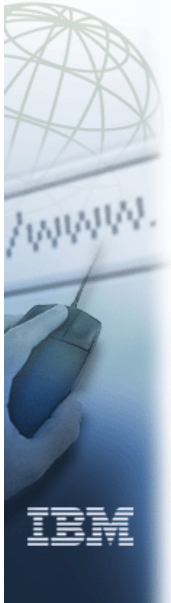


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# z/OS V1R12 EAV support



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## Trademarks



eNetwork	DFSMS/MVS	IMS	RMF
geoManager	DFSMSdftp	IMS/ESA	RS/6000
AD/Cycle	DFSMSdsss	IP PrintWay	S/390
ADSTAR	DFSMSshsm	IPDS	S/390 Parallel Enterprise Server
AFP	DFSMSrmm	Language Environment	SecureWay
APL2	DFSORT	Multiprise	StorWatch
APPN	Enterprise System 3090	MQSeries	Sysplex Timer
BookManger	Enterprise System 4381	MVS/ESA	System/390
BookMaster	Enterprise System 9000	Network Station	System REXX
C/370	ES/3090	NetSpool	SystemView
CallPath	ES/4381	OfficeVision/MVS	SOM
CICS	ES/9000	Open Class	SOMobjects
CICS/ESA	ESA/390	OpenEdition	SP
CICS/MVS	ESCON	OS/2	VisualAge
CICSPlex	First Failure Support Technology	OS/390	VisualGen
COBOL/370	FLowMark	Parallel Sysplex	VisualLift
DataPropagator	FFST	Print Services Facility	VTAM
DisplayWrite	GDDM	PrintWay	WebSphere
DB2	ImagePlus	ProductPac	3090
DB2 Universal Database	Intelligent Miner	PR/SM	3890/XP
DFSMS	IBM	QMFr	z/OS
	IBM System z	RACF	z/OS.e

Domino (Lotus Development Corporation)  
DFS (Transarc Corporation)  
Java (Sun Microsystems, Inc.)  
Lotus (Lotus Development Corporation)

Tivoli (Tivoli Systems Inc.)  
Tivoli Management Framework  
(Tivoli Systems Inc.)  
Tivoli Manger (Tivoli Systems Inc.)

UNIX (X/Open Company Limited)  
Windows (Microsoft Corporation)  
Windows NT (Microsoft Corporation)



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## Extended Address Volume (EAV)

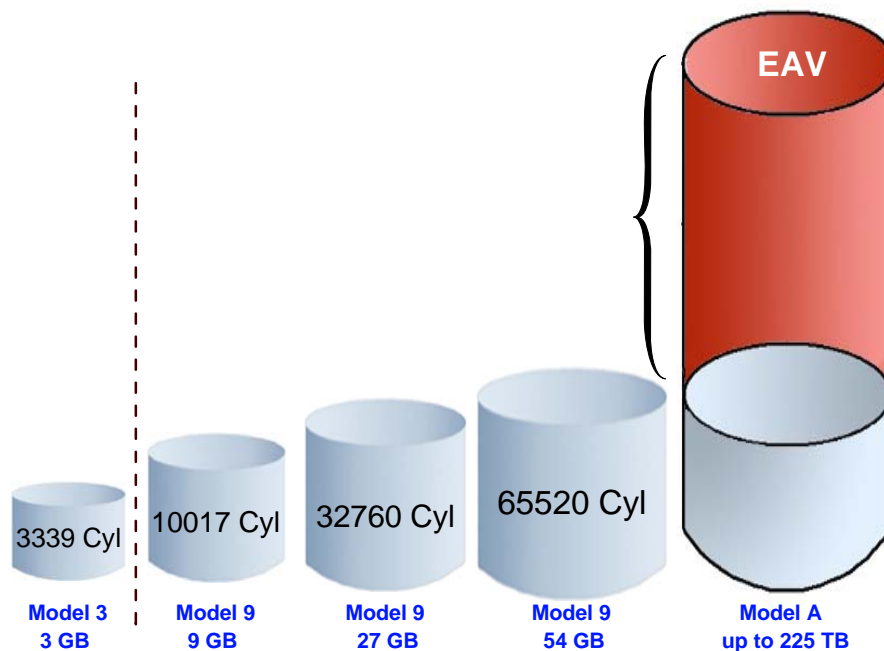


- ❑ An EAV is a volume with more than 65520 cylinders
- ❑ EAV volumes increase the amount of addressable DASD storage per volume beyond 65520 cylinders by changing how tracks on ECKD volumes are addressed
- ❑ Important design points - 3390 track format and image size, and tracks/cyls remain the same as previous 3390 model devices
  - Applications using data sets on an EAV will be comparable to how it runs today on 3390-'numerics'



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## Device Type 3390 and 3390 Model A



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## Extended Address Volume (EAV)



- ❑ Increased z/OS addressable disk storage
- ❑ Provide constraint relief for applications using large data sets
- ❑ **3390 Model A:** Device can be configured to have from 1 to 268,434,453 cylinders - (architectural maximum)
  - Size limited to 223 GB - 262,668 (Max cylinders)
- ❑ Managed by the system as a general purpose volume
  - Works well for applications with large files
  - PAV and HyperPAV technologies help by allowing I/O rates to scale as a volume gets larger

