SHARE Summer 2013 Boston

z/OS SMF Logstream Mode: Update and User Experience

Session 13844

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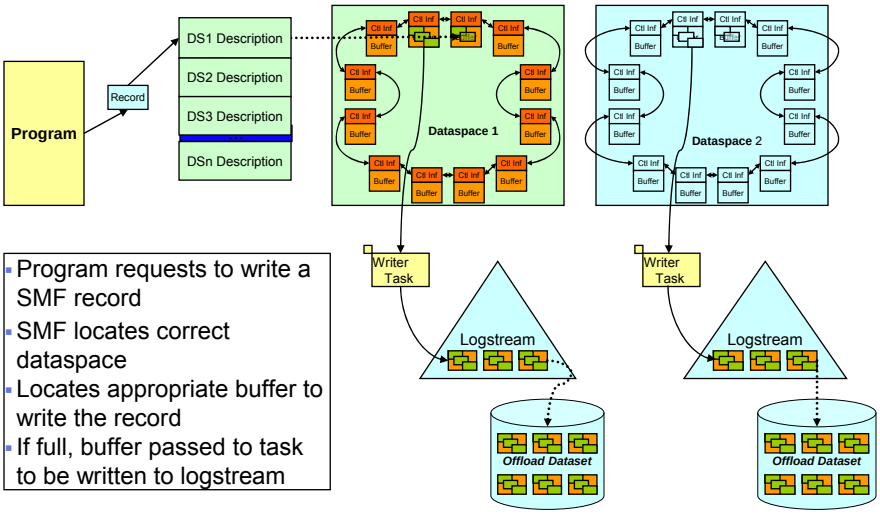
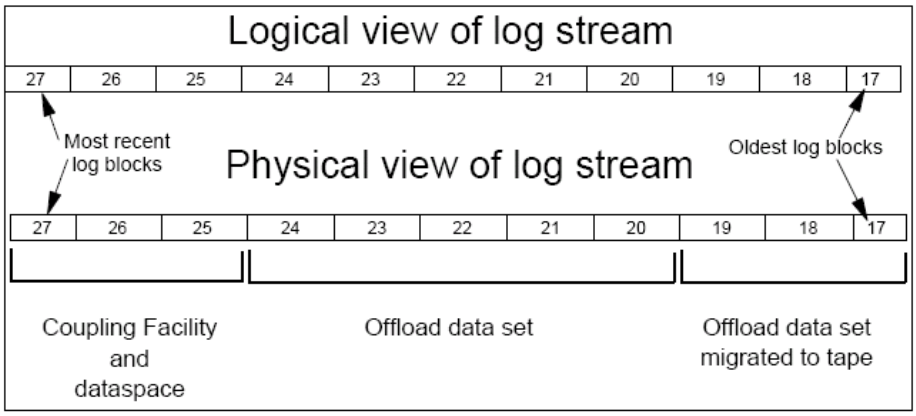
Overview: *SMF Data Flow using log streams*

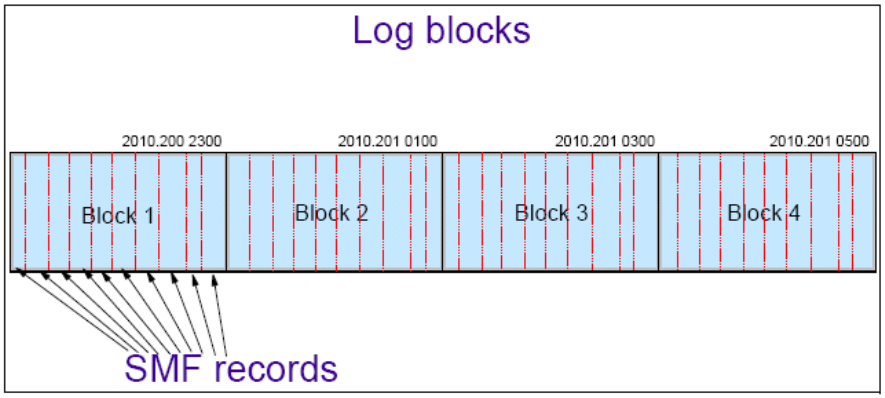


- Program requests to write a SMF record
- SMF locates correct dataspace
- Locates appropriate buffer to write the record
- If full, buffer passed to task to be written to logstream

