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A Storage Admin's Guide to Restful Nights and Productive Days: OMEGAMON XE for Storage

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- OMEGAMON

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Agenda

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Features

- Base product through IF0003
- Latest Features IF0004
  - Storage Toolkit SITUATION Take Action

Monitoring

- Application Monitoring
- Cache CU
- User DASD Groups
- Historical collection and Trending

Performance

- DASD Device Monitoring
- Dataset I/O

Release History

- OMEGAMON is currently at the Version 4.2.0 with 4 Interim Features adding functionality
- An OMEGAMON II for SMS 3270 Address Space still exists.

V4.2.0 GA	4Q 2008
IF1	July 2009
IF2	December 2009
IF3	August 2010
IF4	November 2011
V5.10	Soon 201x

OMEGAMON XE for Storage
Release History

Interim Features are installed with a PTF

They are cumulative

Distributed Interim Fixes may be required

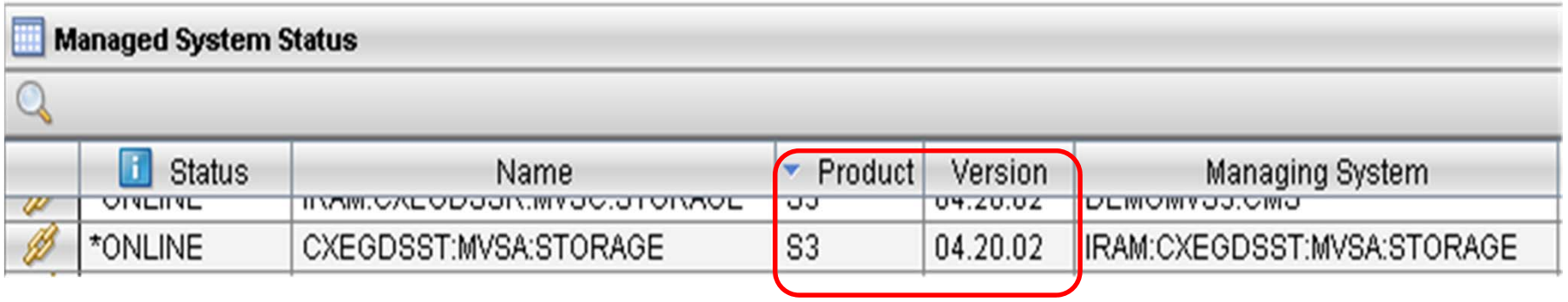
Platform maintenance table

http://www-01.ibm.com/support/docview.wss?rs=203&uid=swg27008514

OMEGAMON XE for Storage
Base product or Interim Feature ?

How to determine which Interim Feature version you're at

Navigator Item: Enterprise
Workspace: Managed System Status
Attributes: Product S3 Version 04.20.*IF* *Interim Feature Number*



OMEGAMON XE for Storage
Version 420 Features

Features

OMEGAMON XE for Storage
Version 420 Features

- BASE Product

- Storage Toolkit enhancements IDCAMS
- New BATCH JCL capabilities
- New COMMAND capabilities
- DFSMSrmm support
- EAV support
- Tivoli Common Reporting TCR Support
- Dynamic workspace links to sTEP children
- Currency new z/OS features
- Security enhanced for userid of TEP user

OMEGAMON XE for Storage
Version 420 Features

- BASE Product

- Storage Toolkit improvements
  - DFHSM
  - DFDSS
  - IDCAMS
  - RMM subcommands

- IF0001

- Edit BATCH JCL Enhancement
- Space Statistic Metrics
- Solid State Device Support
- More attributes in TDW

OMEGAMON XE for Storage
Version 420 Features

- IF0002

- Dynamic DASD Volume Groups
- Dynamic Dataset Groups
- Improved Tivoli Data Warehouse Support
- Hitachi DASD Support

- IF0003 *Never presented*

- Used Space Statistics Metrics
- TotalStorage Array Problem Detection
- Multivolume Dataset Attributes
- Group level Storage Toolkit commands
- Online Application monitoring definition
- DFSMShsm Common recall Queue

OMEGAMON XE for Storage
Version 420 Features

- IF0004

- Storage Toolkit Take Action
- Hitachi DASD Support
- Oracle STK Tape Support

OMEGAMON XE for Storage
Version 420 Features

Currency

- BASE Product
  - DS8000 Support
  - TS7700 Support
  - EAV Support
- IF0001
  - Solid State Device Support

OMEGAMON XE for Storage
Version 420 Features

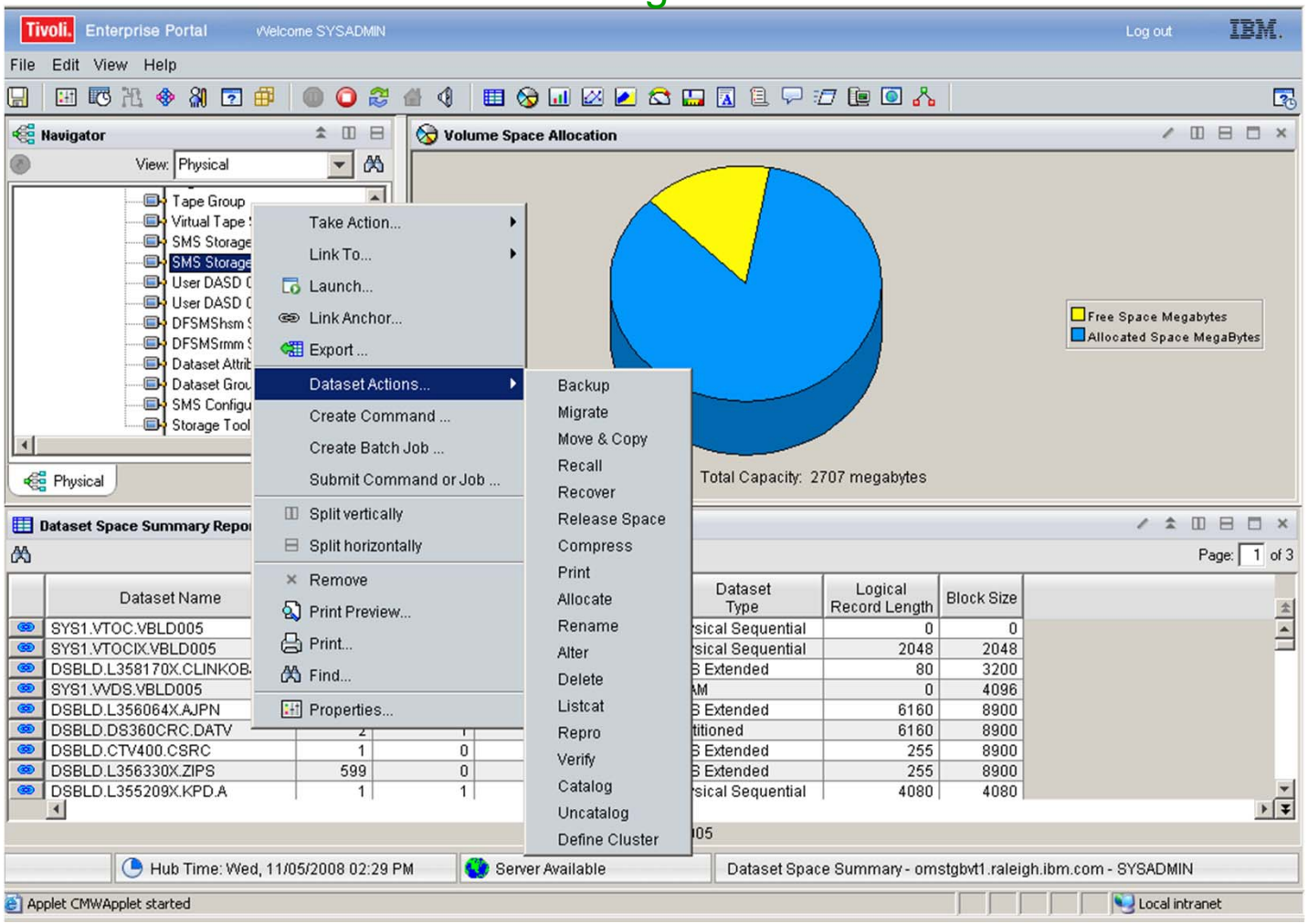
Currency

- No additional hardware currency support needed in

- IF0002
- IF0003
- IF0004

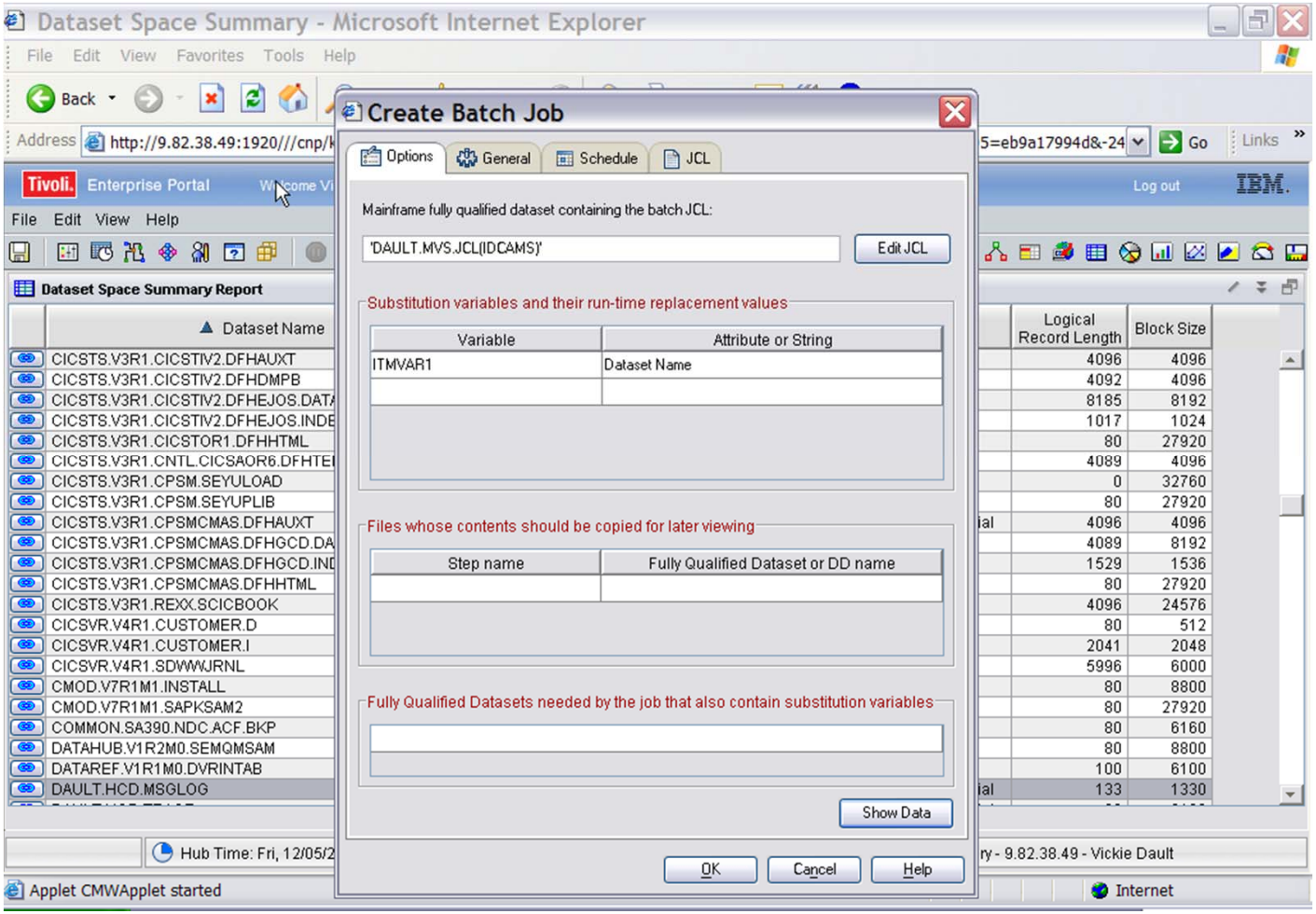
OMEGAMON XE for Storage
Version 420 Features

BASE Product More Storage Toolkit commands



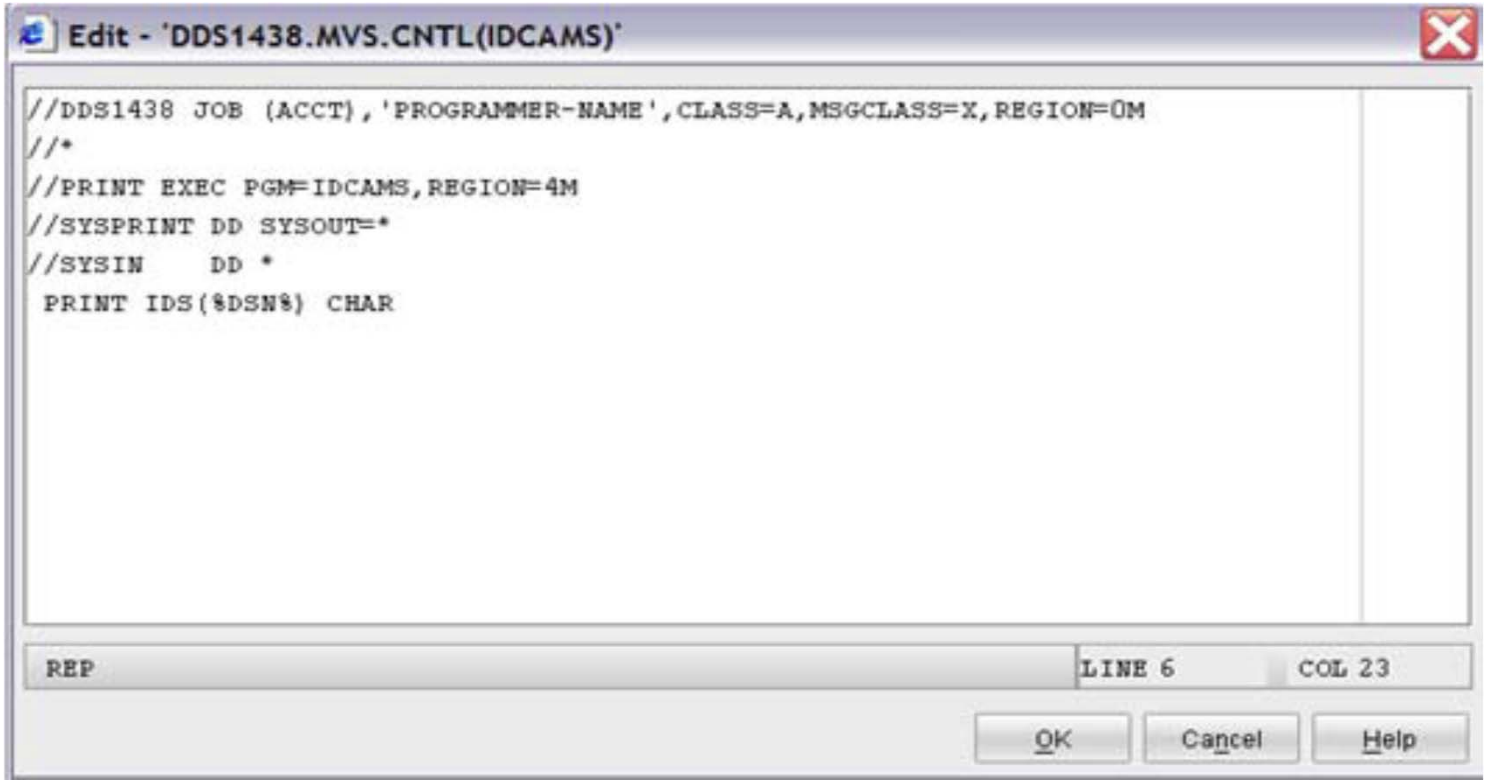
OMEGAMON XE for Storage
Version 420 Features

BASE Product BATCH JCL



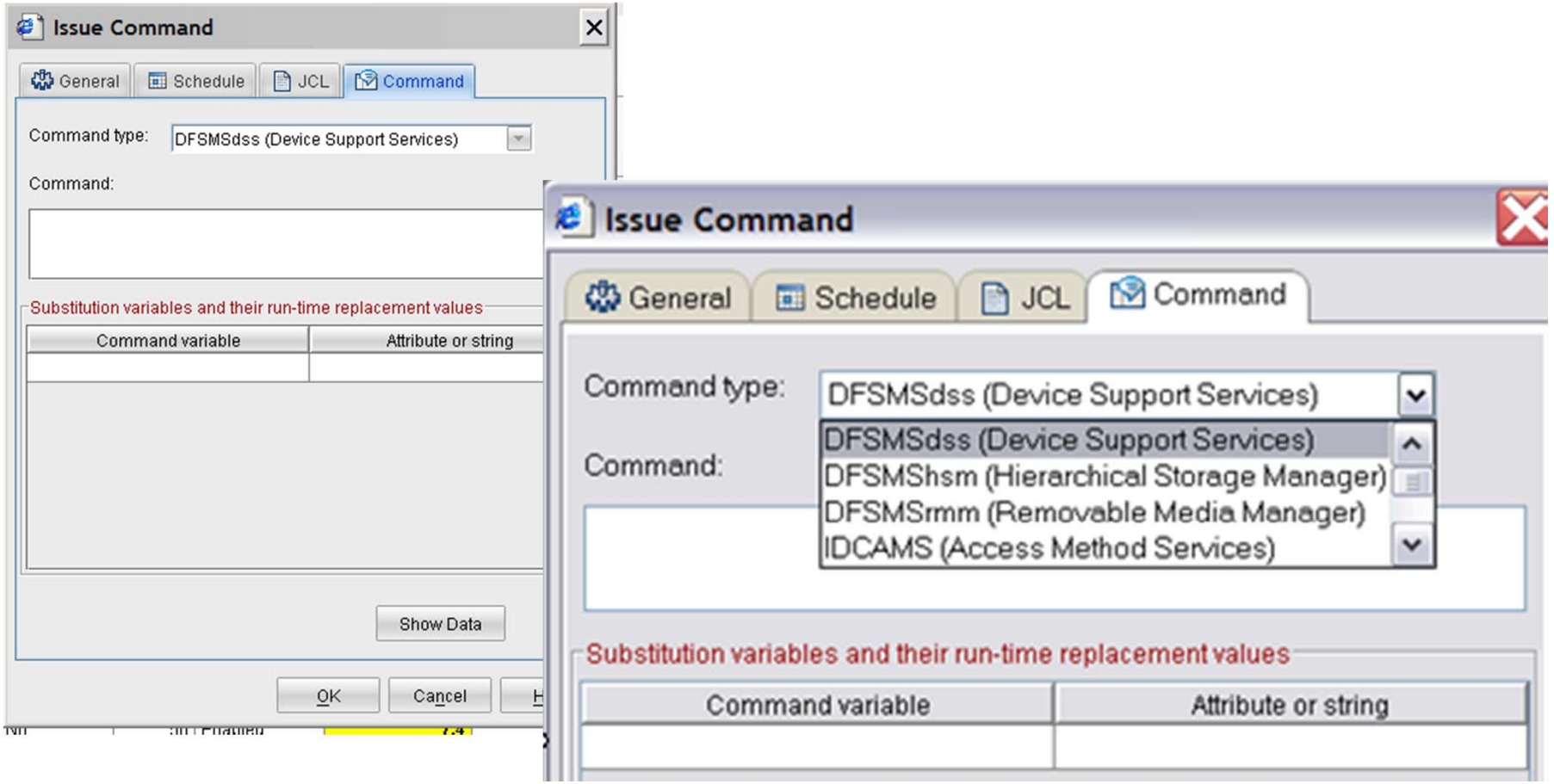
OMEGAMON XE for Storage
Version 420 Features

BASE Product BATCH JCL



OMEGAMON XE for Storage
Version 420 Features

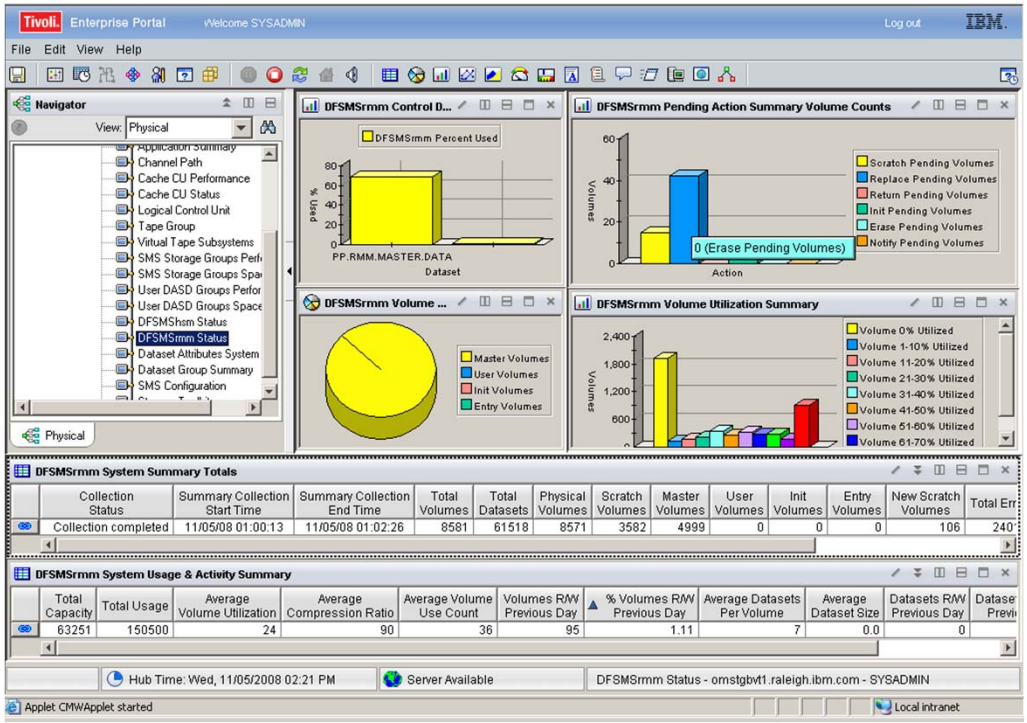
BASE Product ISSUE A COMMAND



OMEGAMON XE for Storage
Version 420 Features

BASE Product DFSMSrmm Support

RMM CDS Information: CDS and Journal utilization
Volume Information: Status, Percentages, Utilization, Pending
Datasets by Job, Accounting, program Owners
VRS Definitions



OMEGAMON XE for Storage
Version 420 Features

BASE Product Tivoli Common Reporting

Support is provided with V420 for Tivoli Common Reporting TCR

Storage HSM Migrate and Recall Function Requests
Storage System Volume and Dataset DASD Usage
Storage Dataset Group DASD Usage

TCR requires the appropriate attribute Groups to be configured in the historical collection and written to the Tivoli Data Warehouse at sufficient intervals for reporting to be provided.

http://publib.boulder.ibm.com/infocenter/tivhelp/v3r1/topic/com.ibm.tivoli.tcr_cog.doc/tcr_welcome.html

OMEGAMON XE for Storage
Version 420 Features

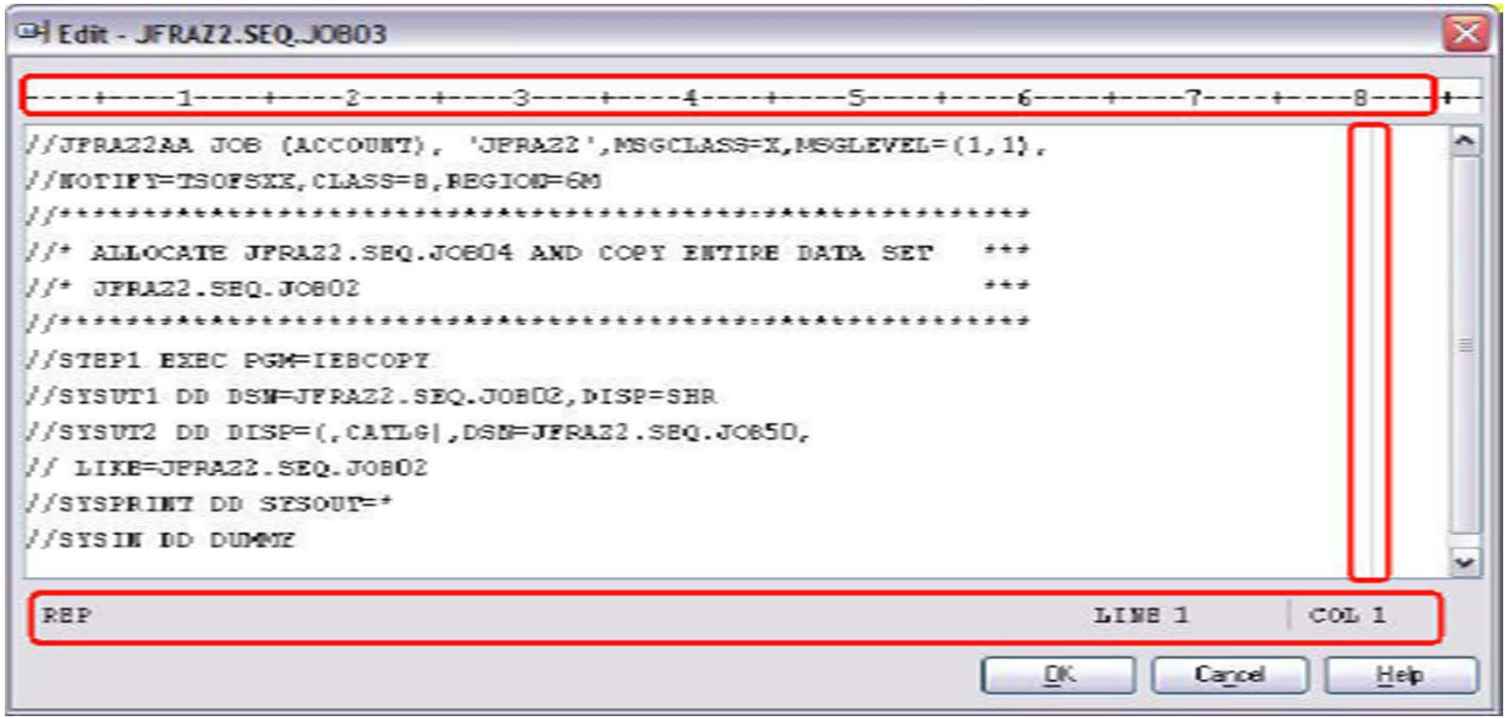
BASE Product Dynamic Workspace Linking Between products

OMEGAMON XE for Storage on z/OS

IBM Tivoli Advanced Audit for DFSMShsm
IBM Tivoli Advanced Reporting for DFSMShsm
IBM Tivoli Advanced Catalog Management
IBM Tivoli Advanced Allocation Management
IBM Tivoli Tape Optimizer

OMEGAMON XE for Storage
Version 420 Features

IF1 EDIT BATCH JCL Enhancements



FB 80 requirement Ruler line # Insert Col indicator

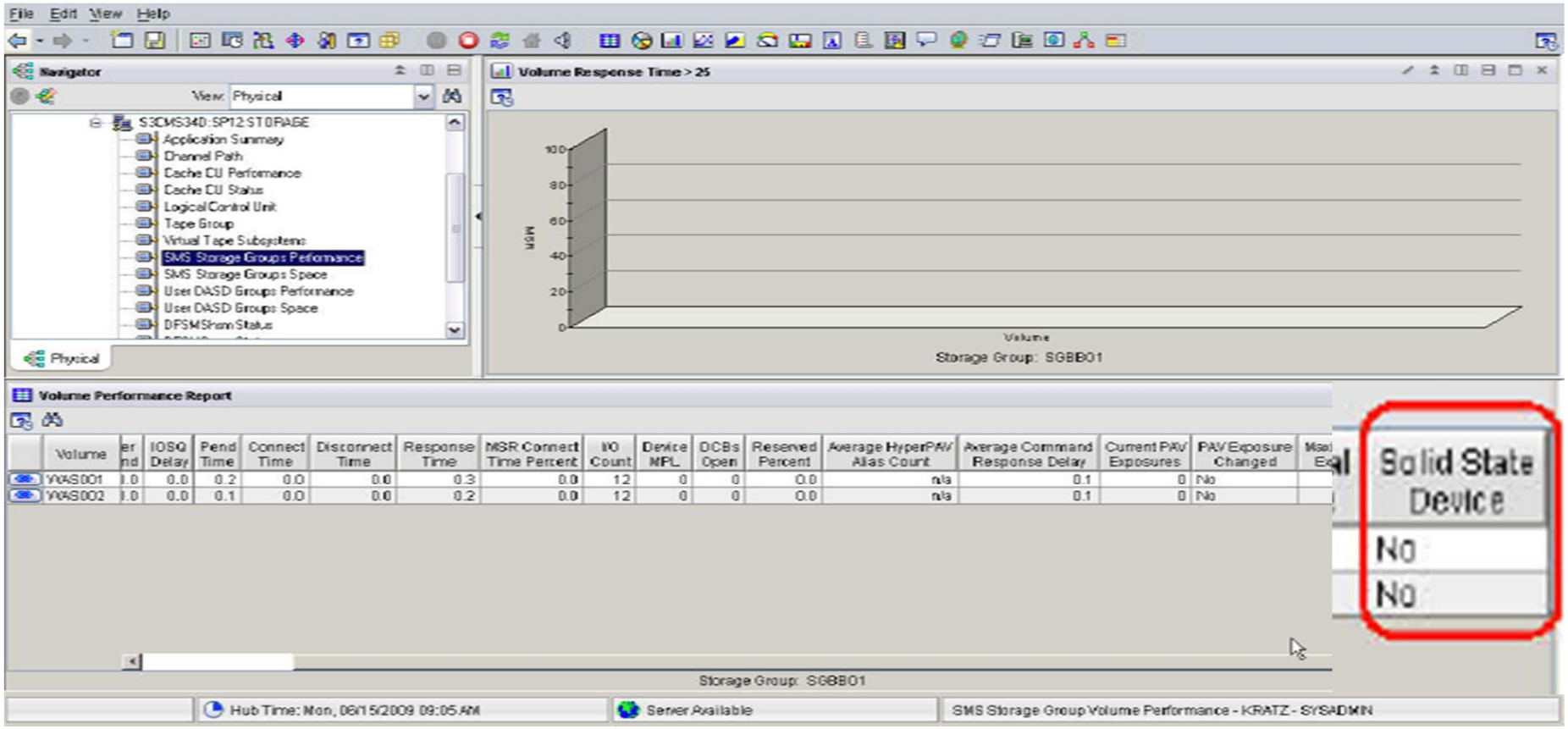
OMEGAMON XE for Storage
Version 420 Features
IF1 Space Statistic Metrics

