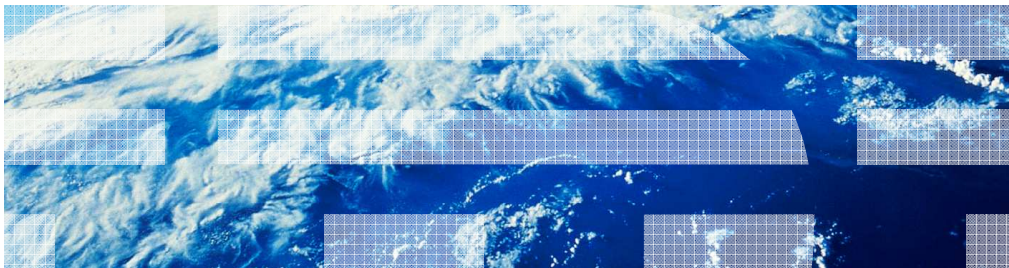

z/OS SMF IFASMF DL enhancements



This education topic provides information regarding z/OS SMF IFASMF DL enhancements.

Session objectives

- Things you will learn
 - The purpose of the SMF Dump Program line item
 - Installation procedures for SMF Dump Program line item
 - **Functional content and benefit**
 - **Migration issues**
 - Explain how this support is invoked
 - Where to read more about it

The objective of this presentation is to teach you about the IFASMF DL Enhancements. Topics covered are its purpose and new features, the installation procedures for it, its functional content and benefits, and migration issues when exploiting the new function. Also discussed is how it is invoked and where to read more about this exciting new function for SMF.

Overview (1 of 2)

- **SMF data management with logstreams lacks function**
 - Customers require the ability to harden the logstream data to datasets at will
 - Customer also require the ability to delete data from the logstream, as was provided with the IFASMFDP program and the CLEAR option
 - To make these changes, additional base functionality for SMF logstreams was required:
 - MAXDORM parmlib option now supported for SMF logstream recording

The base SMF logstream shipped the IFASMFDP program with only a DUMP option. Feedback that we received let us know that it was imperative that a delete function exist for SMF logstreams. Being able to manage the SMF logstream data more closely than is available with the RETPD logger option is a critical migration issue. In addition, customers required the ability to delineate SMF data on a time boundary, something that could have been done with dataset recording by doing an 'I SMF' command to switch datasets at a given time. There is no concept of this with SMF logstream recording since the logstream is a contiguous stream of data.

In addition to the new support, this required supporting the MAXDORM parameter for SMF logstream recording. This SMFPRMxx parameter was not supported with the initial release of the SMF logstream recording support.

Overview (2 of 2)

- This supports allows for:
 1. A new RELATIVEDATE option for selecting a date range of records from the logstream with IFASMF DL
 2. A new ARCHIVE and DELETE option in IFASMF DL
 3. Allow MAXDORM value in SMFPRMxx to be applied to logstream recording so that buffered data can be moved to the logstream at regular intervals.
- Value:
 1. Allows you to remove SMF data from the logstream
 2. Allows for grouping SMF logstream data by generic date masks (daily, weekly, monthly), eliminating the need for secondary post processing handling of the data (perhaps by propagating it into GDGs).
 3. Prevents SMF records from stagnating in the buffer

The new RELATIVEDATE option will allow you to easily select a range of records based on the current day. Since there is no existing function to delineate a range of time in the logstream, and to dump successive days out of a logstream requires manual intervention, this new parameter was developed. This parameter gives you the power to specify the unit of time (BYDAY, BYWEEK, BYMONTH), the number of units to move backwards and the number of units to gather. So for example, RELATIVEDATE(BYWEEK,2,1) will move back two weeks and gather one week. An associated parameter is the WEEKSTART parameter. Since some locales start the week on Sunday and some on Monday this keyword allows you to alter that behavior.

