



IBM Americas Software Group

# IBM Tivoli OMEGAMON XE For Storage on z/OS

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## Agenda

- **Tivoli zSeries Infrastructure Management**
- **Issues in z/OS Storage Management**
- **Different faces of IBM Tivoli OMEGAMON**
- **IBM Tivoli OMEGAMON for Storage on z/OS**
- **New Stuff !!**
- **Questions & Answers**

# Tivoli zSeries Infrastructure Management



Helps continually adjust the end-to-end zSeries infrastructure to deliver high performance in a volatile business climate.

## Tivoli zSeries Infrastructure Management:

- **Tivoli OMEGAMON® brand**
- **First MVS monitor introduced in 1976**
- **Over 28+ years experience in managing complex system and applications**
- **>3,000 customers @ >5,000 sites**

# Tivoli zSeries Infrastructure Management Guiding Principles

*After working with thousands of customers,  
we have distilled 5 principles  
to manage world-class data centers:*



1. **Sense** problems across the end-to-end infrastructure
2. **Isolate** problems down to a specific resource
3. **Diagnose** problems effectively and efficiently
4. **Take Action** to implement adjustments quickly
5. **Evaluate** effectiveness of adjustment



# “Classic” OMEGAMON and OMEGAMON II

- 3270 interface
- Command driven
- Rudimentary graphics
- Build your own screens
- Attribute driven
- Intelligent navigation
- Alerts created through threshold setting
- Real-time and historical

The screenshot shows the OMEGAMON/VS3270 interface. At the top, it displays the title bar 'SUPGATES' and a menu bar with 'File', 'Edit', 'View', 'Options', 'Tools', and 'Help'. Below the menu bar, there's a status line showing '#01 VTM OM/DEX V520./I SYS 02/11/05 10:43:24'. The main display area shows a 'PF24 MENU' with various system statistics including 'SYS >> MLM Goal mode OPT=GG SYSRES=(0R14K1,0563) <<', 'rcta Averages: UIC= 2540 CPU= 97 ASMQ= N/A Paging=', and 'MCPUB5 \_\_Task\_\_ CPU% 0\_\_\_\_\_ 100 \_\_PG N/A in goal mode\_\_ |System % 0\_\_\_\_\_ 100|'. Below this, there's a table of system statistics with columns for task name, CPU percentage, and system percentage. The bottom section shows 'LEXSY OMEGAMON/MVS Exception Analysis' with several warning messages: 'Warning: Channel Path 00 is not operational', 'Warning: Channel Path 01 is not operational', 'Warning: Channel Path 02 is not operational', and 'Warning: Channel Path 03 is not operational'.

The screenshot shows the OMEGAMON/VS3270 interface with a 'System Status' screen. At the top, there's a menu bar with 'Actions', 'GoTo', 'Index', 'Options', and 'Help'. Below the menu bar, there's a status line showing '12/21/98 3:22:29 PM' and 'System: SP12'. The main display area shows a table with three columns: 'Workload status', 'Resource status', and 'Operator Alerts'. The table contains various system statistics with corresponding status indicators (green, red, or blue bars). Below the table, there's a footer with keyboard shortcuts: 'F1=Help F2=Keys F3=Exit F5=Refresh F6=Console F10=Action Bar F11=Print'.

Workload status	Resource status	Operator Alerts
Batch	CPU	Key Task
STC/APPC	DASD	WTO Buffer
TSO: RTA	Tape	WTOs
TSO Host	Paging	DLTEP
Per1 TSO	Storage	DDR Swap
Workload	CSA	Max. Tasks
	Channels	HSM
		Key DASD

# IBM Tivoli Enterprise Portal Interface

The screenshot displays the IBM Tivoli Enterprise Portal interface for monitoring WebSphere processes. The interface is divided into several sections:

- Navigator:** A tree view on the left showing the hierarchy of monitored systems, including OS/390 Systems, SYS9, and various processes.
- Selectable Chart Options:** A toolbar at the top of the chart area with icons for different chart types (bar, line, pie, etc.).
- Personalized Views:** A set of icons on the right side of the chart area for saving and loading different views.
- View Zoom:** A zoom control icon on the right side of the chart area.
- Splitter controls:** A set of icons at the bottom right of the chart area for managing the layout of the views.
- Intelligent Linking:** A feature that links related data across different views, indicated by a circle around a process in the table.
- Persistent customized workspaces:** A feature that allows users to save their customized workspace layout for future sessions.