TRACKS
CYLINDERS
MEGABYTES
GIGABYTES

% UTILIZED
% FREE

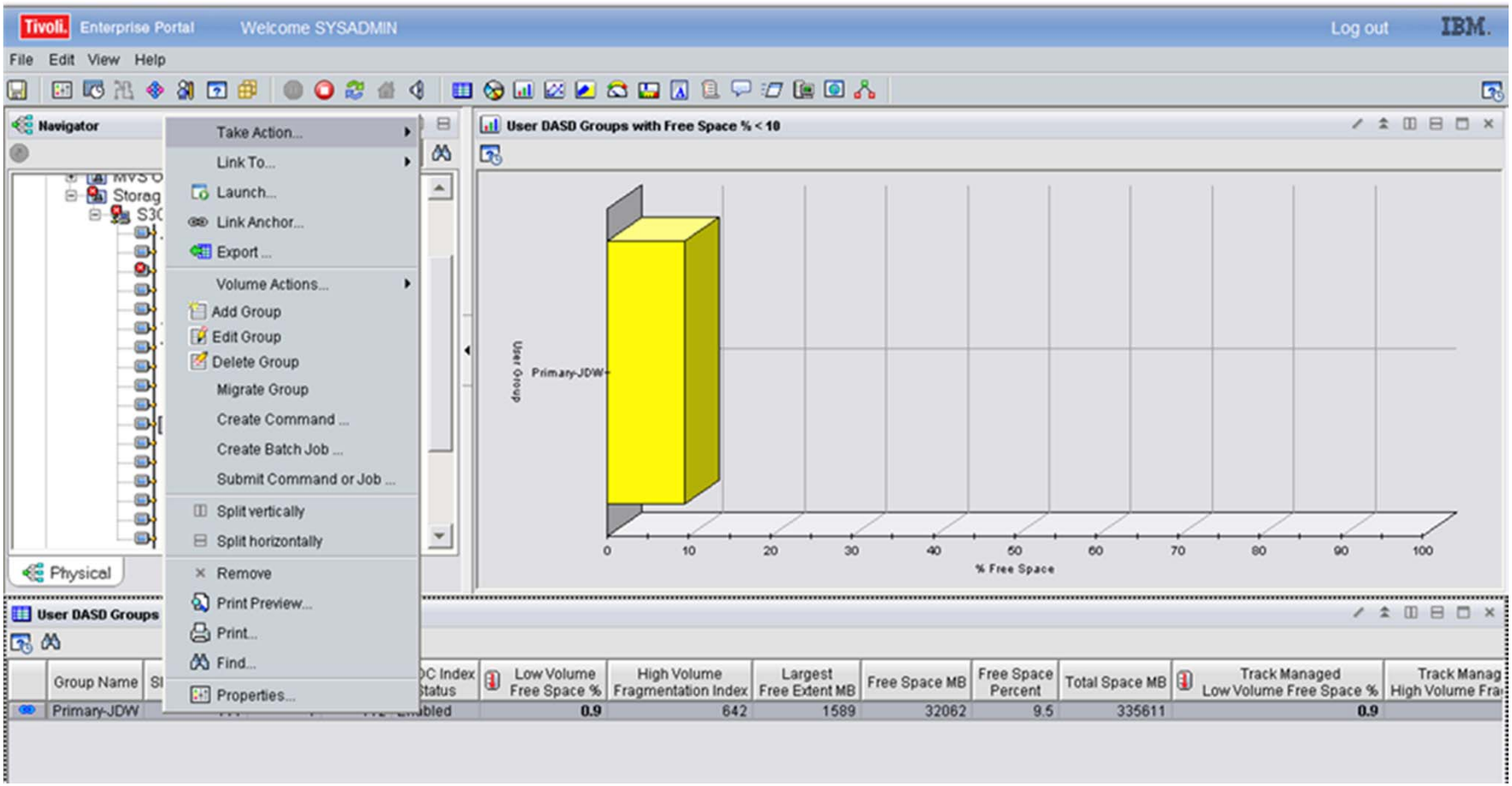
OMEGAMON XE for Storage
Version 420 Features

IF1 Solid State Device Support



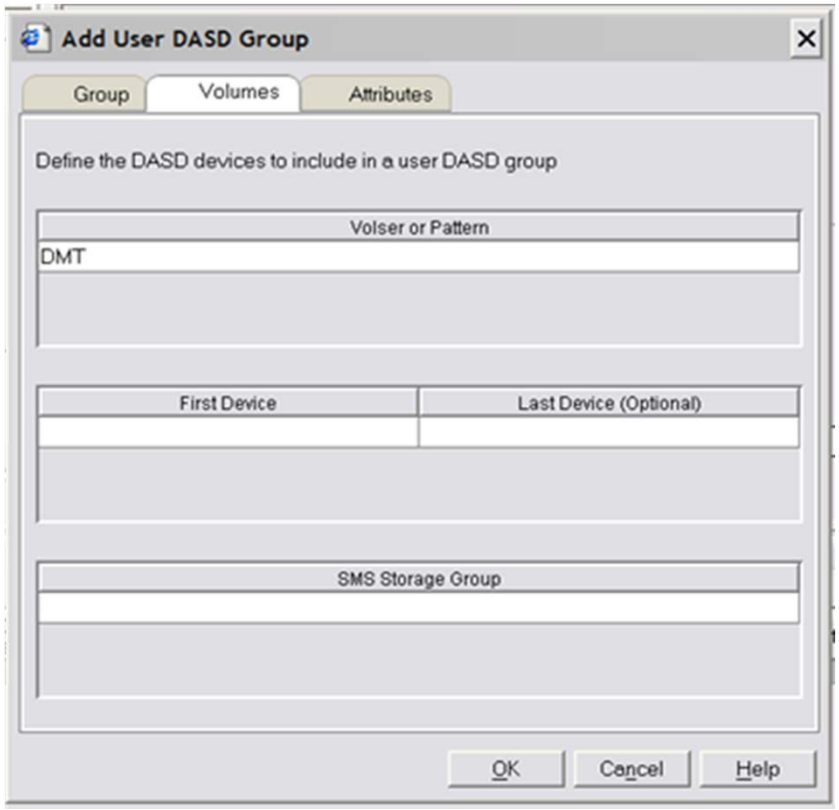
OMEGAMON XE for Storage
Version 420 Features

IF2 Dynamic DASD Volume Groups



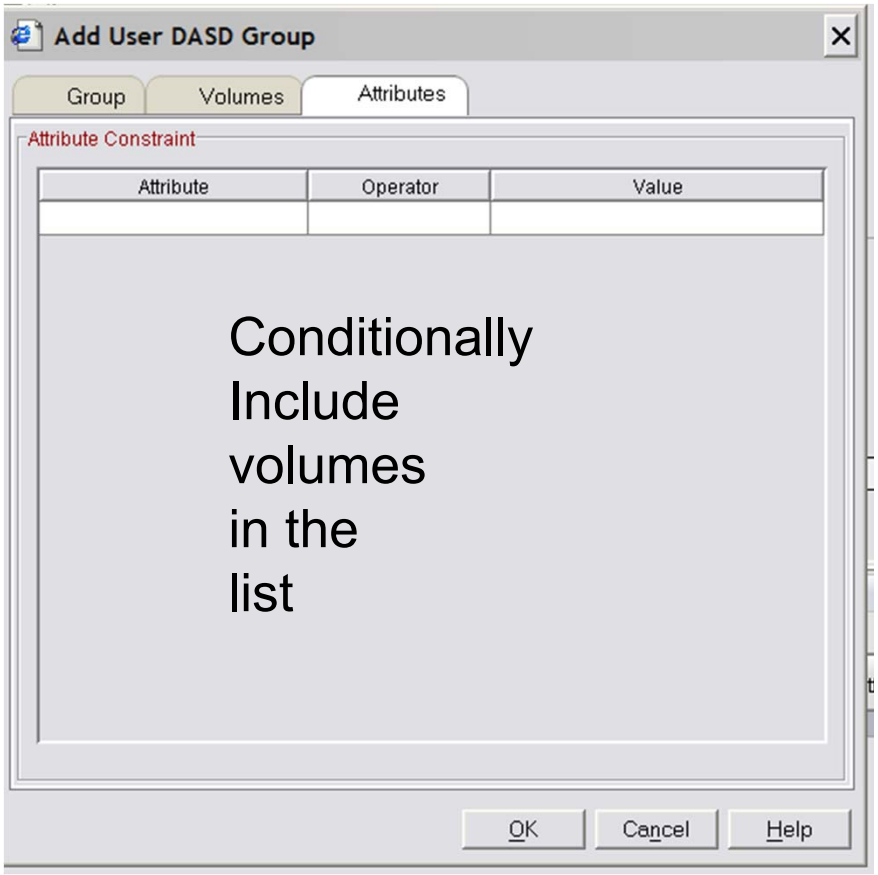
OMEGAMON XE for Storage
Version 420 Features

IF2 Dynamic DASD Volume Groups



Persistent or temporary User DASD Groups return the same Information

OMEGAMON XE for Storage
Version 420 Features
IF2 Dynamic DASD Volume Groups



OMEGAMON XE for Storage
Version 420 Features

IF2 Dataset Attributes Group Summary Background information

Dataset Attributes Database

Collected once every 24 hours by a schedule datasets found on all scanned volumes.

Dataset Group Summary

Collected as indicated in the “Collection Interval” using a dataset mask and starting with the datasets catalog entries.

The Collection interval might be the RMF interval, every 6 hours or On Demand (ie when navigating to the workspace)

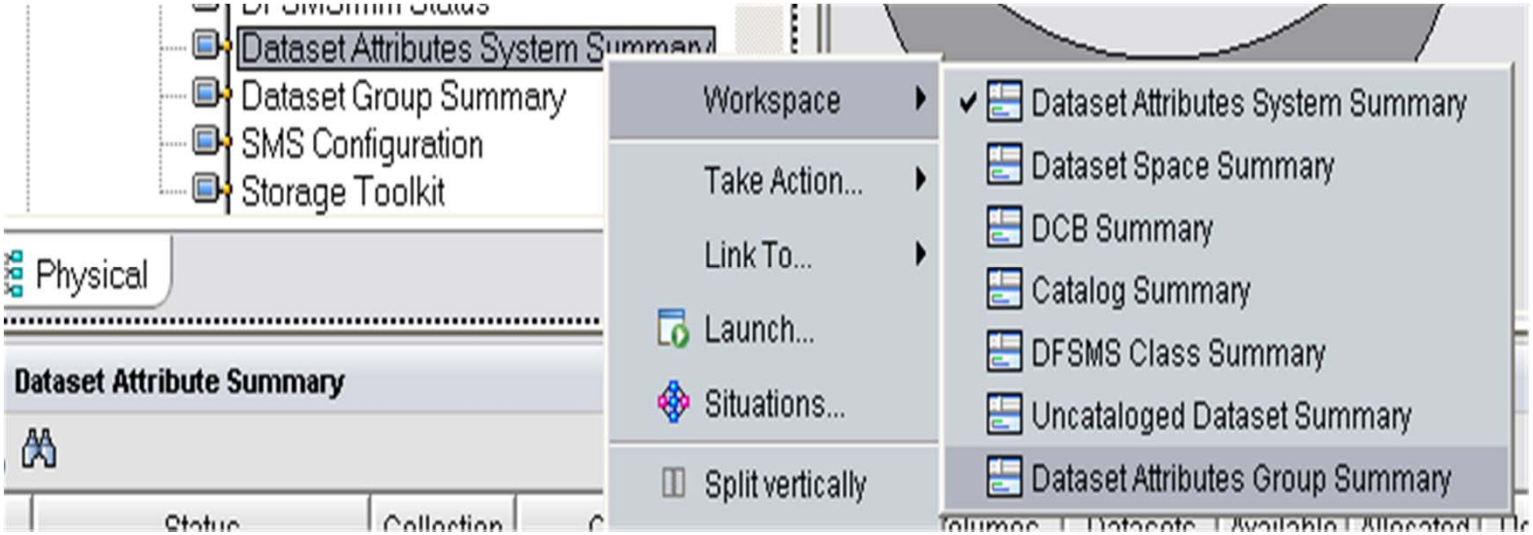
OMEGAMON XE for Storage
Version 420 Features

IF2 Dataset Attributes Group Summary Background information

Dataset Attributes Group Summary

Right click the Dataset attributes system Summary

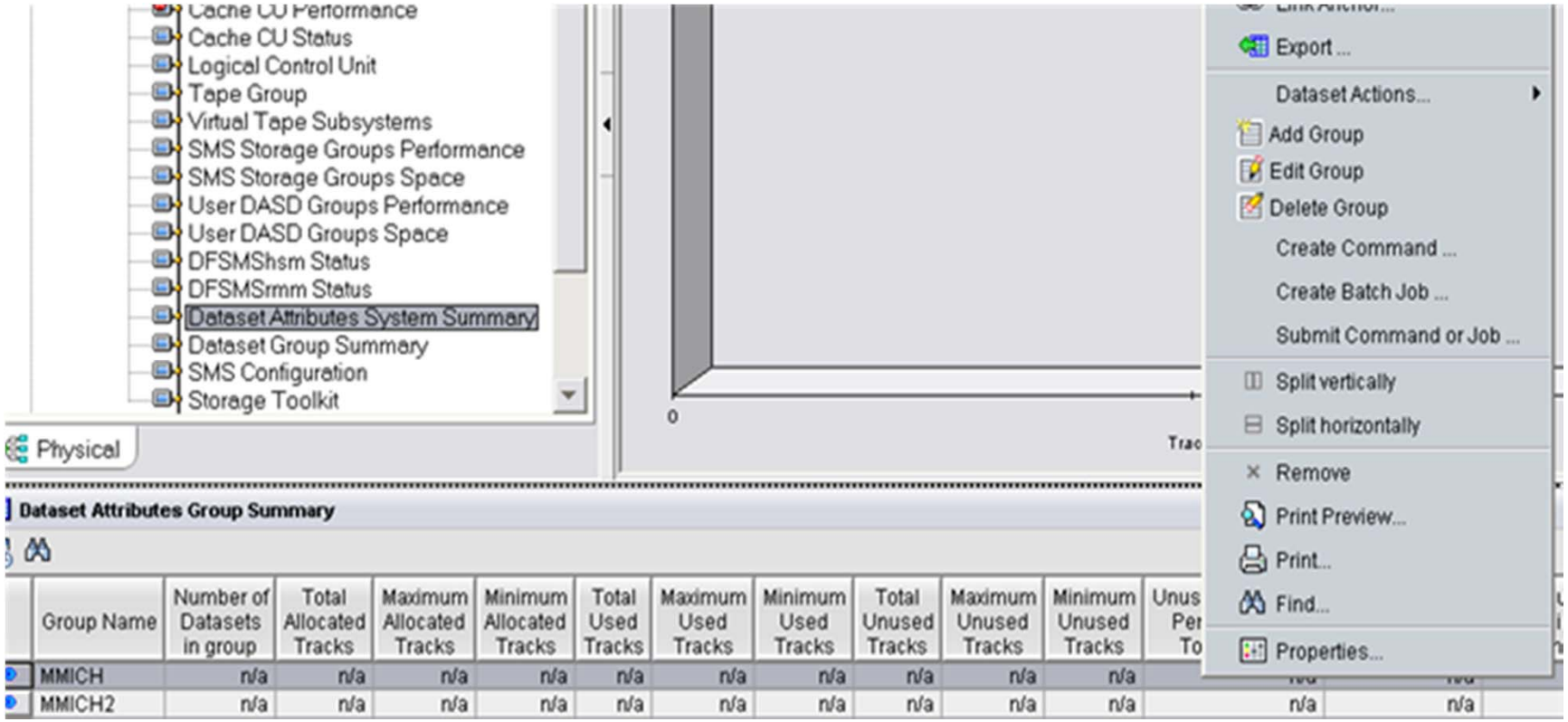
Navigator item and select the Dataset Attributes Group Summary



OMEGAMON XE for Storage
Version 420 Features

IF2 Dataset Attributes Group Summary Background information

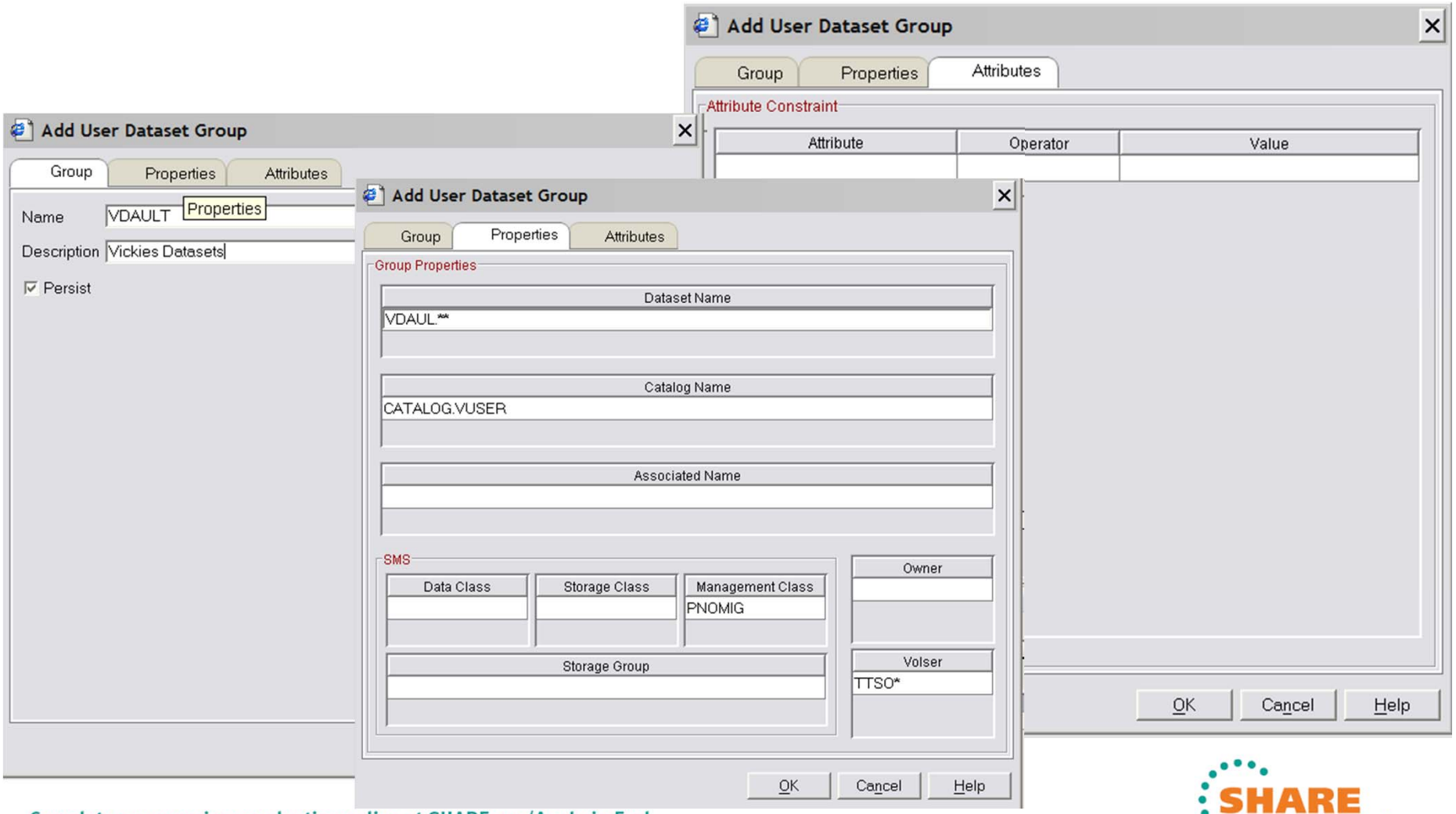
Dynamic Dataset Groups



OMEGAMON XE for Storage

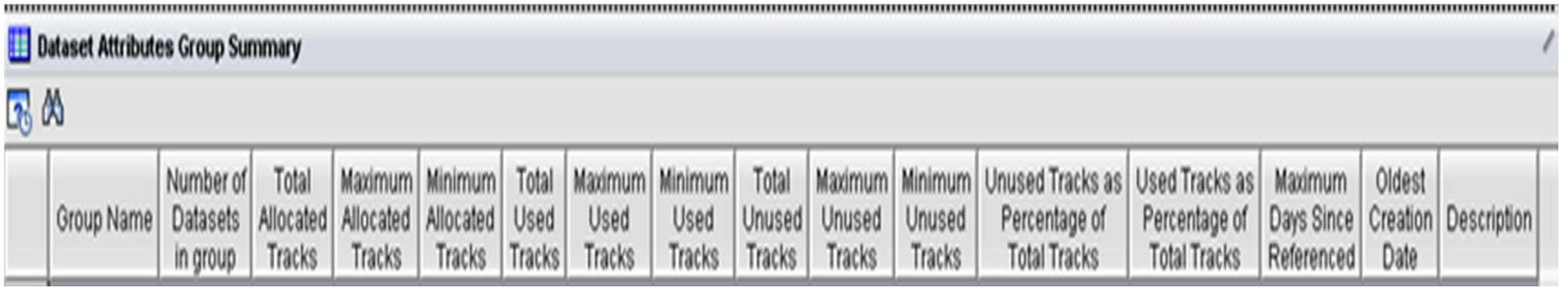
Version 420 Features

IF2 Dataset Attributes Group Summary and Dyanmic Dataset Groups



OMEGAMON XE for Storage
Version 420 Features
IF2 Dynamic Dataset Groups

Results returned in a new row



Storage toolkit actions available

link to details

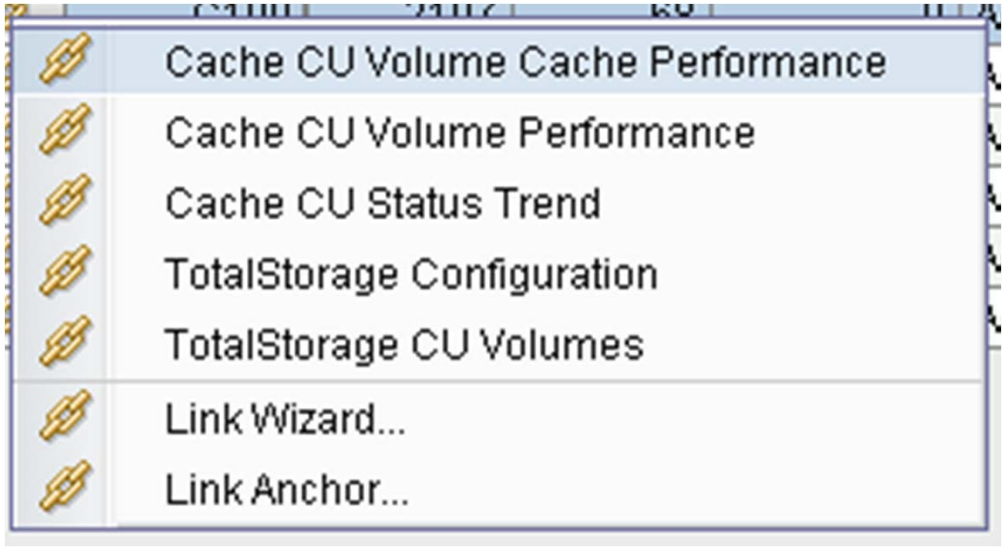
Situation monitoring

OMEGAMON XE for Storage
Version 420 Features

IF2 Hitachi DASD Support

Cache Control Unit Status Report

	Subsystem ID	Control Unit Type	Active Volumes	Deactivated Volumes	Cache Status	Cache MB Configured	Cache MB Available	NVS Status	NVS KB Configured	NVS KB Pinned	Storage Facility Series
	C000	2107	256	0	Active	13920.0	11127.9	Active	524288	0	DS8000
	C100	2107	68	0	Active	13920.0	11127.9	Active	524288	0	DS8000
	C200	2107	34	0	Active	13920.0	11127.9	Active	524288	0	DS8000
	C300	2107	24	0	Active	13920.0	11127.9	Active	524288	0	DS8000
	D000	2107	192	0	Active	1314.9	963.0	Active	131072	0	DS6000
	E000	2107	196	0	Active	1314.9	963.0	Active	131072	0	DS6000
	F000	2107	196	0	Active	1314.9	963.0	Active	131072	0	DS6000



OMEGAMON XE for Storage
Version 420 Features

Interim Feature 3

OMEGAMON XE for Storage
Version 420 Features

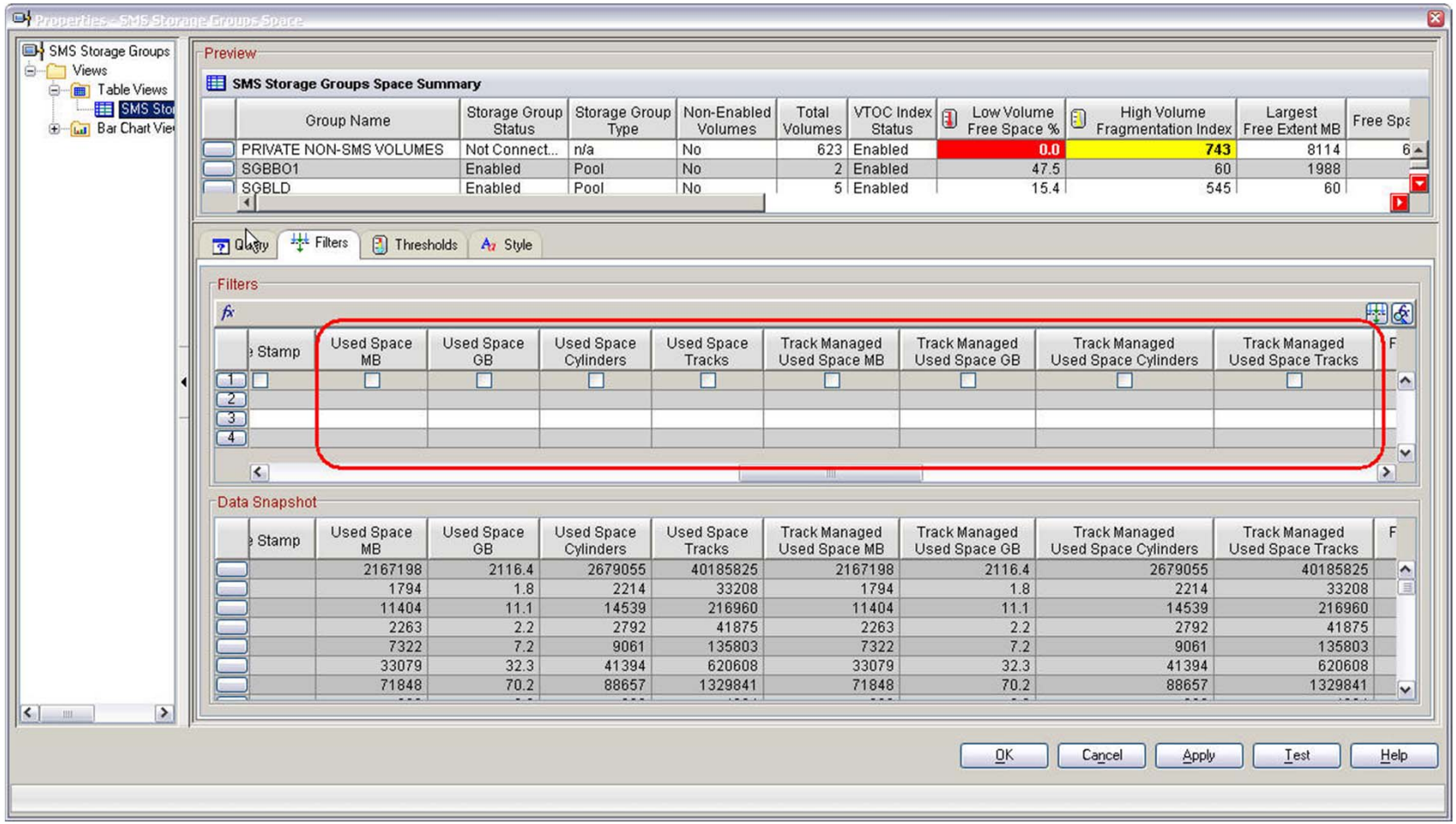
IF3 Used Space Statistics metrics

- Allows the user to see reports based upon metrics and units that they are comfortable with
  - Allows the user to view storage group and user dasd group used space metrics in cylinders, tracks, megabytes and gigabytes
- The cylinders, tracks, megabytes and gigabyte fields are filtered out by default, the user will need to change the filtering information if they prefer to see these fields

  SMS Storage Groups Space
  SMS Storage Groups Space Trend
  User DASD Groups Space
  User DASD Groups Space Trend

OMEGAMON XE for Storage
Version 420 Features

IF3 Used Space Statistics metrics Filtering



OMEGAMON XE for Storage
Version 420 Features

IF3 Used Space Statistics metrics Additional Attributes

Used Space Cylinders
Used Space Tracks
Used Space GB
Used Space MB

Track Managed Used Space Cylinders
Track Managed Used Space Tracks
Track Managed Used Space GB
Track Managed Used Space MB

OMEGAMON XE for Storage
Version 420 Features

IF3 TotalStorage Array Problem Detection

- Allows users to know when a raid rank is not performing due to a problem with an array so that they may take corrective action
- Allows users to be alerted via situations when an array has been identified as being in any of the following conditions:

Raid Degraded.	One or more array members need rebuilding
DDM Throttling.	A Near-line DDM in the array is throttling performance due to temperature or workload.
RPM Exception.	A DDM with an slower RPM than the normal array DDMs is a member of the array as a result of a sparing action.

