

01.01 Summary of Modifications and Enhancements

IAM Version 9.0 provides a high performance alternative to VSAM for application programs that execute under IBM's z/OS operating system on z/Series processors. Enhancements in IAM Version 9.0 include support for EAV super large volumes, increased utilization of 64-bit virtual storage to provide storage constraint relief, and enhancements to IAM Prime Related Overflow feature that can reduce the frequency of file reorganizations for datasets with heavy insert activity. The details of these and other product enhancements are described below.

EAV Support

IAM Version 9.0 supports IAM files on Extended Addressable Volumes (EAV). This function requires z/OS 1.11 or higher. For z/OS 1.11 requires that IAM files must be DFSMS Extended Format to reside on an EAV. For z/OS 1.12 and above the IAM datasets on EAV volumes can be Large Format Sequential or Basic Sequential format. EAV eligibility is set by defining the file with a DFSMS Data Class that specifies the EATTR(OPT) attribute, or is defined with the IDCAMS DEFINE parameter EATTR(OPT). IAM files on EAV's cannot be accessed with prior versions of IAM.

Prime Related Overflow

Prime Related Overflow (PRO) is an alternative overflow structure within IAM files. The PRO overflow structure is designed and intended to be used for IAM files that have very high insert activity. For such files PRO provides the benefits of reduced virtual storage usage for the index structure and will reduce the frequency of reorganizations. The PRO support has been revised and enhanced in Version 9.0. PRO files created with Version 9.0 are not downward compatible with prior IAM releases.

64-bit Virtual Storage

IAM Version 9.0 can use z/OS 64-bit virtual storage to hold the index for opened IAM files. All of the code involved in the processing of the index for IAM files has been converted to utilize the z/Architecture 64-bit instructions. Use of this function provides virtual storage constraint relief and eliminates the two gigabyte limitation for the indexes to IAM files. Depending on installation default values, users may need to use the MEMLIMIT JCL parameter on job steps that they desire to use this capability.

XTIOT & 31-bit DSAB Support

IAM Version 9.0 supports IAM files existing in the XTIOT (above the line TIOT area) and 31-bit DSAB control blocks. This support will allow users to allocate more datasets to their CICS, IAM/RLS, and IAM/PLEX address spaces. The XTIOT support currently excludes IAM files that are DFSMS Extended Format. This support requires that only IAM Version 9.0 or higher is active on a system, otherwise code from prior version will prevent the use of the XTIOT and 31-bit DSAB's for IAM files.

Alter Capability

Through the DEFINE RECATALOG process and the applicable IAM CREATE overrides, various attributes of IAM files can now be altered. The information that can be changed are values for buffer space, journaling, maximum buffers, minimum buffers, the RLSID, and the share options.

Global Option Changes

Some of the default values of the IAM Global Options have changed in Version 9.0 to generally recommended values. Two of the Global Options are new for Version 9.0, as indicated by an asterisk next to the option. For the new options, the Version 8.1 value shown in parenthesis represents the effective value. The table below indicates the Global Option, the new default value for Version 9.0, and the default value in Version 8.1:

Global Option	Version 9.0	Version 8.1
BELOWPOOL	YES	NO
DATASPACE	1024	256
ESDSLOCK*	ENABLED	(enabled)
INDEXSPACE	64BIT	CICS
LONGKEYS	33	128
XESDS*	DISABLED	(disabled)

Figure 1-1: Table 1: New and Changed Global Options

IAM Load Library

Due to quad-word alignment with the 64-bit support, the IAM load library requires and is distributed with a block size of 32760. In order to apply maintenance to some of load modules, it also must be a PDSE. A normal PDS can be used, but modules will have to be copied to a PDSE should maintenance be necessary, and then copied back.

Error Message Enhancements

To aid with problem diagnosis, most error messages will now have a second line containing the affected dataset name. Additionally IAM now supports the ACB message area, passing back open error messages if an open fails for an IAM file to the application program, in addition to writing the message to the job log.

IAM/RLS

Based on user input, a number of modifications have been made to IAM/RLS that are summarized as follows:

There will be one dataset name table that is applicable to all of the IAM/PLEX and IAM/RLS address spaces within a Sysplex. This provides one central location to control the use of IAM record level sharing capabilities. To facilitate a single table, a new parameter of RLSID=nnnn is added on the SELECT and EXCLUDE statements to indicate which IAM/RLS or IAM/PLEX address space can select or exclude the datasets from processing. Additionally, an enhanced dataset name masking capability is provided for the specification of dataset names on the SELECT and EXCLUDE statements. This will help to reduce the size of the table as it exists both in source format and in internal format that is kept in virtual storage.

64-bit addressable virtual storage can now be used to contain the record locks within each IAM/RLS and IAM/PLEX address space. This capability will increase the number of record locks that can be held, and reduce contention for 31-bit addressable storage. This is enabled by specification of the LOCKMEM=64BIT IAM/RLS and IAM/PLEX startup parameter. Use of this capability will generally require users to specify the MEMLIMIT keyword on the EXEC card for the IAM/RLS or IAM/PLEX JCL procedures.

An automatic sync point process is now available for batch jobs. This will be controlled by a new ACCESS override of AUTOSYNCPPOINT=nnnnn which specifies that a sync point will be taken after the specified number of lock obtaining requests have been issued.

RLSINFO, a new statistical report can be automatically produced on a periodic basis for both IAM/RLS and IAM/PLEX address spaces. Similar to the IAMINFO report, these reports provide information on the activity that has occurred within the particular IAM/RLS or IAM/PLEX address space. This report is enabled by the STATS=ON startup parameter, and the specification of an RLSINFO DD card in the proc used to start IAM/RLS or IAM/PLEX.

Various error messages for a dataset, particularly for open failures, are passed back to the program that issued the open in the ACB message area, and are also displayed on the job log. This is to help diagnose problems reducing the need to examine the RLSLOGDD or the job log of the IAM address space to find error messages.

A number of internal processing changes were made that are intended to help performance for IAM/RLS and IAM/PLEX processing and to reduce some of the CPU time used. Included in the changes is a reduction in use of the local lock for serialization. This has included the reducing or elimination of use of various system services, along with implementation of different serialization techniques to reduce the resource contention.

IAM/PLEX

IAM Version 9.0 presents IAM/PLEX, a z/OS SYSPLEX record level sharing capability for VSAM applications that is available as an additional cost feature of the IAM product. This feature enables VSAM applications to concurrently execute and update IAM files on multiple LPAR's / systems that are part of a z/OS Sysplex. The applications sharing these files can be any mix of CICS/TS transactions, batch programs, or TSO applications. The IAM/PLEX approach to Sysplex record level sharing of datasets is one intended to provide users with record level sharing capabilities without the implementation complexity and application changes that are typically necessary for implementing VSAM record level sharing. The IAM/PLEX function utilizes the z/OS Sysplex XCF services, the z/OS System Logger facilities, and the IAM/RLS frame work to enable the sharing of datasets at the record level across multiple LPAR's.

Details on IAM/PLEX are in Section 2.20 and Section 25 of the IAM Manual.

Special Considerations

The minimum requirements for running IAM Version 9.0 are z/OS operating system and a z/Architecture processor. IAM Version 9.0 utilizes various functions and features only available in z/OS operating systems and instructions available only on processors that support z/Architecture.

Due to quad-word alignment required with the 64-bit support, the IAM load library requires and is distributed as a PDSE with a block size of 32760.

IAM users not meeting those requirements can continue to utilize the IAM Version 8.1 software product.