What is MQ SMF?

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Presentation
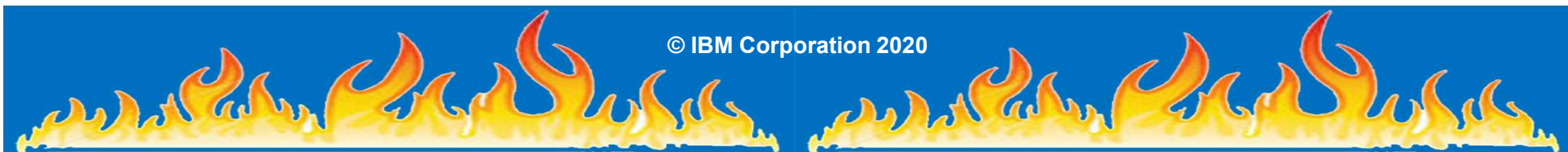
Agenda

- A bit of background

- What is SMF?

- What is MQ SMF?

- Why is the data important?

- MQ SMF Types

- General header information

A bit of background

- In this, what I hope to be the start of a series, I am trying to go back to the basics
  - What I wish I had been told about the MQ SMF data
  - How I use it today
  - And more importantly, how I can do that in very brief presentations

What is SMF?

- SMF is the z/OS System Management Facility
- All or nearly all z/OS subsystems report performance and utilization data via SMF.
    - Each set of data is unique
    - Many, like MQ, have multiple SMF types

IBM System Management Facilities

From Wikipedia, the free encyclopedia

For other uses, see SMF (disambiguation)

IBM System Management Facility (SMF) is a component of IBM's z/OS for mainframe computers, providing a standardised method for writing out records of activity to a file (or data set to use a z/OS term). SMF provides full "instrumentation" of all baseline activities running on that IBM mainframe operating system, including I/O, network activity, software usage, error conditions, processor utilization, etc. One of the most prominent components of z/OS that uses SMF is the IBM Resource Measurement Facility (RMF). RMF provides performance and usage instrumentation of resources such as processor, memory, disk, cache, workload, virtual storage, XCF and Coupling Facility. RMF is technically a priced (extra cost) feature of z/OS. BMC sells a competing alternative, CMF.

SMF forms the basis for many monitoring and automation utilities. Each SMF record has a numbered type (e.g. "SMF 120" or "SMF 89"), and installations have great control over how much or how little SMF data to collect. Records written by software other than IBM products generally have a record type of 128 or higher. Some record types have subtypes - for example Type 70 Subtype 1 records are written by RMF to record CPU activity.

What is MQ SMF?

- From the IBM MQ Knowledge Center: System management facility (SMF) is a z/OS service aid used to collect information from various z/OS subsystems. This information is dumped and reported periodically, for example, hourly. You can use SMF with the IBM MQ trace facility to collect data from IBM MQ. In this way you can monitor *trends*, for example, in system utilization and performance, and collect accounting information about each user ID using IBM MQ.

- Gross indications of use and activity are reported by the Statistics data, also known as type 115 records.

- Greater detail is found in the accounting data, also known as the 116 records.

Why is the MQ SMF data important?

- MQ does not report into the z/OS Health checker
  - So how do I know if my queue manager is healthy?
  - You have to use a combination of sources
    - The MQ JES log for immediate issues and actions
      - Traditionally also used for storage use, the number of log switches, etc.
    - The MQ SMF data and general RMF data to see how the resources are really being used
  - From active MQ administrators, 'I spend 50% of my time or more proving that MQ on z/OS is NOT the problem.'
    - Using the MQ SMF data can be key to identifying changes in activity and use

Types of MQ SMF and Collection Classes

- The MQ SMF data is broken down into two major categories (and SMF data types)
  - Statistics – Type 115
  - Accounting – Type 116

- The generation is controlled by type and class
  - Do not confuse the classes with the subtype
  - Statistics classes – SYSP macro
    - * - collect all classes (01,02,04) of statistics
    - YES – Collect classes 01 and 02 (base statistics)
    - NO – default, do not collect statistics
    - 04 – channel initiator statistics class
  - Accounting Classes SYSP macro
    - * - collect all classes of accounting data
    - 01 – only collect the QMAC data, only used for chargebacks, also result of YES
    - YES – Collect class 01
    - NO – default, do not collect accounting data
    - 03 – Collect the Task with queue use accounting
    - 04 – channel accounting records

General Recommendations for MQ SMF

- Set the MQ STATIME – the statistics interval
  - To 0 for coordination with other subsystems
  - Or to no more than 30 minutes

- Statistics Data:
  - Always collect the MQ Statistics data
    - Very lightweight
    - All Classes
    - Review Periodically
      - At least once a month, depending on workload and volume

- Accounting Data
  - Use logstreams to collect the MQ accounting data
    - Do not combine with equally prolific Db2 and CICS data in a single stream
  - Class 1 Accounting data is Traditional
  - Class 3 & 4 are used for performance evaluation and problem determination
  - Collect and review periodically
    - Provides deep insight into how the queue manager and channel initiator are being used

General information in the records

- There is a lot of data packed into these records
- There is consistent header information in both MQ SMF types
  - Record Length
  - Record Type
    - Hex 73 for 115
    - Hex 74 for 116
  - Date and time
  - LPAR Identifier
  - Queue Manager ID
  - Record Subtype
  - Version of MQ
- From this point, there is a lot of divergence

The end of the first session

- Thank you for your time and attention
  - Much more to come!

Useful Links

- **Description of SMF:**
  https://www-01.ibm.com/servers/resourcelink/svc00100.nsf/pages/zOSV2R3SA380667/$file/ieag200_v2r3.pdf

- WSC Github:
  https://github.com/ibm-wsc

- IBM MQ Knowledge Center:
  https://www.ibm.com/support/knowledgecenter/SSFKSJ_9.1.0/com.ibm.mq.helphome.v91.doc/WelcomePagev9r1.htm

- MQSMFCSV:
  https://github.com/ibm-messaging/mq-smf-csv

- MP1B:
  https://www.ibm.com/support/pages/mp1b-ibm-mq-interpreting-accounting-and-statistics-data-and-other-utilities

- MP16:
  https://ibm-messaging.github.io/mqperf/mp16.pdf

- Start Trace:
  https://www.ibm.com/support/knowledgecenter/SSFKSJ_9.2.0/com.ibm.mq.ref.adm.doc/q086740_.htm

- Stop Trace:
  https://www.ibm.com/support/knowledgecenter/SSFKSJ_9.2.0/com.ibm.mq.ref.adm.doc/q086840_.htm