




# The New 'Storage Manager' Plug-in for Mainstar MXI G2

Session 8962  
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## About Mainstar MXI G2

- Provides ready access to critical information about your z/OS system
- Offers a fast and easy-to-use ISPF interface
- Architecture supports the concept of 'plug-ins'
  - Seamless integration between plug-ins
- Plug-Ins available
  - CICS
  - DB2
  - TCP/IP
  - MQ Series
  - RACF
  - z/OS
  - Storage Manager **NEW!**



## Storage Manager Plug-In



- Monitors and reports on primary storage utilization
  - New MXI G2 address space (MXIDCM)
  - Post-processes the IBM DCOLLECT results
    - Loads into VSAM KSDS dataset for fast access
  - Adhoc and Planned Queries
    - Volume and Dataset information
    - Reports in Tracks, Cylinders, KB, MB, GB
- Summarize dataset statistics by various methods
- Define advance filters (also called 'scopes')
- Drill down to display individual dataset information



## Storage Manager Commands



- DM            DCOLLECT Data Summary
- DMDC        Summary by SMS Data Classes
- DMDS        Dataset Level Statistics
- DMMC        Summary by SMS Management Class
- DMQ         Summary by High Level Qualifier
- DMSC        Summary by SMS Storage Class
- DMSG        Summary by SMS Storage Group
- DMV         Summary by DASD Volume

*Note: DMDC, DMMC, DMSC, DMSG, DMV all drill down to dataset level*



## Storage Manager Plug-In Commands



- DM - Dcollect Data Summary

```
File PlugIn DCollect DASD SMS
MXIQ-DM--RS25----HOME----CPU 15 UIC 108 PAG 19-----Row 00001 of 00033
Command ==> _____ scroll ==> CSR
```

Field	Value
DCollect Date/Time	2010/05/14 11.19.54
DCollect System SMF ID	RS25
Number Of Datasets	506096
Total Allocated Space (Mb)	1811268
Total Used Space (Mb)	1451914
Space Used Percentage	80
Size Of Largest Dataset (K)	10638611
Number Of Large Datasets	3469
Number Of Medium Datasets	492187
Number Of Small Datasets	9012
Datasets Unreferenced For Week	438798
Datasets Unreferenced For Month	345317
Datasets Unreferenced For Year	122211
Number Of Empty Datasets	13846
Number Of Multi-Volume Datasets	378
Number Of VSAM Datasets	340409



## Storage Manager Plug-In Commands



- DM - Dcollect Data Summary (continued)

Field	Value	Field	Value
Number Of HFS Datasets	530	Number Of Null DSORG Datasets	8185
Number Of Temporary Datasets	113	Number Of Error Datasets	782
Number Of PDSE Datasets	7239	Total Allocated Space (K)	1854738919
Number Of GDS Datasets	16930	Total Used Space (K)	1486760235
Number Of Striped Datasets	8592	Total Allocated Space (Gb)	1768
Number Of Compressed Datasets	8592	Total Used Space (Gb)	1417
Number Of ICF Catalogs	336	Total Allocated Space (Cyl)	2153860
Number Of Other Datasets	140539	Total Used Space (CYL)	1726536
Number Of Uncataloged Datasets	134718		



## Storage Manager Plug-In Commands



- DMDC - Summary by SMS Data Classes

MXIQ-DMDC-RS25-----HOME-----CPU 2 UIC 42215 PAG 2----->-Row 00004 of 00025  
 Command ==> \_\_\_\_\_ Scroll ==> CSR  
 DCLS =\* \_\_\_\_\_ Large >=0 \_\_\_\_\_ Small >=0 \_\_\_\_\_  
 Null >=0 \_\_\_\_\_ Error >=0 \_\_\_\_\_ Date 2010/05/14 15.19.54

Cmd	DCLS	Datasets	AllocMb	UsedMb	Use%	MaxK
BJTBASIC		19	15	14	94	3265
BJTDATA		29	2	2	100	277
BJTDATA1		218	176	13	7	830
BJTDATA2		1	0	0	0	0
BJTEXTEN		16	39	35	89	12451
BJTEXTE2		1	12	11	93	12451
BJTLARGE		1	2	1	68	2490
DATAF		3	41	41	100	14111
DB2EA		6808	9270	8484	91	2051857
DCESDS		32	471	420	89	207510
DCPDSA		1	3	2	76	3320
EFBIAS		142	96	65	68	5810
EFCOMP		440	20917	17676	84	1162055
EFCOMP2		4	81	81	99	81122
EFNOCMP		7	487	1	0	498023
EFNOCMP2		27	13373	13368	99	2044110

## Storage Manager Plug-In Commands



- DMDS - Dataset Level Statistics

MXIQ-DMDS-RS25-----HOME-----CPU 2 UIC 42215 PAG 1----->-Row 000 No Action  
 Command ==> \_\_\_\_\_ Scroll ==> CSR  
 Dataset =\* \_\_\_\_\_ Volser =\* \_\_\_\_\_  
 Scope \_\_\_\_\_ SGRP =\* \_\_\_\_\_ Date 2010/05/14 15.19.54