Logical and Physical View of Logstream



Relationship of SMF Records to Log Blocks



Usage & Invocation

- **The support is invoked by:**
  - Define new logstreams in system logger
    - See "*Setting up a Sysplex*" for documentation
  - Defining new keywords in SMFPRMxx:

    LSNAME(IFASMF.q1.q2,TYPE(xx:yy))
    DEFAULTLSNAME(IFASMF.q1.q2)
    RECORDING(DATASET|LOGSTREAM)
    - SETSMF operator command can be used to toggle recording settings (for fallback, as an example)
  - Creating new JCL to use IFASMFDL with new logstreams
  - Update processes to use data from logstreams, if necessary
    - Ex. Automate periodic "Switch SMF" commands to drive new SMF Dump program
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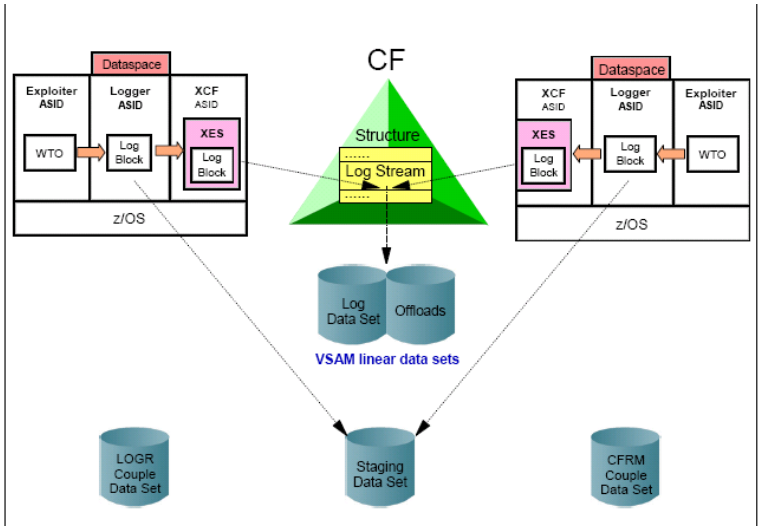
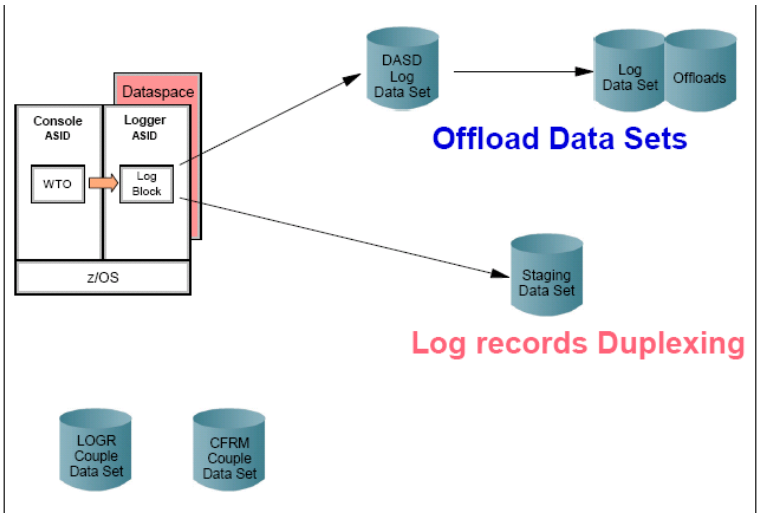
Log Stream in a Coupling Facility