OMEGAMON XE for Storage
Version 420 Features

IF3 TotalStorage Array Problem Detection Changed Workspaces

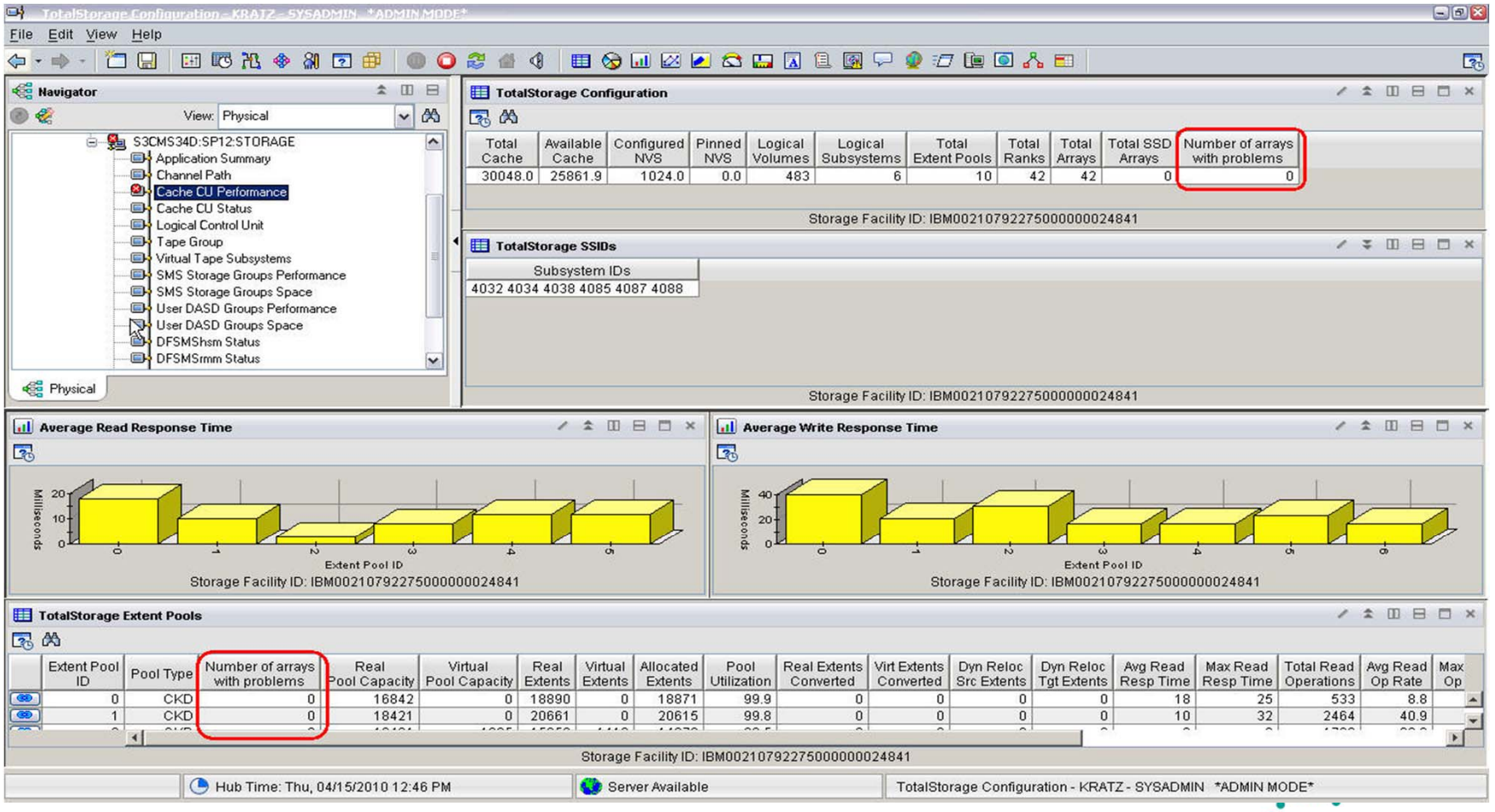
- TotalStorage Configuration
- TotalStorage Ranks
- TotalStorage Array Configuration
- TotalStorage Extent Pool Trend
- TotalStorage Ranks Trend
- TotalStorage Rank History

Situations for Direct Situation Analysis

- * KS3_TDS_Rank_Array_Prob_Crit
- * KS3_TDS_ExtPool_Array_Prob_Crit
- * KS3_TDS_Array_Prob_Crit

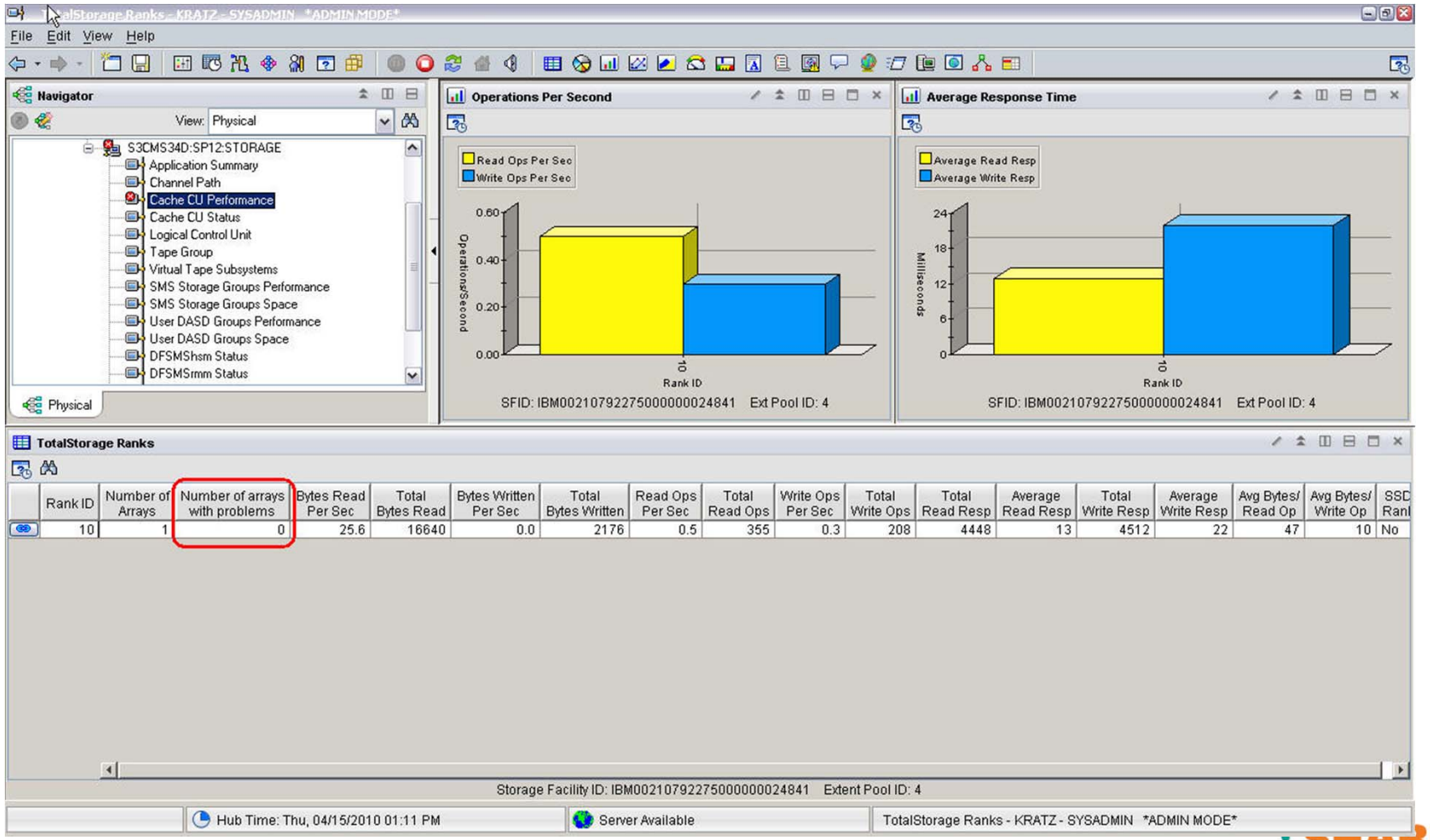
OMEGAMON XE for Storage
Version 420 Features

IF3 TotalStorage Configuration



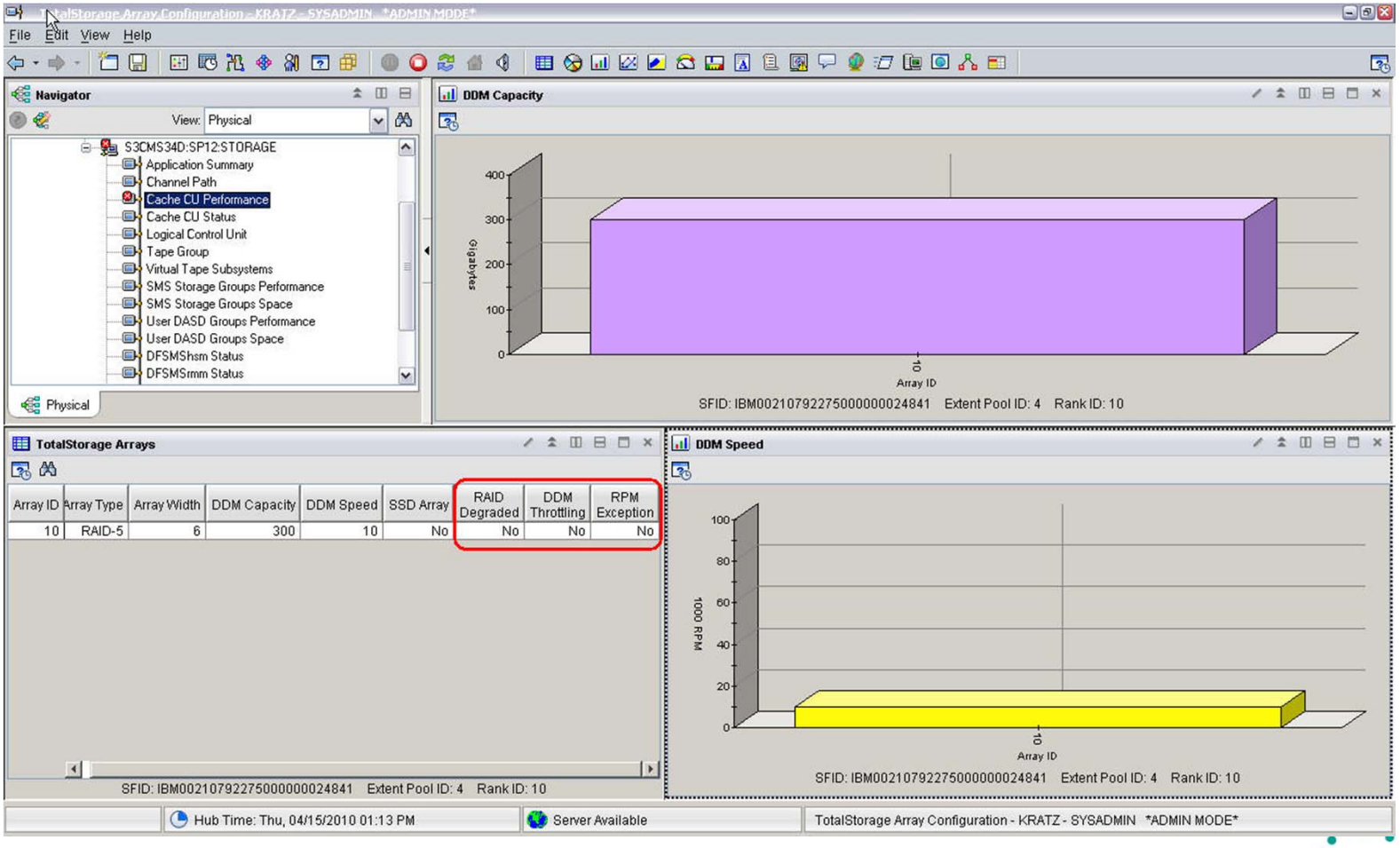
OMEGAMON XE for Storage
Version 420 Features

IF3 TotalStorage Ranks



OMEGAMON XE for Storage
Version 420 Features

IF3 TotalStorage Array Configuration



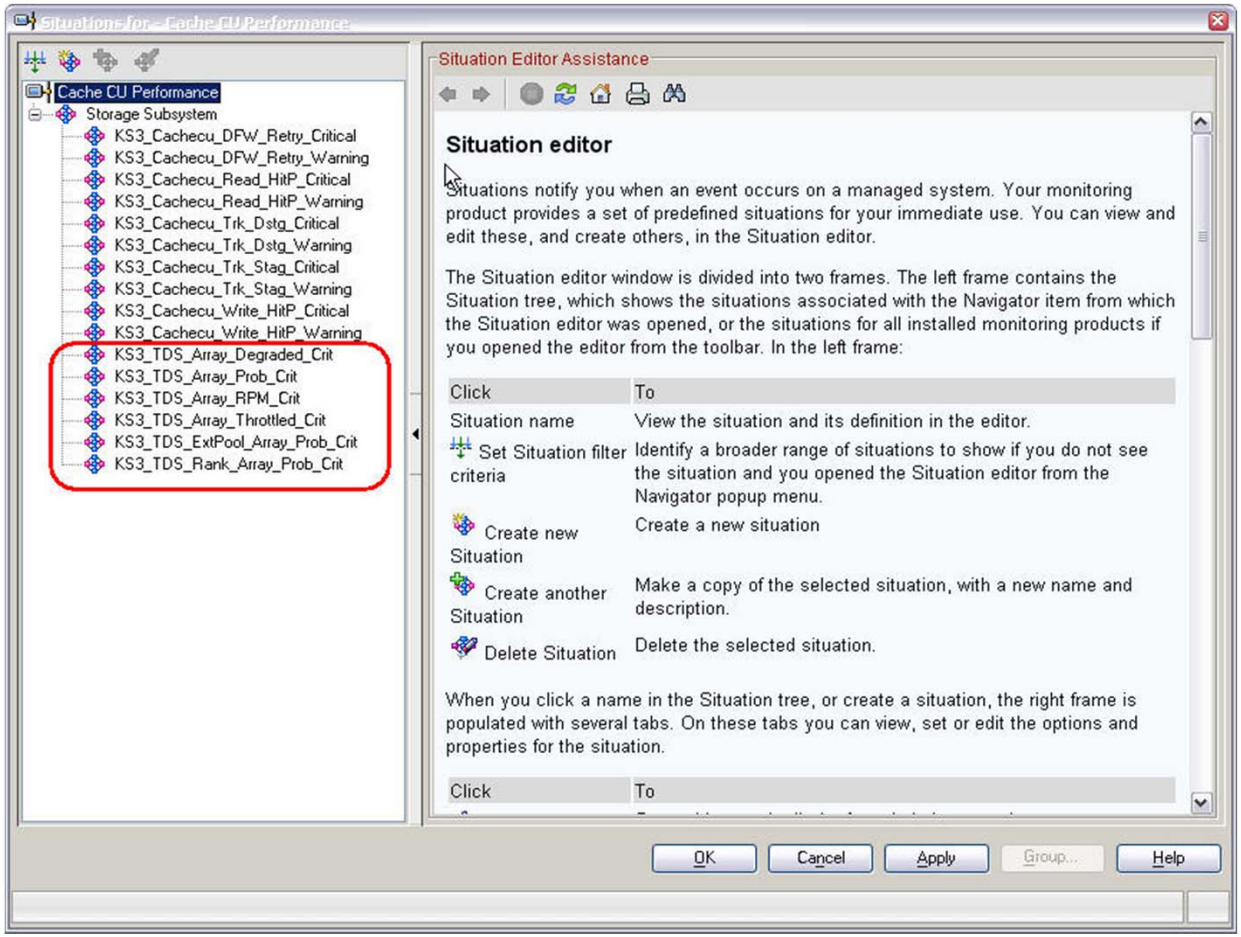
OMEGAMON XE for Storage
Version 420 Features

IF3 TotalStorage Problem Detection New Situations

- KS3_TDS_Array_Degraded_Crit
- KS3_TDS_Array_Throttled_Crit
- KS3_TDS_Array_RPM_Crit
- KS3_TDS_Rank_Array_Prob_Crit
  - Direct situation analysis link to TotalStorage Array Configuration
- KS3_TDS_ExtPool_Array_Prob_Crit
  - Direct situation analysis link to TotalStorage Ranks
- KS3_TDS_Array_Prob_Crit
  - Direct situation analysis link to TotalStorage Configuration

OMEGAMON XE for Storage
Version 420 Features

IF3 TotalStorage Problem Detection New Situations



OMEGAMON XE for Storage
Version 420 Features
IF3 MultiVolume Dataset Support

- Allow users to see multivolume datasets as a single entity rather than as multiple entities over multiple volumes so that they can properly assess the allocation of multivolume datasets

- Allows users to see accurate metrics that properly reflect multivolume datasets so that they can see the largest datasets on their system, not the largest on a single volume

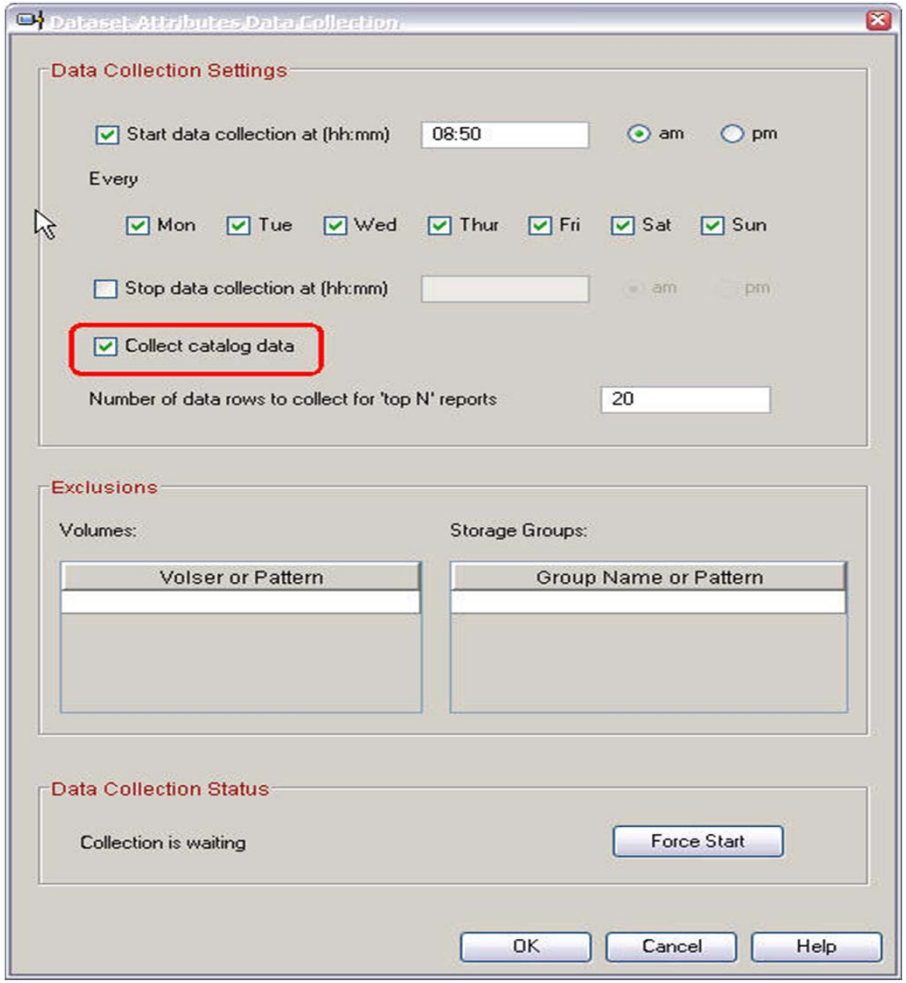
OMEGAMON XE for Storage
Version 420 Features

IF3 MultiVolume Dataset Support Changed Workspaces and Attributes

- * Multivolume Dataset Attribute Details
- Dataset Attributes System Summary
- Dataset Space Summary
- Largest Datasets in DSORG
- Largest Inefficient Blocksize Datasets
- Newborn Dataset Summary – Datasets 0 or 1 Day Old
- Mature Dataset Summary – Largest Datasets Unreferenced > 366 Days
- Largest Never Referenced Datasets
- Datasets in Catalog
- Largest Datasets in SMS Class
- Dataset Attributes Group Details

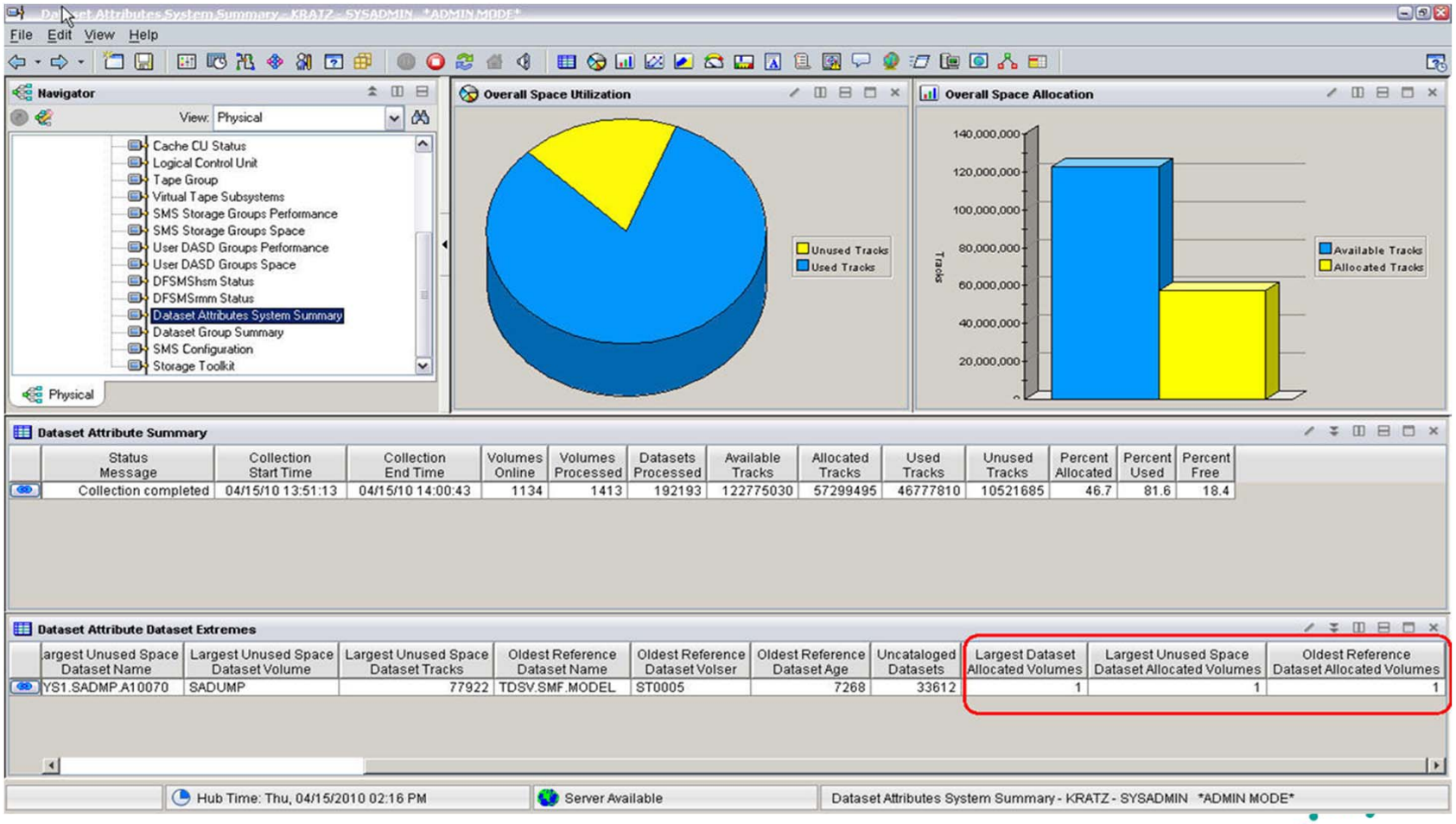
OMEGAMON XE for Storage
Version 420 Features

IF3 MultiVolume Dataset Support Dataset Attribute Dataset Collection



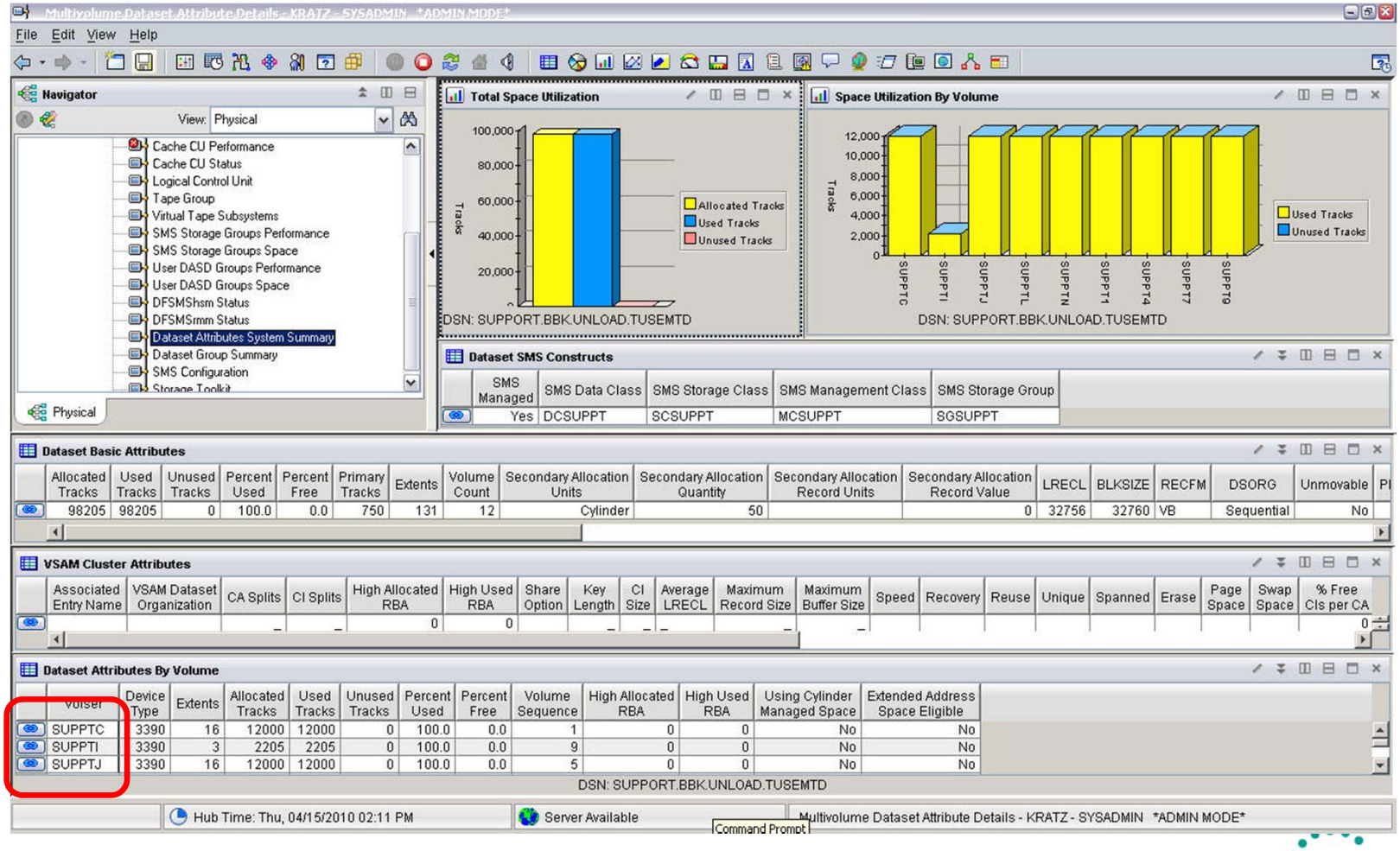
OMEGAMON XE for Storage
Version 420 Features