Cmd	Dataset	Volser	Use%	AllocK
!TOTAL			83	230165324
ABJ.AABJCLST		DL1801	60	553
ABJ.AABJCLST		DL1901	100	664
ABJ.AABJLCP		DL1901	96	6142
ABJ.AABJLCP		DL1801	53	5589
ABJ.AABJMLIB		DL1801	49	111
ABJ.AABJMLIB		DL1901	49	111
ABJ.AABJMOD1		DL1901	40	3708
ABJ.AABJMOD1		DL1801	20	3708
ABJ.AABJPLIB		DL1801	58	941
ABJ.AABJPLIB		DL1901	100	1107
ABJ.AABJSAM1		DL1801	100	498
ABJ.AABJSAM1		DL1901	94	941
ABJ.AABJSAM2		DL1801	81	2379
ABJ.AABJSAM2		DL1901	100	3763
ABJ.AABJSLIB		DL1801	75	221

## Storage Manager Plug-In Commands



- Select dataset for details at-a-glance!

```

MXIQ-DMDS-RS25-----HOME-----CPU 14 UIC 21787 PAG ----- Top Of Data
Command ==>                               Scroll ==> CSR
Dataset =ABP.ABP0610.ZADATA.ABPSMEPL      Volser =DVP12E
Scope      SGRP      =*      Date      2010/05/14 15.19.54
Field      Value
Dataset Name      ABP.ABP0610.ZADATA.ABPSMEPL
Volume Serial    DVP12E
Space Used Percentage  53
Allocated Space (K)  830
Used Space (K)     443
Wasted Space (K)   182
Days Since Last Reference  7
SMS Storage Group  DEVG1
Extents          1
Logical Record Length  8188
Block Size       32760
Dataset Organisation  PS
Record Format     VB
Create Date      2010/05/06
Days Since Created  7
Last Reference Date  2010/05/06
    
```

## Storage Manager Plug-In Commands



- DMMC - Summary by SMS Management Class

```

MXIQ-DMMC-RS25-----HOME-----CPU 3 UIC 65534 PAG 2----->-Row 00001 of 00032
Command ==>                               Scroll ==> CSR
MCLS      =*      Large      >=0      Small      >=0
Null      >=0      Error      >=0      Date      2010/05/14 15.19.54
Cmd  MCLS      Datasets      AllocMb      UsedMb      Use%      MaxK
!TOTAL      506096      1811268      1451914      80      10638611
-<NULL>-      125560      560816      409830      73      8312841
BACKUP      488      13553      12950      95      595968
BKPBKP      14      6694      6690      99      705533
CVSMC      325      943      881      93      186759
DBML2      3792      70802      70801      99      83004
DB2      56057      83939      61620      73      1353794
DEL1DAY      299      568      14      2      4150
DEVIMC      5662      107062      98263      91      2053517
DUMP      29      9499      8356      87      748806
EMCCXMC      27      3062      717      23      310767
EXTBAK      3684      29726      21484      72      366047
GDGBKUP      9      0      0      100      55
HSMACT      207      307      284      92      19700
INTERIM      4      2      0      24      830
MCNOMIG      2      6      5      79      4980
    
```

## Storage Manager Plug-in Commands



- DMQ - Summary by High Level Qualifier

```
MXIQ-DMQ-RS25-----HOME-----CPU 1 UIC 65534 PAG 0----->-Row 00001 of 01255
Command ==> _____ Scroll ==> CSR
HLQ   =* _____ Large >=0 _____ Small >=0 _____
Null  >=0 _____ Error >=0 _____ Date 2010/05/14 15.19.54
```

Cmd	HLQ	Datasets	AllocMb	UsedMb	Use%	MaxK
	!TOTAL	506096	1811268	1451914	80	10638611
	ABJ	117	159	106	67	6142
	ABP	822	7017	5276	75	664031
	ABX	431	1725	438	25	184545
	ADCD	12	11	8	75	3929
	ADH	788	12617	9796	77	680632
	ADHSPSRV	199	1602	1463	91	312261
	ADHV0210	1	0	0	0	0
	ADP	1	0	0	100	221
	AJC	8	141	116	81	139447
	AKD	31	44	38	87	17431
	AKDQ	1	0	0	66	166
	ALA	339	4102	3643	88	335336
	ALA320	1	4	3	96	4150
	ALC	8	15	8	55	4759
	ALLSTATE	2	1	0	55	1273

## Storage Manager Plug-in Commands



- DMSC - Summary by SMS Storage Class

```
MXIQ-DMSC-RS25-----HOME-----CPU 8 UIC 42157 PAG 26----->-Row 00001 of 00105
Command ==> _____ Scroll ==> CSR
SCLS  =* _____ Large >=0 _____ Small >=0 _____
Null  >=0 _____ Error >=0 _____ Date 2010/05/14 15.19.54
```