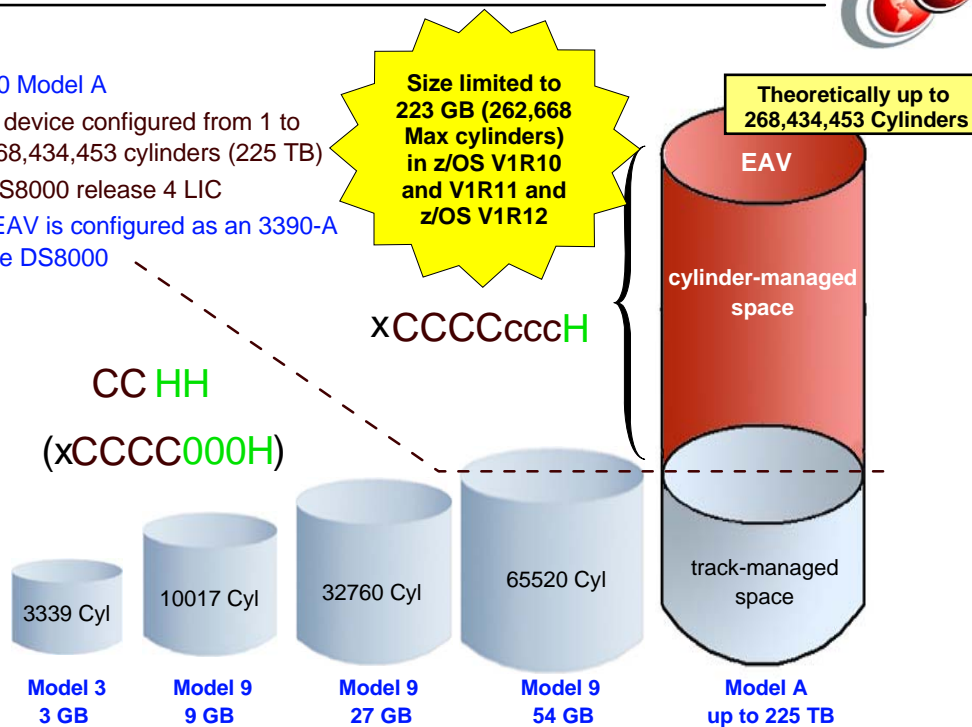


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## Current EAV Support

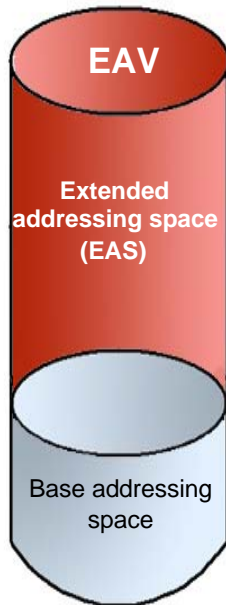


- ❑ 3390 Model A
  - A device configured from 1 to 268,434,453 cylinders (225 TB)
  - DS8000 release 4 LIC
- ❑ An EAV is configured as an 3390-A in the DS8000



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# EAV Volumes Track Address Design



Cylinder 262667

## Tracks and Cylinders

Cylinders 65536 to 262667

28-bit cylinder addressing (CCCCcccH)

VSAM data sets are EAS eligible

Cylinder 65535

## Tracks and Cylinders

Cylinders 0 to 65535

16-bit cylinder addressing (CCHH)

How disks are addressed today



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# Dynamic Volume Expansion



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## Dynamic Volume Expansion (DVE)



- ❑ Significantly reduces the complexity of migrating to larger volumes
- ❑ Copy Service relationships must be removed
- ❑ Previously, customers must use migration utilities that require an additional volume for each volume that is being expanded and require the data to be moved
- ❑ DVE can expand volumes beyond 65,520 cylinders
  - Without moving data or application outage
- ❑ Two methods to dynamically grow a volume:
  - Use the command-line interface (DSCLI)
  - Use a Web browser GUI



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## Dynamic Volume Expansion



- ❑ More recently, 'Dynamic Volume Expansion' is a function (available at the IBM DS8000 console):
  - Increases the capacity of existing zSeries volumes
  - A manual operation for the system programmer has to expand the VTOC size
    - 3390 model 3 to 3390 model 9
    - 3390 model 9 to EAV volume sizes using z/OS V1R10

Note: Volumes cannot be in Copy Services relationships (point-in-time copy, FlashCopy SE, Metro Mirror, Global Mirror, Metro/Global Mirror, and z/OS Global Mirror) during expansion. All systems must be at the z/OS V1R10 level for the DVE feature to be used when the systems are sharing the Release 4.0 Licensed Internal Microcode updated DS8000 at a LCU level.



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# Using Web Browser Gui



- ❑ Need a URL for your own connection to the DS8000 Storage Manager
  - http://9.12.6.17:8451/DS8000/Console
  - Login
  - Select ----- Volumes - zSeries
  - Select ----- Select Storage Image
  - Select LCU ---- number (0C) - where Device is and Page number of device



