IBM Education Assistance for z/OS V2R3

Line Item Name: SMF Record Type Constraint Relief
Element/Component: MVS System Management Facilities (SMF)

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Agenda

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Trademarks

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- Additional Trademarks:
  - None.

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Session Objectives

- In this presentation, we will describe the functionality of the new SMF Record Type Constraint Relief support and how to use it, including:
  - Updated SMF record header
  - SMFPRMxx updates
  - Macros and other programming interface updates

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Overview

- Problem Statement / Need Addressed
  - SMF supports 256 unique record types. This constraint must be lifted
    Types 0-127 are reserved for IBM use only.
  - Only a handful of these types are available for future use
    Types 128-255 are available for use external to IBM.
- Solution
  - SMF will now support 2048 unique record types.
    Types 0-127 and 1152-2047 are reserved for IBM.
    Types 128-1151 are available for use external to IBM.
- Benefit / Value
  - Increasing the number of record types will improve SMF recording capabilities.

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Overview

- Existing IBM supplied records and record types are not changed
- No new record types are currently in plan

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Overview

Current Standard SMF Record Header

Offset		Length	Description
0		4	Record length and segment (RDW)
4	4	1	Flag byte 0 - In use 1 – Subtypes are valid **2 – Reserved** 3 – In use : 7 – In use
5	5	**1**	**Record type: hexadecimal values 0-255 (hexadecimal 0-FF)**
6	6	4	Time
10	A	4	Date
14	E	4	System Identifier
18	12	4	Subsystem Identifier
22	16	2	Record Subtype

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Overview

New **Extended** SMF Record Header

Offset		Length	Description
0	0	4	Record length and segment (RDW) **length must be at least 56 ('38'x)**
4	4	1	Flag byte 0 - In use 1 – Subtypes are valid **– must be on** **2 – Extended Header Exists – must be on** 3 – In use : 7 – In use
5	5	**1**	**Legacy Record type: Must be 126 ('7E'x)**
6	6	4	Time
10	A	4	Date
14	E	4	System Identifier
18	12	4	Subsystem Identifier
22	16	2	Record Subtype
:		:	**Continued on next slide...**

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Overview

New **Extended** SMF record Header **continued**

Offset		Length	Description
24	18	2	Length of this Extended Header – must be 32 ('20'x)
26	1A	1	Version – must be 1
27	1B	1	Reserved
28	1C	16	STCKE Of when the record was buffered,set by IBM
44	2C	8	Time Zone Offset taken from CVTLDTO, set by IBM
52	34	2	Actual Record type: 0-2047 (hexadecimal 0-7FF)
54	36	2	Reserved

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Usage & Invocation

The Rules:

- Record length at offset 0 must be at least 56 ('38'x)
- Bit 1 at offset 4 must be on
- Bit 2 at offset 4 must be on
- Record type at offset 5 must be 126 (;7E'x)
- Extended header length at offset 24 ('18'x) must be 32 ('20'x)
- Version at offset 26 ('1A'x) must be 1
- The value at offset 52 ('34'x) must be a value between 0-2047 (hexadecimal 0-7FF)

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Usage & Invocation

SMFWTM / SMFEWTM:

- No changes to how they are called
- New return codes:
  - 56 ('38'x) is issued if validation of **The Rules** (from the previous slide) fails for a record as it is passed in to SMF.
  - 60 ('3C'x) is issued if validation of **The Rules** (from the previous slide) fails for a record following a call to an IEFU8x exit. This would mean that the exit invalidated the record.

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Usage & Invocation

SMFPRMxx

No new options - TYPE now accepts values 0:2047

Defaults:

SMFPRMxx: No change in the TYPE option default of TYPE(0:255)

SMF dump utilities (IFASMFDP and IFASMFDL): New default of TYPE(0:2047)

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Usage & Invocation

Macros

IFASMFH – New SMF Header Mapping Macro (all versions)

IFAHDR – New executable macro to simplify decoding all versions of the header

```
IFAHDR REQUEST=GETINFO,          {Required}
       RECPTR=record pointer,  {Required input}
       TYPE=type,                {Optional output}
       SUBTYPE=subtype           {Optional output}
```

IFAEXITP – New IEFU86 exit parameter list, described on a future slide

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Usage & Invocation

Exits

- Existing IEFU83, IEFU84, and IEFU85 exits are not called for records with extended headers
- **New IEFU86 exit** will be called for all records – those with the standard header as well as those with the extended header.
  - A return code of 4 from any (new or old) exit will result in the record being rejected by SMF
  - On entry to IEFU86, register 1 points to a new parameter list (31 bit storage), mapped by IFAEXITP

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Usage & Invocation

Exits

IFAEXITP – IEFU86 parameter list

Offset		Length	Description
0	0	4	Macro acronym – 'SMXP'
4	4	2	Length of the IFAEXITP structure
6	6	1	Version – currently 1
7	7	1	Flags 0 – SVC caller. Set by IBM 1 – Branch entry non cross memory caller. Set by IBM 2 - Branch entry cross memory caller. Set by IBM
8	8	4	Record pointer
12	C	2	Work area offset
14	E	2	Work area length

All values in the parameter list are filled in by IBM.

A work area is provided to IEFU86. It resides at the offset past the beginning of IFAEXITP, as defined at offset 12 ('C'x) in the parameter list. Its length is defined at offset 14 ('E'x). Currently the length of the work are is 1024 bytes.

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Usage & Invocation

Exits

- SMF dump utilities exits
  - IFASMFDP and IFASMFDL **existing** exits:
    - USER1 called at post record read time
      - Only called for records with standard headers
    - USER2 called at post select / pre write time
      - Only called for records with standard headers
  - IFASMFDP and IFASMFDL **new** exits:
    - USEr4 called just prior to calling USER1
      - Called for records with any type of header
    - USER5 called just prior to calling USER2
      - Called for records with any type of header
    - Same parameter lists as USER1 and USER2

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Usage & Invocation

Other Interfaces

- IFAQUERY
  - New keyword EXTENDEDTYPES=YES|NO
    When ExtendedTypes=YES, fields QUALSREC, QuafType and QUAPRecType will be zero and fields QUALSExtRecTypeBits, QuafExtType and QuapExtType will contain information about all record types, respectively. Note that specifying ExtendedTypes=YES will require a significantly larger outarea to return the extended record type data for DETAILS=LOGSTREAM.

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Usage & Invocation

New or Changed SMF Records

- **SMF type 90 subtypes 5, 9, 13, and 15**
  - The Subsystem Record section is enhanced to report a 2048 bit record selectivity string, analogous to SMF90SYS, which reports the bit string for the existing 256 record types.

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Interactions & Dependencies

- None.

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Migration & Coexistence Considerations

- Toleration APAR OA52061 will accept and ignore extended record types on the SMFPRMxx TYPE option. With this APAR, IFASMFDP and IFASMFDL will recognize and ignore records with extended types.

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Installation

- None. The support is in the base of z/OS 2.3

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Session Summary

- SMF now accepts records 2048 unique record types
  - New extended header, mapped by IFASMFH
  - SMFPRMxx TYPE accepts extended types
  - IFAHDR decodes all record header versions
  - New IEFU86 exit and parameter list
  - New USER4 and USER5 dump utility exits
  - IFAQUERY enhancements
  - SMF type 90 enhancements

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Appendix

- Publications:
  - SA23-1380 z/OS MVS Initialization and Tuning Reference
  - SA23-1381 z/OS MVS Installation Exits
  - SA38-0667 z/OS MVS System Management Facilities (SMF)

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