Now with the IFASMF DL program SMF data can be removed from the logstream with the ARCHIVE and DELETE options. The ARCHIVE option will first dump the data from the logstream to a dataset, and then perform a delete of the data from the logstream. The DELETE option will only perform a delete of the data from the logstream without dumping it. It should be noted that unlike the DUMP option, the ARCHIVE and DELETE option operates on logger block boundaries. This means that there can be a fuzziness in the selected output records. This is why the MAXDORM parmlib option is now supported.

MAXDORM support for logstreams was crucial to supporting the new ARCHIVE and DELETE functions. MAXDORM has the same effect as it did with dataset recording except it will work with each logstream now. To limit the amount of “fuzziness” mentioned, a smaller MAXDORM value should be used. This causes the buffers to be purged to the logstream more often, and each time this is done a new logger block is created for these records. This is only a concern for logstreams which do not have much data being recorded to them. A logstream with a high write rate will never actually require the MAXDORM process to purge a buffer as the continuous writing of SMF data will naturally purge the buffers.

Usage and invocation

- The support for ARCHIVE, DELETE and RELATIVEDATE is invoked by the IFASMF DL program. The support for MAXDORM is invoked by updating your SMFPRMxx.
- RELATIVEDATE Parameter
 - Used to specify a date range based on the current day, week or month
 - **RELATIVEDATE(u, x, y)**
 - u – BYDAY, BYWEEK or BYMONTH
 - x – Number of units to move back
 - y – Number of units to gather
- DELETE/ARCHIVE Option
 - LSNAME(IFASMF.LS1,OPTIONS(**ARCHIVE**))
 - LSNAME(IFASMF.LS1,OPTIONS(**DELETE**))

The new IFASMF DL usability is implemented as options to the IFASMF DL program with the exception of MAXDORM which is an option in SMFPRMxx. The DELETE and ARCHIVE options are specified in the OPTIONS(yyy) keyword of the LSNAME parameter in the SYSIN to the IFASMF DL program. The RELATIVEDATE parameter is specified as a parameter to the IFASMF DL program with the SYSIN as well.

Usage and invocation (continued) (1 of 12)

- BYDAY RELATIVEDATE Example
 - Assume the below job is run on Feb 20, 2009:

```
//RUNSMFDL JOB MSGLEVEL=(1,1),NOTIFY=&SYSUID,CLASS=A,REGION=0M
//SMFDMP1 EXEC PGM=IFASMPDL
//DUMP01 DD DSN=ASOFIA.SMF.DUMP5,DISP=(NEW,CATLG),
// UNIT=3390,VOL=SER=181PAK,SPACE=(CYL,(10,10))
//SYSMDUMP DD DSN=ASOFIA.IFASMPDL.SYSMDMP2,DISP=(NEW,CATLG),
// UNIT=3390,VOL=SER=183PAK,SPACE=(CYL,(50,5))
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
LSNAME(IFASMP.MULTSYS.STREAM1,OPTIONS(DUMP))
OUTDD(DUMP01,TYPE(0:255))
RELATIVEDATE(BYDAY,7,3)
/*
```

This job is an example of using the RELATIVEDATE parameter with the BYDAY option with the current day of Feb 20th 2009. It is coded to DUMP three days worth of SMF records starting at seven days previous to today. The RELATIVEDATE parameter is coded in the job and no DATE parameter has been specified.

Usage and invocation (continued) (2 of 12)

February 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

For illustration purposes, here is how the function works. First the current day is identified. In this case the job is running on Feb 20th 2009.

Begin counting backwards seven days starting with the last full day, which is Feb 19th. This bring you back to the first day in the range which is Feb 13th.

Now, count forward three days from the 13th, which gives you a range of Feb 13th – Feb 15th.