IF3 MultiVolume Dataset Support Dataset Attribute System Summary



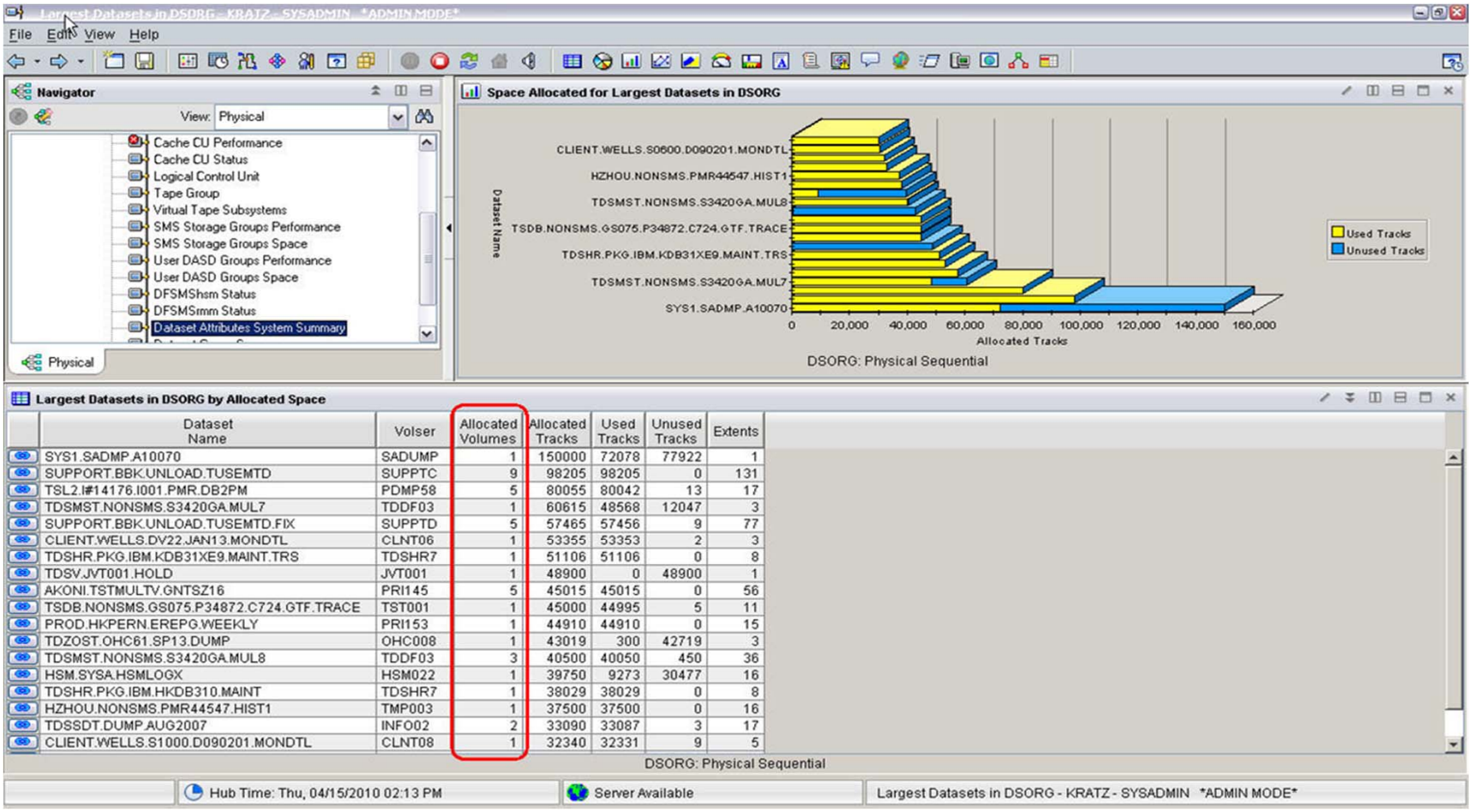
OMEGAMON XE for Storage
Version 420 Features

IF3 MultiVolume Dataset Support Dataset Attribute Dataset Details



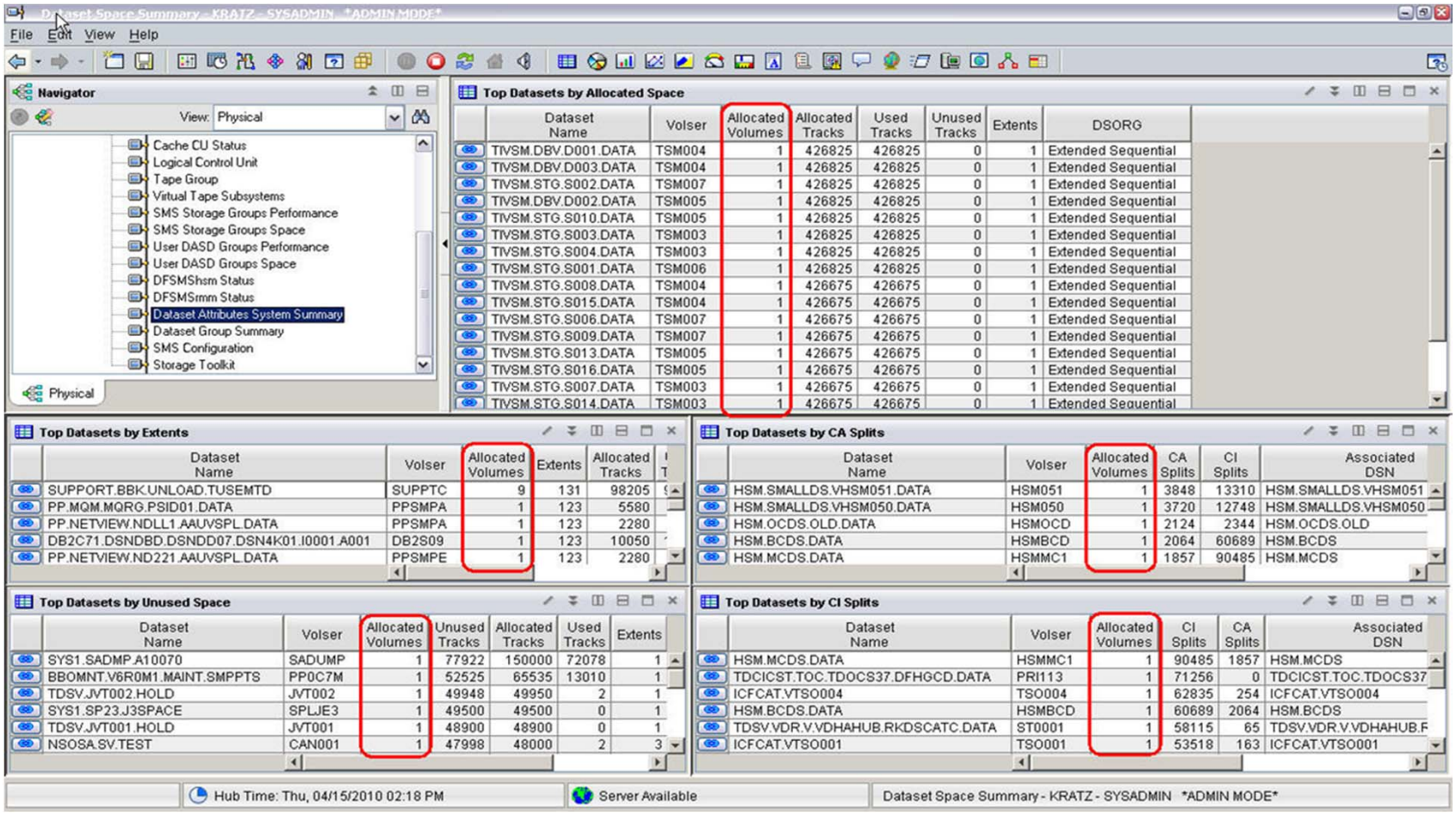
OMEGAMON XE for Storage
Version 420 Features

IF3 MultiVolume Dataset Support Dataset Attribute Largest DS DSORG



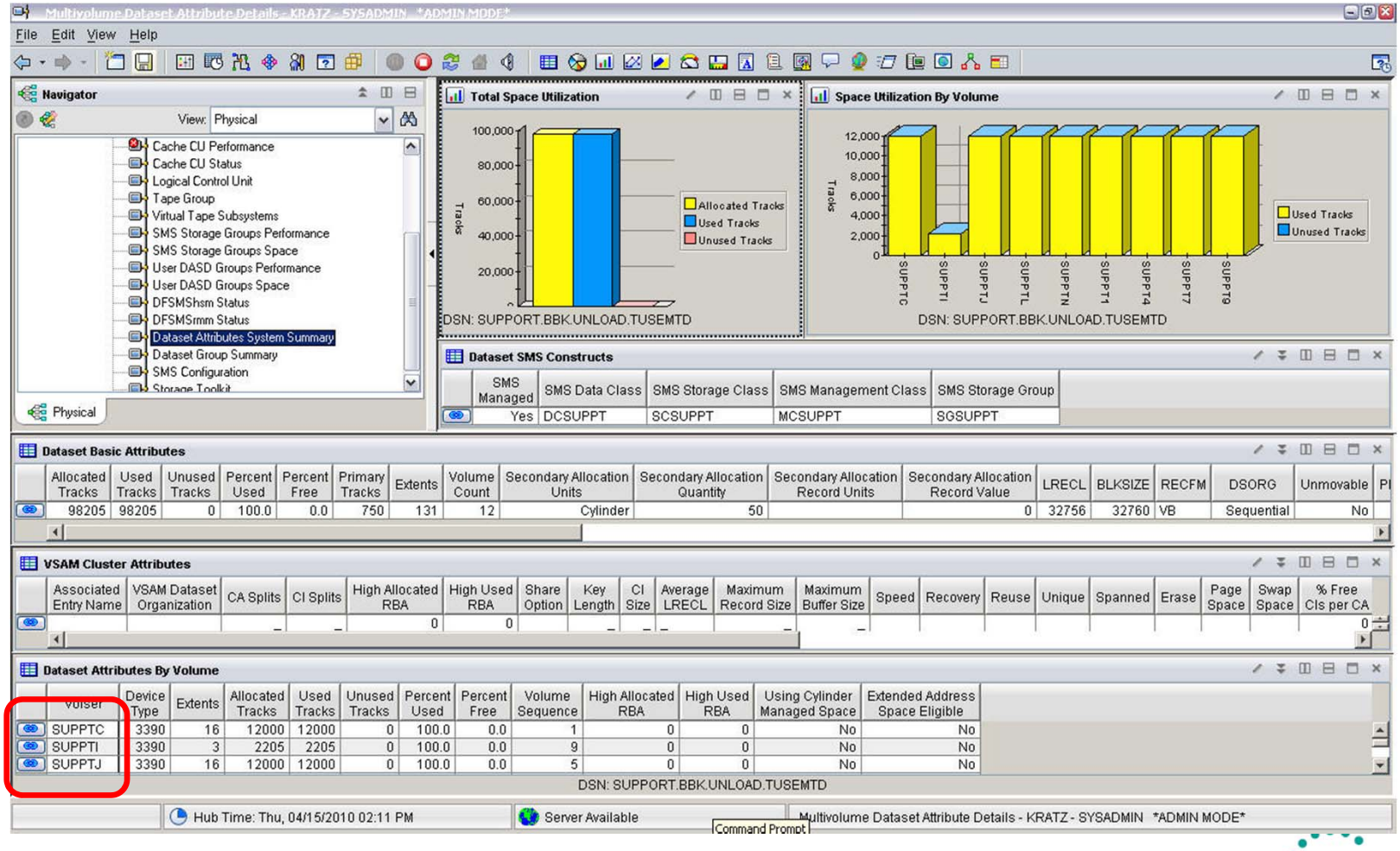
OMEGAMON XE for Storage
Version 420 Features

IF3 MultiVolume Dataset Support Dataset space Summary



OMEGAMON XE for Storage
Version 420 Features

IF3 MultiVolume Dataset Support Dataset Attribute Dataset Collection



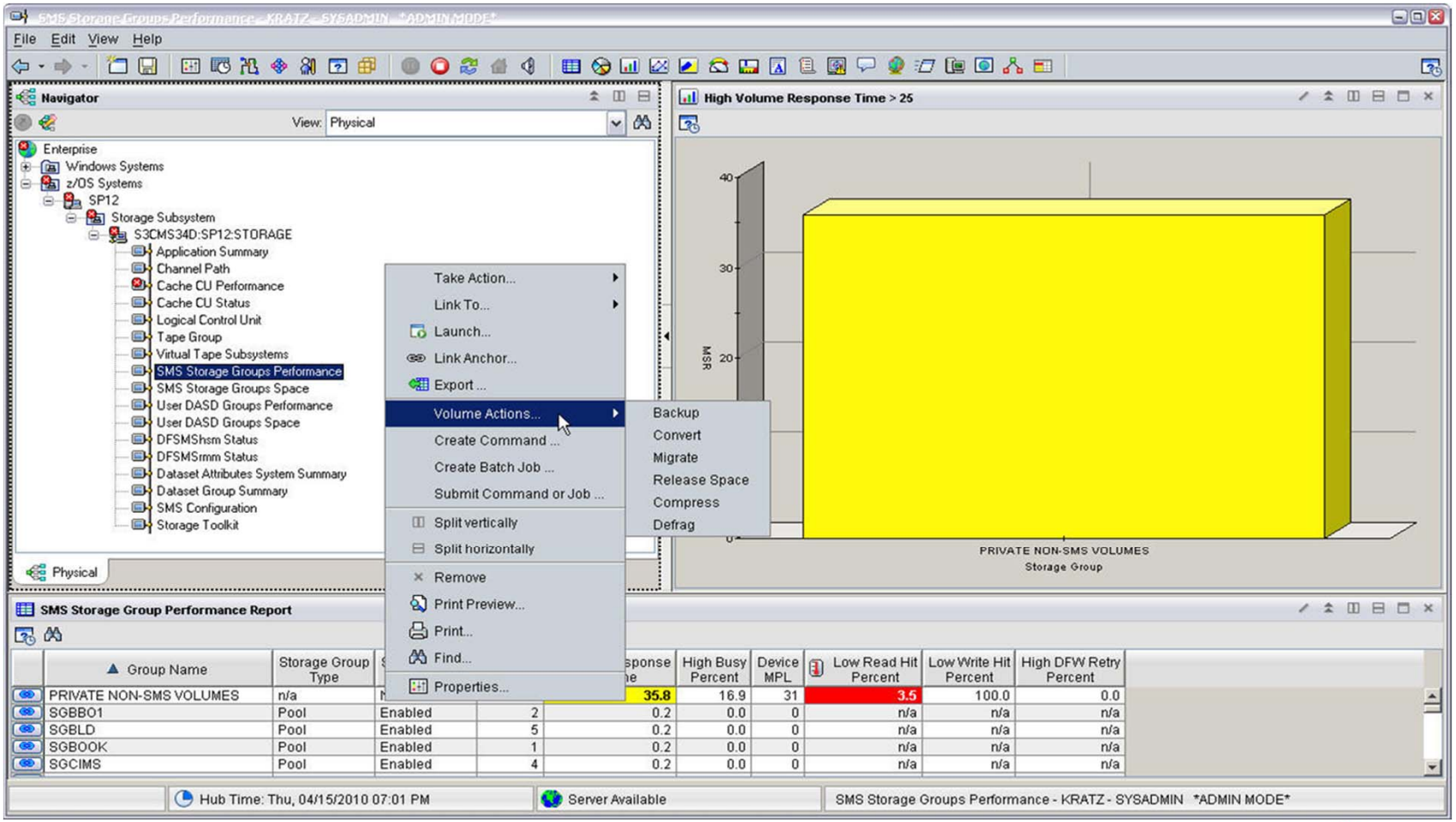
OMEGAMON XE for Storage
Version 420 Features

IF3 Group Level Storage Toolkit Commands

- Allow users to issue storage toolkit commands at the Storage Group, User DASD group and User Dataset Group levels for the volumes/datasets the group contain
    - SMS Storage Groups Performance
    - SMS Storage Groups Space
    - User DASD Groups Performance
    - User DASD Groups Space
    - Dataset Group Summary
    - Dataset Attributes Group Summary

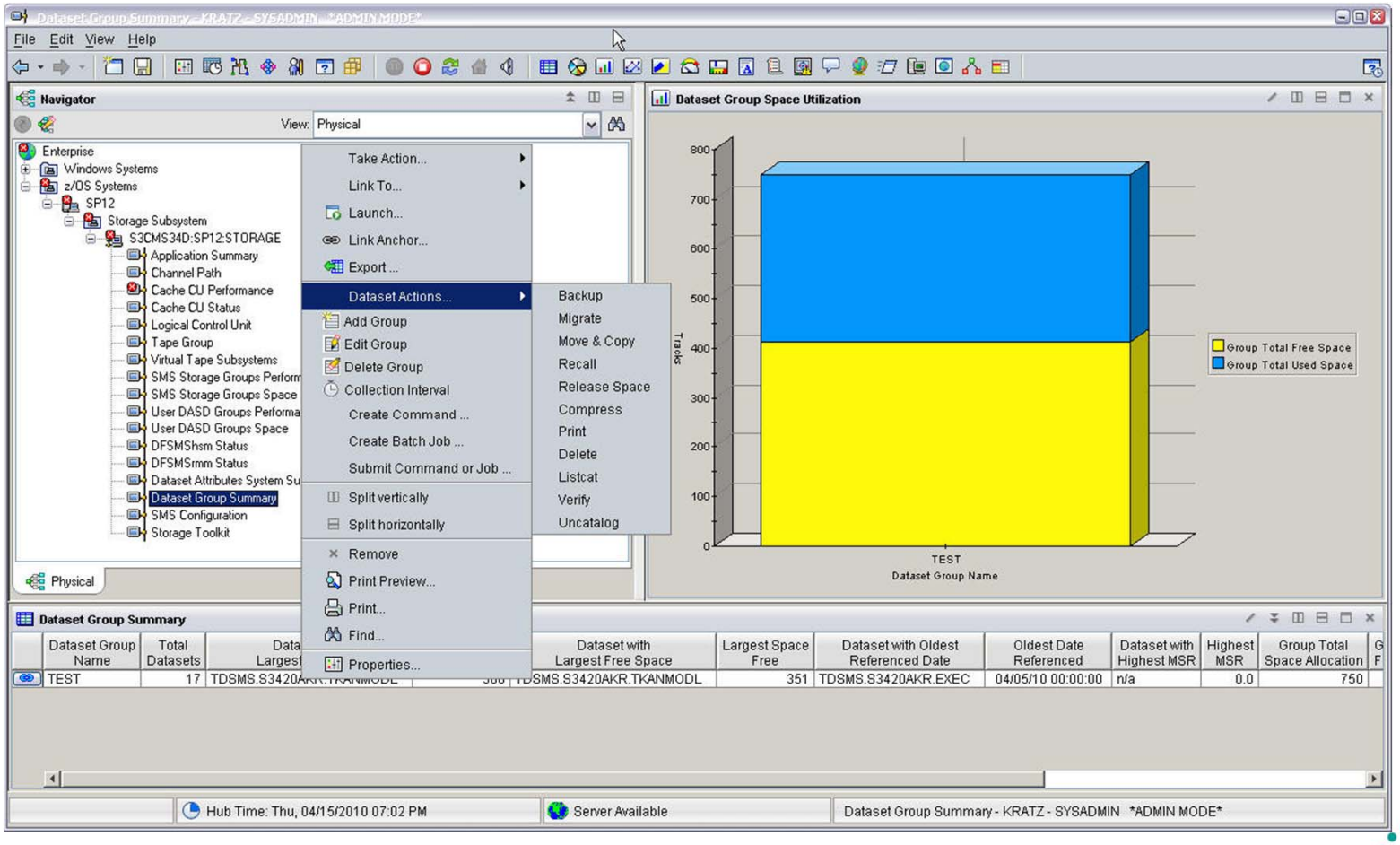
OMEGAMON XE for Storage
Version 420 Features

IF3 Group Level Storage Toolkit Commands Volume



OMEGAMON XE for Storage
Version 420 Features

IF3 Group Level Storage Toolkit Commands Datasets



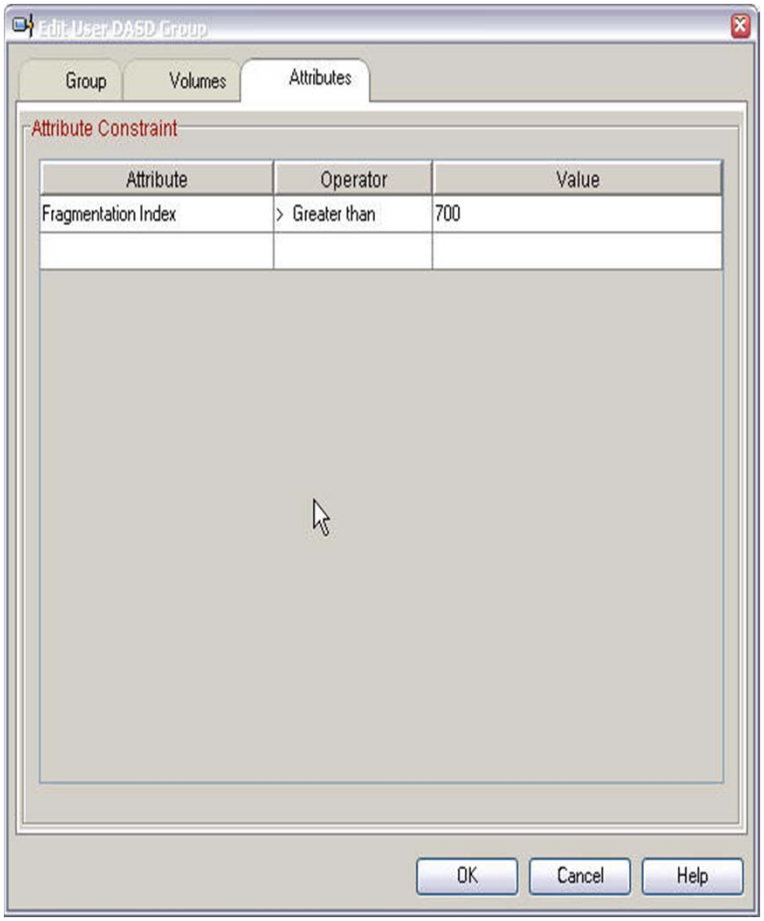
OMEGAMON XE for Storage
Version 420 Features

IF3 Group Level Storage Toolkit Commands Example

Problem to be solved:

User wants to run a daily defrag at 1:00 am on all volumes where the fragmentation index is greater than 700

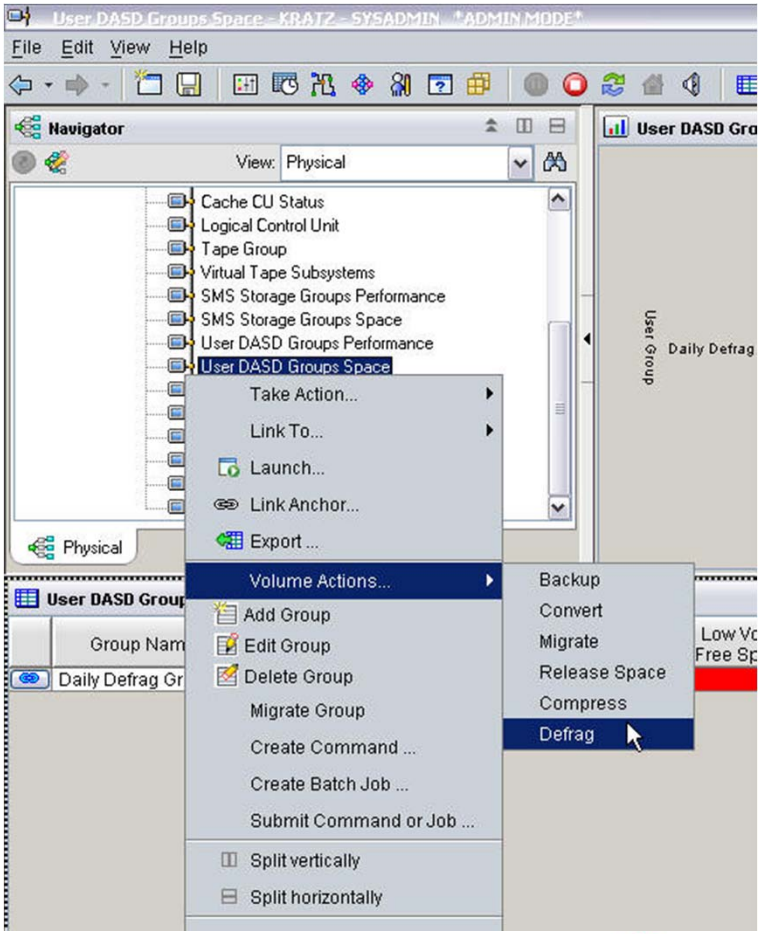
1) Go to the User DASD Space workspace
2) Create a group with the attributes shown on the right



OMEGAMON XE for Storage
Version 420 Features

IF3 Group Level Storage Toolkit Commands Example

3) Right click on row
4) Select Volume Actions -> Defrag

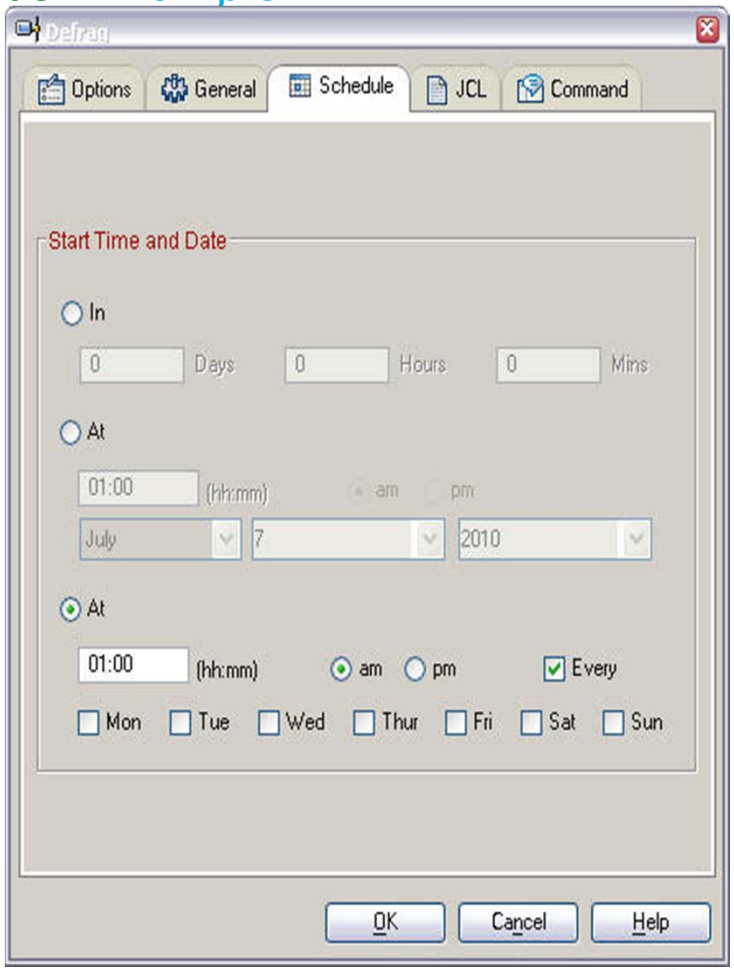


OMEGAMON XE for Storage
Version 420 Features

IF3 Group Level Storage Toolkit Commands Example

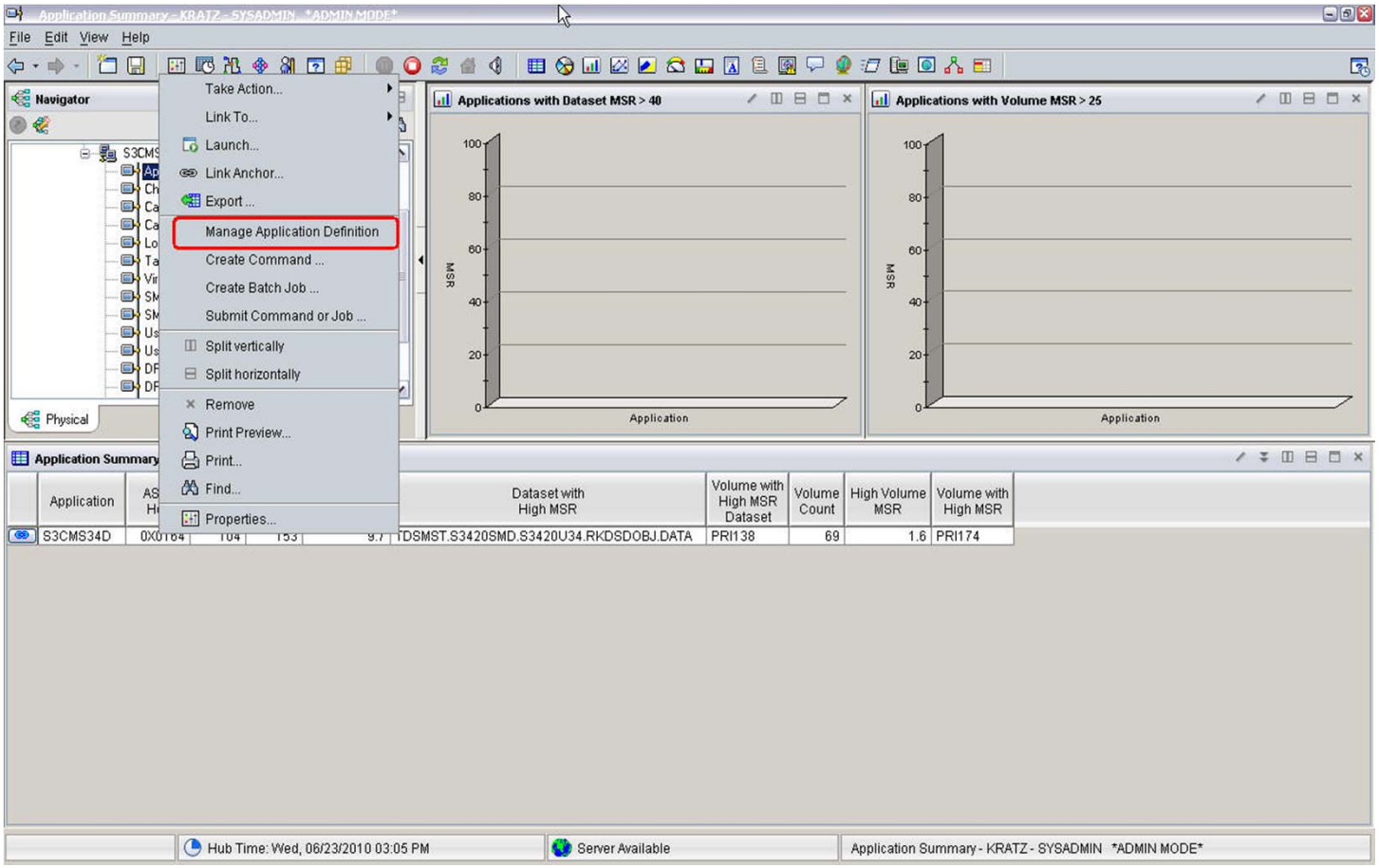
5) Schedule the command to run at 1:00 am each morning

