Sterling Connect:Direct for z/OS

**IBM**

# Extended Address Volume (EAV) Support

*Version 5.2*

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# Contents

# Sterling Connect:Direct for z/OS EAV support

IBM® Sterling Connect:Direct® for z/OS® supports Extended Address Volume (EAV) features at the z/OS 1.12 level.

An EAV is a volume with more than 65,520 cylinders. An EAV increases the amount of addressable direct access storage device (DASD) storage per volume beyond 65,520 cylinders by changing how tracks on extended count key data (ECKD) volumes are addressed. In z/OS 1.12, the largest supported EAV volume is 262,668 cylinders. In z/OS 1.13, the largest supported EAV volume is 1,182,006 cylinders.

To utilize the Sterling Connect:Direct for z/OS support for EAV, you need to be familiar with EAV concepts and terminology, such as Track Managed Space (TMS), Cylinder Managed Space (CMS), Base Addressing Space (BAS), Extended Addressing Space (EAS), breakpoint value (BPV) and the default behavior when EATTR is not specified.

For more information on EAV concepts and terminology, refer to DFSMS Extended Address Volumes in the z/OS *Introduction and Release Guide*, or IBM Redbook DFSMS V1.10 and EAV Technical Guide. For the most recent updates to EAV, see z/OS DFSMS Using the New Functions.

Sterling Connect:Direct for z/OS for EAV provides support for the following features:
- Support for EATTR in COPY statements, TYPE records, and DGADTDYN.
- Support for 28-bit cylinder numbers in format-3, format-4, format-8 and format-9 DSCBs.
- Support for any data set type supported by z/OS in CMS.

## EATTR parameter

Sterling Connect:Direct for z/OS support for EAV includes support for the EATTR data set attribute.

EATTR has two valid values:
- OPT - (optional) the data set can have extended attributes. If it is allocated on an EAV, it is biased towards being allocated in CMS.
- NO – the data set cannot have extended attributes. If it is allocated on an EAV, it is allocated in TMS.

In Sterling Connect:Direct for z/OS, the EATTR value can come from a number of places. When it is specified in more than one place, this order of precedence is used:
1. EATTR (in COPY statement) or SYSOPTS EATTR.
2. TYPE when the TYPE record contains an EATTR.
3. LIKE or SYSOPTS LIKE (dataset attribute).
4. DATACLAS or SYSOPTS DATACLAS.
5. TYPE when the TYPE record contains a DATACLAS.
6. The COPY FROM dataset's EATTR setting (propagation).

7. Otherwise, if an EATTR value is not specified when a data set is created, the system uses a default behavior equivalent to OPT for VSAM, and NO for non-VSAM.

## COPY statement support

EATTR can be added to the PROCESS COPY statement TO side.

To add EATTR to a PROCESS COPY statement TO side, use this syntax:

```
COPY FROM (...) TO (DSN=... DISP=(NEW,...) EATTR=[OPT|NO|<blank>]
```

**Note:** A blank or null value for EATTR is valid in COPY statements and will ensure the created data set has no EATTR value.

The EATTR parameter is on the COPYFILE Receiving File panel:

```
DMI@CF20              COPYFILE - RECEIVING FILE (z/OS or OS/390)        TIME: 14:35
 CMD ==>
 NODE NAME: CD.ART
 RECEIVING DSNAME:  EPETE1.O.CKPT.TEST_____
 _____
 _____
 _____
 DISPOSITION:      ( RPL , CATLG_ , _____ )
 UNIT PARAMETER:   ( _____ )
 VOLUME SERIAL(S):( _____ )  )
        RETAIN: _  (Y OR N)    COUNT: ___ (1-255)
 DCB PARAMETER:    ( _____ )
 LABEL PARAMETER: ( _____ )
 SPACE:           ( _____ )
 TYPE KEY:          _____       MSVGP NAME:   _____
 SYSOPTS:         _____
 SMS: DATA CLASS: _____   STORAGE CLASS: _____   MGMT CLASS: _____
      AVERAGE RECORDS: _  DSNTYPE: _____   EATTR: ___
      VSAM ORGANIZATION: ____ KEY LENGTH: ___   KEY OFFSET: _____
      LIKE DSNAME:      _____
      SECURITY MODEL: _____
      GENERIC MODEL:   ___   (YES OR NO)
```