Usage and invocation (continued) (3 of 12)

```
▪ BYDAY RELATIVEDATE Example (continued)
  IFA010I SMF DUMP PARAMETERS
  IFA010I WEEKSTART(SUN) -- DEFAULT
  IFA010I END(2400) -- DEFAULT
  IFA010I START(0000) -- DEFAULT
  IFA010I DATE(1900000,2099366) -- DEFAULT
  IFA010I RELATIVEDATE(BYDAY,07,03) -- SYSIN
  IFA010I OUTDD(DUMP01,TYPE(0:255)) -- SYSIN
  IFA010I LSNAME(IFASMF.MULTSYS.STREAM1,OPTIONS(DUMP)) -- SYSIN
  IFA834I RELATIVEDATE PARAMETER RESULTS IN START DATE 2009.044, END
        DATE 2009.046
```

In the output for the job you can see the IFA834I message indicating that the calculated range was 2009 044 through 2009 046. The summary status report will follow.

Usage and invocation (continued) (4 of 12)

- BYWEEK RELATIVEDATE Example
 - Assume the below job is run on Feb 20, 2009:

```
//RUNSMFDL JOB MSGLEVEL=(1,1),NOTIFY=&SYSUID,CLASS=A,REGION=0M
//SMFDMPI EXEC PGM=IFASMFDL
//DUMP01 DD DSN=ASOFIA.SMF.DUMP5,DISP=(NEW,CATLG),
// UNIT=3390,VOL=SER=181PAK,SPACE=(CYL,(10,10))
//SYSMDUMP DD DSN=ASOFIA.IFASMFDL.SYSMDMP2,DISP=(NEW,CATLG),
// UNIT=3390,VOL=SER=183PAK,SPACE=(CYL,(50,5))
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
LSNAME(IFASMF.MULTSYS.STREAM1,OPTIONS(DUMP))
OUTDD(DUMP01,TYPE(0:255))
RELATIVEDATE(BYWEEK,2,1)
WEEKSTART(SUN)
/*
```

This job is an example of using the RELATIVEDATE parameter with the BYWEEK option with the current day again being Feb 20th 2009. It is coded to DUMP one week worth of SMF records from two weeks ago. The WEEKSTART option is coded here for clarity as Sunday is the default value used.

Usage and invocation (continued) (5 of 12)

February 2009						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

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For illustration purposes, here is how the function works. First the current day is identified which is Feb 20th. Once this is established IFASMF DL will figure out what the first day of the week is, in this case it is Feb 15th.

RELATIVEDATE always starts counting with the last FULL unit, so the first week that is counted is the week of Feb 8th.

Next it moves to the week of Feb 1st. Feb 1st is the starting day for the range.

Now it counts ahead only one week, so the Feb 1st through Feb 7th is resolved as the date range that will be dumped.

Usage and invocation (continued) (6 of 12)

▪ Examples (continued)

```
IFA010I SMF DUMP PARAMETERS
IFA010I END(2400) -- DEFAULT
IFA010I START(0000) -- DEFAULT
IFA010I DATE(1900000,2099366) -- DEFAULT
IFA010I WEEKSTART(SUN) -- SYSIN
IFA010I RELATIVEDATE(BYWEEK,02,01) -- SYSIN
IFA010I OUTDD(DUMP01,TYPE(0:255)) -- SYSIN
IFA010I LSNAM(IFASMF.MULTSYS.STREAM1,OPTIONS(DUMP)) -- SYSIN
IFA834I RELATIVEDATE PARAMETER RESULTS IN START DATE 2009.032, END
DATE 2009.038
```

In the output for the job you can see the IFA834I message indicating that the calculated range was 2009 032 through 2009 038. It also shows that the WEEKSTART(SUN) option was specified on the SYSIN. The summary status report will follow.

Usage and invocation (continued) (7 of 12)

- BYMONTH RELATIVEDATE Example

- Assume the below job is run on July 1st, 2009

```
//RUNSMFDL JOB MSGLEVEL=(1,1),NOTIFY=&SYSUID,CLASS=A,REGION=0M
//SMFDMP1 EXEC PGM=IFASMFDL
//SYSMDUMP DD DSN=ASOFIA.IFASMFDL.SYSMDMP2,DISP=(NEW,CATLG),
//          UNIT=3390,VOL=SER=183PAK,SPACE=(CYL,(50,5))
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
          LSNAM (IFASMF.MULTSYS.STREAM1,OPTIONS (DELETE))
          RELATIVEDATE (BYMONTH,3,3)
/*
```

The final example of using RELATIVEDATE parameter is with the BYMONTH option. For this job the current day is July 1st 2009. It is coded to DUMP the last three months of data from the log stream, which will be the second quarter of 2009.