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# Defined EAV Volumes



IBM System Storage™ DS8000 Storage Manager

Welcome Volumes - zSeries: Real-time

Volumes - zSeries

Select LCU  
0C

Refresh Last refresh: Tuesday, July 15, 2008 4:41:58 PM EDT

Select	Nickname	VOLSER	ID	Status	Base/Alias	Volume Type	Type	Storage Allocation	GB(2^30)	GB(10^9)	Cylin
<input type="checkbox"/>		NWDC64	0C64	Normal	Base	3390 Standard Mod 9	Z	Standard	7.9	8.5	
<input checked="" type="checkbox"/>	MLDC65	MLDC65	0C65	Normal	Base	3390 Mod A	Z	Standard	55.5	59.6	
<input type="checkbox"/>	MLDC66	MLDC66	0C66	Normal	Base	3390 Mod A	Z	Standard	8.7	9.3	
<input type="checkbox"/>			0C67	Normal	Alias			Standard	0.0	0.0	
<input type="checkbox"/>			0C68	Normal	Alias			Standard	0.0	0.0	
<input type="checkbox"/>			0C69	Normal	Alias			Standard	0.0	0.0	
<input type="checkbox"/>			0C6A	Normal	Alias			Standard	0.0	0.0	
<input type="checkbox"/>			0C6B	Normal	Alias			Standard	0.0	0.0	
<input type="checkbox"/>			0C6C	Normal	Alias			Standard	0.0	0.0	
<input type="checkbox"/>			0C6D	Normal	Alias			Standard	0.0	0.0	

Page 11 of 26 11 Go Total: 252 Filtered: 252 Displayed: 10 Selected: 1



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# Increase Capacity of Volumes



IBM System Storage™ DS8000 Storage Manager

Welcome Volumes - zSeries: Real-time zSeries Volumes - Increase Capacity: Real-time

zSeries Volumes - Increase Capacity

Select LCU  
0F

Refresh Last refresh: Wednesday, July 23, 2008 4:02:33 PM EDT

Select	Nickname	VOLSER	ID	Status	Type	Storage Allocation	GB(2^30)	GB(10^9)
<input checked="" type="checkbox"/>	NWDF64	NWDF64	0F64	Standard	Mod 9 Z	Standard	7.9	8.5
<input type="checkbox"/>	MLDF65	MLDE65	0F65	Standard	Z	Standard	59.9	64.3
<input type="checkbox"/>			0F66	Standard		Standard	0.0	0.0
<input type="checkbox"/>			0F67	Standard		Standard	0.0	0.0
<input type="checkbox"/>			0F68	Standard		Standard	0.0	0.0
<input type="checkbox"/>			0F69	Standard		Standard	0.0	0.0
<input type="checkbox"/>			0F6A	Standard		Standard	0.0	0.0
<input type="checkbox"/>			0F6B	Standard		Standard	0.0	0.0
<input type="checkbox"/>			0F6C	Standard		Standard	0.0	0.0
<input type="checkbox"/>			0F6D	Standard		Standard	0.0	0.0

Page 11 of 26 11 Go

Selected: 1



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# Increase Capacity of Volumes



IBM System Storage™ DS8000 Storage Manager

Welcome Volumes - zSeries: Real-time zSeries Volumes - Increase Capacity: Real-time

zSeries Volumes - Increase Capacity

zSeries Volumes - Increase Capacity: Real-time

Specify a new size for the volumes, and click the OK button. The volume size may be entered in cylinders or as a multiple of a 3390 Model 1 volume size.

**CMUG00230W**

If you change the size of a volume that has a volume type of 3390 model 3 or 3390 model 9 to a size that is not standard, the volume type changes to 3390 custom. Click OK to change the size of all of the volumes that you have selected or click Cancel to cancel the operation without changing the size of the selected volumes.

Close Message

Minimum size  
10017

Maximum size available  
162498

Size Format  
Cylinders

\*Specify the new capacity

Print report Download spreadsheet

Nickname ID Status Type GB(2^30) GB(10^9) Cylinders RAID



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# Increase Capacity of Volumes



IBM System Storage™ DS8000 Storage Manager

Welcome | Volumes - zSeries: Real-time | zSeries Volumes - Increase Capacity: Real-time

zSeries Volumes - Increase Capacity

zSeries Volumes - Increase Capacity: Real-time

Specify a new size for the volumes, and click the OK button. The volume size may be entered in cylinders or as a multiple of a 3390 Model 1 volume size.

Minimum size  
10017

Maximum size available  
162498

Size Format  
Cylinders

\*Specify the new capacity  
**75000**

Print report | Download spreadsheet

Nickname	ID	Status	Type	GB(2 <sup>30</sup> )	GB(10 <sup>9</sup> )	Cylinders	RAID
	0F64	Normal	Z	7.9	8.5	10,017	RAID 5

Page 1 of 1 | Total: 1 | Filtered: 1 | Displayed: 1

OK | Cancel



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# Increase Capacity of Volumes



IBM System Storage™ DS8000 Storage Manager

Welcome | Volumes - zSeries: Real-time | zSeries Volumes - Increase Capacity: Real-time

zSeries Volumes - Increase Capacity

zSeries Volumes - Increase Capacity: Real-time

Specify a new size for the volumes, and click the OK button. The volume size may be entered in cylinders or as a multiple of a 3390 Model 1 volume size.

**CMUG00268E**

When you specify a size for a 3390 mod A volume that is greater than 65,520 cylinders, the number of cylinders that you specify must be a multiple of 1,113 cylinders. Select Continue to submit the task using a requested size of 75,684 cylinders, or select Cancel to cancel the operation.