*Figure 1. COPYFILE Receiving File panel*

**Attention:** Do not attempt to deliver a file with EATTR present in a COPY statement to a node that is running a version of Sterling Connect:Direct for z/OS without EAV support. It will cause these errors on the receiving node:

```
SDAA098I - UNKNOWN 5 BYTE KEYWORD FOUND IN SYSOPTS
SDAA001I - SYSOPTS=EATTR
SDAA004I - SYSOPTS=" EATTR=OPT"
```

## VIEW PROCESS support

When EATTR is specified in the process, it appears in the output for the VIEW PROCESS command.

VIEW PROCESS example:

```
VIEW PROC WHERE(CASE=YES,PNUM=000002)
```

```
============================================================
                      VIEW PROCESS

          PROCESS NAME: EAV1      PROCESS NUMBER: 2
============================================================


EAV1      PROCESS SNODE=CD.BOB                                 -
                  PNODE=CD.ART                                 -
                  HOLD=YES                                     -
                  RETAIN=NO                                    -
                  CLASS=1                                      -
                  PRTY=10


COPY      COPY FROM                                            -
            (PNODE                                             -
             DSN='EPETE1.F80.DATA1'                            -
             DISP=(SHR)                                        -
            )                                                  -
                TO                                             -
            (SNODE                                             -
             DSN='EPETE1.F80.DATA2'                            -
             SPACE=(CYL,(00000021,00000021,),,,ROUND)          -
             DISP=(NEW,CATLG,DELETE)                           -
             UNIT=(SYSDA,,)                                    -
             SYSOPTS=\" EATTR=OPT"\                            -
            )
```

*Figure 2. EAV1 View Process*

## TYPE file support

EATTR can be added to INSERT TYPE and UPDATE TYPE commands. EATTR appears in the output for the SELECT TYPE. The EATTR parameter appears on the TYPE Record SMS/VTAM Attributes panel.

EATTR has two valid values: OPT (optional) and NO. Blanking out the parameter will remove it from the TYPE record.

INSERT TYPE and UPDATE TYPE commands:

- INS TYPE TYPEKEY=EATTR1 EATTR=OPT

  The data set can have extended attributes. If it is allocated on an EAV, it is biased towards being allocated in the CMS. (optional)
- UPD TYPE TYPEKEY=EATTR1 EATTR=NO

  The data set cannot have extended attributes. If it is allocated on an EAV, it is allocated in the TMS.
- UPD TYPE TYPEKEY=EATTR1 EATTR=

  This setting erases the value set in the type file.

SELECT TYPE example:

SEL TYPE WHERE(TYPEKEY=(EATTR1))

```
==========================================================
                   SELECT TYPE DEFAULTS
==========================================================

  TYPE KEY => EATTR1              DATE CREATED => 01.09.2012

       DISP=(NEW,CATLG,DELETE)
       SPACE=(CYL, (21,21,45))
       UNIT=EAVTEST
       EATTR=OPT
       DCB=(DSORG=PO,LRECL=80,BLKSIZE=3120,RECFM=FB)
```

*Figure 3. EATTR1 Select Type Defaults*

TYPE Record SMS/VTAM Attributes panel example:

```
DMIIUTPV                    Type Record SMS/VSAM Attributes                    10:28
CMD ==>


Operation   ==> UPDATE
Type Key    ==> T

(SMS=)      Data Class        ==> _____
            Management Class  ==> _____
            Storage Class     ==> _____

(Other=)    EATTR             ==> ___        (OPT or NO)
            DSNTYPE           ==> _____   (PDS, LIBRARY, LARGE, BASIC, EXTREQ,
                                              EXTPREF)
(MODEL=)    Like Data Set Name ==> _____
            Security Profile  ==> _____
            Generic Profile   ==> ___       (YES or NO)

(SPACE=)    Average Record Value ==> _   (U, K or M)

(VSAM=)     Organization ==> __         (ES - ESDS, KS - KSDS, RR - RRDS, LS - LDS)
            Key Offset   ==> _____      (0 - 32760)
            Key Length   ==> ___        (1 - 255)
```

*Figure 4. TYPE Record SMS/VTAM Attributes panel*

# DGADTDYN support

The EATTR parameter can be used with DGADTDYN ALLOCATE.