The main content area displays two charts: "UNIX Run Time" and "CPU Times". The "UNIX Run Time" chart is a 3D bar chart showing run time for various processes. The "CPU Times" chart is a 3D bar chart showing user and system CPU time for the same processes. Below the charts is a table titled "OS/390 UNIX Processes for WebSphere" with columns for MVS Status, Process Status, Execution State, Process ID, Parent Process ID, Leader Session ID, Process Group, and Foreground Process.

MVS Status	Process Status	Execution State	Process ID	Parent Process ID	Leader Session ID	Process Group	Foreground Process
Normal	Multiple_Tasks_In_Process_+ Pthrea...	Running_not_in_kernel_wait	50462821	1	50462821	50462821	
Normal	Multiple_Tasks_In_Process_+ Pthrea...	Running_not_in_kernel_wait	33685615	1	33685615	33685615	
Normal	Multiple_Tasks_In_Process_+ Pthrea...	Running_not_in_kernel_wait	50462832	1	50462832	50462832	
Normal	Multiple_Tasks_In_Process_+ Pthrea...	Running_not_in_kernel_wait	33685672	1	33685672	33685672	
Swapped_Out	Multiple_Tasks_In_Process_+ Pthrea...	Running_not_in_kernel_wait	16908492	1	16908492	16908492	
Swapped_Out	Multiple_Tasks_In_Process_+ Pthrea...	Running_not_in_kernel_wait	33685727	1	33685727	33685727	
Normal	Multiple_Tasks_In_Process_+ Pthrea...	Running_not_in_kernel_wait	16908519	1	16908519	16908519	
Normal	Multiple_Tasks_In_Process_+ Pthrea...	Running_not_in_kernel_wait	50462998	1	50462998	50462998	

## Tivoli Enterprise Portal

- **Browser-based access to monitoring data**
- **Ability to create intelligent alerts using conditional logic**
- **Ability to see an alert and information related to it from the same interface**
- **Reflex automation capabilities**
- **Procedural/resolution information can be provided through Expert Advice**
- **Integration of alerts from other subsystems using OMEGAMON DE**
- **Built-in TN3270 to quickly navigate to console, TSO**
- **Built-in Web Browser**
- **Real-time, near term and long term history**
- **Classic and OMEGAMON II's included with (some) XEs**
- **Consistent interface across all OMEGAMON products**
- **Strategic direction for all product enhancements**

## Detect Events, View Details, Get Expert Advice and Take Action

The screenshot displays the CandleNet Portal interface within a Microsoft Internet Explorer browser window. The address bar shows a local URL for the portal. The left sidebar contains a tree view of the system hierarchy, including Enterprise, OS/390 Systems, MES1, Storage Subsystem, and various performance and status monitors. A critical event, 'KS3\_Vol\_Free\_Space\_Pct\_Critical', is highlighted in the tree.

The main content area is divided into two sections: 'Initial Situation Values' and 'Current Situation Values'. Both sections contain a table with the following columns: Percent Free Space, Volume, Device Address, Device Type, Total Capacity Megabytes, Free Space Megabytes, Fragmentation Index, Largest Free Extent MB, SMS Conversion Status, SMS Status, and Allocated Megabytes.

**Initial Situation Values Table:**

Percent Free Space	Volume	Device Address	Device Type	Total Capacity Megabytes	Free Space Megabytes	Fragmentation Index	Largest Free Extent MB	SMS Conversion Status	SMS Status	Allocated Megabytes
0.9	SV9OS9	C811	0	2707	27	36	26	Non-SMS	Not Connected	
4.4	IV9OS1	C820	0	2707	121	4	121	Non-SMS	Not Connected	
1.6	SV9OS1	C821	0	2707	46	10	45	Non-SMS	Not Connected	
1.8	SV9OS2	C834	0	2707	49	30	47	Non-SMS	Not Connected	

**Current Situation Values Table:**

Percent	Volume	Device	Device	Total Capacity	Free Space	Fragmentation	Largest Free	SMS Conversion Status	SMS Status	Allocated Megabytes
								Non-SMS	Not Connected	
								Non-SMS	Not Connected	
								Non-SMS	Not Connected	
								Non-SMS	Not Connected	

A critical event dialog box is displayed, showing the event name 'KS3\_Vol\_Free\_Space\_Pct\_Critical', the volume 'S3J1DSST:MES1:STORAGE', and the timestamp '02/11/05 07:14:01'. Below the dialog, a yellow bar contains the text: 'Select workspace link button to view event results for: KS3\_Vol\_Disabled\_VTOC\_Critical'.