Cmd	SCLS	Datasets	AllocMb	UsedMb	Use%	MaxK
	!TOTAL	506096	1811268	1451914	80	10638611
	-<NULL>-	125532	560492	409550	73	8312841
	ABPSC1	1	648	386	59	664031
	ARYSC01	78	1266	1183	93	39842
	ARYSC03	1269	1773	993	56	341976
	ARYSC05	64	1358	1346	99	39842
	ARYSC07	1622	7352	6816	92	2417738
	ARYSC09	52	1006	983	97	39842
	ARYSC11	9915	5032	4273	84	2417848
	ARYSC13	61	1312	1294	98	39842
	ARYSC15	731	7794	7553	96	2417904
	ARYSC17	29	529	511	96	39842
	ARYSC19	1191	4478	4119	91	1423517
	ARYSC21	13	2256	2249	99	1020948
	A3DBSC	1961	2026	1122	55	19091
	A3EX1SC	29	75	57	76	7470

## Storage Manager Plug-in Commands



- DMSG - Summary by SMS Storage Group

```

MXIQ-DMSG-RS25-----HOME-----CPU 6 UIC 21361 PAG 2----=>-Row 00049 of 00146
Command ==> scroll ==> CSR
SGRP =* Large >=0 Small >=0
Null >=0 Error >=0 Date 2010/05/14 15.19.54
    
```

Cmd	SGRP	Volumes	Datasets	TotalMb	Free%	AllocMb
	DHHSRCSG	2	54	16239	99	138
	DMPG1	2	34	16239	39	9844
	EMCCXSG	2	31	53109	94	3079
	FLASHSG	4	4180	3608	91	272
	FTRG1	7	10758	18945	3	18162
	FTRG2	19	68690	67663	22	37457
	FTRG3	10	22227	27065	32	12688
	FTRG4	10	40385	27065	53	12579
	GGCSG02	10	20	81196	97	410
	GGCSG1	2	4	16239	99	2
	GGCSG2	2	148	16239	84	2485
	HFSG1	1	54	2706	39	1634
	HFSG2	4	240	106219	10	83795
	HSMG1	4	247	16239	59	6620
	HSMG3	3	12	13532	18	10888
	IMSCPLA	1	878	902	23	687

## Storage Manager Plug-in Commands



- DMV - Summary by DASD Volume

```

MXIQ-DMV--RS25-----HOME-----CPU 4 UIC 21361 PAG 3----=>-Row 00001 of 01231
Command ==> scroll ==> CSR
Volser =* Large >=0 Small >=0
Scope Error >=0 Date 2010/05/14 15.19.54
    
```

Cmd	Volser	Unit	SGRP	Datasets	TotalMb	Free%	AllocMb
	!TOTAL			506096	8839025	74	1811268
	ABP100	A01B	ABPG1	3	8119	91	649
	ABP101	A846	ABPG1	2	2706	99	1
	ARP18A	B38A	ARYSG21	15	8119	71	2260
	ARX10A	B5DA	ARYSG02	7	902	84	122
	ARX10B	B5DB	ARYSG02	6	902	80	160
	ARX10C	B5DC	ARYSG02	4	902	97	5
	ARX10D	B5DD	ARYSG02	4	902	97	5
	ARX10E	B5DE	ARYSG02	4	902	89	82
	ARX10F	B5DF	ARYSG02	7	902	88	87
	ARX100	B5D0	ARYSG01	29	902	48	450
	ARX101	B5D1	ARYSG01	4	902	89	82
	ARX102	B5D2	ARYSG01	7	902	88	87
	ARX103	B5D3	ARYSG01	6	902	88	83
	ARX104	B5D4	ARYSG01	32	902	59	350
	ARX105	B5D5	ARYSG01	6	902	80	160

## Storage Manager Plug-in Commands



- Additional commands available

File	PlugIn	DCollect	DASD	SMS
MXIQ-DMSG-RS2				
Command ==>				
SGRP =*				
Null >=0				
Cmd SGRP				
!TOTAL				
-<NULL>-				
ABPG1				
ARYSG01				
ARYSG02				
/ ARYSG03				
ARYSG04				
ARYSG05				
ARYSG06				
ARYSG07				
ARYSG08				
ARYSG09				
ARYSG10				
ARYSG11				
ARYSG12				

S Command	Description	
- DMDS	List Datasets In Storage Group	
- EMP	Show Empty Datasets	ocMb
- ERR	Show Datasets In Error	1268
- LDS	Show Large Datasets In Group	6579
- LRM	Datasets Unreferenced For Month	651
- LRW	Datasets Unreferenced For Week	1303
- LRY	Datasets Unreferenced For Year	981
- MVOL	Show Multi-Volume Datasets	1810
- NEW	Datasets Less Than 3 Days Old	3635
- NULL	Show Datasets with Null Dsorg	1395
- S	Storage Group Dataset Summary	3587
- SDS	Show Small Datasets In Group	8025
- SGRP	SMS Storage Group Definition	5957
- SGV	DASD Volumes In Storage Group	1160
- VS	Show VSAM Datasets In Group	3935
		5075
		15190

## Storage Manager Action Commands



- Arrange columns
- Filter data
  - Can use \* as wildcard
- Print results to a dataset
- Display results in ISPF view
- Issue operator commands
- Use Point-and-shoot to drill down to dataset level
- And more...