6) When the commands runs at 1:00, the group will be evaluated at that time to see which volumes match the fragmentation index > 700 and run the defrag command against those volumes



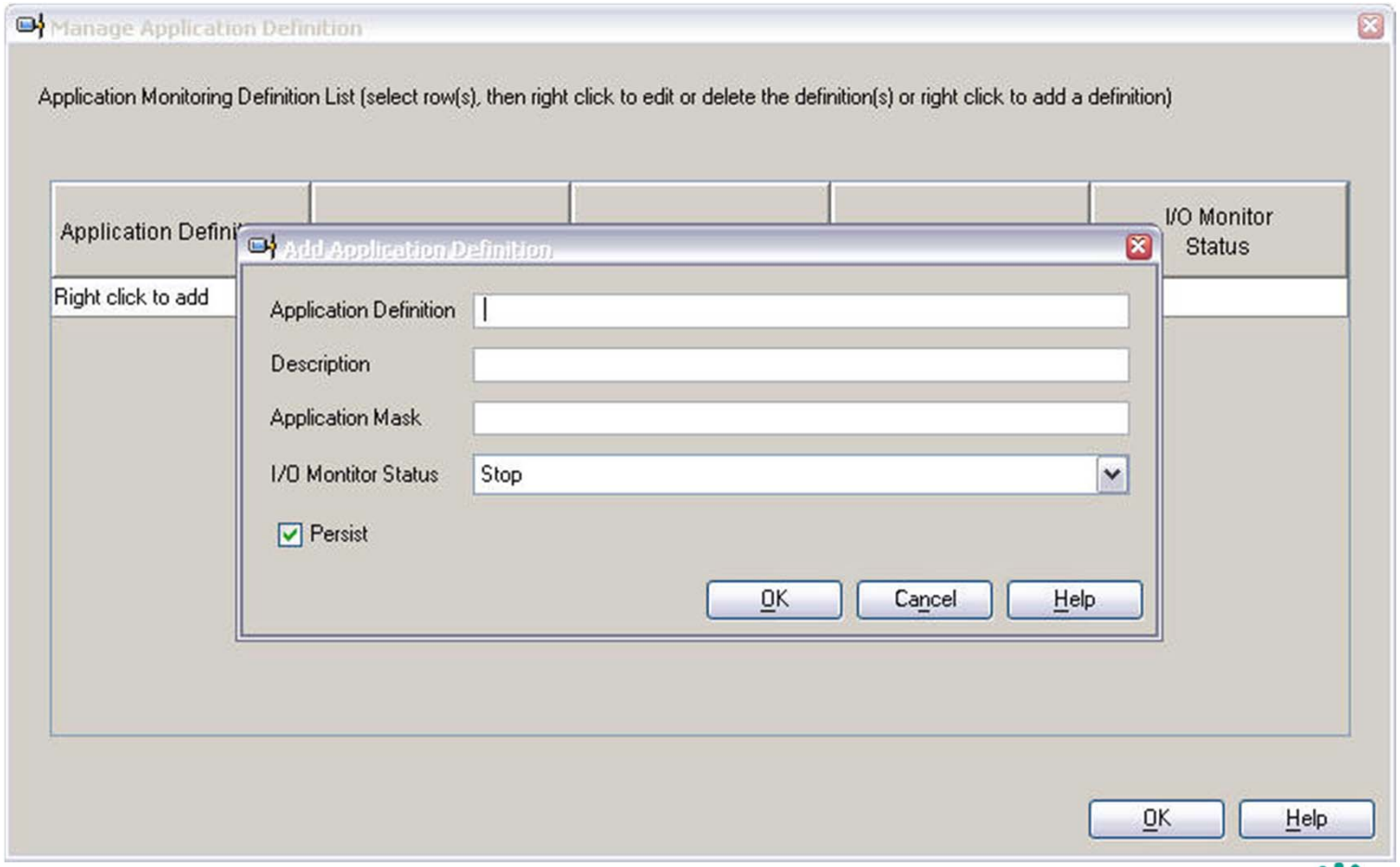
OMEGAMON XE for Storage
Version 420 Features

IF3 TEP Application Monitoring definitions



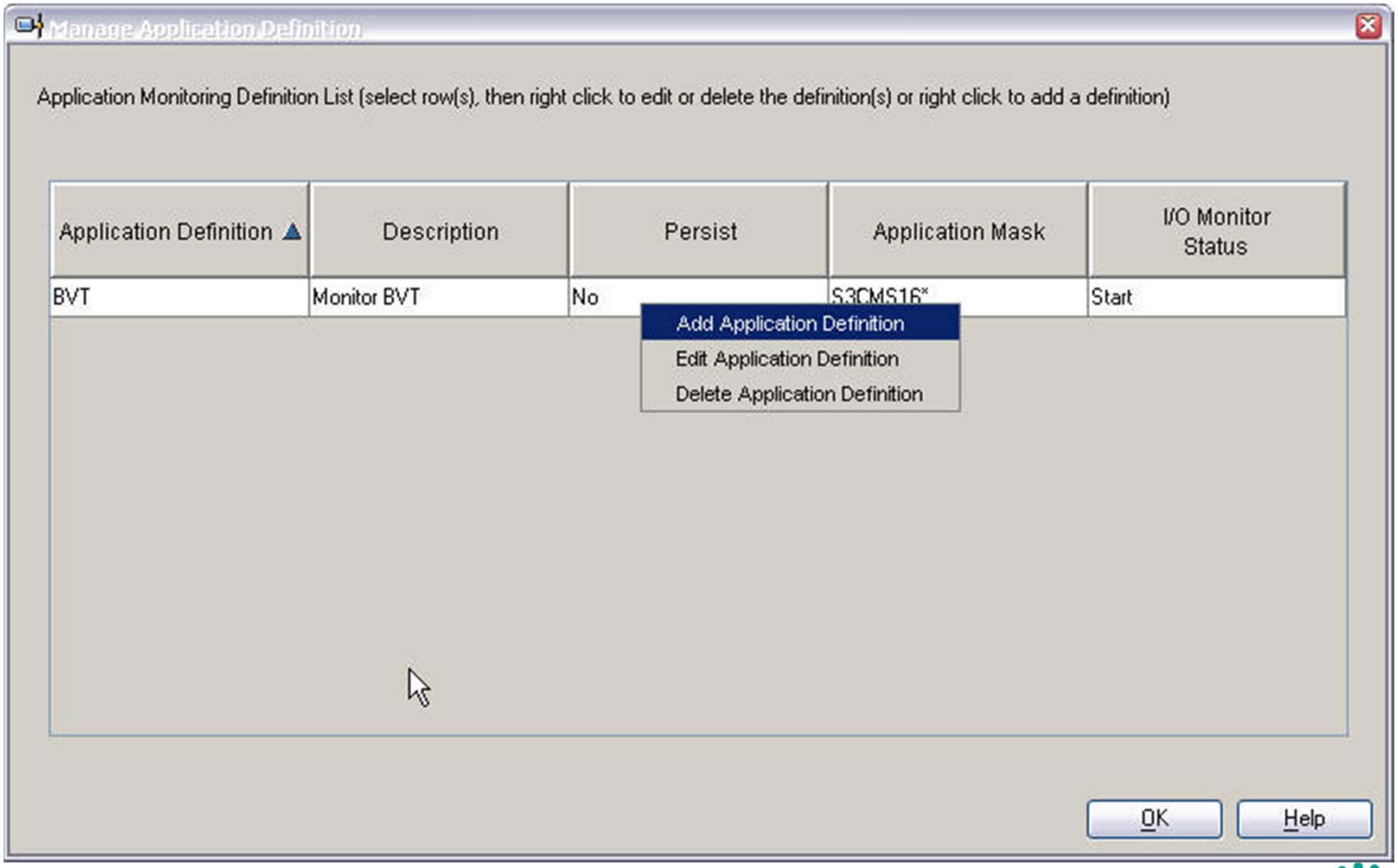
OMEGAMON XE for Storage
Version 420 Features

IF3 TEP Application Monitoring definitions Add Application



OMEGAMON XE for Storage
Version 420 Features

IF3 TEP Application Monitoring definitions Modify Edit Delete Application



OMEGAMON XE for Storage
Version 420 Features

IF3 DFSMShsm Common Recall Queue

- Allow users to monitor the DFSMShsm common recall queue.
- Allow users to view the recall activity within an HSMplex from any OM XE Storage attached to the HSMplex so the user can quickly identify the general health and detailed activity of the function for better management capability.
- Allow users to see summarization information about the requests on the common recall queue to quickly assess health.
- Allow users to see configuration information about the DFSMShsm common queue to quickly identify if there is a problem or could be a potential problem.
- Allow users to monitor the status of individual requests on the queue and attached DFSMShsm address spaces servicing these requests, so that they can see which DFSMShsm is processing the request for better management and problem analysis capability.
- Allow users to see configuration information about the DFSMShsm common queue on a single new workspace so that they can easily understand the health of the common queue.
- Allow users to see common recall queue activity information in a single view so that they can follow the workflow.

OMEGAMON XE for Storage
Version 420 Features

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OMEGAMON XE for Storage
Version 420 Features

IF3 DFSMShsm Common Recall Queue

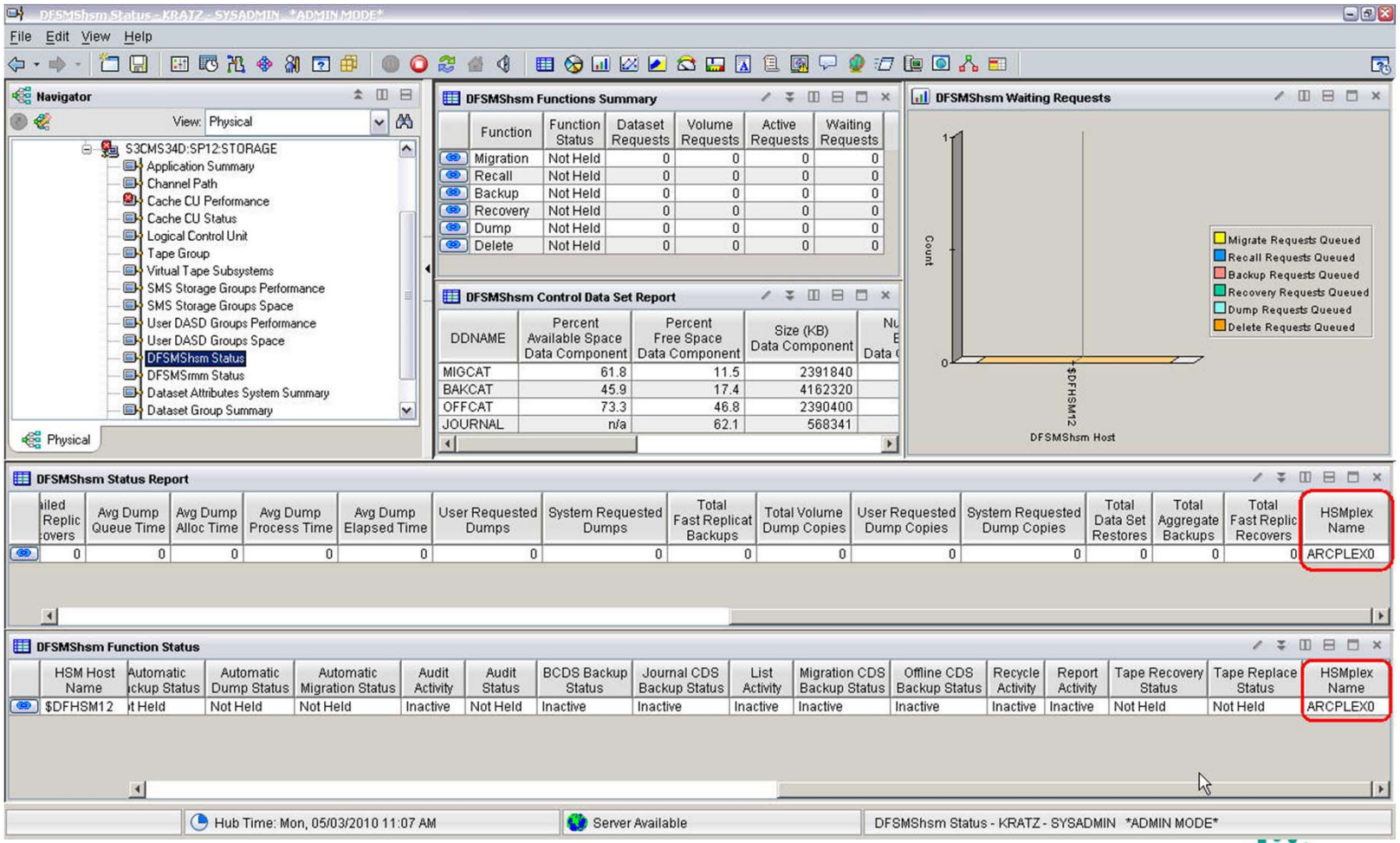
- DFSMShsm Status
- DFSMShsm Host Details
- * HSMplex CRQplex Details
- * CRQplex Details
- * CRQplex Requests

Situation workspaces for Direct Situation Analysis

- * KS3_HSM_CRQ_Host_Critical
- * KS3_HSM_CRQ_Host_Held_Critical
- * KS3_HSM_CRQ_Host_Recall_Crit
- * KS3_HSM_CRQ_Host_Place_Crit
- * KS3_HSM_CRQ_Host_Select_Crit
- * KS3_HSM_CRQ_Host_Disconn_Crit
- * KS3_HSM_CRQ_Entry_Full_Warning
- * KS3_HSM_CRQ_Element_Full_Warn

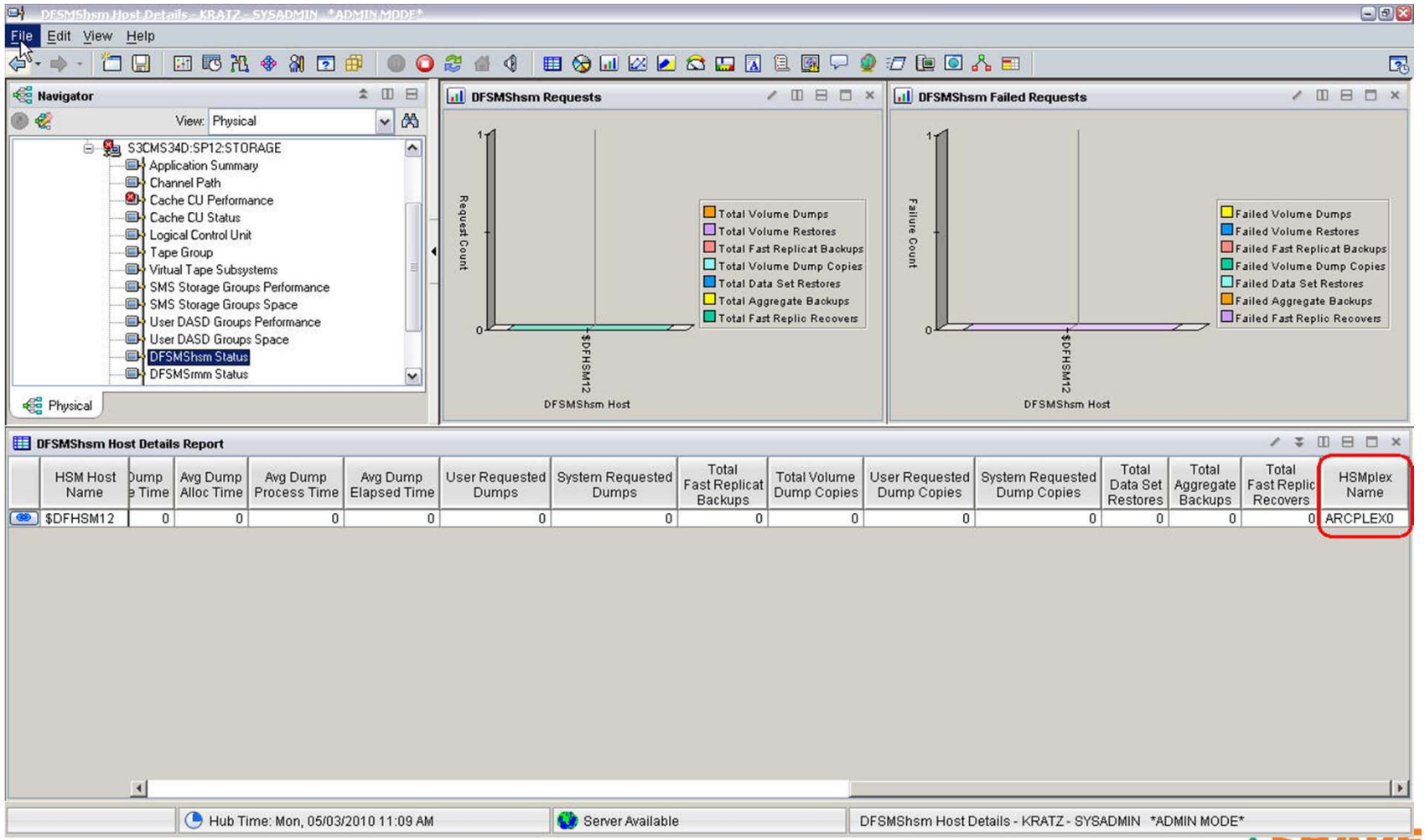
OMEGAMON XE for Storage
Version 420 Features

IF3 DFSMShsm Common Recall Queue DFHSM Status



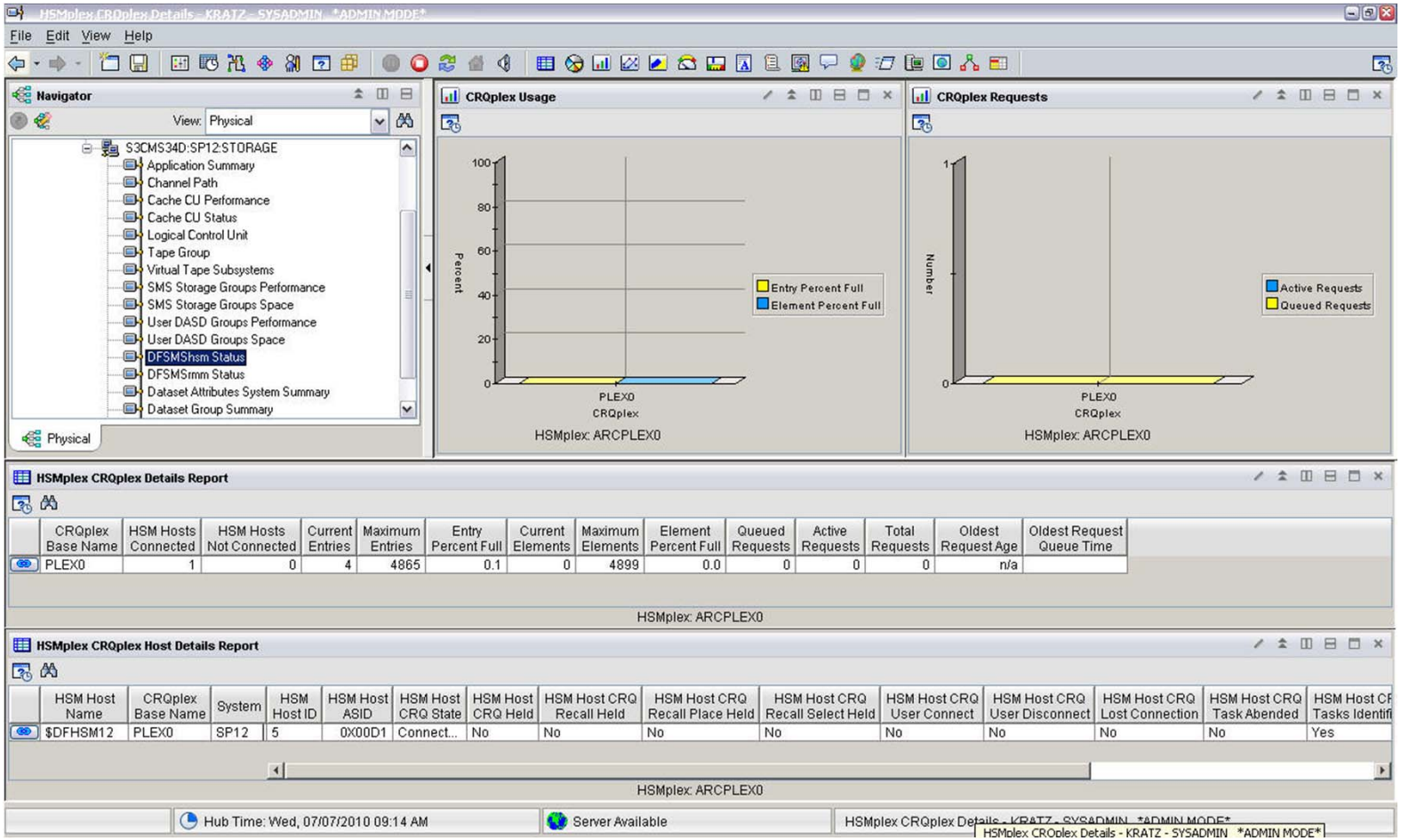
OMEGAMON XE for Storage
Version 420 Features

IF3 DFSMShsm Common Recall Queue DFHSM Host Details



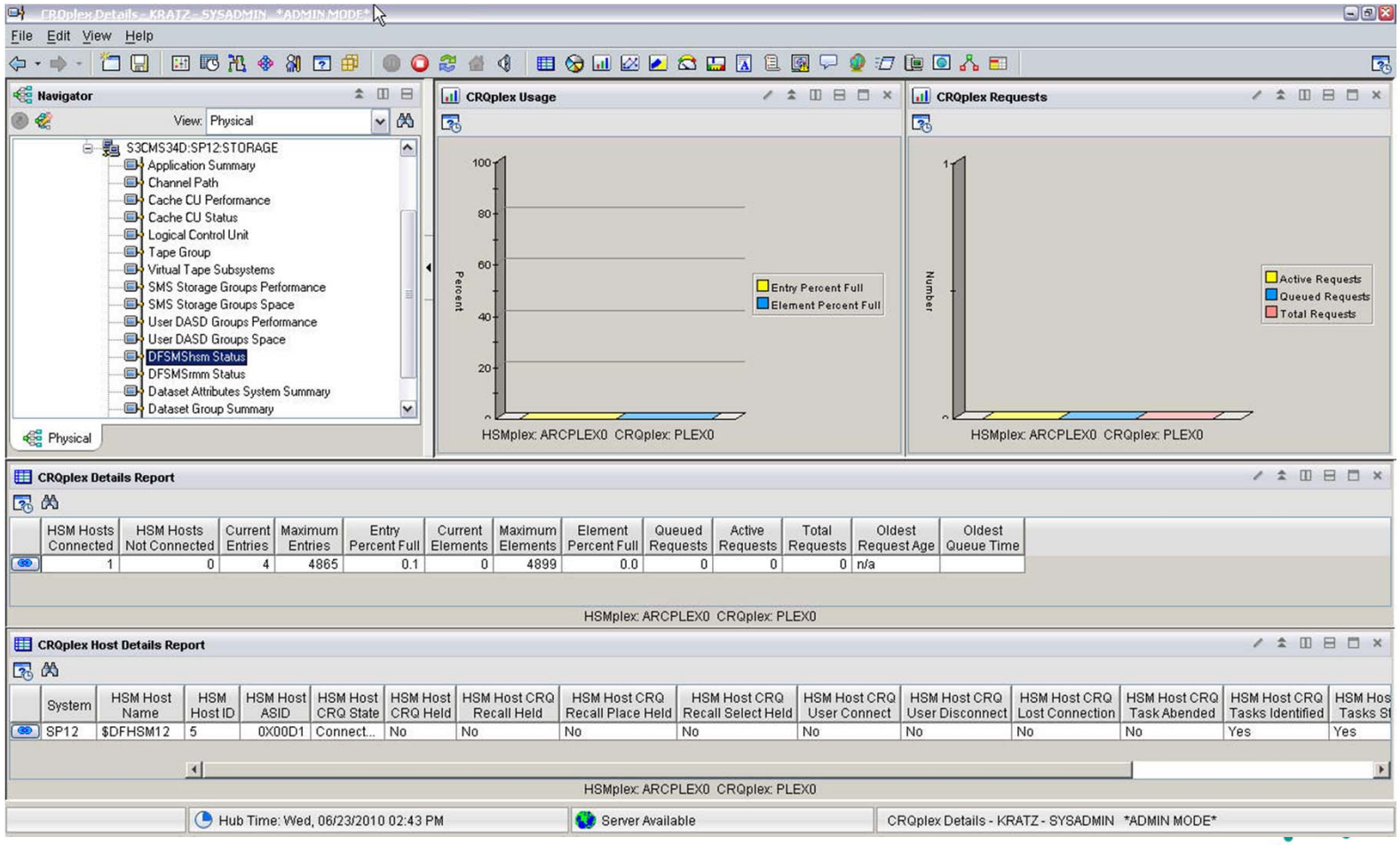
OMEGAMON XE for Storage
Version 420 Features

IF3 DFSMShsm Common Recall Queue HSMplex CRQPLEX Details



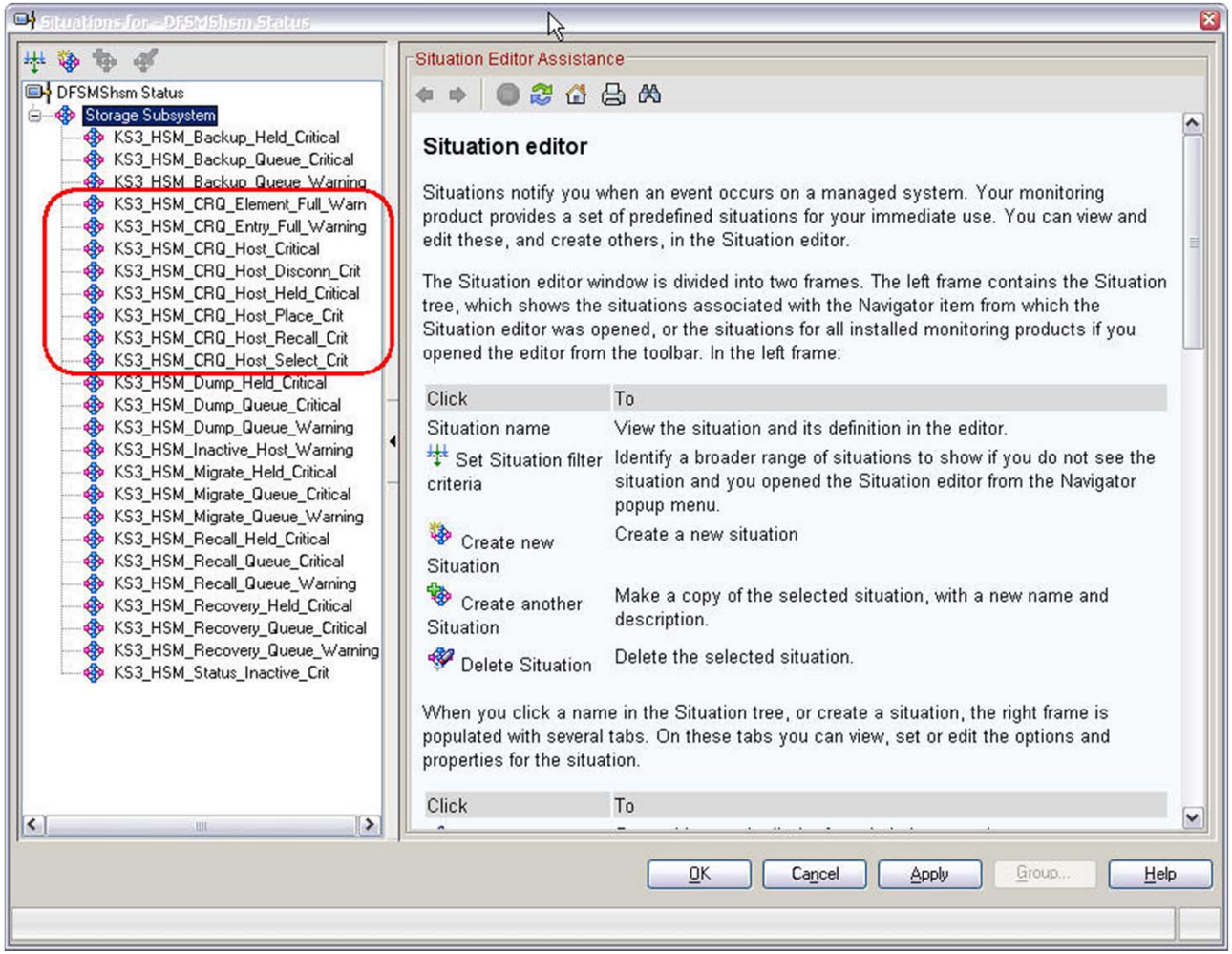
OMEGAMON XE for Storage
Version 420 Features