DASD Only Log Stream



Installation

- **Prerequisites for installation**
  - Use IXCM2APU to create log streams for SMF
    - Decide on retention periods, CF vs DASDONLY, staging/offload dataset size, etc.
    - Recommend using staging data sets for early implementers
  - Use CFSIZER to plan size of CF Structures:
    - Consider data from recent IFASMFDP summaries to determine current data volume
    - Consider how long data should be retained in CF
      - If size too small, logger will have to offload frequently
    - Consider the Logger “HIGHOFFLOAD” specification
      - HIGHOFFLOAD(80) means 20% of structure space will be “white space”, intended to hold records while offloading during peak recording
    - Future re-planning exercises can use SMF Type 88 record data

IXCMIAPU – Define CF Logstream

```
//STEP1    EXEC PGM=IXCMIAPU
//STEPLIB  DD   DSN=SYS1.MIGLIB,DISP=SHR
//SYSPRINT DD   SYSOUT=*
//SYSABEND DD   SYSOUT=*
//SYSIN    DD   *
   DATA TYPE(LOGR) REPORT(YES)
     DEFINE STRUCTURE NAME(LOGGER_SMF)    LOGSNUM(2)

     DEFINE LOGSTREAM NAME(IFASMF.ALLSYS.DATA)
          STRUCTNAME(LOGGER_SMF)
          LOGGERDUPLEX(UNCOND)
          DUPLEXMODE(UNCOND)
          STG_DUPLEX(YES)
          STG_DATACLAS(MVSLOGR)
          LS_DATACLAS(MVSLOGR)
          LS_SIZE(500000)
          HLQ(LOGGER)
          HIGHOFFLOAD(85)
          LOWOFFLOAD(0)
          AUTODELETE(YES)
          RETPD(2)
```

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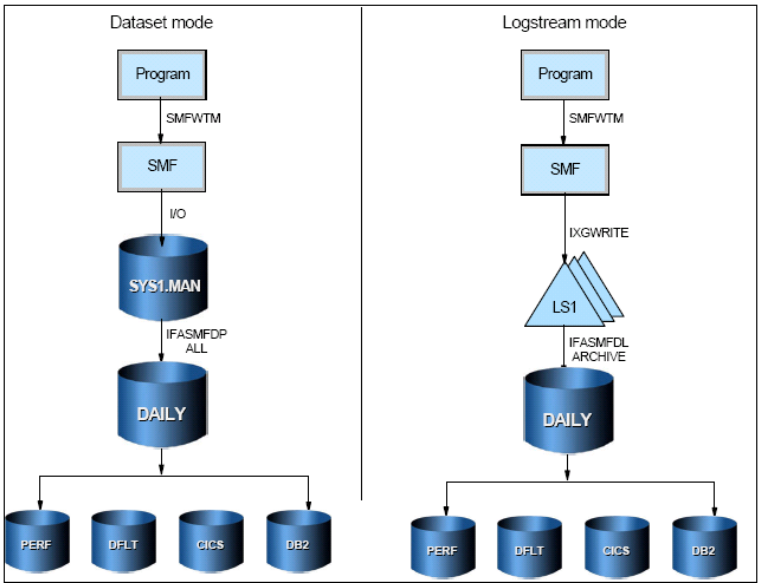
Replace SYS1.MAN Datasets with Logstreams



Usage & Invocation (examples)

- **Using logstreams, you can:**
  - Write data to a DASDONLY logstream, simply replacing SMF SYS1.MANx datasets
    - Use DEFAULTLSNAME(IFASMF.xxx) or LSNAME(IFASMF.xxx,TYPE(0:255)) to specify logstream
    - Run new SMF Dump Program to archive data

  Value

  1. Simplest approach to using logstreams
  2. Better performance using logstream vs. SMF data sets

Usage & Invocation (examples)

- **A more sophisticated approach is also possible…**
  - Write data to a logstream on a 'task oriented' basis
    - Record Types (30,70:72,99) to one log stream (eg. IFASMF.PERF.DATA)
    - Record Types 30,80:81,83 to another log stream (eg. IFASMF.AUDIT.DATA)
    - Record DB2 data (Type 101) to a third stream (eg. IFASMF.DB2.DATA)
    - And use the DEFAULTLSNAME keyword to record all other record types.