## Storage Manager Action Commands



- Example: Arrange Columns

- Allows the user to customize the order of displayed values
- Available from any view

Command ==> MXI - Arrange Columns Row 1 to 17 of 42

Cmd	Column	Fix	Pos	offset	width	Description
—	Cmd	Yes	1	1	4	Command
—	Dataset	Yes	2	6	44	Dataset Name
—	Volser	No	3	51	6	Volume Serial
6	Use%	No	4	58	4	Space Used Percentage
7	Allock	No	5	63	16	Allocated Space (K)
8	UsedK	No	6	80	16	Used Space (K)
—	WasteK	No	7	97	16	Wasted Space (K)
4	DaysRef	No	8	114	8	Days Since Last Reference
5	SGRP	No	9	123	8	SMS Storage Group
—	XT	No	10	132	3	Extents
—	Lrecl	No	11	136	5	Logical Record Length
—	BlkSize	No	12	142	7	Block Size
—	Dsorg	No	13	150	5	Dataset Organisation
—	Recfm	No	14	156	5	Record Format
—	CreateDate	No	15	162	10	Create Date
—	DaysCre	No	16	173	8	Days Since Created
—	RefDate	No	17	182	10	Last Reference Date



## Storage Manager Action Commands




- Example: Filter
  - Powerful filtering to display specific data criteria
  - Available from any view

Command ==> MXI - Filter Display Row 1 to 17 of 41

Column	Op	Value
DATASET	==	*
VOLSER	==	*
DAYSREF	>=	365
DAYS CRE	>=	0
DAYS BKUP	>=	0
XT	>=	0
LRECL	>=	0
BLKSIZE	>=	0
SGRP	==	*
CREATE DATE	==	*
REFDATE	==	*
DSORG	==	ps
RECFM	==	*
ALLOCK	>=	0
WASTEK	>=	0
USEDK	>=	0
USE%	>=	0




## Storage Manager Action Commands




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- Point-and-shoot
  - The DCOLLECT data is summarized and cross-referenced and then loaded into the VSAM KSDS
  - Two alternate indexes are built in this file that enable use by the following keys :
    - Primary Key - DATASET and VOLSER
    - Alternate Key 1 - SGRP
    - Alternate Key 2 – VOLSER
  - Queries that specify one or more of the keys will perform noticeably faster
  - Those without any key specification will process sequentially



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## Storage Manager Action Commands



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- Example: Point-and-shoot
  - Click on HLQ to be expanded
  - Displays all datasets for that HLQ

```

MXIQ-DMQ--RS25----HOME-----
Command ==>
HLQ      =*          Large
Null     >=0       Error
-----
Cmd  HLQ      Datasets
!TOTAL 506096
  ABJ      117
  ABP      822
  ABX      431
  ADCC ←    12
  ADH      788
  ADHSPSRV 199
  ADHY0210 1
  ADP      1
  AJC      8
  AKD      31
  AKDQ     1
  ALA      339
  ALA320   1
  ALC      8
  ALLSTATE 2
            
```

```

MXIQ-DMDS-RS25-----HOME-----CPU 1 UIC 62923 PAG
Command ==>
Dataset =ADCD.*
Scope   SGRP   =*   Date
-----
Cmd  Dataset
!TOTAL
  ADCC.ADCDSA.PARMLIB
  ADCC.DYNISPF.ISPPLIB
  ADCC.LIB.JCL
  ADCC.Z16.CLIST
  ADCC.Z16.ISPPLIB
  ADCC.Z16.LINKLIB
  ADCC.Z16.LPALIB
  ADCC.Z16.PROCLIB
  ADCC.Z16.VTAM.SOURCE
  ADCC.Z16.VTAMLIB
  ADCC.Z16.VTAMLST
  ADCC.Z16.WLMIN
            
```

## Storage Manager Action Commands



- Example: Point-and-shoot
  - Click on volser to drill down to dataset level


MXIQ-DMV--RS25-----HOME-----CPU 3					MXIQ-DMDS-RS25-----HOME-----CPU 3 UIC 42049 PAG 51--				
Command ==>					Command ==>				
Volser =* Large >=0					Dataset =*				
Scope Error					Scope SGRP =* Date 20				
Cmd	Volser	Unit	SGRP	Datasets	Cmd	Dataset		Volser	
	!TOTAL			435333		!TOTAL			
	ABP100	A01B	ABPG1	3		DSN.ARY.QA.EDS1.J08289.DUMP		ARP18A	
	ABP101	A846	ABPG1	2		DSN.ARY.QA.EDS1.J08289.TERSE1		ARP18A	
	ARP18A	B38A	ARYSG21	15		DSN.ARY.QA.EDS1.J08289.TERSE2		ARP18A	
	ARX10A	B5DA	ARYSG02	7		DSN.ARY.QA.E81A.J08282.TERSE1		ARP18A	
	ARX10B	B5DB	ARYSG02	6		DSN.ARY.QA.E81A.J08282.TERSE2		ARP18A	
	ARX10C	B5DC	ARYSG02	4		DSN.ARY.QA.E81B.J08287.TERSE1		ARP18A	
	ARX10D	B5DD	ARYSG02	4		DSN.ARY.QA.E81B.J08287.TERSE2		ARP18A	
	ARX10E	B5DE	ARYSG02	4		DSN.ARY.QA.E91A.J08283.DUMP		ARP18A	
	ARX10F	B5DF	ARYSG02	7		DSN.ARY.QA.E91A.J08283.TERSE1		ARP18A	
	ARX100	B5D0	ARYSG01	29		DSN.ARY.QA.E91A.J08283.TERSE2		ARP18A	
	ARX101	B5D1	ARYSG01	4		DSN.ARY.QA.E91B.J08289.TERSE1		ARP18A	
	ARX102	B5D2	ARYSG01	7		DSN.ARY.QA.E91B.J08289.TERSE2		ARP18A	
	ARX103	B5D3	ARYSG01	6		DSN.ARY.QA.JCL		ARP18A	
	ARX104	B5D4	ARYSG01	32		SYS1.VTOCIX.ARP18A		ARP18A	
	ARX105	B5D5	ARYSG01	6		SYS1.VVDS.VARP18A		ARP18A	

