017-12.14.33 SYSF CPU

Show all Report Data

---

- ▶ **SMF Data**
- ▶ **RMF Postprocessor Messages**

### RMF Postprocessor Interval Report [System SYSE] : CPU Activity Report

RMF Version : z/OS V2R3    SMF Data : z/OS V2R2  
Start : 08/17/2017-11.59.33    End : 08/17/2017-12.14.33    Interval : 15:00:000 minutes    Cycle : 1000 milliseconds

- ▶ **CPU Activity**
- ▶ **Partition Data Report**
- ▶ **LPAR Cluster Report**
- ▶ **Group Capacity Report**

2. With sections expanded:

### ▼ SMF Data

IFASMF.PERF.SYSDPLEX

### ▼ RMF Postprocessor Messages

ERB103I PPS: OPTIONS IN EFFECT

ERB103I PPS: NODELTA -- DEFAULT

ERB103I PPS: NOEXITS -- DEFAULT

ERB103I PPS: ETOD(0000,2400) -- DEFAULT

ERB103I PPS: STOD(0000,2400) -- DEFAULT

ERB103I PPS: RTOD(0000,2400) -- DEFAULT

ERB103I PPS: SYSOUT(A) -- DEFAULT

ERB103I PPS: NOSUMMARY -- SYSIN

ERB103I PPS: REPORTS(CPU) -- SYSIN

ERB103I PPS: DATE(01011967,12312066) -- DEFAULT

## 8 New GPM messages

Together with the new SMF data set support, two new GPM messages are introduced to the RMF DDS:

### **GPM0748W Incomplete action or Postprocessor data (Reason: *reason\_text*).**

**Explanation:** The Postprocessor job was successfully run, but the DDS did not return all output data or an action (e.g. deletion of job output) did not complete successfully.

**System action:** Either only a partial XML answer is produced for the request or the Postprocessor job output is not purged.

**User response:** Observe the *reason\_text*, check the Postprocessor messages or the Postprocessor job directly. If job output could not be purged, examine your security definitions for the JESJOBS class.

**GPM0749E** The provided JCL is not valid for this Postprocessor HTTP request.

**Explanation:** The DDS uses a Postprocessor JCL template which is designed for the usage of SMF data sets and SMF logstream data, but this template does not contain the marker strings which are required for this functionality in the DDS.

**System action:** The HTTP Postprocessor request is rejected.

**User response:** Correct the Postprocessor JCL template which is used with the GPMPPJCL DD card of the GPMSEERVE started task.

## 9 Bibliography

- z/OS RMF User's Guide,  
[https://www.ibm.com/support/knowledgecenter/SSLTBW\\_2.3.0/com.ibm.zos.v2r3.erbb200/toc.htm](https://www.ibm.com/support/knowledgecenter/SSLTBW_2.3.0/com.ibm.zos.v2r3.erbb200/toc.htm)
- z/OS RMF Programmer's Guide,  
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- z/OS Security Server RACF Security Administrator's Guide,  
[https://www.ibm.com/support/knowledgecenter/en/SSLTBW\\_2.3.0/com.ibm.zos.v2r3.icha700/toc.htm](https://www.ibm.com/support/knowledgecenter/en/SSLTBW_2.3.0/com.ibm.zos.v2r3.icha700/toc.htm)