Continue | Cancel

Minimum size  
10017

Maximum size available  
162498

Size Format  
Cylinders

\*Specify the new capacity  
**75000**

Print report | Download spreadsheet

Nickname	ID	Status	Type	GB(2 <sup>30</sup> )	GB(10 <sup>9</sup> )	Cylinders	RAID
----------	----	--------	------	----------------------	----------------------	-----------	------



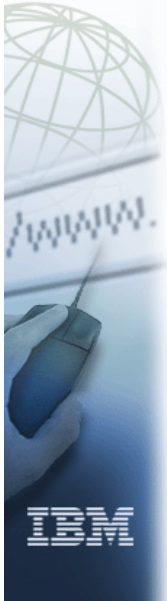
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# VVDS (VSAM volume data sets) with z/OS V1R12



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## z/OS V1R12 EAV New Support



- ❑ Almost all types of data sets are EAS-eligible
  - EAS-data eligible data sets added in V1R12 include:
    - Sequential data sets (basic and large formats)
    - Partitioned data sets
    - Direct data sets
    - Catalogs (BCS and VVDS)
- ❑ Catalogs (BCS and VVDS) which adds the ability to:
  - Control allocation of catalogs in cylinder managed space using the EATTR parameter on the DEFINE USERCATALOG command

## DEFINE USERCATALOG Command



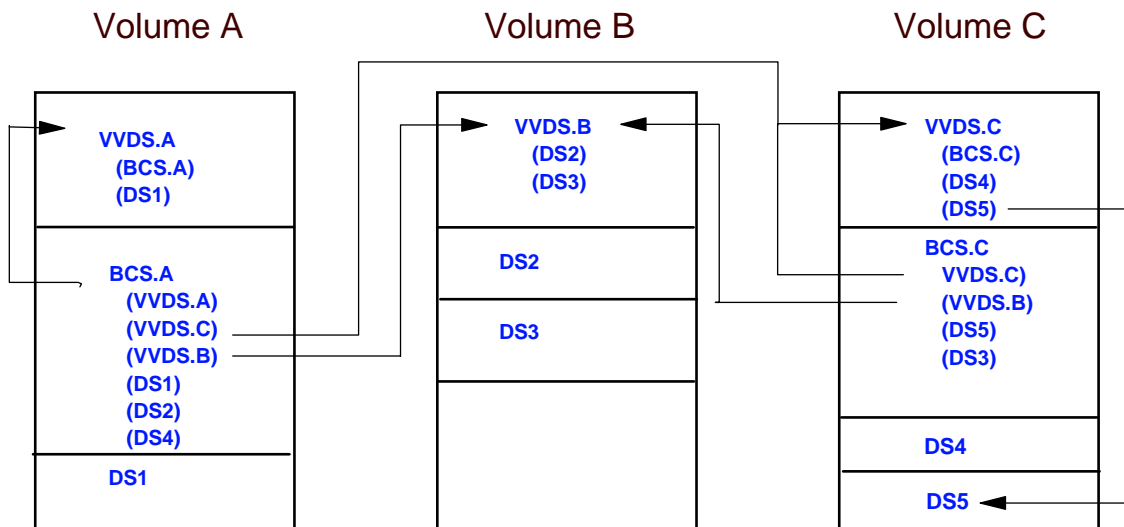
- ❑ EATTR(NO) - The catalog can not have extended attributes (format 8 and 9 DSCBs) or optionally reside in EAS
  - The catalog is restricted to track-managed space
  - NO is the default
- ❑ EATTR(OPT) - The catalog can optionally have extended attributes (format 8 and 9 DSCBs) and can optionally reside in EAS
  - You can also specify EATTR with the MODEL parameter

## Basic Catalog Structure (BCS) - VVDS



- ❑ Every catalog consists of one BCS and one or more VVDSs
  - A BCS does not “own” a VVDS
  - More than one BCS can have entries for a single VVDS
  - Every VVDS that is connected to a BCS has an entry in the BCS

## Relationship BCS and VVDS



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## VVDS in z/OS V1R12



- ❑ VVDS data sets are EAS eligible
- ❑ DEFINE CLUSTER for VVDS object
  - EATTR(NO) – Can not have extended attribute DSCBs or optionally reside in EAS
  - EATTR(OPT) – Can have extended attribute DSCBs and optionally reside in EAS
    - Both recorded in the DSCBs that get created in the VTOC
    - VVDS objects restricted to track-managed space when EATTR is not specified - This is the action taken when VVDS is allocated by the system.
    - No EATTR option in pre z/OS V1R12 systems
    - Data Class/Model does not apply to a DEFINE of an VVDS - (Only way is with the EATTR keyword)



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## VVDS in z/OS V1R12

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- ❑ The specified value for EATTR of NO or OPT is recorded in the VVDS in the DSCBs that gets created in the VTOC
- ❑ A DEFINE without the EATTR keyword will result in the VVDS object restricted to track-managed space
  - This is the action taken by the pre-V1R12 systems for VVDS defines

## Estimating Space for an Extended Format BCS

---



- ❑ A BCS is limited to 4 GB unless
  - You define it as an extended format BCS, which means it can use extended addressability
  - Using extended addressability, the size limit for a BCS is determined by the control interval size multiplied by 4 GB
  - For example, a control interval size of 4 KB yields a maximum data set size of 16 TB, while a control interval size of 32 KB yields a maximum data set size of 128 TB
  - To use extended addressability, the BCS must be SMS managed and defined as extended format

## Estimating Space for an Extended Format BCS



- ❑ You can specify extended format for a BCS using:
  - SMS data class DSNTYPE=EXT parameter and
  - Subparameters R (meaning required) or P (meaning preferred) on the ISMF DATA CLASS DEFINE/ALTER panel
    - Use R to ensure the BCS is extended
    - The Extended Addressability value must be set to Y (Yes)
- ❑ The only extended format option available for a BCS is extended addressable
  - This means that BCSs cannot be compressed or striped