The 'Take Action' section at the bottom left provides fields for 'Action' (Name and Command), 'Destination System(s)', and a 'Run' button. To the right of this section, an 'Expert Advice' box contains the following text:

The percentage of free space on a volume is below the critical threshold. If datasets on the volume will require more space on this volume, then either migrate some datasets to another volume or release space from datasets that may be over-allocated.

The status bar at the bottom of the interface shows 'Ready', 'Hub Time: Fri, 02/11/2005 12:18 PM', 'Server Available', and the current session information: 'KS3\_Vol\_Free\_Space\_Pct\_Critical - localhost - SYSADMIN'.



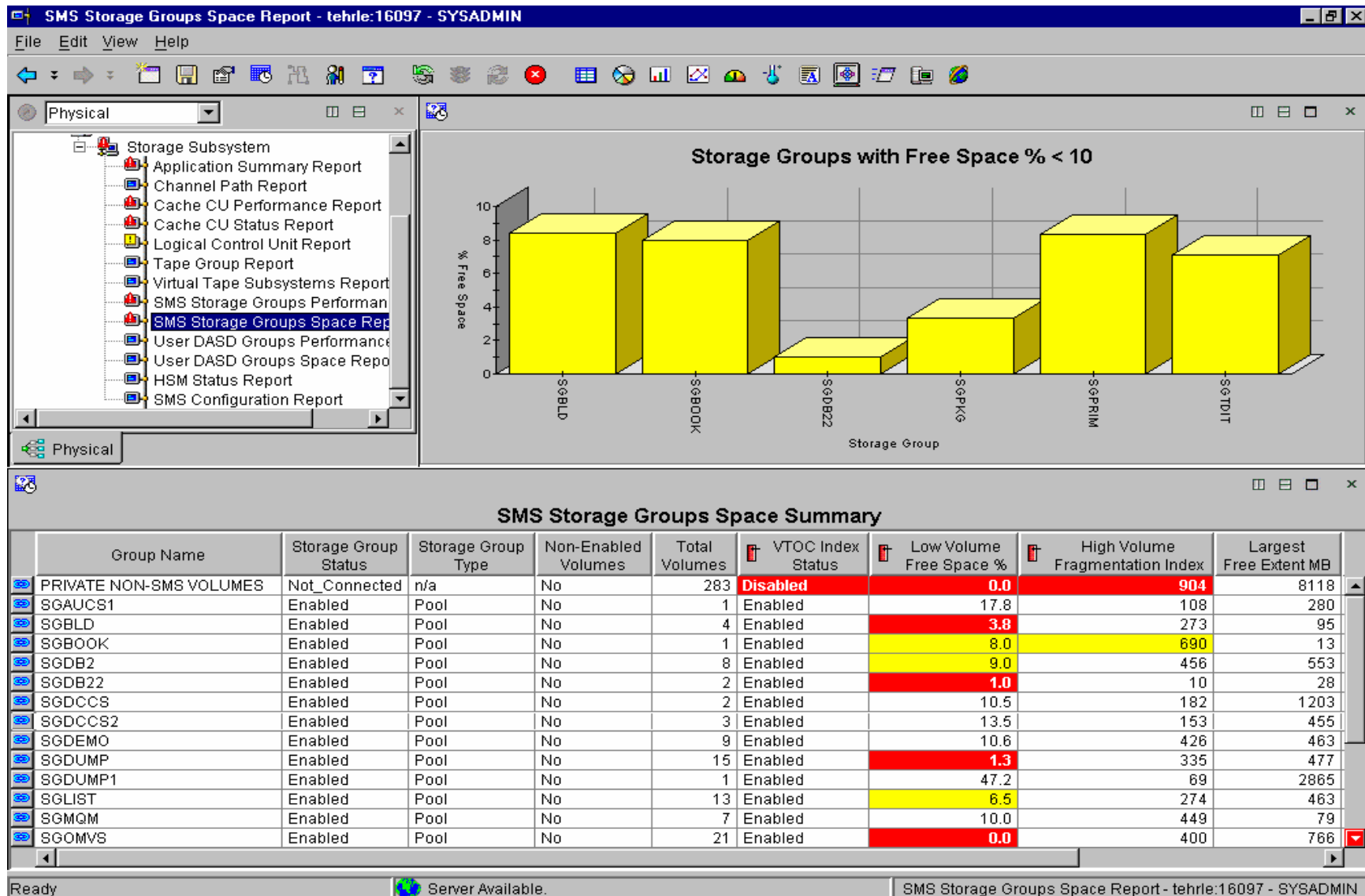
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# IBM Tivoli OMEGAMON for Storage