## Storage Manager Scopes



- What are Scopes?
  - Complex filters
  - Defined by PARMLIB statements
  - Expressed by one or more action on various fields in object in question
- Scope Syntax
  - SCOPE=NAME(scope\_name),
  - SUBJECT(scope\_subject),
  - TYPE(scope\_type),
  - EXPR(scope\_expression)
- Why use Scopes?
  - For Queries that need to be run on a regular basis

## Storage Manager Scope Examples




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- **Volsers that begin with RZ, PG or MC**

```
Scope=Name(ZVOL),Subject(DASD),Type(Group),
Expr(DASD.VOLSER LIKE "RZ*" OR
DASD.VOLSER LIKE "PG*" OR
DASD.VOLSER LIKE "MC*")
```
- **Inefficient Blocksize**


```
Scope=Name(BLK4096),Subject(DSN),Type(Group),
Expr(DSN.BLKSIZE > 0 AND DSN.BLKSIZE < 4096)
```
- **VSAM datasets in 100 or more extents**

```
Scope=Name(VSAMXT),Subject(DSN),Type(Group),
Expr(DSN.DSORG = "VS" AND DSN.XT >= 100)
```



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## Storage Manager Scopes




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- **DMS Command - Summary by User Defined Scope**

```
MXIQ-SCPE-RS25-----HOME-----CPU 11 UIC 65534 PAG 1----->-Row 00001 of 00004
Command ==> _____ scroll ==> CSR
Scope ==* _____
Subject ==* _____
```

Cmd	Scope	Subject	Global	LastUpdt	Expr
	TESTMORE8SYMBOL	DASD	Yes	2010/08/02 10.39.25	DASD.VOLSER LIKE "RZ*"
b	ZVOL	DASD	Yes	2010/08/02 10.39.25	DASD.VOLSER LIKE "RZ*"
	3390-27	DASD	Yes	2010/08/02 10.39.25	DASD.TOTALK/1024 > 84
	3390-54	DASD	Yes	2010/08/02 10.39.25	(DASD.TOTALK > (1024*
- **Browse scope criteria (can also edit and copy)**

```
VIEW          SCOPE(ZVOL)-SUBJECT(DASD)          Columns 00001 00071
Command ==> _____ scroll ==> PAGE
***** ***** Top of Data *****
000001 DASD.VOLSER LIKE "RZ*" OR
000002 DASD.VOLSER LIKE "PG*" OR
000003 DASD.VOLSER LIKE "MC*"
***** ***** Bottom of Data *****
```



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## Storage Manager Scopes



- Display Scope Results

```

MXI0-DMS--RS25----HOME----CPU 7 UIC 552 PAG 7----=>-Row 00001 of 00003
Command ==>
Scope =:* Large >=0 Small >=0 Scroll ==> CSR
Subject =:* Error >=0 Date 2010/05/14 15.19.54
  
```

Cmd	Scope	Subject	Datasets	AllocMb	UsedMb	Use%
ZVOL		DASD	9242	218350	118073	54
3390-27		DASD	96130	620089	534552	86
3390-54		DASD	0	0	0	0

```

MXI0-DMS--RS25----HOME----CPU 1 UIC 620 PAG 15-----Row 00001 of 00035
Command ==>
Scope =ZVOL Large >=0 Small >=0 Scroll ==> CSR
Subject =:* Error >=0 Date 2010/05/14 15.19.54
  
```

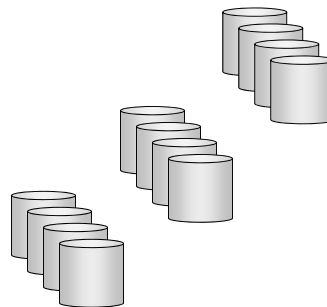
Field	Value
Scope Name	ZVOL
Scope Subject	DASD
Number Of Datasets	9242
Total Allocated Space (Mb)	218350
Total Used Space (Mb)	118073
Space Used Percentage	54
Size Of Largest Dataset (K)	8312841
Number Of Large Datasets	307
Number Of Medium Datasets	8862
Number Of Small Datasets	5
Number Of Empty Datasets	46
Number Of Multi-Volume Datasets	0
Datasets Unreferenced For Week	8846
Datasets Unreferenced For Month	8529
Datasets Unreferenced For Year	4646
Number Of VSAM Datasets	94