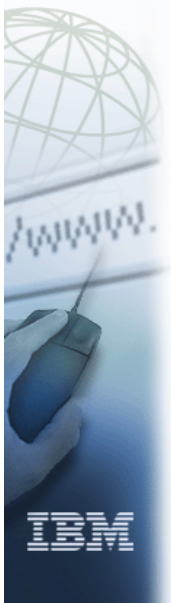


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## z/OS V1R12 EAV Support



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## EAS-eligible Data Sets with z/OS V1R12



- ❑ EAS-eligible data sets are those that can be allocated anywhere on an extended address volume
  - SMS and non-SMS managed VSAM (all types), including:
    - BCS and VVDS catalog data sets
    - VSAM data sets inherited from prior physical migrations or copies
    - VSAM temporary data sets
    - zFS data sets (they are VSAM)
  - Sequential data sets, including extended, basic, and large formats
  - PDS and PDSE data sets
  - Direct (BDAM) data sets
  - Data sets allocated with undefined DSORGs



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## Non-EAS Eligible Data Sets - z/OS V1R12



- ❑ Data sets that can be allocated only in the track-managed space of an EAV volume
- ❑ For z/OS V1R12, non-EAS eligible data sets include:
  - HFS data sets
  - Page data sets
  - VTOC and VTOC index data sets
  - VSAM data sets with imbed or keyrange attributes that may have been inherited from prior physical migrations or copies



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## z/OS V1R12 Enhancements for EAV



- ❑ Enhancements provided by z/OS V1R12 support in DFSMS:
  - Support additional non-VSAM data set types
  - Binder support of data sets in the extended addressing space (EAS)
  - JES2 EAV support for spool and checkpoint data
  - JES3 EAV support for spool and checkpoint
  - Stand-alone dump support for EAV
  - Superzap support for EAV



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## Catalog Data Sets in EAS - z/OS V1R12



- ❑ DFSMS volume selection is enhanced to support catalog data sets in EAS
- ❑ During allocation of SMS-managed catalog data set, SMS checks EATTR value to see if its EAS eligible
  - If it is EAS eligible (EATTR= OPT is specified), SMS prefers EAV volumes over non-EAV volumes when the requested space is equal to or greater than the BPV
    - DFSMS treats EAV and non-EAV volumes equally when the requested space is less than the BPV
    - If it is not EAV eligible (EATTR=NO or not specified), SMS will treat both EAV and non-EAV volumes equally regardless of the requested space quantity

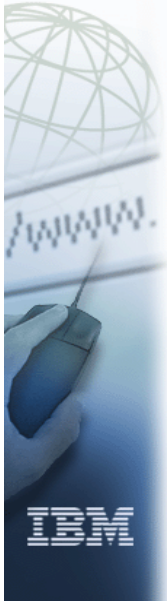


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# Migration to EAV Volumes



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## EAV and IGDSMSxx Parmlib Member



- USEEAV(YESINO)**
  - Specifies, at the system level, whether SMS can select an extended address volume during volume selection processing
  - Check applies to new allocations and when extending data sets to a new volume
- YES** - EAV volumes can be used to allocate new data sets or to extend existing data sets to new volumes
- NO** - Default - SMS does not select any EAV during volume selection
  - SETSMS USEEAV(YESINO)



## EAV and IGDSMSxx Parmlib Member



- ❑ BreakPointValue (0- 65520) in cylinders
  - Value used by SMS in making volume selection decisions and subsequently by DADSM
    - If the allocation request is less than the BreakPointValue, the system prefers to satisfy the request from free space available from the track-managed space
    - If the allocation request is equal to or higher than the BreakPointValue, the system prefers to satisfy the request from free space available from the cylinder-managed space

SETSMS BreakPointValue(0-65520)

If the preferred area cannot satisfy the request, both areas become eligible to satisfy the requested space amount



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## Using BPV for Space Allocation

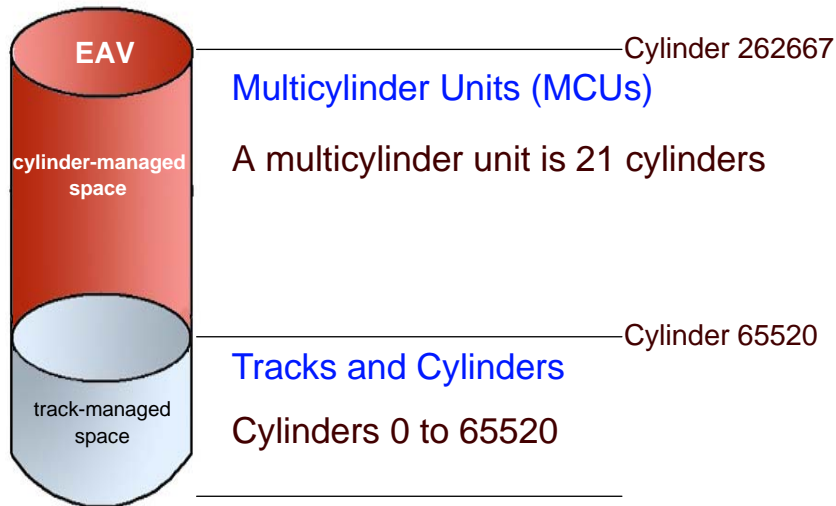


- ❑ EAV volume, system and storage group (BPV) helps direct space requests to cylinder or track-managed
  - When the size of a disk space request is the BPV or more, the system prefers to use the cylinder-managed space for that extent - rule applies to each request for primary or secondary space for data sets that are eligible for the cylinder-managed space
  - If cylinder-managed space is insufficient, system uses track-managed space or uses both types of spaces
  - When the size of a disk space request is less than the breakpoint value, the system prefers to use the track-managed space