SMFPRMxx – SYS1.PARMLIB

```
ACTIVE                      /*ACTIVE SMF RECORDING*/
BUFSIZMAX(0800M)            /* MAXIMUM BUFFER SIZE */
DSNAME(&SYSNAME..MAN1,&SYSNAME..MAN2,&SYSNAME..MAN3,&SYSNAME..MAN4)
LISTDSN                     /* LIST DATA SET STATUS AT IPL*/
NOPROMPT                    /*DON'T PROMPT THE OPERATOR  */
DEFAULTLSNAME(IFASMF.ALLSYS.DEFAULT)
LSNAME(IFASMF.ALLSYS.DATA,TYPE(100:255))
RECORDING(LOGSTREAM)
INTVAL(05)                  /* SMF GLOBAL RECORDING INTERVAL */
MEMLIMIT(50G)               /* LIMIT ABOVE THE BAR        */
SYNCVAL(45)                 /* GLOBAL SYNC VALUE             */
REC(PERM)                   /*TYPE 17 PERM RECORDS ONLY*/
MAXDORM(3000)               /* WRITE AN IDLE BUFFER AFTER 30 MIN*/
STATUS(010000)              /* WRITE SMF STATS AFTER 1 HOUR*/
JWT(0030)                   /* 522 AFTER 30 MINUTES*/
SID(&SYSNAME(1:4))          /* USE SYSNAME AS SID     */
SYS(NOTYPE(32,99),
    EXITS(IEFACTRT,IEFUTL,IEFUSI,IEFU83,IEFU84,IEFU29),
    INTERVAL(SMF,SYNC),NODETAIL)
/* WRITE ALL RECORDS EXCEPT TYPE 32 (TSO RECORDS), TAKE THE
```

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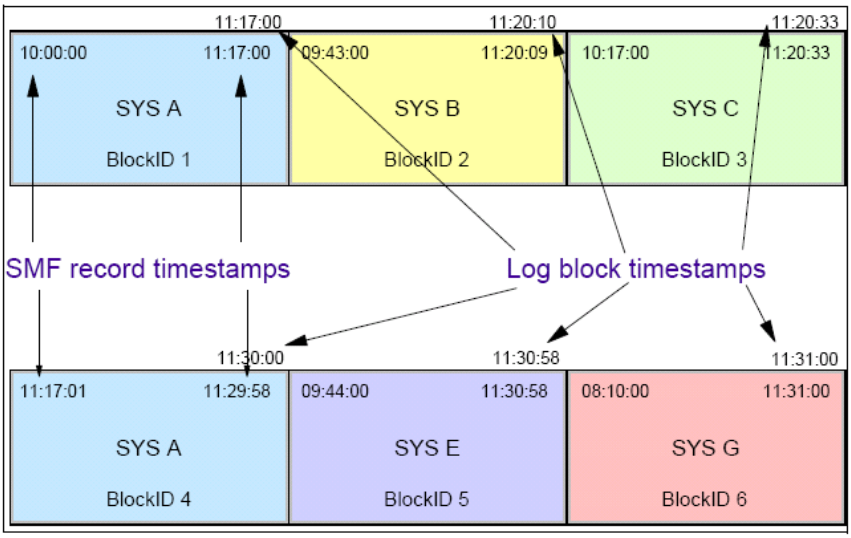
SMF Logstream Processing

- Relative data processing in IFASMFDL intended to mirror typical GDG processing
- RELATIVEDATE keyword
  - Specify DAILY,WEEKLY,or MONTHLY range and number of units
- IFASMFDL LSNAME OPTIONS to dump and/or delete data from logstream (vs. waiting for retention period to expire)
  - DUMP
  - DELETE
  - ARCHIVE (DUMP and DELETE)
- SMFPRMxx MAXDORM applies to SMF log streams (in addition to dataset recording)