## Practical Uses for Storage Manager



- Volume / Pool Reporting
  - Volume / Pool over-allocated
    - More than 80% used
  - Volume / Pool under-allocated
    - Less than 30% used
- Non-SMS volumes
- SMS managed volumes
- Volumes with no VTOC Index



## Practical Uses for Storage Manager



- Data Set Level
  - Data sets over-allocated wasting space
  - Unreferenced data
    - *ie. data not referenced in 1 year or more*
      - *Action: Migrate data*
  - Datasets with blocksize less than 4096
  - Empty Datasets
  - VSAM datasets in more than 120 extents
  - Number of Multi-volume datasets



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## MXI G2 Consolidation Analysis Engine (CAE) Web Interface for Storage Manager

***Coming soon!***




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## MXI CAE Web Interface Overview




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- Web Interface to MXI G2 Commands
  - Includes operator commands
    - [Start/stop started tasks](#)
    - [Issue common display commands](#)
- Customizable Dashboards
  - Display statistics for quick overview of system
  - Configure threshold specifications
  - Automatic responses and custom actions
    - [Email](#)
    - [WTO](#)
    - [Operator Command](#)
    - [JCL](#)
  - View Trends



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## MXI G2 Web Interface for Storage Manager



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- Same reporting as ISPF view
  - Just Point-n-Click for details

Home Help
Logged in as: C59KL Logout




**MXI G2**  
Rocket Software

9:23:25 AM  
[Get All Rows](#)

Systems RS25   [List Commands](#)

Groups	Command	Comment	Group	Command	Comment
ALL	SM	Storage Manager Summary	DCM	SMQ YEAR(>0) SORT(YEAR,D)	Datasets Unreferenced
CICS	SMDC	Dataset Summary By Data Class	DCM	SMQ	Dataset Summary By BU
DATASET	SMDS BLOCKSIZE(<4096) DSORG(<NULL)	Datasets With Small Block Size	DCM	SMR	Dataset Summary By SC
DB2	SMDS BLOCKSIZE(>2720)	Datasets With Large Block Size	DCM	SMSC	Dataset Summary By SC
DCM	SMDS DSORG(VS) XT(>100)	VSAM Dataset In Many Extents	DCM	SMSC	Dataset Summary By SC
MODULE	SMDS	Dataset Summary By Managemt Class	DCM	SMG	Non-IMS Volumes
MO	SMQ EMPTY(>0) SORT(EMPTY,D)	Empty Datasets	DCM	SMV SMS(NO)	SMS Managed Volumes
RACF	SMQ LARGE(>0) SORT(LARGE,D)	Large Datasets	DCM	SMV SMS(YES)	SMS Managed Volumes
SMS	SMQ LARGE(>0) SORT(LARGE,D)	Large Datasets	DCM	SMV DSRE(<10)	Volumes Less Than 10%
STORAGE	SMQ MONTH(>0) SORT(MONTH,D)	Datasets Unreferenced For Month	DCM	SMV DSRE(>80)	Volumes Greater Than
SYSPLX	SMQ MULTIVOL(>0) SORT(MULTIVOL,D)	Multi-Volume Datasets	DCM	SMV VTIOCTX(NO)	Volumes Without Index
SYSTEM	SMQ SMALL(>0) SORT(SMALL,D)	Small Datasets	DCM	SMV	Dataset Summary By To
UNIT	SMQ WEEK(>0) SORT(WEEK,D)	Datasets Unreferenced For Week	DCM		



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## MXI G2 Web Interface for Storage Manager



- Example: Storage Manager Summary

Field	Value	Field	Value
Collect Date/Time	08/05 - 03:47:44	Number of Temporary Datasets	90
Collect System SRF ID	R221	Number of VDE Datasets	4072
Number of Datasets	500696	Number of GDS Datasets	17323
Total Allocated Space (Gb)	2034229	Number of Striped Datasets	11191
Total Used Space (Gb)	1557854	Number of Compressed Datasets	11191
Space Used Percentage	76	Number of ICF Catalogs	476
Size of Largest Dataset (K)	10638611	Number of Other Datasets	139226
Number of Large Datasets	3739	Number of Uncataloged Datasets	137494
Number of Medium Datasets	481384	Number of Null DSDS Datasets	5259
Number of Small Datasets	13936	Number of Error Datasets	983
Datasets Unreferenced For Week	442322	Total Allocated Space (K)	2083046939
Datasets Unreferenced For Month	352147	Total Used Space (K)	1595242938
Datasets Unreferenced For Year	170451	Total Allocated Space (Mb)	1986
Number of Empty Datasets	15658	Total Used Space (Gb)	1521
Number of Multi-Volume Datasets	448	Total Allocated Space (Cyl)	2418988
Number of VSAM Datasets	334291	Total Used Space (Cyl)	1852514
Number of RFP Datasets	618		