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## EAV Volumes and Multicylinder Units



## Multicylinder Unit Considerations

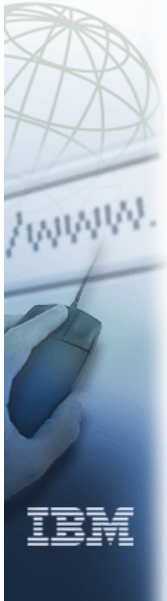


- ❑ The 21 cylinder value for the MCU is derived from being the smallest unit that can map out the largest possible EAV volume and stay within the index architecture (with a block size of 8192 bytes), as follows:
  - Value that divides evenly into the 1GB storage segments of an IBM DS8000
  - These 1GB segments are the allocation unit in the IBM DS8000 and are equivalent to 1113 cylinders.
  - These segments are allocated in multiples of 1113 cylinders starting at cylinder 65520

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# EAV Migration to EAV Volumes and the Migration Assistance Tracker



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## EAV Track Address Design



- ❑ **Extended addressing space (EAS)**
  - On an extended address volume, the cylinders whose addresses are equal to or greater than 65,536
  - These cylinder addresses are represented by 28-bit cylinder numbers - (cylinder-managed space)
- ❑ **Base addressing space**
  - On an extended address volume, the cylinders whose addresses are below 65,536
  - These cylinder addresses are represented by 16-bit cylinder numbers or by 28-bit cylinder numbers whose high order 12 bits are zero - (track-managed space)

# Old Track Address



Base addressing space: the area on an EAV located within the first 65,536 cylinders

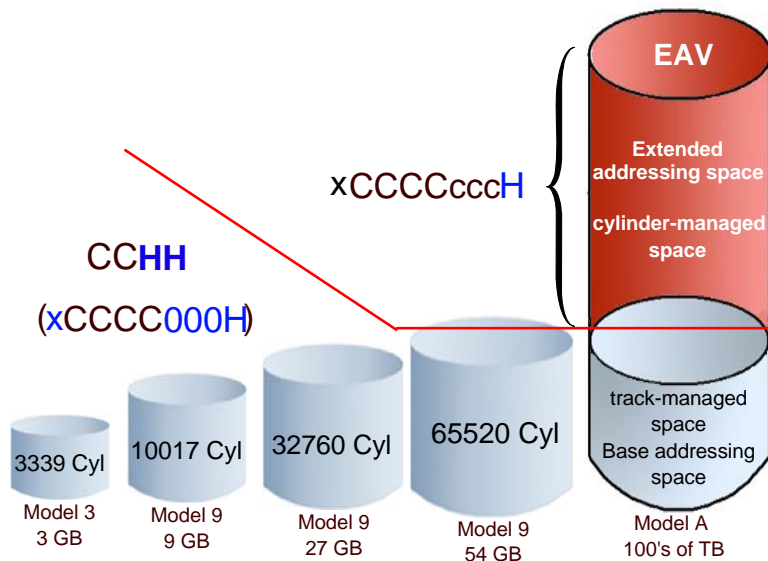
CC HH R

- Record, number of records per track (0-255)
- Head - number of tracks per cylinder max value is 64K..but frozen at 15 since 3380
- Cylinder - number of cylinders per volume max value is 64K, currently at 64K with "3390-54"



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# Device Type 3390 and 3390 Model A



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## Track Address Examples



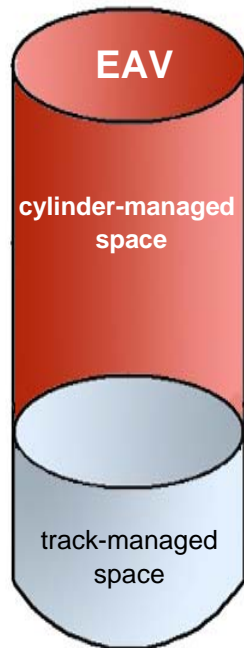
- ❑ Two track addresses, which is higher?
  - x'FFF0000E' - Cylinder 65,520 track 14
  - x'0000001E' - Cylinder 65,536 track 14
- ❑ TRKADDR macro
  - IBM recommends using the new TRKADDR macro for all track address comparisons and calculations
  - Programs should not need to do 28-bit manipulation themselves
  - Use this for all track address computations even those not directly affected by this support for VSAM data sets using EAS

## VTOC Index with EAV Volumes

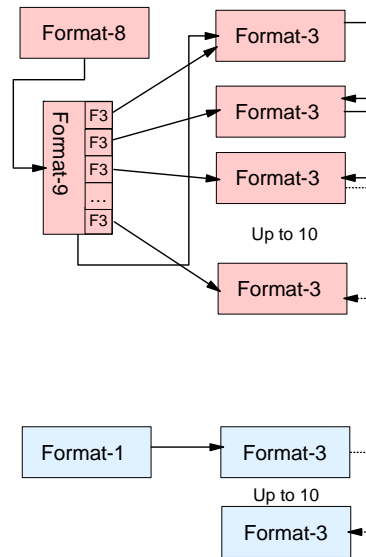


- ❑ Beginning with z/OS V1R10, the index block size is increased from 2048 bytes to 8192 bytes for devices with cylinder-managed space
  - The new block size is recorded in the format-1 DSCB for the index and is necessary to allow for scaling to largest sized volumes
  - The DEVTYPE INFO=DASD macro can be used to return the actual block size or
    - Can be determined from examining the format-1 DSCB of the index data set

## Access to EAS-eligible data sets on EAV



EAS eligible data sets can reside anywhere on an EAV through a chain of Format 8/9 DSCBs.