Usage and invocation (continued) (8 of 12)

2009

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

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For illustration purposes, here is how the function works. First the current month is identified – it is July.

Now that the current month is established, subtract the number of months to go back - start with the previous full month. This gives you April as your start month.

Since you are gathering three months worth of information, IFASMF DL has calculated the end date as June 30th. This gives you the second quarter of 2009.

Since this a DELETE request, the start point is ignored and the match includes all data from the start of the logstream.

Usage and invocation (continued) (9 of 12)

▪ Examples (continued)

```
IFA010I SMF DUMP PARAMETERS
IFA010I WEEKSTART(SUN) -- DEFAULT
IFA010I END(2400) -- DEFAULT
IFA010I START(0000) -- DEFAULT
IFA010I DATE(1900000,2099366) -- DEFAULT
IFA010I OUTDD(DUMPOUT,TYPE(0:255)) -- DEFAULT
IFA010I RELATIVEDATE(BYMONTH,03,03) -- SYSIN
IFA010I LSNAME(IFASMF.MULTSYS.STREAM1,OPTIONS(DELETE)) -- SYSIN
IFA834I RELATIVEDATE PARAMETER RESULTS IN START DATE 2009.091, END
DATE 2009.181
```

In the output for the job you can see the IFA834I message indicating that the calculated range was the second quarter of the 2009 year. The start date is ignored since the DELETE option was used.

Usage and invocation (continued) (10 of 12)

- BYMONTH RELATIVEDATE Example 2
 - Assume the below job is run on Feb 20, 2009:

```
//RUNSMFDL JOB MSGLEVEL=(1,1),NOTIFY=&SYSUID,CLASS=A,REGION=0M
//SMFDMP1 EXEC PGM=IFASMFDL
//DUMP01 DD DSN=ASOFIA.SMF.DUMP5,DISP=(NEW,CATLG),
// UNIT=3390,VOL=SER=181PAK,SPACE=(CYL,(10,10))
//SYSMDUMP DD DSN=ASOFIA.IFASMFDL.SYSMDMP2,DISP=(NEW,CATLG),
// UNIT=3390,VOL=SER=183PAK,SPACE=(CYL,(50,5))
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
LSNAME(IFASMF.MULTSYS.STREAM1,OPTIONS(DUMP))
RELATIVEDATE(BYMONTH,0,1)
/*
```

This example shows when a RELATIVEDATE range extends into the future. It will capture everything in the current month, which is February.

Usage and invocation (continued) (11 of 12)

```
▪ BYMONTH RELATIVEDATE Example 2 (continued)
IFA010I SMF DUMP PARAMETERS
IFA010I WEEKSTART(SUN) -- DEFAULT
IFA010I END(2400) -- DEFAULT
IFA010I START(0000) -- DEFAULT
IFA010I DATE(1900000,2099366) -- DEFAULT
IFA010I RELATIVEDATE(BYMONTH,00,01) -- SYSIN
IFA010I OUTDD(DUMP01,TYPE(0:255)) -- SYSIN
IFA010I LSNAME( IFASMF.MULTSYS.STREAM1,OPTIONS(DUMP)) -- SYSIN
IFA834I RELATIVEDATE PARAMETER RESULTS IN START DATE 2009.032, END
DATE 2009.059
IFA836I RELATIVEDATE RANGE EXTENDS INTO FUTURE, END DATE AND TIME USED IS 2009.051 11:38
```

In the output for the job you can see the IFA834I message indicating that the calculated range was 2009 032 (Feb 1) to 2009 059 (Feb 27). Since this range extends into the future, the date and time when the job was submitted is used as the end time. The user is informed of the new end date and time with message IFA836I.