IF3 DFSMShsm Common Recall Queue CRQplex Requests



OMEGAMON XE for Storage
Version 420 Features

IF3 DFSMShsm Common Recall Queue problem Detection



OMEGAMON XE for Storage
Version 420 Features

Interim Feature 4

OMEGAMON XE for Storage
Version 420 Features

IF4 Storage Toolkit Take Action in Situation Definitions

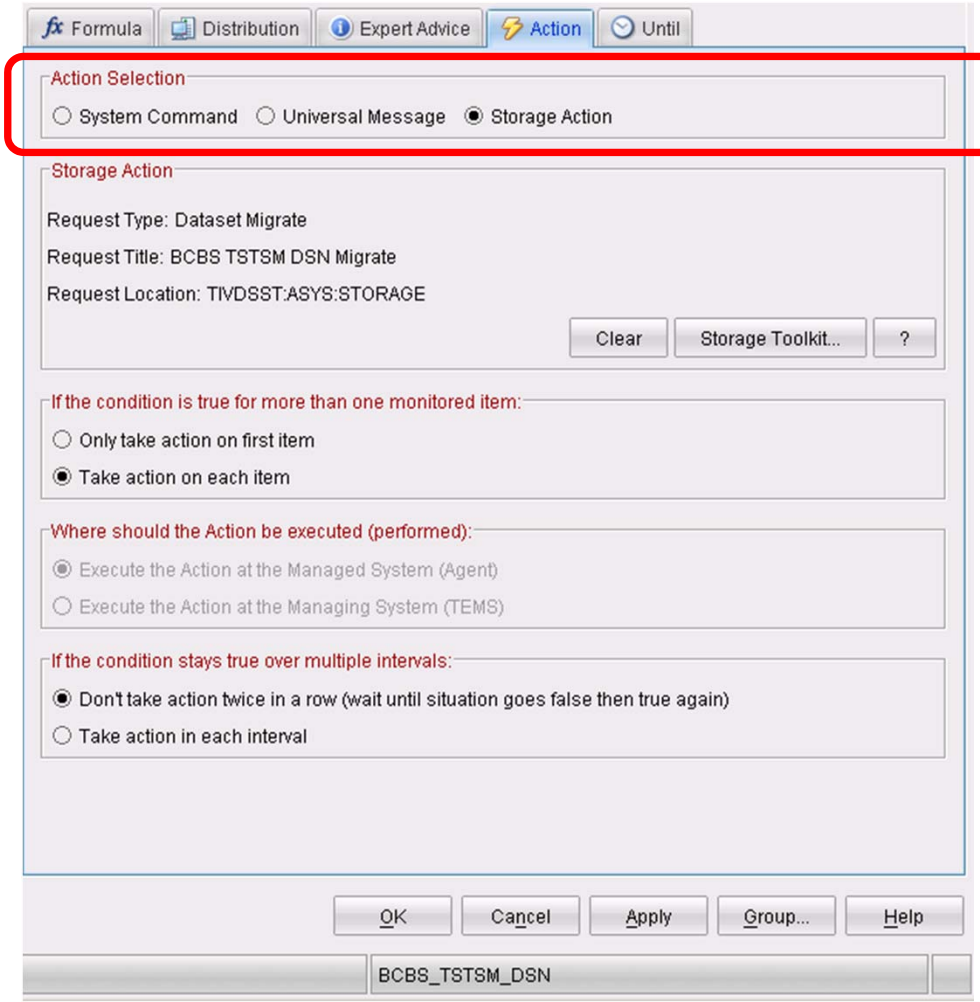
Situation Take Action extended beyond
SYSTEM COMMANDS and UNIVERSAL MESSAGES

STORAGE TOOLKIT

Allows for the Volume, Dataset, BATCH JOB and Command when a Situation becomes TRUE

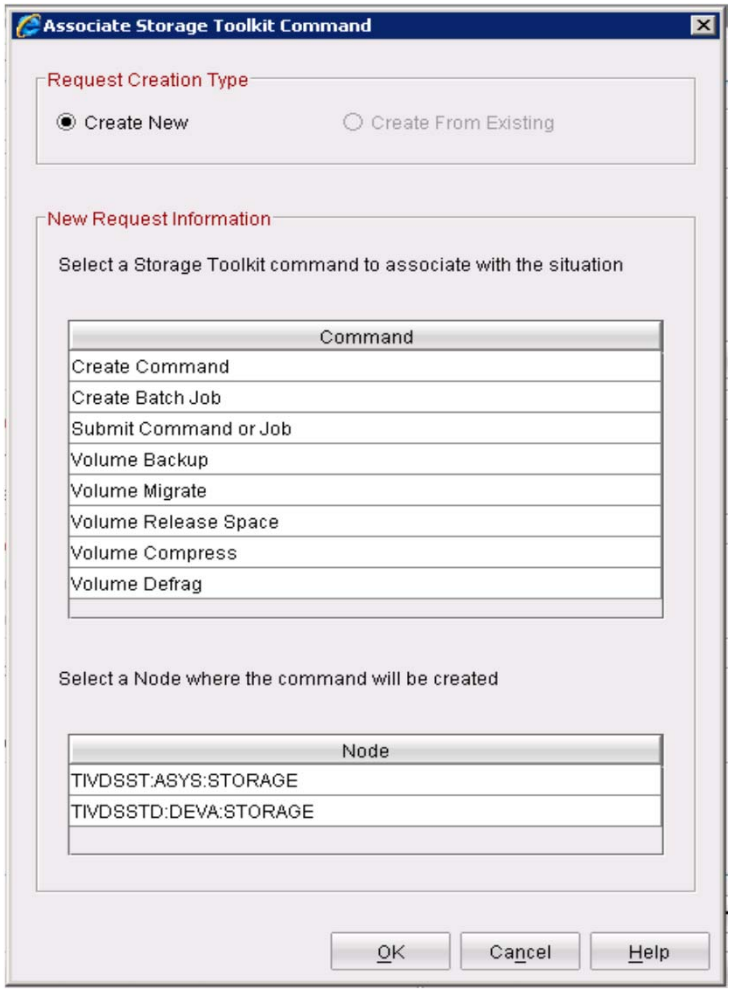
OMEGAMON XE for Storage
Version 420 Features

IF4 Storage Toolkit Take Action in Situation Definitions



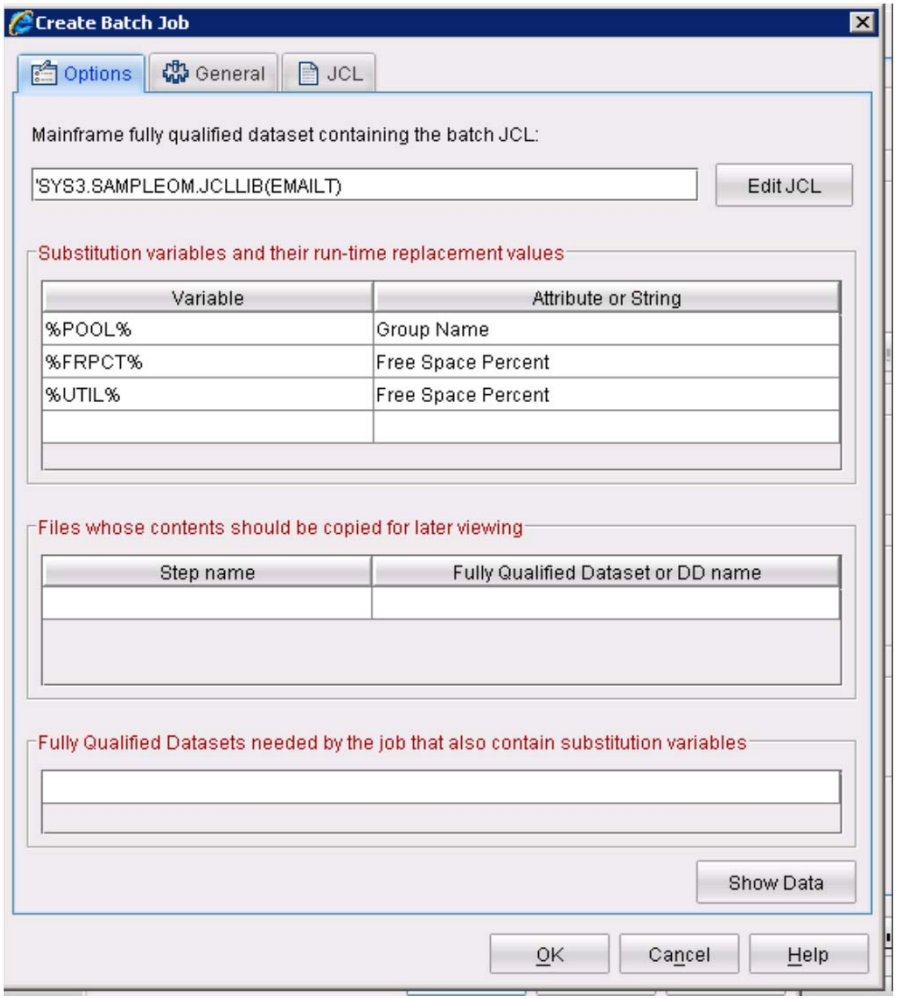
OMEGAMON XE for Storage
Version 420 Features

IF4 Storage Toolkit Take Action in Situation Definitions



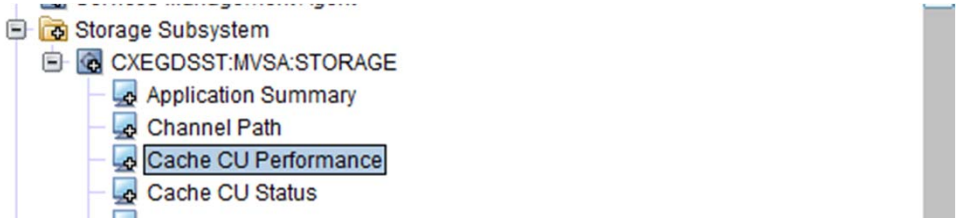
OMEGAMON XE for Storage
Version 420 Features

IF4 Storage Toolkit Take Action in Situation Definitions



OMEGAMON XE for Storage
Version 420 Features
IF4 Hitachi Data Systems Devices

- Monitoring for Hitachi Data Systems type 2107 devices



OMEGAMON XE for Storage
Version 420 Features

IF4 ORACLE (SUN/STK) VSM support

Support for STK tape devices: STK tape devices, real and virtual, had been contained as part of the generic tape groups identified by tape device model. This enhancement results in STK VTSs and LSMs being identified by a row in the Tape Group Workspace. STK tape devices are displayed as being in the STK group rather than in the generic tape groups.

Tivoli Data Warehouse Enhancements

OMEGAMON XE for Storage
Version 420 Features

More Data in the Tivoli Data Warehouse support

- BASE Product
  - No New Attributes
- IF0001
  - Channel Path
  - Cache Control unit
  - Logical control unit
  - Volume Group Summary

OMEGAMON XE for Storage
Version 420 Features

IF1 More Attribute Groups in the Tivoli Data Warehouse TDW

Channel Path
Cache control Unit
Logical control Unit
Volume Group Summary

By moving historical trending into the Tivoli Data Warehouse
Summarization and Pruning are now available

Be careful to match history collection to RMF interval

OMEGAMON XE for Storage
Version 420 Features

More Data in the Tivoli Data Warehouse support

- IF0002

Logical Volume Cache Attributes
Logical Volume Space Attributes
Logical Volume Performance Attributes

- IF0003

Cache Devices
User DASD Groups
SMS Storage Groups
Dataset Attribute Groups

OMEGAMON XE for Storage
Version 420 Features

More Data in the Tivoli Data Warehouse support

- IF0004

No new attributes in TDW

Performance Improvements
Enhanced dataset group historical collection: This enhancement provides storage administrators with the ability to control the collection of detail historical data for the data sets in a data set group at the data set group level to reduce resource utilization. The improvement provides a way for you to switch the detail historical data collection on/off for certain data set groups

OMEGAMON XE for Storage
Version 420 Features

Monitoring

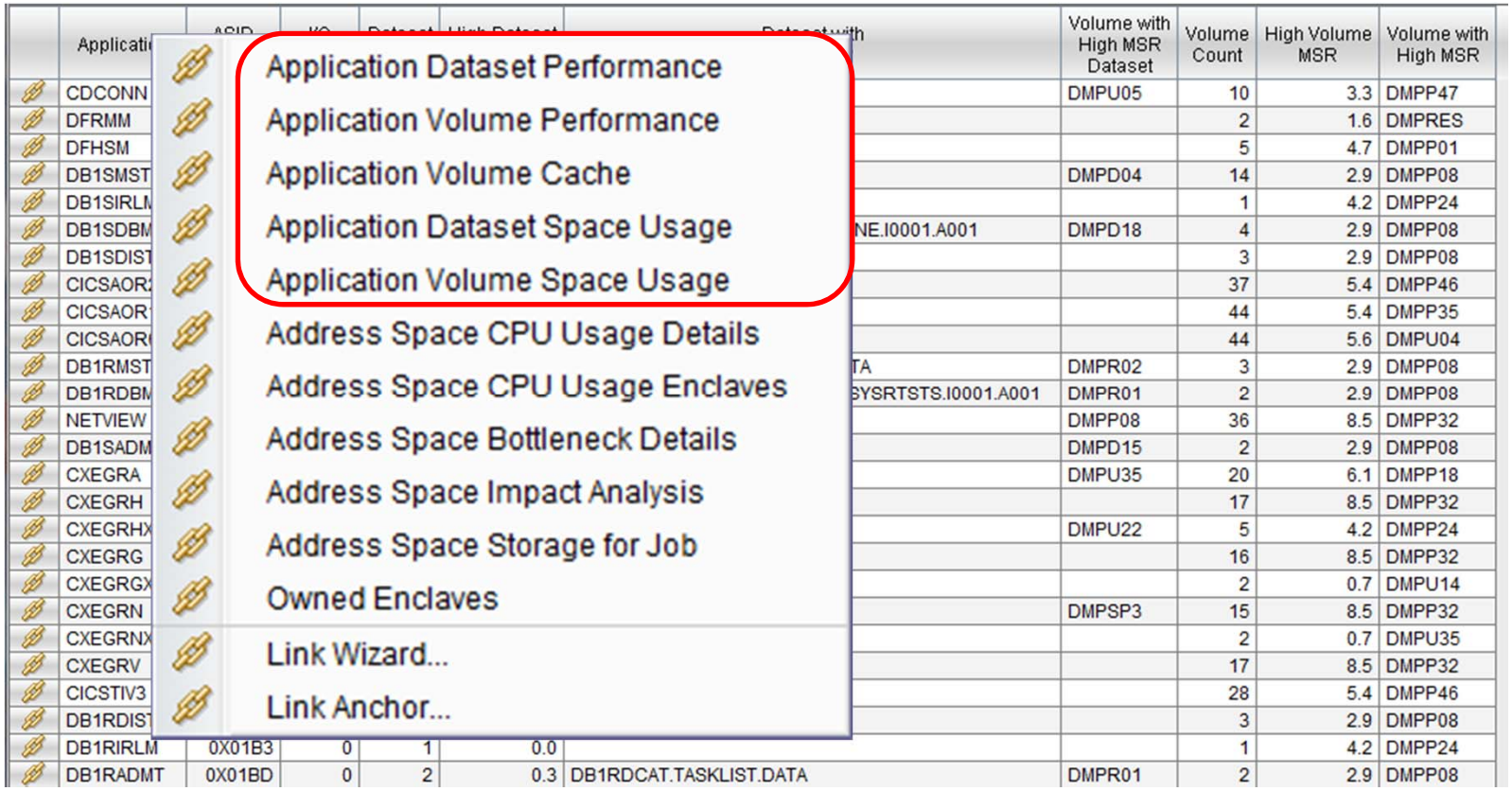
OMEGAMON XE for Storage
Version 420 Monitoring

Application Monitoring Performance and Space

	Application	ASID Hex	I/O Second	Dataset Count	High Dataset MSR	Dataset with High MSR	Volume with High MSR Dataset	Volume Count	High Volume MSR	Volume with High MSR
	CDCONN	0X001F	0	20	0.3	CONDIR.V5R1.TCX.DATA	DMPU05	10	3.3	DMPP47
	DFRMM	0X0024	1	4	0.0			2	1.6	DMPRES
	DFHSM	0X0078	10	9	0.0			5	4.7	DMPP01
	DB1SMSTR	0X0083	16	17	0.3	DSNSCAT.DB1S.BSDS02.DATA	DMPD04	14	2.9	DMPP08
	DB1SIRLM	0X0086	0	1	0.0			1	4.2	DMPP24
	DB1SDBM1	0X008F	41	4	0.6	DSNSCAT.DSNDBD.DB2PM.ONLINE.I0001.A001	DMPD18	4	2.9	DMPP08
	DB1SDIST	0X0092	0	3	0.0			3	2.9	DMPP08
	CICSAOR2	0X0099	0	69	0.0			37	5.4	DMPP46
	CICSAOR1	0X009A	3	96	0.0			44	5.4	DMPP35
	CICSAOR6	0X009E	1	90	0.0			44	5.6	DMPU04
	DB1RMSTR	0X012C	1	12	0.5	DB1RLCAT.LOGCOPY2.DS03.DATA	DMPR02	3	2.9	DMPP08
	DB1RDBM1	0X0137	0	2	0.3	DB1RDCAT.DSNDBD.DSNDB06.SYSRTSTS.I0001.A001	DMPR01	2	2.9	DMPP08
	NETVIEW	0X0144	2357	93	18.4	TIVIM.V7R1.SEYLSPL	DMPP08	36	8.5	DMPP32
	DB1SADMT	0X0158	0	2	0.3	DSNSCAT.TASKLIST.DATA	DMPD15	2	2.9	DMPP08
	CXEGRA	0X017D	25	23	1.0	TIVACM.V2R2.COPY.SCKMLOAD	DMPU35	20	6.1	DMPP18
	CXEGRH	0X017E	0	20	0.0			17	8.5	DMPP32
	CXEGRHX	0X017F	2	6	0.5	SYS1.VTOC.VDMPU22	DMPU22	5	4.2	DMPP24
	CXEGRG	0X0180	0	20	0.0			16	8.5	DMPP32
	CXEGRGX	0X0181	0	2	0.0			2	0.7	DMPU14
	CXEGRN	0X0182	0	20	0.4	SYS1.HASPACE	DMPSP3	15	8.5	DMPP32
	CXEGRNX	0X0183	0	2	0.0			2	0.7	DMPU35
	CXEGRV	0X0184	0	20	0.0			17	8.5	DMPP32
	CICSTIV3	0X018B	0	44	0.0			28	5.4	DMPP46
	DB1RDIST	0X01AD	0	3	0.0			3	2.9	DMPP08
	DB1RIRLM	0X01B3	0	1	0.0			1	4.2	DMPP24
	DB1RADMT	0X01BD	0	2	0.3	DB1RDCAT.TASKLIST.DATA	DMPR01	2	2.9	DMPP08

OMEGAMON XE for Storage
Version 420 Monitoring

Application Monitoring Performance and Space



Applicati	ASID	I/O	Dataset	High Dataset	Dataset with	Volume with High MSR Dataset	Volume Count	High Volume MSR	Volume with High MSR
CDCONN						DMPU05	10	3.3	DMPP47
DFRMM							2	1.6	DMPRES
DFHSM							5	4.7	DMPP01
DB1SMST						DMPD04	14	2.9	DMPP08
DB1SIRLM							1	4.2	DMPP24
DB1SDBM					NE.I0001.A001	DMPD18	4	2.9	DMPP08
DB1SDIST							3	2.9	DMPP08
CICSAOR2							37	5.4	DMPP46
CICSAOR							44	5.4	DMPP35
CICSAOR							44	5.6	DMPU04
DB1RMST					TA	DMPR02	3	2.9	DMPP08
DB1RDBM					SYSRTSTS.I0001.A001	DMPR01	2	2.9	DMPP08
NETVIEW						DMPP08	36	8.5	DMPP32
DB1SADM						DMPD15	2	2.9	DMPP08
CXEGRA						DMPU35	20	6.1	DMPP18
CXEGRH							17	8.5	DMPP32
CXEGRHX						DMPU22	5	4.2	DMPP24
CXEGRG							16	8.5	DMPP32
CXEGRGX							2	0.7	DMPU14
CXEGRN						DMPSP3	15	8.5	DMPP32
CXEGRNX							2	0.7	DMPU35
CXEGRV							17	8.5	DMPP32
CICSTIV3							28	5.4	DMPP46
DB1RDIST							3	2.9	DMPP08
DB1RIRLM	0X01B3	0	1	0.0			1	4.2	DMPP24
DB1RADMT	0X01BD	0	2	0.3	DB1RDCAT.TASKLIST.DATA	DMPR01	2	2.9	DMPP08

OMEGAMON XE for Storage
Version 420 Monitoring

Application Monitoring Detail Space for Application Selected

Dataset Space Report

Dataset Name	Volume	Tracks Allocated	Tracks Used	Tracks Used Percent	Number of Extents	Dataset Type	Logical Record Length	Block Size
CANDLET.XEGA.DEMOMVS.RKANMOD	DMPP39	9675	4779	49.3	9	Partitioned	0	32760
CANDLET.XEGA.DEMOMVS.RKANMODP	DMPP42	825	0	0.0	4	PDS Extended	0	32760
TIVACM.V2R2.COPY.SCKMLOAD	DMPU35	225	212	94.2	1	Partitioned	0	32760
TIVARD.V2R3.SARHLOAD	DMPP24	175	0	0.0	1	PDS Extended	0	32760
TIVAAD.V2R3.COPY.SAKDLOAD	DMPU14	105	105	100.0	4	Partitioned	0	6144
TIVABR.V2R2.SBKMLOAD	DMPP04	521	0	0.0	3	PDS Extended	0	32760
CANDLET.XEGA.DEMOMVS.RKANDATV	DMPP46	6469	4157	64.2	16	Partitioned	6160	24656
CANDLET.XEGA.DEMOMVS.RKANPARU	DMPP18	345	94	27.2	1	Partitioned	80	8880
CANDLET.XEGA.DEMOMVS.RKANPAR	DMPP46	102	100	98.0	6	Partitioned	80	8880
TIVABR.V2R2.SBKMPARM	DMPP50	23	21	91.3	6	Partitioned	80	27920
TIVABR.V2R2.ACDIDB.INDEX	DMPP27	1	0	10.0	1	VSAM	4601	4608
TIVABR.V2R2.ACDIDB.DATA	DMPP27	135	3	2.4	1	VSAM	4096	4608
TIVABR.V2R2.IDS.INDEX	DMPP31	364	364	99.9	91	VSAM	8185	8192
TIVABR.V2R2.IDS.DATA	DMPP31	32535	27469	84.4	47	VSAM	32752	4096
TIVACM.V2R2.COPY.SCKMPARM	DMPU51	30	22	73.3	2	Partitioned	80	27920
TIVARD.V2R3.SARHPLNS	DMPU32	5	4	80.0	1	Partitioned	80	27920
TIVARD.V2R3.SARHCMDS	DMPU49	10	6	60.0	2	Partitioned	80	27920
TIVARD.V2R3.SARHMSGS	DMPP43	8	8	100.0	1	Partitioned	80	27920
TIVARD.V2R3.SARHPARM	DMPP28	4	3	75.0	2	Partitioned	80	27920
TIVAAD.V2R3.COPY.PLANS	DMPU45	53	0	0.0	1	PDS Extended	80	27920
TIVAAD.V2R3.COPY.SAKDCNTL	DMPU28	45	33	73.3	1	Partitioned	80	27920

OMEGAMON XE for Storage
Version 420 Monitoring

Application Monitoring Volume Space for Application Selected

Volume Space Report

	Volume	Device Address	Device Type	Total Capacity Megabytes	Free Space Megabytes	Percent Free Space	Fragmentation Index	Largest Free Extent MB	SMS Conversion Status	SMS Status	Storage Group Name	VTOC Index Status	Solid State Device
	DMPP39	156C	3390	8120	2076	25.5	317	463	Converted	Enabled	PRIMARY	Enabled	No
	DMPP42	11C5	3390	8120	3520	43.3	286	692	Converted	Enabled	PRIMARY	Enabled	No
	DMPU35	153E	3390	8120	270	3.3	753	8	Converted	Enabled	USRGROUP	Enabled	No
	DMPP24	15B8	3390	8120	2620	32.2	117	2084	Converted	Enabled	PRIMARY	Enabled	No
	DMPU14	158F	3390	8120	326	4.0	629	11	Converted	Enabled	USRGROUP	Enabled	No
	DMPP04	1568	3390	8120	6256	77.0	77	5402	Converted	Enabled	PRIMARY	Enabled	No
	DMPP46	1530	3390	8120	3024	37.2	54	2750	Converted	Enabled	PRIMARY	Enabled	No
	DMPP18	1599	3390	8120	1132	13.9	261	542	Converted	Enabled	PRIMARY	Enabled	No
	DMPP50	1534	3390	8120	4999	61.5	97	3917	Converted	Enabled	PRIMARY	Enabled	No
	DMPP27	159E	3390	8120	4483	55.2	74	3952	Converted	Enabled	PRIMARY	Enabled	No
	DMPP31	1574	3390	8120	2697	33.2	101	2253	Converted	Enabled	PRIMARY	Enabled	No
	DMPU51	153A	3390	8120	360	4.4	595	18	Converted	Enabled	USRGROUP	Enabled	No
	DMPU32	154A	3390	8120	344	4.2	623	31	Converted	Enabled	USRGROUP	Enabled	No
	DMPU49	11C1	3390	8120	163	2.0	732	24	Converted	Enabled	USRGROUP	Enabled	No
	DMPP43	11C6	3390	8120	4909	60.4	221	1878	Converted	Enabled	PRIMARY	Enabled	No
	DMPP28	159F	3390	8120	5208	64.1	145	3209	Converted	Enabled	PRIMARY	Enabled	No
	DMPU45	11D1	3390	8120	325	4.0	685	11	Converted	Enabled	USRGROUP	Enabled	No
	DMPU28	1537	3390	8120	362	4.4	799	3	Converted	Enabled	USRGROUP	Enabled	No
	DMPU23	1545	3390	8120	348	4.2	768	6	Converted	Enabled	USRGROUP	Enabled	No
	DMPU47	11BF	3390	8120	314	3.8	694	9	Converted	Enabled	USRGROUP	Enabled	No

OMEGAMON XE for Storage
Version 420 Monitoring

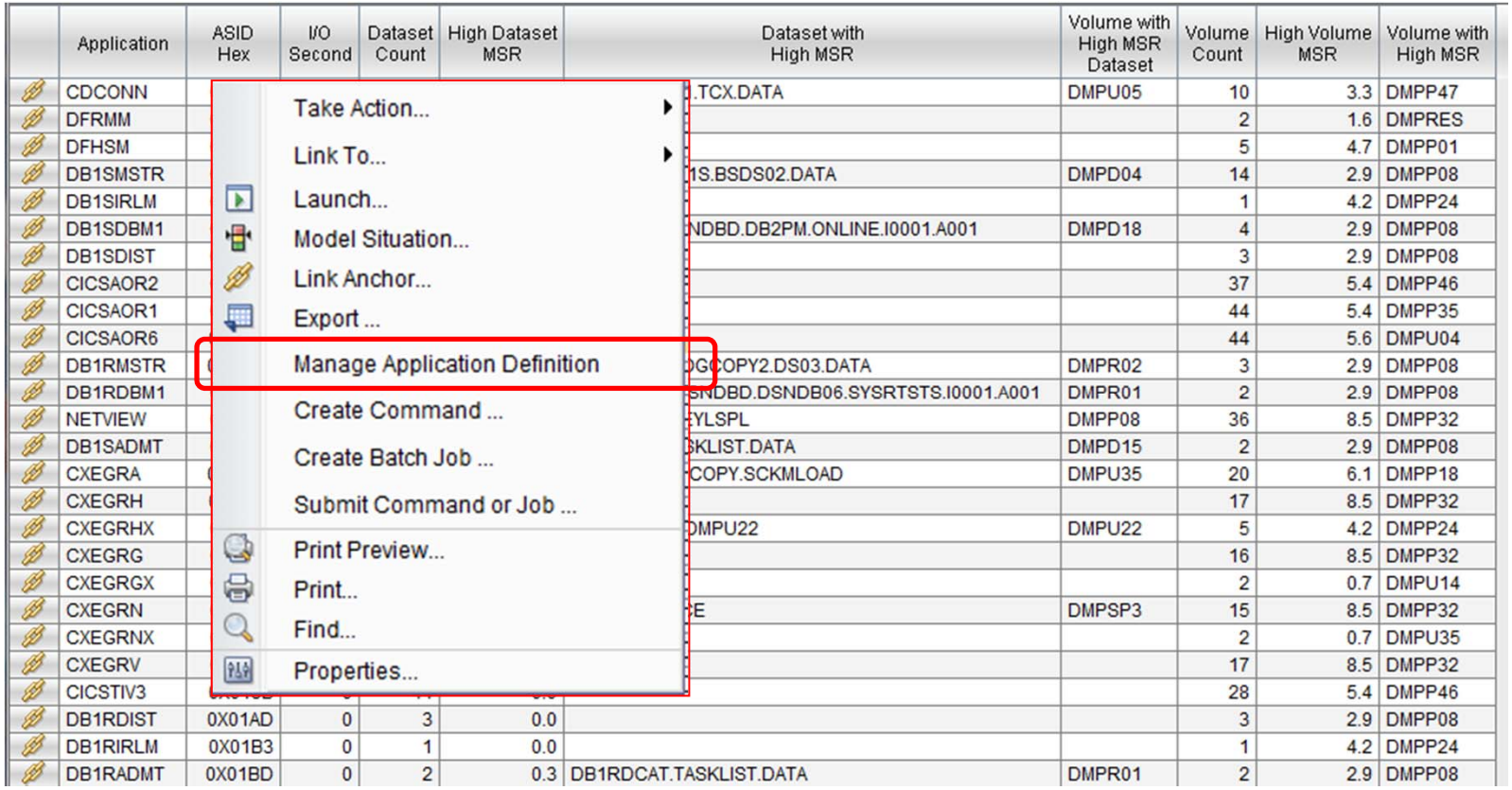
Application Monitoring Volume Performance for Application Selected