## MXI G2 Web Interface for Storage Manager



- Issue Commands

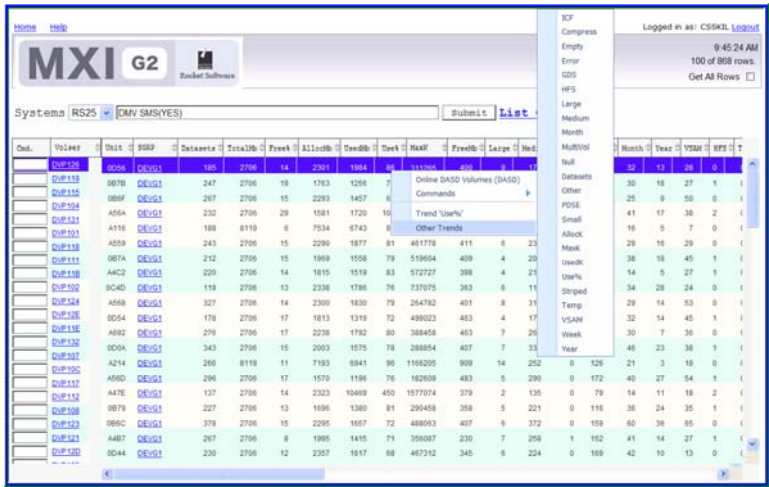
Onl.	Volser	Ds1s	SRF	Datasets	TotalGb	FreeG	AllIcMb	Credd	DsK	SRF	FreeMb	Large	Medium	Small	Week	Month	Year	VSAM	RFP
DL1301	AD2	--		226	2106	4													
DL1302	AD2	--		86	2706	42													
DL1301	AD13	--		908	8119	1													
DL1301	AD20	--		477	8119	8													
DL1301	AD44	--		519	13532	42	7758	6638	85	1381240									
DL1316	AD02	--		532	13532	46	7144	6090	85	1286505									
DL1318	AD01	--		533	13532	38	8259	7310	88	2988220									
DL131C	AD00	--		533	13532	39	8217	7260	88	2988220									
DL131A	AD03	--		533	13532	38	8179	7083	88	2988220									
DL1326	AD00	--		871	13532	4	10240	8598	83	2875988									
DL1328	AD01	--		871	13532	4	10219	10278	83	2875988									
DL1328	AD06	DEVS1		185	2706	14	2301	1984	88	311265									
DL1331	AD6A	DEVS1		232	2706	29	1581	1720	108	240688									
DL1331	A116	DEVS1		188	8119	6	7934	6743	89	2853517									
DL1331	AD59	DEVS1		243	2706	15	2290	1877	81	481778									
DL1332	AD2C	DEVS1		220	2706	14	1815	1519	83	572727	398	4	215	0	199	14	5	27	1
DL1332	AD17	DEVS1		266	8119	11	7183	6841	96	1166205	909	14	252	0	126	21	3	18	0
DL1321	AD7E	DEVS1		137	2706	14	2323	10469	450	1577074	379	2	135	0	79	14	11	18	2
DL1328	AD79	DEVS1		227	2706	13	1896	1380	81	290408	358	5	221	0	116	36	24	35	1
DL1314	AD42	DEVS1		274	2706	15	2292	1975	88	478103	409	5	269	0	138	30	15	43	0





## MXI G2 Web Interface for Storage Manager

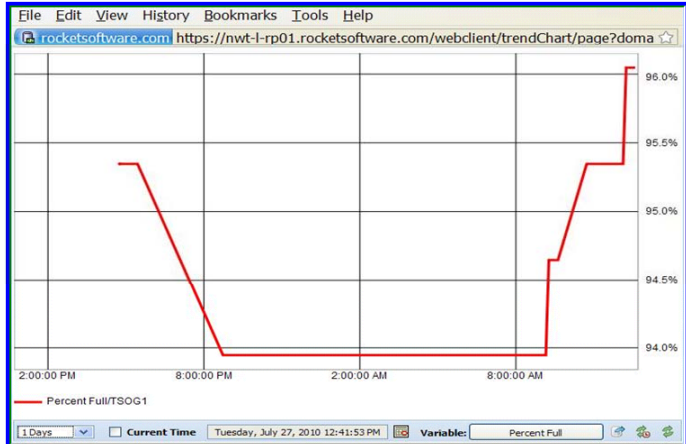
- Create Trends for Data
  - Click on column to trend or select column from 'Other Trends'