Usage and invocation (continued) (12 of 12)

- ARCHIVE and DELETE both operate on logger block boundaries.
- Entire logstream is read through only once.
- An IXGDelete is not done until all output datasets have been successfully closed.
 - There is no case where a “partial delete” of data can occur
- No “holes” in the logstream can exist. Blocks must be deleted in a contiguous subset starting at the beginning of the logstream.
- ARCHIVE and DELETE always begin at the start of the logstream regardless of the start date specified.
- Every record in the time range needs to match an OUTDD for ARCHIVE
- Entire logstream cannot be ARCHIVED or DELETED. Only a subset of the logstream can be processed.

There are several things to be aware of when using the ARCHIVE and DELETE functions:

ARCHIVE and DELETE both work on logger block boundaries. There is no way to delete a subset of a logger block so you must decide to take either the entire block or none of it. Since MAXDORM support is available for logstreams the amount of fuzziness in any given logblock should be minimized to the value specified in MAXDORM. This is only a concern for logstreams with low volumes of data being recorded.

The entire logstream is read through one time, there is not a separate read of the logstream for the dumping and deleting associated with an ARCHIVE request.

Nothing is deleted from the logstream until all output datasets are successfully closed. This eliminates the possibility of an I/O error to your output datasets leading to SMF data loss. If the IFASMF DL job does not complete successfully then no SMF data was deleted from the logstream.

For ARCHIVE and DELETE to work a contiguous subset of the logstream starting from the beginning of the logstream must be selected. For ARCHIVE this includes all possible filters, TYPE, SID, DATE/RELATIVEDATE START and END. For example, if a logblock in the date range contained a record type which is not being dumped to an OUTDD the ARCHIVE request can fail.

As previously mentioned logger only supports deleting data starting from the beginning of the logstream, so all ARCHIVE and DELETE operations always start from the beginning of the logstream despite the specified start time.

The entire logstream cannot be deleted. A valid subset must be selected. If an attempt is made to ARCHIVE or DELETE the entire logstream a RC=8 is returned and IFA832I will be in the joblog.

New and changed external output from IFASMF DL

- IFA832I is a new message that identifies when an ARCHIVE or DELETE operation can not complete.
- IFA834I is a new message that tells you what dates the RELATIVEDATE parameter resolved.
- IFA836I is a new message that is issued if the RELATIVEDATE range extends into the future.
- For other new messages see publications in the appendix

New message IFA832I is issued when an ARCHIVE or DELETE fails. ARCHIVE or DELETE operations require a contiguous subset of data starting at the beginning of the logstream for the delete to work. The range subset is determined by using the DATE or RELATIVEDATE keywords. Each record in the range needs to match to at least one OUTDD for an ARCHIVE. For a DELETE operation all major criteria need to be matched. To resolve this message the job should be examined to make sure that all record types and SIDs in each logstream being operated on are accounted for.

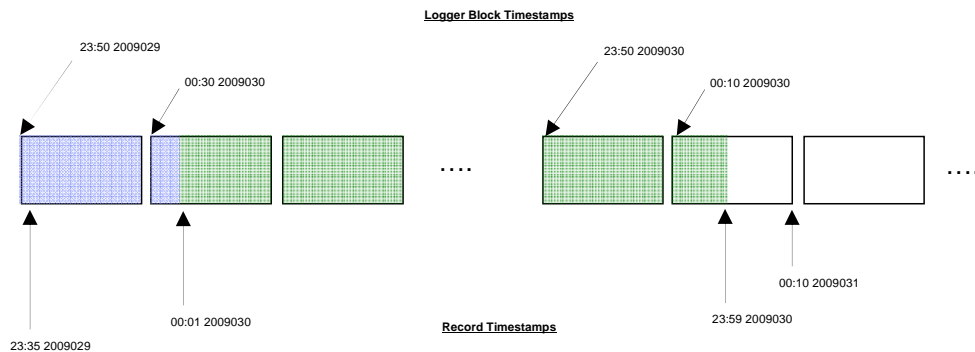
New message IFA834I is issued each time the RELATIVEDATE parameter is used. This message informs you of the resolved start and end date from the parameters specified. No action needs to be taken as a result of this message.