Usage and Invocation

- The support for ARCHIVE, DELETE and RELATIVEDATE is invoked by the IFASMFDL program. The support for MAXDORM is invocated 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**))

Log Blocks in a Multi-System CF Logstream

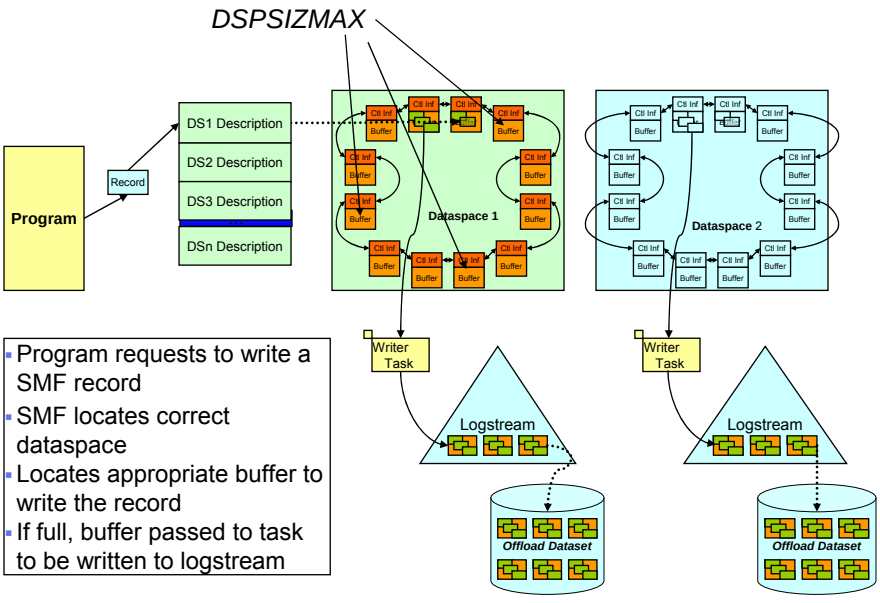


IFASMFDL Improvements in z/OS R13

- Avoid reading to end of logstream
  - IFASMFDL starts reading a logstream at a point (approximately) representing a specified time
    - **SMARTENDPOINT** keyword to specify that IFASMFDL should stop reading a logstream before the end
    - **SMARTEPOVER** specifies amount of time added to end date/time (default is two hours)
  - Avoids reading to end of logstream
- Allow entire logstream to be archived or deleted
  - Treat logstreams as though they were SMF datasets
  - Will reset logstream starting point to next new block

z/OS Ver 2.1 - SMF Logger Updates

- Specify log stream buffer sizes with new DSPSIZMAX parameter in SMFPRMxx
  - Support for DSPSIZMAX to be used when SMF is initialized also available for z/OS V1.12 and V1.13 with the PTF for APAR OA35175
  - z/OS V2.1 supports dynamic changes via SET SMF and SETSMF
- SMF also supports the use of data compression on zEC12 and zBC12 systems with the zEDC Express feature and the zEnterprise Data Compression (zEDC) feature for z/OS V2.1.



Appendix

- **Publication References**
  - SA22-7630 MVS System Management Facilities (SMF)
  - SA22-7592 MVS Initialization and Tuning Reference
  - SA22-7625 MVS Setting Up a Sysplex
  - SA22-7593 MVS Installation Exits
  - SA22-7627 MVS System Commands
  - SA22-7637 MVS Messages, Volume 7 (IEE messages)
  - SA22-7638 MVS Messages, Volume 8 (IFA messages)
  - SQ24-6898 System Logger Redbook
- **IBM Washington Systems Center – White Papers**
  - z/OS SMF Recording with MVS Logger – WP101130
  - Migrating SMF from Data Set Recording to Log Stream Logging – WP101271
    - **Available at: www.ibm.com/support/techdocs**