To add EATTR to DGADTDYN ALLOCATE, use this syntax:

```
ALLOC DSN=... DISP=(NEW,...) ... EATTR=[OPT|NO] ...
```

**Note:** A blank or null value for EATTR is invalid with DGADTDYN and will
cause a syntax error. If a value is not specified, the EATTR text unit will not be
included in the SVC 99.

**Attention:** Do not attempt to deliver a file with EATTR present in ALLOC
parameters for DGADTDYN (DMRTDYN) to a node that is running a version of
Sterling Connect:Direct for z/OS without EAV support. It will cause these errors
on the receiving node:

```
SDAA048I - SYNTAX ERROR
SDAA001I - EATTR=EATTR
```

# z/OS operating system support of EAV

There are several things to consider before deciding to put datasets on EAV, and
deciding between CMS and TMS.

## Datasets on EAV

z/OS support for EAV was introduced in release 1.10 (DS8000 Release 4.0 Licensed Internal Code is also required). A DS8700 can define CKD volumes with up to 262,668 cylinders (~223 GB) and a DS8800 can define 1,182,006 cylinders (~1 TB) per volume. An EAV is a 3390A with more than 65520 cylinders. It is divided into the base addressing space (BAS) containing cylinders 0-65535 and the extended address space (EAS) containing the rest. An EAV is also divided into the track managed space (TMS) containing cylinders 0-65519, and cylinder managed space (CMS) containing the rest.

EATTR provides a way to directly set the allocation behavior for an EAS eligible data set. This gives the user a way to override the default allocation behavior for any data set, regardless of whether it's EAS eligible at that OS level. EATTR=NO means it cannot have extended attributes, and so if allocated on an EAV, it is always allocated in the TMS (track managed space). EATTR=OPT means it can have extended attributes, and so if allocated on an EAV, it is biased towards being allocated in the CMS (cylinder managed space). Not specifying EATTR means to use the default allocation behavior for the data set type. For VSAM data sets, the default behavior is the equivalent of EATTR=OPT. For non-VSAM data sets, the default behavior is the equivalent of EATTR=NO. The EATTR setting is saved in DS1EATTR in the F1 or F8 DSCB (data set control block).

## CMS and TMS

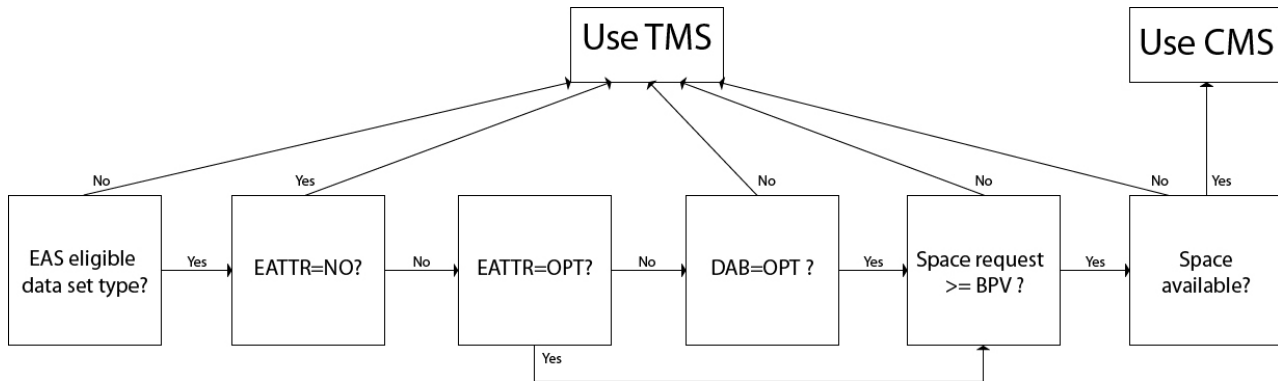The system uses this logic to decide between CMS and TMS:



*Figure 5. EAV Logic.* Logic needed to decide between CMS and TMS.

**Note:** For more information about defining the Break Point Value (BPV), see page 314 in the IBM Redbook DFSMS V1.10 and EAV Technical Guide

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