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## New Extended Attribute DSCBs



- ❑ DSCB types that provide a method of protecting existing programs from seeing unexpected track addresses (28-bit cylinder numbers)
  - Format 8 DSCB is equivalent to a format 1 DSCB and contains a chain pointer to a format 9 DSCB
  - Format 9 DSCB provides attribute data and a list of pointers to each possible format 3 DSCB
    - Contains a chain pointer to possible next format 9 or format 3 DSCB
    - Attributes are maintained only for the first volume and only one format 9 DSCB in z/OS V1R10
- ❑ Use EADSCB=OK on macro service to access DSCB



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## EAV Migration Assistance Tracker



- ❑ Uses the Console ID Tracking facility from z/OS V1R6
- ❑ Helps to find programs that might need to change if supporting EAV volumes
  - Identify select systems services by job and program name
  - Identify possible instances of improper use of returned information in programs, like parsing 28-bit cylinder numbers in output as 16-bit cylinder numbers
  - Identify instances of programs that will either fail or run with an informational message if they run on an EAV



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## Error Detection by the Tracker



- ❑ Identify interfaces that access to the VTOC - upgraded to have EADSCB=OK specified for the following functions:
  - OBTAIN, CVAFDIR, CVAFDSM, CVAFVSM, CVAFSEQ, CVAFFILT, OPEN to VTOC, OPEN EXCP
- ❑ Identify programs using new services as info messages
- ❑ Identify possible improper use of returned information,
  - Parsing 28-bit cylinder numbers in output as 16-bit cylinder numbers as warning messages for the following commands and functions:
    - IEHLIST LISTVTOC, IDCAMS LISTCAT, IDCAMS LISTDATA PINNED, LSPACE, DEVTYPE, IDCAMS DCOLLECT



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## Migration Tracker Commands



- ❑ **SETCON command**
  - Used to activate and deactivate the Console ID Tracking facility
- ❑ **DISPLAY OPDATA,TRACKING command**
  - Used to display the current status of the console ID tracking facility, along with any recorded instances of violations



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## CNIDTRxx Parmlib Member



- ❑ An optional CNIDTRxx parmlib member can be defined to exclude instances from being recorded
- ❑ Exclusion list is picked up when the tracker is started or via the SET command
- ❑ recommended exclusion list and list of DFSMS instances is available on a web site for downloading, as follows:
  - <http://www-03.ibm.com/servers/eserver/zseries/zos/downloads/>
- ❑ To identify or use an exclusion list, use the following operator command

```
set cnidtr=7t
IEE536I CNIDTR  VALUE 7T NOW IN EFFECT
```



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# Tracking Command Example



```
13.21.19 SYSTEM1          d opdata,tracking
13.21.19 SYSTEM1          CNZ1001I 13.21.19 TRACKING DISPLAY 831
STATUS=ON,ABEND NUM=15    MAX=1000 MEM=7T  EXCL=45  REJECT=0
-----TRACKING INFORMATION----- -VALUE-- JOBNAME  PROGRAM+OFF-- ASID NUM
SMS-E:1 CVAFDIR STAT082    045201 CVAFJBN  CVAFPGM   756  28  4
SMS-E:1 CVAFDSM STAT082    045201 CVAFJBN  CVAFPGM   556  28  4
SMS-E:1 CVAFFILT STAT086   04560601 CVAFJBN  CVAFPGM   456  28  4
SMS-E:1 CVAFSEQ STAT082    045201 CVAFJBN  CVAFPGM   656  28  4
SMS-E:1 DADSM OBTAIN       C08001 OBTJBN   OBTPGM    856  28  4
SMS-E:1 DCB OPEN VSAM 113-44  01 OPENJBN  OPENPGM   256  28  4
SMS-E:1 DCB OPEN VTOC 113-48  01 OPENJBN  OPENPGM   356  28  4
SMS-I:3 DEVTYPE           02 DEVTJOB  DEVTPROG  CE5C   11  1
SMS-I:3 IDCAMS DCOLLECT    02 DCOLLECT IDCAMS   1515  28  4
SMS-I:3 LSPACE EXPMSG=     8802 VTDS0IS1 VTDS0IS2  118  28  2
SMS-I:3 LSPACE MSG=       5002 ALLOCAS IEFW21SD 4CE5C   11  2
SMS-I:3 LSPACE MSG=       9002 *MASTER* IEE70110 52F6   01  43
SMS-W:2 IDCAMS LISTDATA PINN 03 LISTDATX IDCAMS   E48E   28  2
SMS-W:2 IDCAMS LISTCAT     03 LISTCAT  IDCAMS    956   28  4
SMS-W:2 IEHLIST LISTVTOC    03 LISTVTOC IEHLIST   1056  28  4
-----
TO REPORT THESE INSTANCES, SEND THIS MESSAGE VIA E-MAIL TO
CONSOLES@US.IBM.COM. FOR ADDITIONAL INFORMATION OR TO OBTAIN A CURRENT
EXCLUSION LIST, SEE APAR II13752.
```



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## Migration Considerations



# Redbooks

International Technical Support Organization

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## EAV Data Set Support with z/OS V1R12



- ❑ z/OS V1R12 supports the following types of data sets in the extended addressing space (EAS) on EAV volumes:
  - Additional non-VSAM data set types I
  - Introduces support for sequential (basic, large)
  - Partitioned (PDS/PDSE)
  - Catalogs
  - BDAM, BSAM, QSAM data sets
    - DCBE with EADSCB=OK is not required
    - Data set extents in the DEB may contain 28-bit cylinder numbers, these programs need to be changed to support 28-bit cylinder addressing - no way to check this