Volume Performance Report

Volume	Device Address	Busy Percent	I/O Per Second	IOSQ Delay	Pend Time	Connect Time	Disconnect Time	Response Time	MSR Connect Time Percent	I/O Count	Device MPL	DCBs Open	Reserved Percent	Average HyperPAV Alias Count	Average Command Response Delay	Current PAV Exposures	PAV Exposure Changed	Maximum PAV Exposures
DMPP39	156C	0.7	1.6	0.0	0.1	4.5	0.0	4.6	97.8	2562	7	84	0.0	n/a	0.0	0	No	0
DMPP42	11C5	0.0	0.4	0.0	0.1	0.3	0.0	0.4	75.0	601	0	60	0.0	n/a	0.0	0	No	0
DMPU35	153E	0.0	0.1	0.0	0.1	0.5	0.0	0.6	83.3	149	0	1	0.0	n/a	0.0	0	No	0
DMPP24	15B8	0.4	1.2	0.0	0.1	3.2	0.0	3.4	94.1	1606	4	49	0.0	n/a	0.0	0	No	0
DMPU14	158F	0.0	0.1	0.0	0.1	0.5	0.0	0.6	83.3	138	0	2	0.0	n/a	0.0	0	No	0
DMPP04	1568	0.1	4.8	0.0	0.1	0.2	0.0	0.4	50.0	5969	2	28	0.0	n/a	0.0	0	No	0
DMPP46	1530	0.3	0.4	0.0	0.1	6.9	0.0	7.0	98.6	643	3	103	0.0	n/a	0.0	0	No	0
DMPP18	1599	0.1	0.2	0.0	0.1	6.8	0.0	7.0	97.1	297	1	48	0.0	n/a	0.0	0	No	0
DMPP50	1534	0.0	0.0	0.0	0.5	0.3	0.0	0.9	33.3	70	0	64	0.0	n/a	0.4	0	No	0
DMPP27	159E	0.0	1.9	0.0	0.1	0.2	0.0	0.3	66.7	2438	1	10	0.0	n/a	0.0	0	No	0
DMPP31	1574	0.1	4.6	0.0	0.1	0.2	0.0	0.4	50.0	9627	2	86	0.0	n/a	0.0	0	No	0
DMPU51	153A	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	44	0	0	0.0	n/a	0.0	0	No	0
DMPU32	154A	0.0	0.0	0.0	0.1	0.1	0.0	0.2	50.0	69	0	2	0.0	n/a	0.0	0	No	0
DMPU49	11C1	0.0	0.0	0.0	0.1	0.1	0.0	0.2	50.0	75	0	10	0.0	n/a	0.0	0	No	0
DMPP43	11C6	0.0	1.0	0.0	0.1	0.3	0.0	0.4	75.0	1901	0	29	0.0	n/a	0.0	0	No	0
DMPP28	159F	1.9	117.2	0.0	0.1	0.1	0.0	0.3	33.4	144430	35	42	0.0	n/a	0.0	0	No	0
DMPU45	11D1	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	75	0	2	0.0	n/a	0.0	0	No	0
DMPU28	1537	0.0	0.0	0.0	0.1	0.1	0.0	0.2	50.0	23	0	0	0.0	n/a	0.0	0	No	0
DMPU23	1545	0.0	0.0	0.0	0.1	0.1	0.0	0.2	50.0	47	0	0	0.0	n/a	0.0	0	No	0
DMPU47	11BF	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	53	0	2	0.0	n/a	0.0	0	No	0

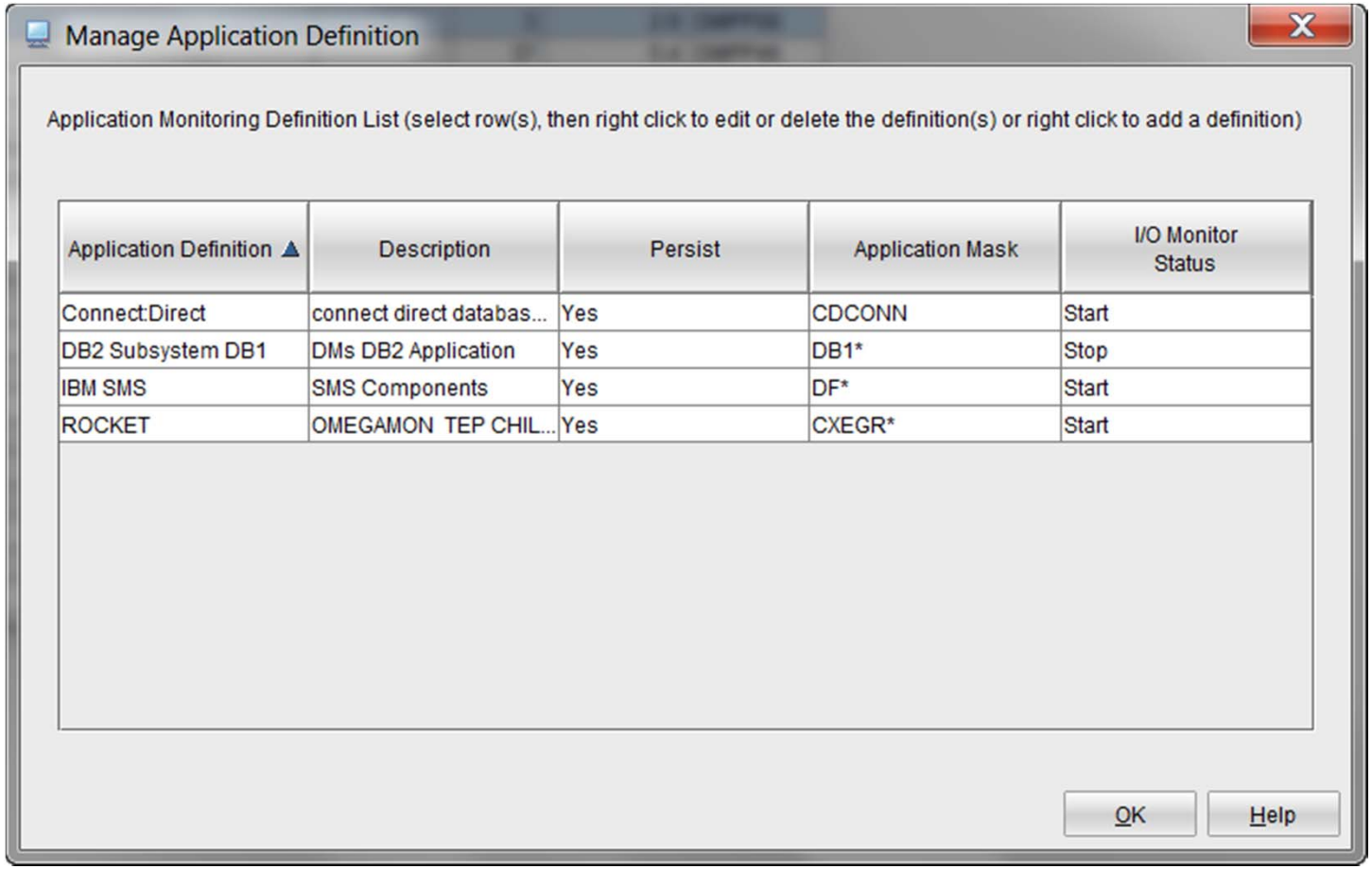
OMEGAMON XE for Storage
Version 420 Monitoring

Application Monitoring DEFINING the App to Monitor



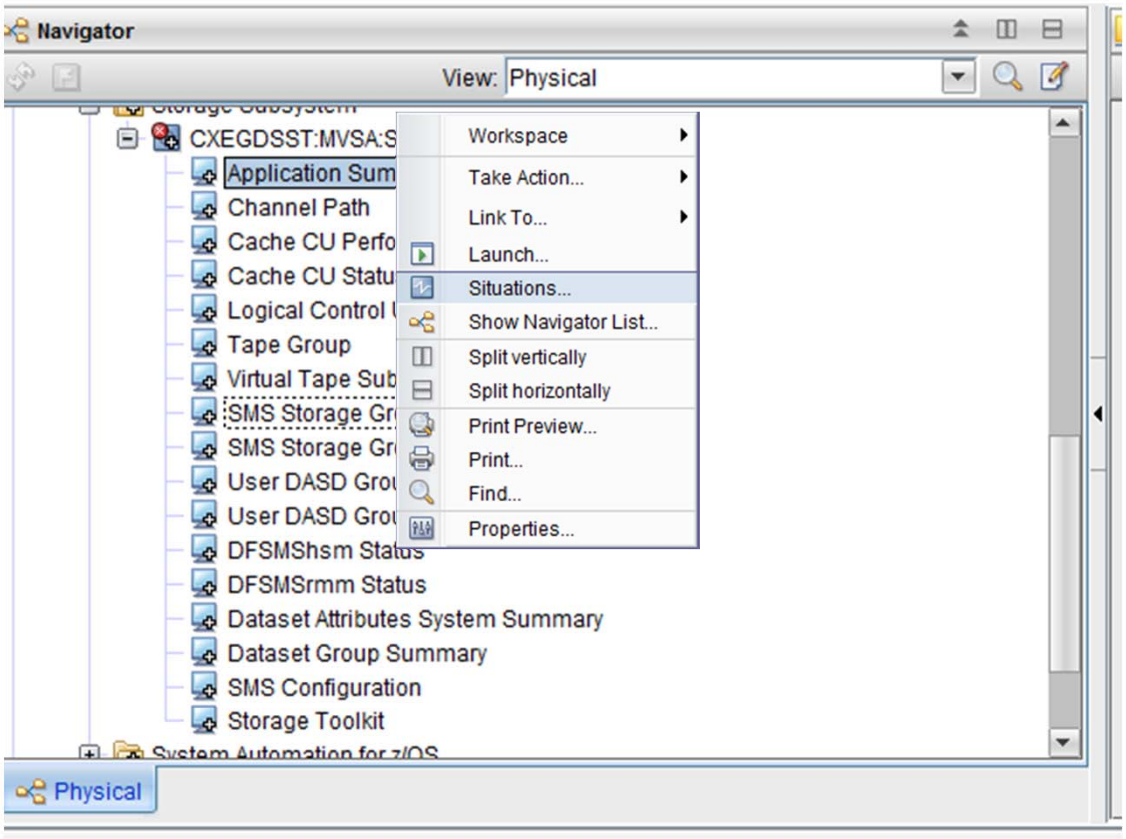
OMEGAMON XE for Storage
Version 420 Monitoring

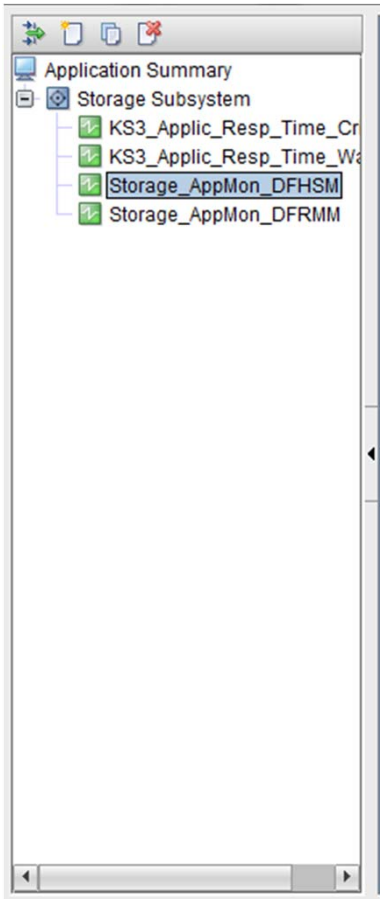
Application Monitoring New definitions



OMEGAMON XE for Storage
Version 420 Monitoring

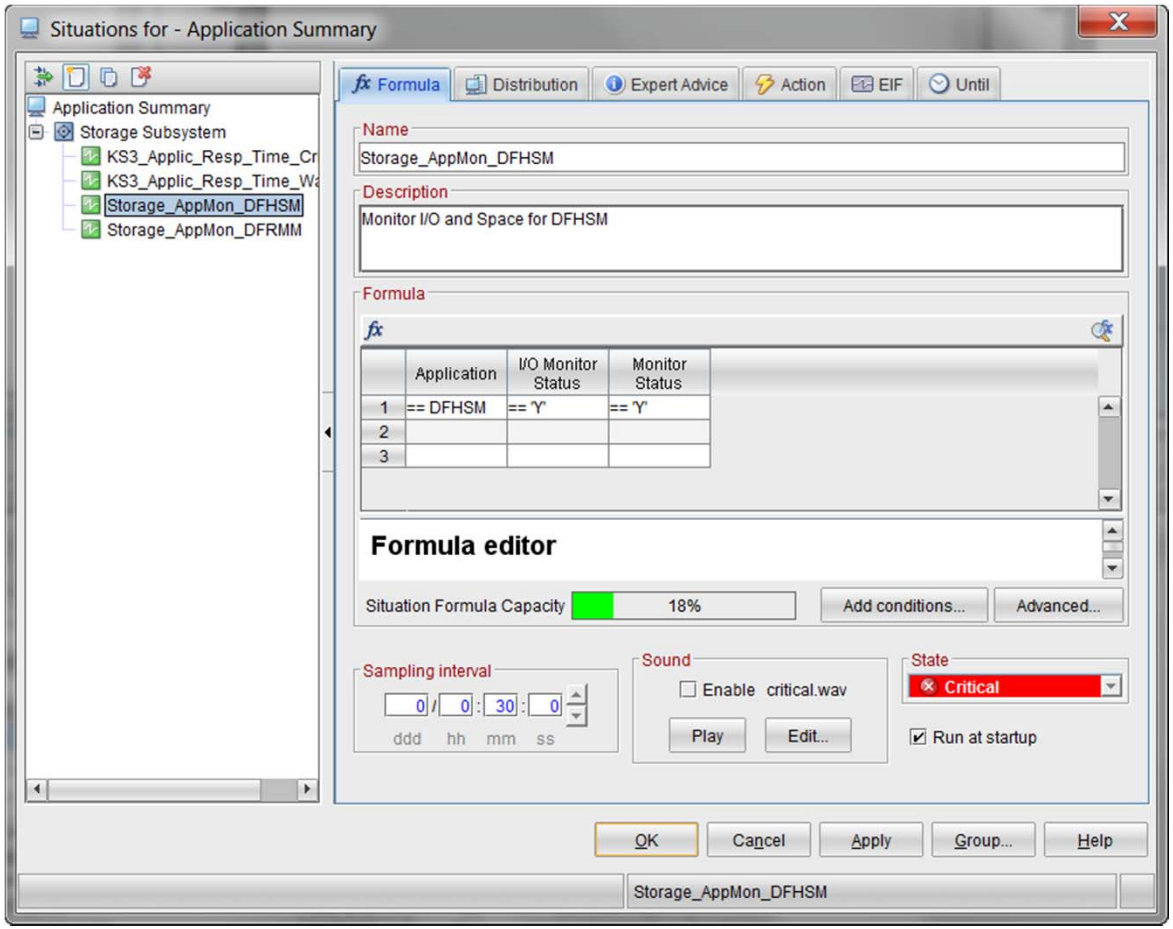
Application Monitoring Old definitions





OMEGAMON XE for Storage
Version 420 Monitoring

Application Monitoring Old definitions



OMEGAMON XE for Storage
Version 420 Monitoring

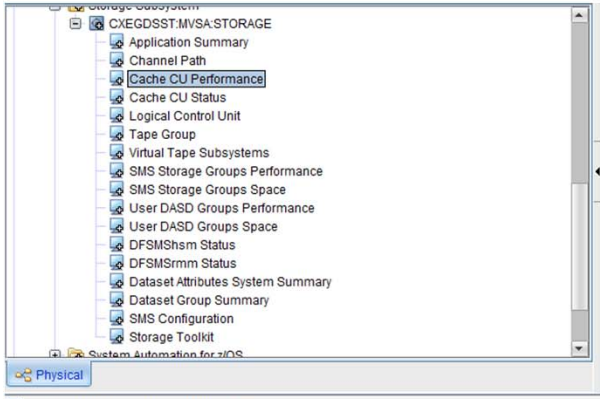
Cache CU

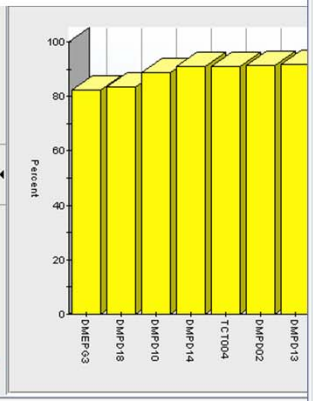
- Cache metrics shown for the z/OS image and by SSID
  - Lowest volume read hit percent
  - Lowest volume write hit percent
  - Lowest volume DFW hit percent
  - Highest volume destaging rate
  - Highest volume staging rate

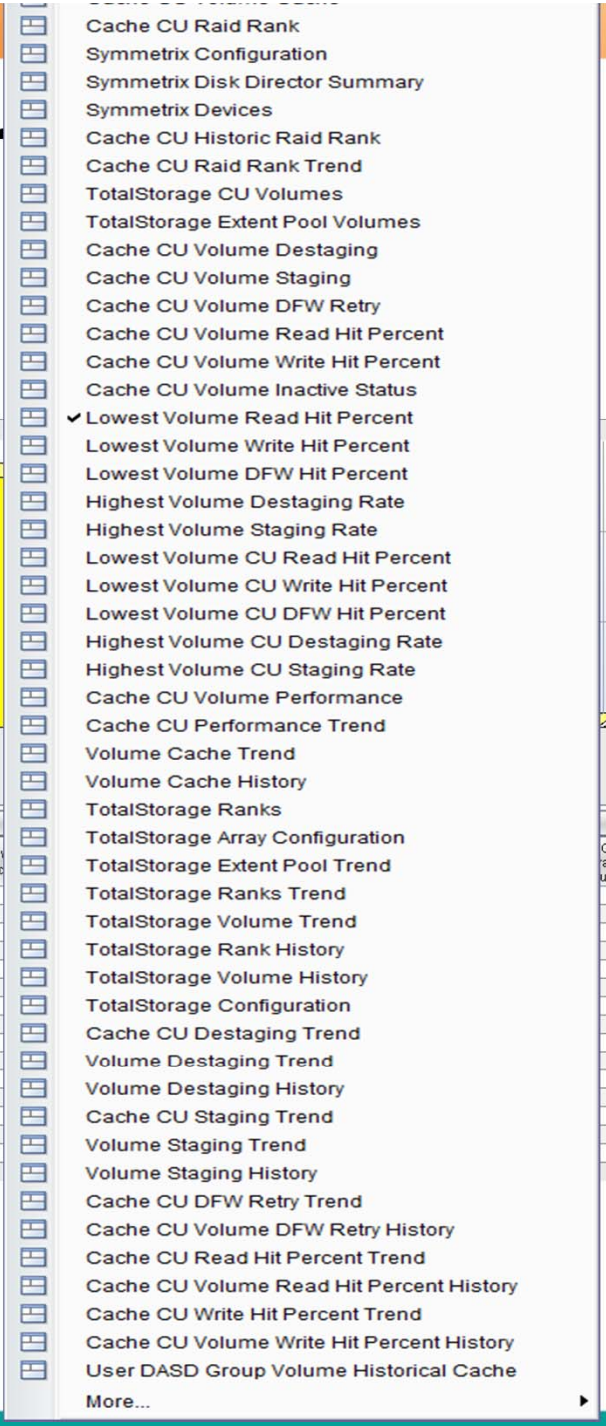
OMEGAMON XE for Stor

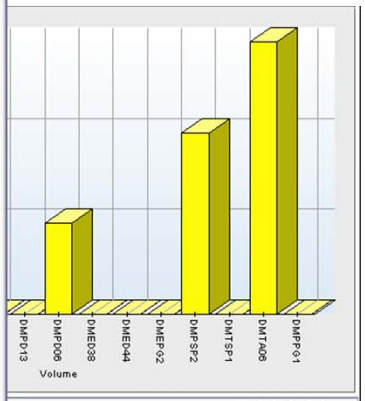
Version 420 Monitoring

Cache CU Performance









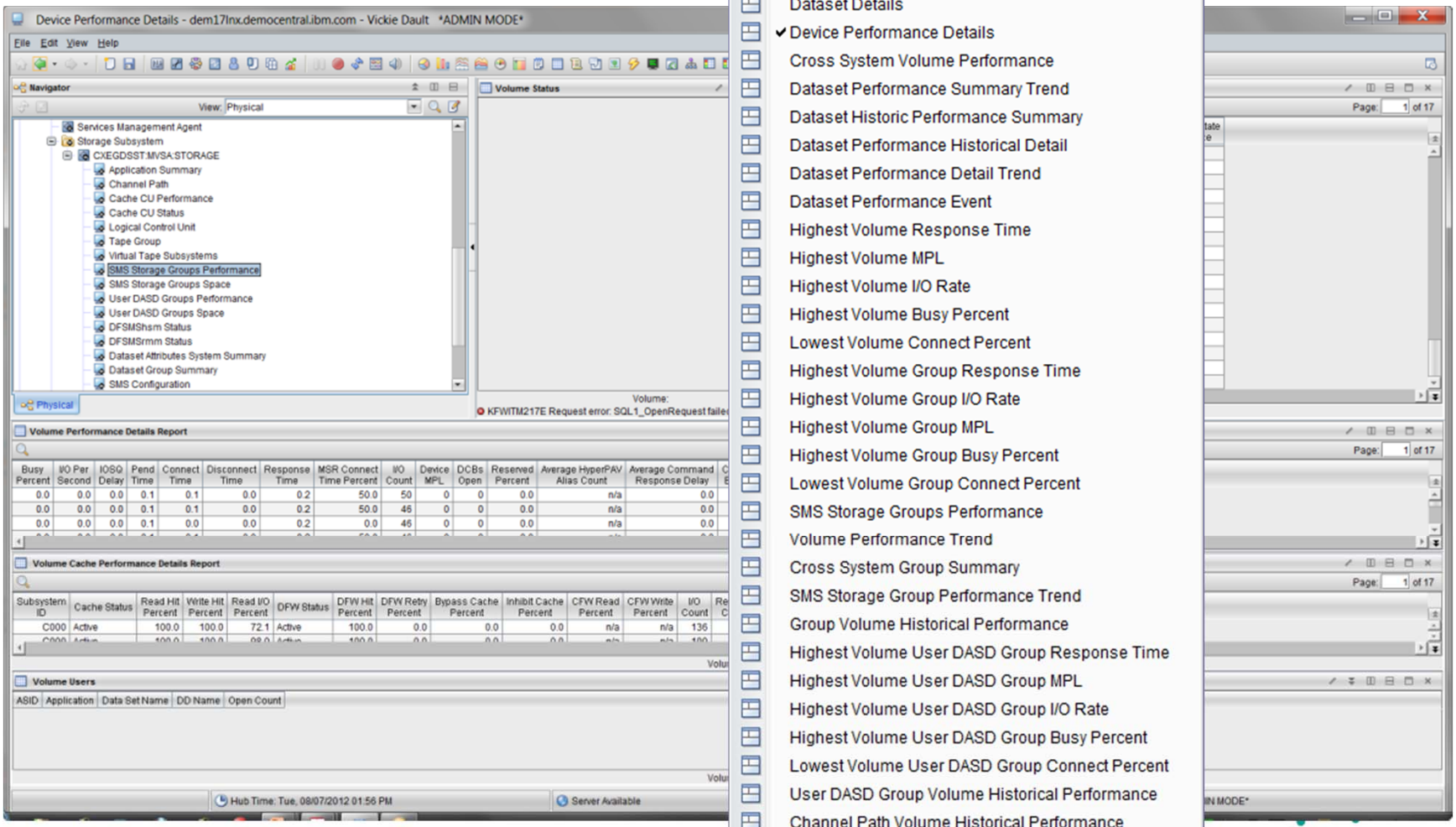
Volumes With Lowest Read Hit Percent

Volume	Device Address	Subsystem ID	Read Hit Percent	Write Hit Percent	Read I/O Percent	DFW Status	DFW Hit Percent	DFW Retry Percent	Bypass Cache Percent	Inhibit Cache Percent	CFW Read Percent	CFW Perc
DMEPG3	15BB	C500	82.5	100.0	51.3	Active	100.0	0.0	0.0	0.0	n/a	
DMPD18	15C8	C500	83.3	100.0	87.8	Active	100.0	0.0	0.0	0.0	n/a	
DMPD10	1308	C300	88.7	100.0	64.8	Active	100.0	0.0	0.0	0.0	n/a	
DMPD14	130C	C300	90.8	100.0	80.3	Active	100.0	0.0	0.0	0.0	n/a	
TCT004	10D3	C000	90.9	100.0	44.5	Active	100.0	0.0	0.0	0.0	n/a	
DMPD02	1300	C300	91.3	100.0	69.0	Active	100.0	0.0	0.0	0.0	n/a	
DMPD13	130B	C300	91.7	100.0	17.0	Active	100.0	0.0	0.0	0.0	n/a	
DMPD06	1304	C300	92.9	100.0	79.0	Active	100.0	0.0	0.0	0.0	n/a	
DMED38	1712	C700	93.1	100.0	43.9	Active	100.0	0.0	0.0	0.0	n/a	
DMED44	1718	C700	93.5	100.0	29.8	Active	100.0	0.0	0.0	0.0	n/a	
DMEPG2	166A	C600	93.5	100.0	54.8	Active	100.0	0.0	0.0	0.0	n/a	
DMPSP2	1218	C200	94.1	100.0	50.0	Active	100.0	0.0	0.0	0.0	n/a	
DMTSP1	1503	C500	95.0	100.0	17.1	Active	100.0	0.0	0.0	0.0	n/a	
DMTA06	1525	C500	95.5	100.0	89.2	Active	100.0	0.0	0.0	0.0	n/a	
DMPPG1	1219	C200	96.1	100.0	13.8	Active	100.0	0.0	0.0	0.0	n/a	

Cache Tracks Sequential	DASD to Cache Non Promotes per Second	DASD to Cache Non Promotes	DASD to Cache Tracks per Sec Sequential	D
7	0.0	0	0.0	
11	0.0	0	0.0	
46	0.0	0	0.0	
14	0.0	0	0.0	
10	0.0	0	0.0	
54	0.0	0	0.0	
33	0.0	0	0.0	
79	0.0	0	0.0	
10	0.0	0	0.0	
0	0.0	0	0.0	
3	0.0	0	0.0	
213	0.0	0	0.0	
17	0.0	0	0.0	
184	0.0	0	0.2	
2	0.0	0	0.0	