New message IFA836I is issued if the RELATIVEDATE range extends into the future. For example you might have coded RELATIVEDATE(BYDAY,2,3). In the case where this message comes out it will have the end date and time which is going to be used. This end date and time is the result of a STCK that is done when the IFASMF DL program starts, so it is essentially the job start time.

ARCHIVE/DELETE processing

Regardless of supplied date range processing always goes from the start of the log stream to the end of the log block whose timestamp is at the end of the filter.

Assume that the start of the log stream is below and an ARCHIVE request was done with the parameter DATE(2009030,2009030)



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ARCHIVE and DELETE requests operate on logger block boundaries, and although these boundaries are not externalized by SMF when the DUMP option is used it is important to understand how they affect the ARCHIVE and DELETE operations. The logger block write timestamps are also the timestamp used by ARCHIVE and DELETE when deciding which records are included.

In the example logstream shown, each rectangle represents a logger block which is full of records. The left side is the start of the logstream. The timestamps along the bottom are for the SMF records and the timestamps along the top are the timestamps for when the logger block was written to the logstream.

The area marked in green shows the records that can be selected if the DUMP option was used. As you can see this range of begins and ends in the middle of logger blocks and does not start at the beginning of the log stream.

All the areas colored would be selected for an ARCHIVE or DELETE operation. Things to notice here are that the range starts at the beginning of the logstream despite the specified start date and time. Also note how the end point has changed. The very end of the day is not included with this operation since the timestamp of the logger block which contains those records is outside the range of the filter. These records will be included during the next ARCHIVE or DELETE that is done.

Interactions and dependencies

- Hardware dependencies
 - None
- Software dependencies
 - None

There are no hardware or software dependencies associated with this function.

Migration and coexistence considerations

- Support is shipped at V1R9 and V1R10 in APAR OA27037
- When using ARCHIVE or DELETE with a logstream shared on a sysplex it is suggested that all systems be running with the support installed.
- The ALL option in IFASMF DL, while accepted, will have the same function as the DUMP option. Message IFA837I will be issued notifying you if ALL is used.

The ARCHIVE and DELETE function do have a mild dependency on the logger blocks not spanning too much time. Without MAXDORM support for logstream there was no mechanism to move stagnant data out of the buffer and into the logstream, so for a logstream defined with types that are not being written at a high rate there can be large time spans of data contained in a single logger block. Since the ARCHIVE and DELETE functions operate on logger block boundaries, this could cause a lot of data outside of the range to be returned or to not be returned (depending if the data is at the start or the end of the range). It is suggested that for using the ARCHIVE and DELETE functions that all systems writing to the logstreams have the support installed.

The original IFASMF DL only had a single option, DUMP. The ALL option was also permitted but defaulted to DUMP. Now that there are other options, the ALL option has maintained its behavior being a synonym for DUMP. Message IFA837I is issued if the ALL keyword is used to inform you that it is defaulting to the DUMP behavior.

Installation

- Prerequisites for installation
 - Shipped in base V1R11. PTF required for V1R9 and V1R10
 - MAXDORM parameter in SMFPRMxx should be reexamined

The MAXDORM option may still be set up in your SMFPRMxx file from the days of dataset recording, so it would be a good idea to re-evaluate the value when installing this function. This value will determine the amount of “fuzziness” which will occur when using the ARCHIVE and DELETE functions.

Session summary

- New ARCHIVE and DELETE function allow better management of the SMF logstreams
- New RELATIVEDATE function gives increased usability for jobs to select ranges of dates

In summary the new ARCHIVE, DELETE and RELATIVEDATE functions introduced for the IFASMF DL program give additional flexibility to customers who want to use logger for SMF recording.

References

Publication references

- SA22-7630 MVS System Management Facilities (SMF)
- SA22-7592 MVS Initialization and Tuning Reference
- SA22-7638 MVS Messages, Volume 8 (IFA messages)

These publications are provided for reference.



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