Obj.	VolName	Unit	SSP	Datasets	TotalMB	Free4	All100%	FreeMB	Free1	Max1	FreeMB	Target	Red
D:P:110	0054	DEV1		100	2706	14	2204	1856					
D:P:110	0076	DEV1		247	2706	19	1763	1256					
D:P:110	008F	DEV1		267	2706	15	2293	1457					
D:P:110	A56A	DEV1		232	2706	29	1581	1720					
D:P:111	A118	DEV1		188	8119	6	7534	6743					
D:P:111	A559	DEV1		243	2706	15	2290	1877	81	491778	411	6	23
D:P:111	007A	DEV1		212	2706	15	1969	1558	79	519604	409	4	20
D:P:118	AC2	DEV1		229	2706	14	1815	1519	83	572727	398	4	25
D:P:118	0C4D	DEV1		119	2706	13	2338	1786	76	737075	363	6	11
D:P:124	A568	DEV1		327	2706	14	2300	1630	79	264782	401	8	31
D:P:126	0054	DEV1		178	2706	17	1813	1319	72	499023	483	4	17
D:P:132	A892	DEV1		276	2706	17	2238	1792	80	388458	483	7	26
D:P:132	000A	DEV1		343	2706	15	2003	1575	78	288854	407	7	33
D:P:150	A214	DEV1		266	8119	11	7193	6841	96	1166205	909	14	252
D:P:151	A56D	DEV1		296	2706	17	1570	1198	76	182608	483	5	290
D:P:151	A47E	DEV1		137	2706	14	2323	10469	450	1577074	379	2	135
D:P:158	0079	DEV1		227	2706	13	1696	1380	81	230458	258	5	221
D:P:162	096C	DEV1		278	2706	15	2295	1657	72	489053	407	6	322
D:P:162	A487	DEV1		267	2706	8	1906	1416	71	350087	230	7	258
D:P:162	0D44	DEV1		230	2706	12	2357	1617	68	467312	345	6	224

## MXI G2 Web Interface for Storage Manager

- Example: Trend on Volume Utilization




File Edit View History Bookmarks Tools Help  
[rocketsoftware.com https://mwt-l-rp01.rocketsoftware.com/webclient/trendChart/page?doma](https://mwt-l-rp01.rocketsoftware.com/webclient/trendChart/page?doma)





Percent Full/TSOG1


1 Days Current Time Tuesday, July 27, 2010 12:41:53 PM Variable: Percent Full

## MXI G2 Web Interface




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- Customizable Dashboard
  - Create, edit, and view graphical displays of current and historical system information
  -  Message Board Summary
  -  Event Summary
  -  Monitored Information Meter
  -  Trend Chart



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## MXI G2 Web Interface

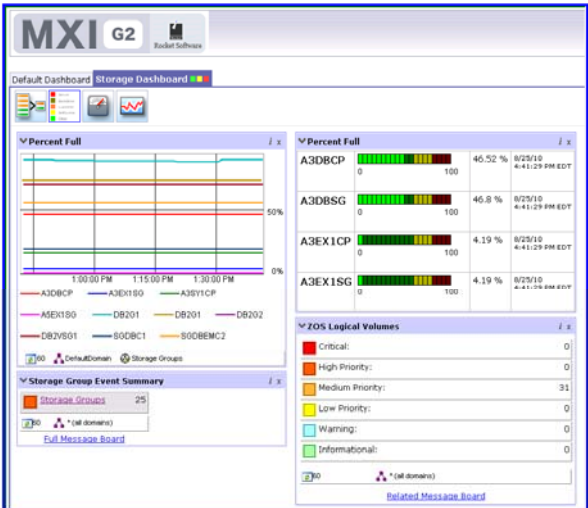


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- Example: Storage Dashboard

Trend Chart

Event Summary




The screenshot shows the MXI G2 Storage Dashboard with several sections:

- Percent Full:** A line chart showing storage usage over time for various storage groups.
- Monitored Information Meter:** A table showing the percentage full for storage groups:
 

Storage Group	Percent Full	Alert
A3DBCP	46.52 %	8/25/10 4:41:29 PM EDT
A3DBSG	46.8 %	8/25/10 4:41:29 PM EDT
A3EX1CP	4.19 %	8/25/10 4:41:29 PM EDT
A3EX1SG	4.19 %	8/25/10 4:41:29 PM EDT
- ZOS Logical Volumes:** A list of logical volumes with their status (Critical, High Priority, Medium Priority, Low Priority, Warning, Informational).
- Storage Group Event Summary:** A summary of events for storage groups, with a link to the full message board.

Monitored Information Meter

Message Board Summary



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## MXI G2 Storage Manager Summary



- Report and analyze data on primary DASD
  - Powerful filter and sort capabilities
  - Adhoc and batch
- Manage SMS storage groups
- Identify data to migrate
- Track & consolidate multi-volume data sets
- Track & manage data set over-allocation
- Model planned changes to SMS constructs
- Monitor volume and pool utilization
- Threshold monitoring
- Generate commands



## Current MXI 4.3 Freeware User?



- Be Aware! MXI 4.3 freeware no longer supported
  - Known issues include :
    - No knowledge of 64-bit storage for address space and system level metrics
    - No knowledge of 5-digit UCBs
    - No knowledge of PAV
    - No knowledge of z/IIP and z/AAP
    - Some DASD and SMS displays can be truncated on large shops and even fail with region size related abends
    - DB2 V9 is not supported
    - Linkage index display produces no results
    - No knowledge of EAV DASD (very high capacity DASD)
    - "DASD" command produces incorrect capacity/usage results for EAV DASD
    - SMF Type 70 record processing does not handle fragmented records when site has large number of LPARs and/or LCPUs





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