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## EATTR Support with z/OS V1R12



- ❑ Can share EAVs with pre-V1R12 systems until explicit action taken to allow non-VSAM data sets to reside in EAS
- ❑ Applies to basic, large sequential, partitioned, direct data sets - EATTR defaults to NO for non-VSAM data sets:
  - Non-VSAM data set allocated with extended attribute DSCBs on V1R12 - not able to open on pre-V1R12 systems
- ❑ EATTR is specifiable for non-EAS eligible data sets:
  - EATTR=OPT could have been specified on pre z/OS V1R12 system and ignored
  - With z/OS V1R12, the EATTR=OPT setting will take effect
  - Be certain that applications can handle extended attribute DSCBs and 28-bit cylinder numbers as the data sets may become EAS-eligible in z/OS V1R12



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## Sharing EAVs Across Systems Options



- ❑ z/OS V1R12 systems can share EAVs with systems at the z/OS V1R10 and z/OS V1R11 level
  - You can take explicit action to allow non-VSAM data sets to reside in the EAS of an EAV
  - For VSAM data sets allocated on EAVs between V1R12, V1R11 and V1R10, sharing is implied because all levels support VSAM files as being EAS-eligible
  - By specifying an EATTR value of NO for VSAM files the allocation will be done without extended attribute DSCBs
  - The explicit action of defining a data set with an EATTR value of OPT to allow a data set to be allocated with extended attribute DSCBs can be done from either a V1R12 or V1R11 system



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## Storage Group Definition



```
D SMS,SG(GKEAV),LISTVOL
IGD002I 17:33:44 DISPLAY SMS 669

STORGRP  TYPE      SYSTEM= 1 2 3 4
EAVGK    POOL              + + + +

VOLUME   UNIT      SYSTEM= 1 2 3 4          STORGRP NAME
GKDD65   DD65              + + + +          EAVGK
***** LEGEND *****
. THE STORAGE GROUP OR VOLUME IS NOT DEFINED TO THE SYSTEM
+ THE STORAGE GROUP OR VOLUME IS ENABLED
- THE STORAGE GROUP OR VOLUME IS DISABLED
* THE STORAGE GROUP OR VOLUME IS QUIESCED
D THE STORAGE GROUP OR VOLUME IS DISABLED FOR NEW ALLOCATIONS ONLY
Q THE STORAGE GROUP OR VOLUME IS QUIESCED FOR NEW ALLOCATIONS ONLY
> THE VOLSER IN UCB IS DIFFERENT FROM THE VOLSER IN CONFIGURATION
SYSTEM  1 = SC63          SYSTEM  2 = SC64          SYSTEM  3 = SC65
SYSTEM  4 = SC70
```



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## Mixed Level in the Sysplex (R10, R11, or R12) in any Combinations



- ❑ You can share EAVs with pre-z/OS V1R12 systems until explicit action is taken to begin allowing non-VSAM data sets to reside in the EAS of an EAV
  - Applies to basic and large sequential, partitioned and direct data sets
  - This is because EATTR will default to NO for non-VSAM data sets
  - A non-VSAM data set allocated with extended attribute DSCBs on z/OS V1R12 will not be able to be opened on pre z/OS V1R12 systems

## Mixed Level in the Sysplex (R10, R11, or R12) in any Combinatio



- ❑ EATTR specifiable for non-EAS eligible data sets
  - EATTR=OPT could have been specified on pre z/OS V1R12 system and ignored
  - In z/OS V1R12 the EATTR=OPT setting will take effect
  - Be certain that applications can handle extended attribute DSCBs and 28-bit cylinder numbers as they may become EAS-eligible data sets in z/OS V1R12

## Compatibility with z/OS V1R12



- ❑ Open, close, EOV
  - In a mixed environment with z/OS V1R10 or V1R11, the following APARs should be considered OA28651 for proper open, close and EOV handling, as follows:
    - UA52685 for z/OS V1R10
    - UA52686 for z/OS V1R11



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## DFSMSHsm EAV Support - z/OS V1R12



- ❑ You can use EAVs as migration copies and backup volumes for systems
- ❑ You can manage allocation of ML1, ML2, and Backup data sets in cylinder managed space using:
  - Whether or not to allow cylinder-managed space
    - SETSYS USECYLINDERMANAGEDSPACE(Y | N)
  - USECYLINDERMANAGEDSPACE can be abbreviated as
    - USECMS
    - Y (YES) specifies that migration copies and backup versions can reside in EAS - For allocation, DFSMSHsm uses EATTR=OPT for its migration copy or backup version



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## DFSMSHsm Considerations - z/OS V1R12\



- ❑ DFSMSHsm does support the use of EAVs for L0, migration and backup volumes
- ❑ However since they will not be able to be successfully accessed on a release prior to z/OS V1R12, their use should be restricted until all systems in a mixed sysplex environment with z/OS V1R12 are, at least all at V1R12
  - Existing z/OS V1R10 and V1R11 toleration support for DFSMSHsm will detect when EAVs are used for migration and backup volumes and fail the request if a data set being recalled or recovered, is EAS eligible
    - Some of the HSM owned data sets (Journal, LOGx-y, CDS backup copies, PDA) could be allocated in EAS on z/OS V1R12 and not be able to be accessed on V1R11 or V1R10