OMEGAMON XE for Stor
Version 420 Monitoring

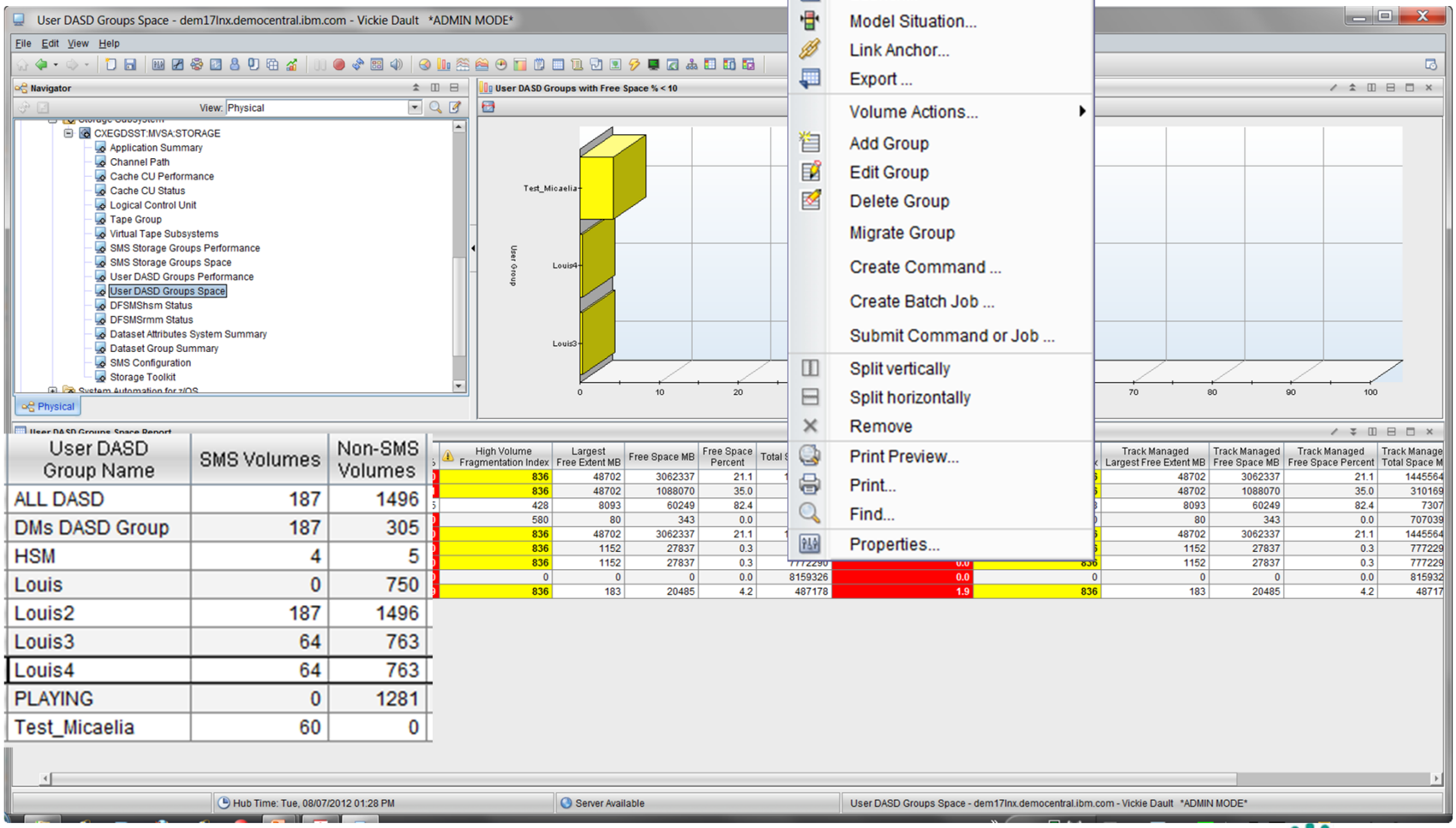
DASD Device Monitoring



OMEGAMON XE for Storage

Version 420 Monitoring

User DASD Groups

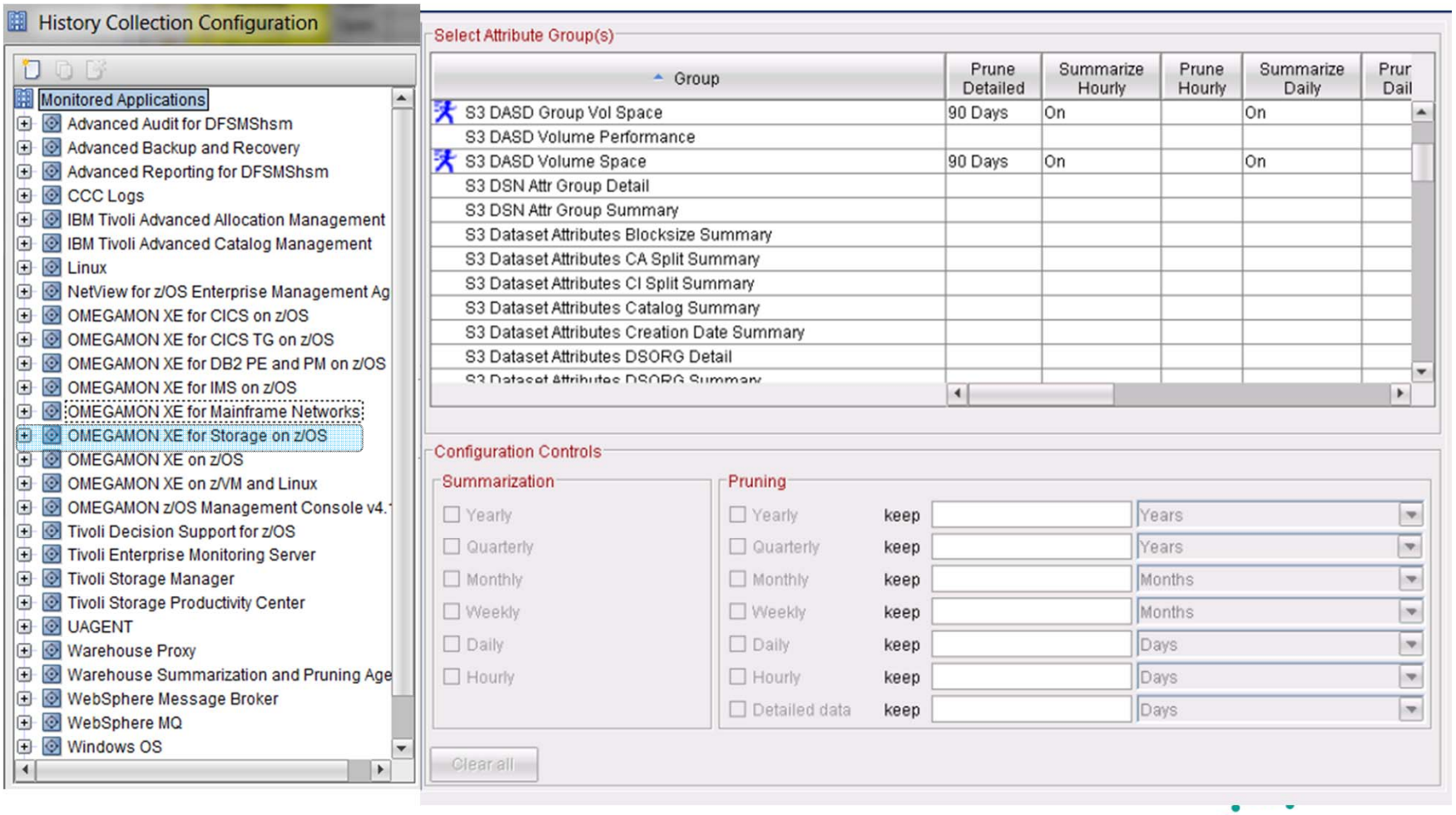


User DASD Group Name	SMS Volumes	Non-SMS Volumes
ALL DASD	187	1496
DMs DASD Group	187	305
HSM	4	5
Louis	0	750
Louis2	187	1496
Louis3	64	763
Louis4	64	763
PLAYING	0	1281
Test_Micaelia	60	0

High Volume Fragmentation Index	Largest Free Extent MB	Free Space MB	Free Space Percent	Total	Track Managed Largest Free Extent MB	Track Managed Free Space MB	Track Managed Free Space Percent	Track Manage Total Space M
836	48702	3062337	21.1		48702	3062337	21.1	1445564
836	48702	1088070	35.0		48702	1088070	35.0	310169
428	8093	60249	82.4		8093	60249	82.4	7307
580	80	343	0.0		80	343	0.0	707039
836	48702	3062337	21.1		48702	3062337	21.1	1445564
836	1152	27837	0.3		1152	27837	0.3	777229
836	1152	27837	0.3		1152	27837	0.3	777229
0	0	0	0.0	8159326	0	0	0.0	815932
836	183	20485	4.2	487178	183	20485	4.2	48717

OMEGAMON XE for Storage
Version 420 Monitoring

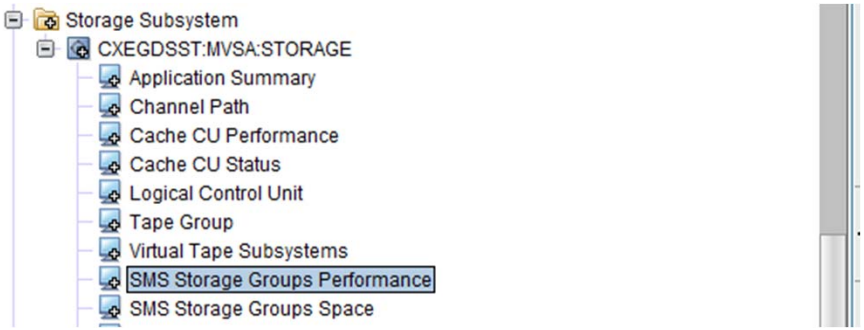
Historical Collection Required for Trending



OMEGAMON XE for Storage

Version 420 Monitoring

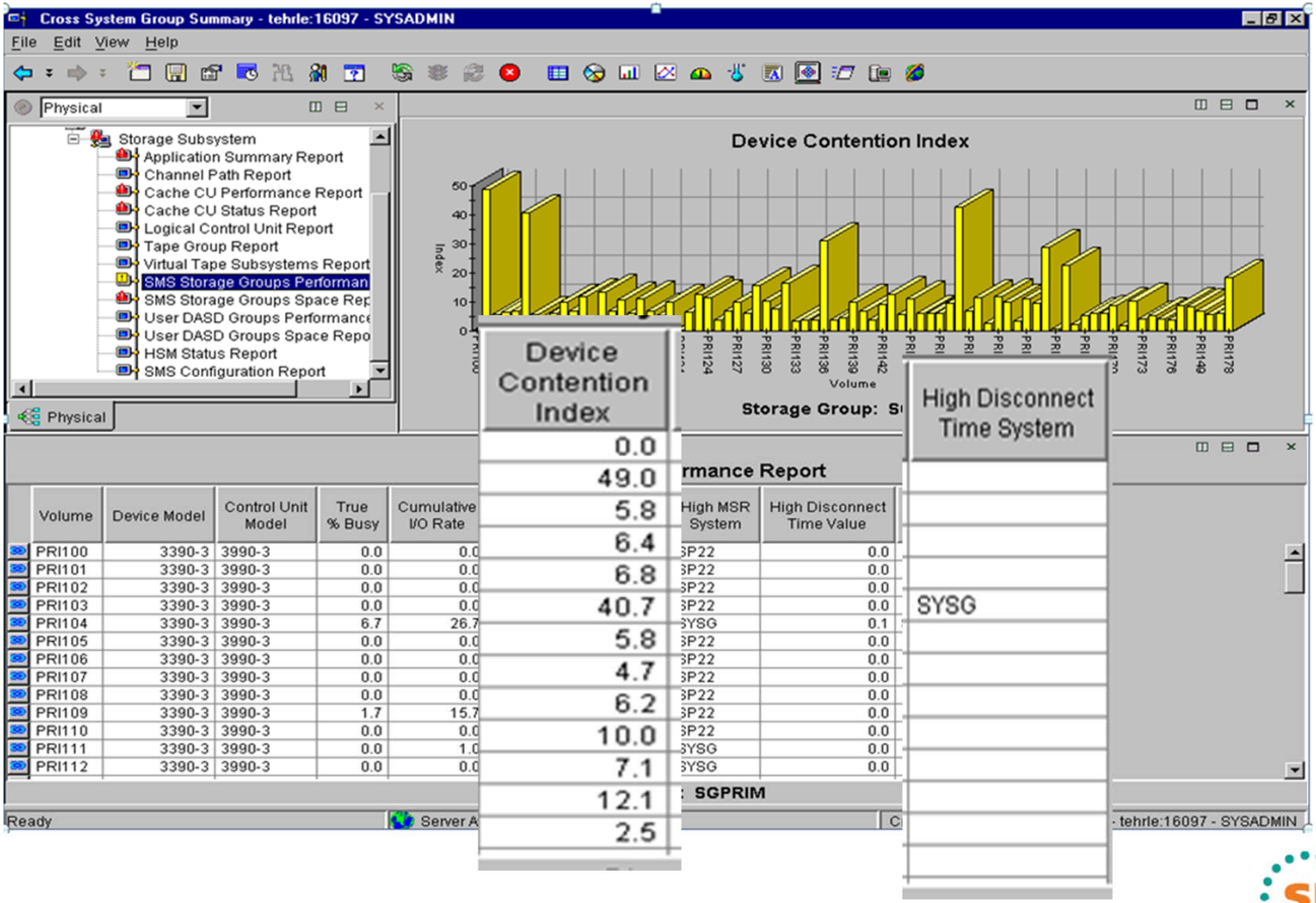
Cross system Contention



- SMS Storage Group Volume Performance
- Dataset Performance Summary
- Dataset Performance Detail
- SMS Storage Group Volume Cache
- Physical Volume Group Performance
- Physical Volume Group Cache
- Dataset Details
- Device Performance Details
- ✔ Cross System Volume Performance
- Dataset Performance Summary Trend
- Dataset Historic Performance Summary
- Dataset Performance Historical Detail
- Dataset Performance Detail Trend
- Dataset Performance Event
- Highest Volume Response Time
- Highest Volume MPL
- Highest Volume I/O Rate
- Highest Volume Busy Percent
- Lowest Volume Connect Percent
- Highest Volume Group Response Time
- Highest Volume Group I/O Rate
- Highest Volume Group MPL
- Highest Volume Group Busy Percent
- Lowest Volume Group Connect Percent
- SMS Storage Groups Performance
- Volume Performance Trend
- Cross System Group Summary
- SMS Storage Group Performance Trend
- Group Volume Historical Performance
- Highest Volume User DASD Group Response Time
- Highest Volume User DASD Group MPL
- Highest Volume User DASD Group I/O Rate
- Highest Volume User DASD Group Busy Percent
- Lowest Volume User DASD Group Connect Percent
- User DASD Group Volume Historical Performance
- Channel Path Volume Historical Performance
- Louis Perf small
- Louis SMS Group Perf

OMEGAMON XE for Storage
Version 420 Monitoring

Cross system Contention



OMEGAMON XE for Storage
Version 420 Features

Configuration for Performance

OMEGAMON XE for Storage
Version 420 PERFORMANCE Considerations

Collections Default Values

Cache Statistics	collect every 5 minutes
DASD Response time	once a minute
DASD Space/fragmentation index	a multiple of response time
Tape Monitoring	every 5 minutes
Application Volume datasets	every 5 minutes

OMEGAMON XE for Storage
Version 420 PERFORMANCE Considerations

Collections Defaults in ICAT

```
------------------- DATA COLLECTION OPTIONS / RTE:              ---------------
COMMAND ===>

  Monitor sampling intervals:
    Cache statistics:              300    (0-999 seconds)
    Cache reset interval:          RMF    (0-999 minutes or RMF)
    DASD response time:            60     (0-999 seconds)
    DASD space/fragmentation:      RMF    (0-99 response time intervals,
                                           or RMF=once per RMF interval)
    Tape monitoring interval:      300    (0-99999 seconds or OFF)
    Application vols/datasets:     300    (0-999 seconds)
  SMF recording:
    SMF record number:             0      (128-255; 0=No SMF recording)
    SMF recording interval:        OFF    (0-999 min, RMF, SMF, or OFF)
    Minimum I/O count threshold:   25     (1-999, or OFF)
  Historical data collection:
    DASD collection enabled?         Y      (Y, N)
    Dataset collection enabled?      Y      (Y, N)
    Application collection enabled?  Y _    (Y, N)
  Virtual tape server:
    Collect virtual tape data?         Y      (Y, N)
    VTS data for historical reporting? Y      (Y, N)
 Enter=Next  F1=Help  F3=Back
```

OMEGAMON XE for Storage
Version 420 PERFORMANCE Considerations

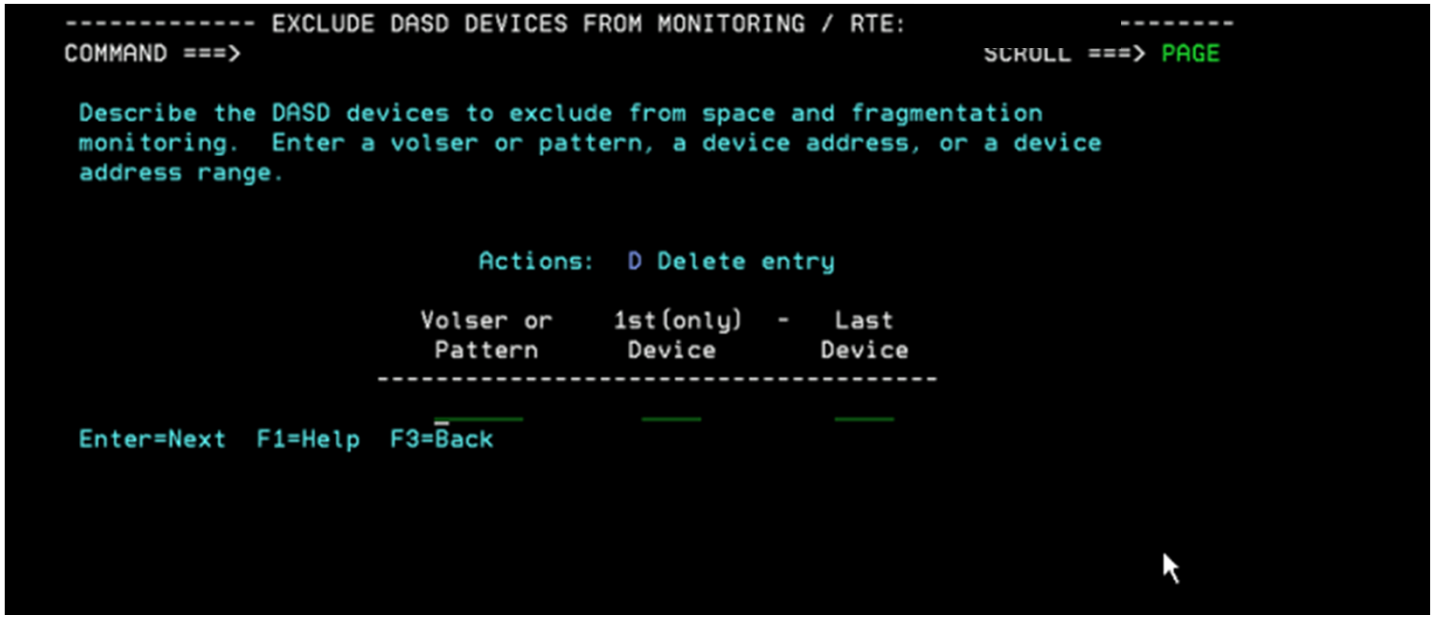
Collections Example - reduced collection intervals

```
------------------- DATA COLLECTION OPTIONS / RTE ----------------
COMMAND ===> _

  Monitor sampling intervals:
    Cache statistics:              300    (0-999 seconds)
    Cache reset interval:          RMF    (0-999 minutes or RMF)
    DASD response time:            900    (0-999 seconds)
    DASD space/fragmentation:      2      (0-99 response time intervals,
                                           or RMF=once per RMF interval)
    Tape monitoring interval:      3600   (0-99999 seconds or OFF)
    Application vols/datasets:     300    (0-999 seconds)
  SMF recording:
    SMF record number:             0      (128-255; 0=No SMF recording)
    SMF recording interval:        OFF    (0-999 min, RMF, SMF, or OFF)
    Minimum I/O count threshold:   OFF    (1-999, or OFF)
  Historical data collection:
    DASD collection enabled?         Y    (Y, N)
    Dataset collection enabled?      Y    (Y, N)
    Application collection enabled?  Y    (Y, N)
  Virtual tape server:
    Collect virtual tape data?         Y    (Y, N)
    VTS data for historical reporting? Y    (Y, N)
 Enter=Next  F1=Help  F3=Back
```

Response time – 900 15 minutes
DASD space/frag - 2 30 minutes
Tape monitoring - 3600 1 hour

OMEGAMON XE for Storage
Version 420 PERFORMANCE Considerations

Collections DISK to EXCLUDE



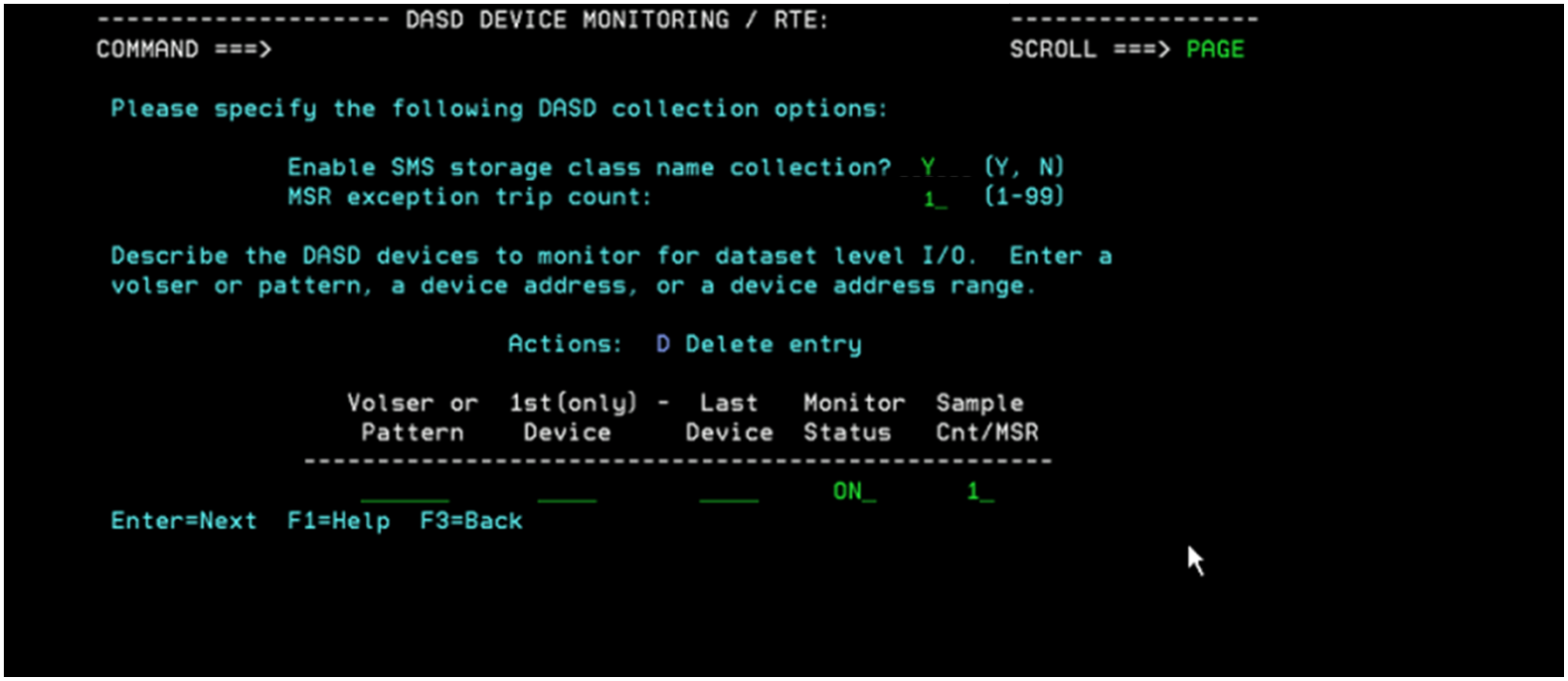
Exclude as much as possible

SYSRES, PAGxxx SPOOLx SPAREv etc

In a Shared DASD environment ONLY collect in one RTE

OMEGAMON XE for Storage
Version 420 PERFORMANCE Considerations

Collections I/O Performance



Default ICAT values

MSR Exception trip count is 2

Monitor Status ON

Sample 1

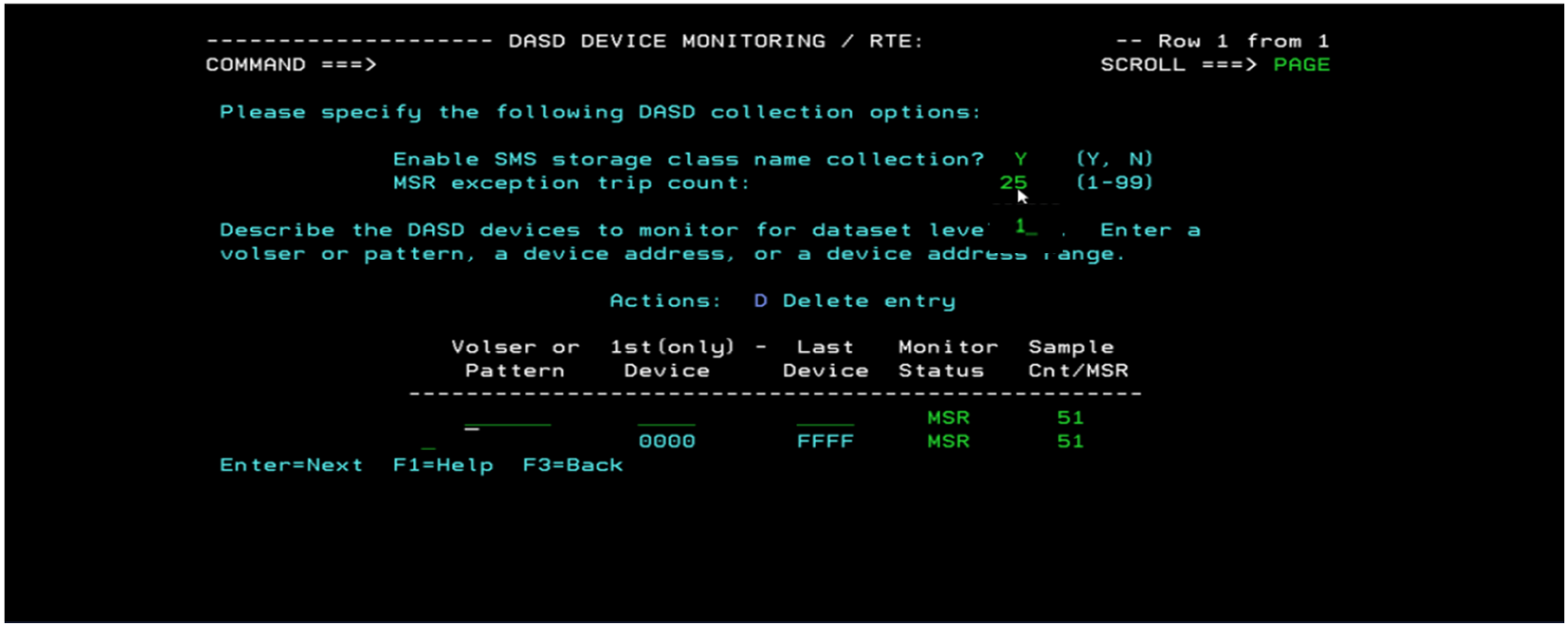
OMEGAMON XE for Storage
Version 420 PERFORMANCE Considerations

Collections

```
-------------------- DASD DEVICE MONITORING / RTE:            -- Row 1 from 1
COMMAND ===>                                                SCROLL ===> PAGE

 Please specify the following DASD collection options:

            Enable SMS storage class name collection? _Y_  (Y, N)
            MSR exception trip count:                  1_  (1-99)

 Describe the DASD devices to monitor for dataset level I/O.  Enter a
 volser or pattern, a device address, or a device address range.

                          Actions:  D Delete entry

               Volser or  1st(only) -  Last   Monitor  Sample
                Pattern    Device     Device  Status   Cnt/MSR
             ----------------------------------------------------
                ______      ____       ____    MSR      51
                _           0000       FFFF    MSR      51
 Enter=Next  F1=Help  F3=Back
```

OMEGAMON XE for Storage
Version 420 PERFORMANCE Considerations

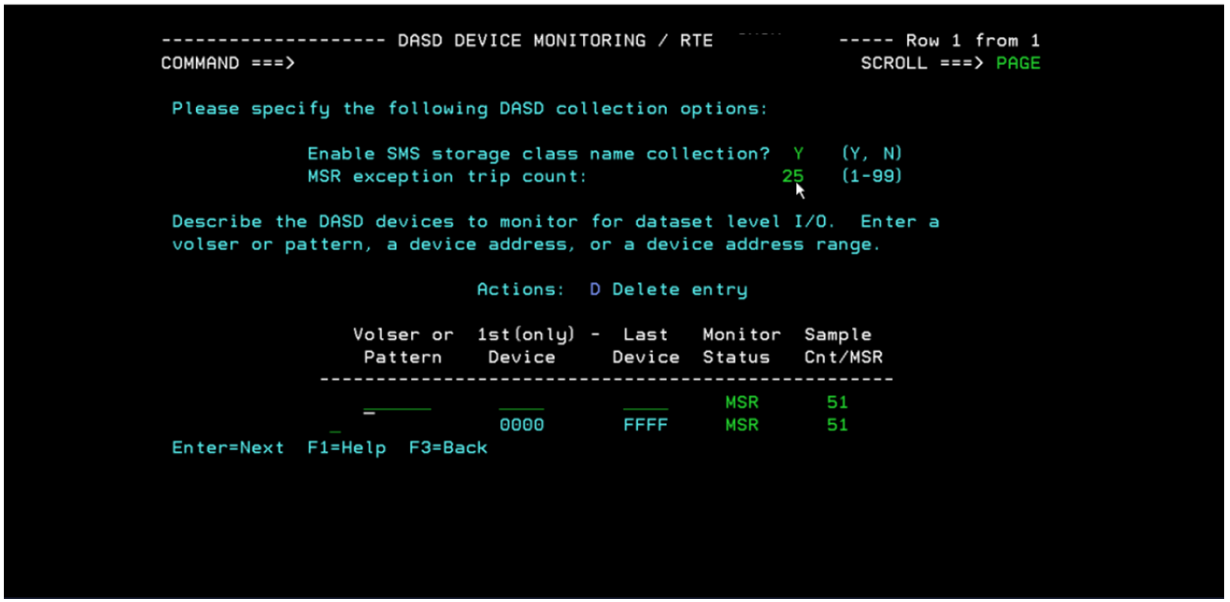
Collections



MSR Exception trip count is 2 or higher determines overhead
Monitor Status MSR
Sample Cnt/MSR MSR default is 51

OMEGAMON XE for Storage
Version 420 PERFORMANCE Considerations

Collections



Monitor every I/O but until an I/O MSR exceeds 51 milliseconds 2 times in this sampling interval the I/O is not recorded as a problem.

Until millisecond response time exceeds Sample Cnt/MSR MSR exception trip count times in the sampling interval don't record Response time problem

Summary

- OMEGAMON XE for Storage Agent can monitor events that occur sporadically
- You can be notified for your BEFORE the problem impacts your storage environment and now drive a response automatically.
- Dynamic Linking between OMEGAMON Agents directs your attention to get directly to the source of the problem.
- Storage toolkit invocation with Situations allows for the automated correction or at least notification when problems are detected that warrants your immediate response
- Configuring OMEGAMON XE for Storage properly in your environment can gain the most benefit for the least overhead.