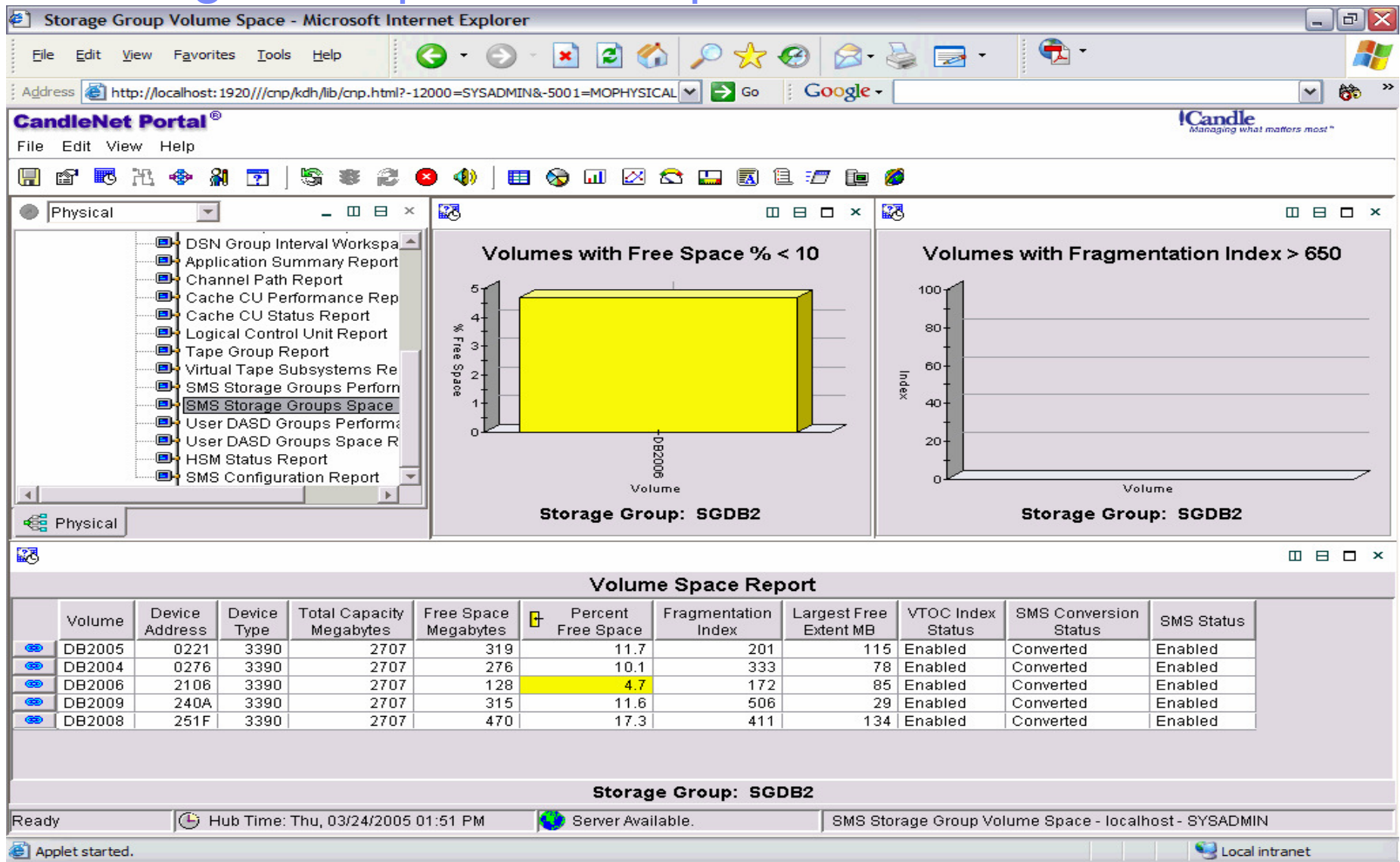
## IBM Tivoli OMEGAMON for Storage on z/OS

- **z/OS Storage monitor**
  - Alerts, Reports, Actions
- **Tivoli Management Portal UI**
- **Views of z/OS Storage subsystem configuration, performance and space**
- **Real-time, trend and point-in-time views**
- **Monitored aspects of storage subsystem include:**
  - DFSMS Storage Group Space, Performance & configuration
  - User DASD Group Space & Performance
  - Tape, Tape Library & VTS performance & configuration
  - Storage Controller performance, availability & Cache metrics
  - zSeries Channels (incl. FICON), LCUs
  - DFHSM activity & control
  - DFSMS constructs
  - RAID device Logical ↔ Physical volume mapping
  - Application monitoring

# Storage Group Space

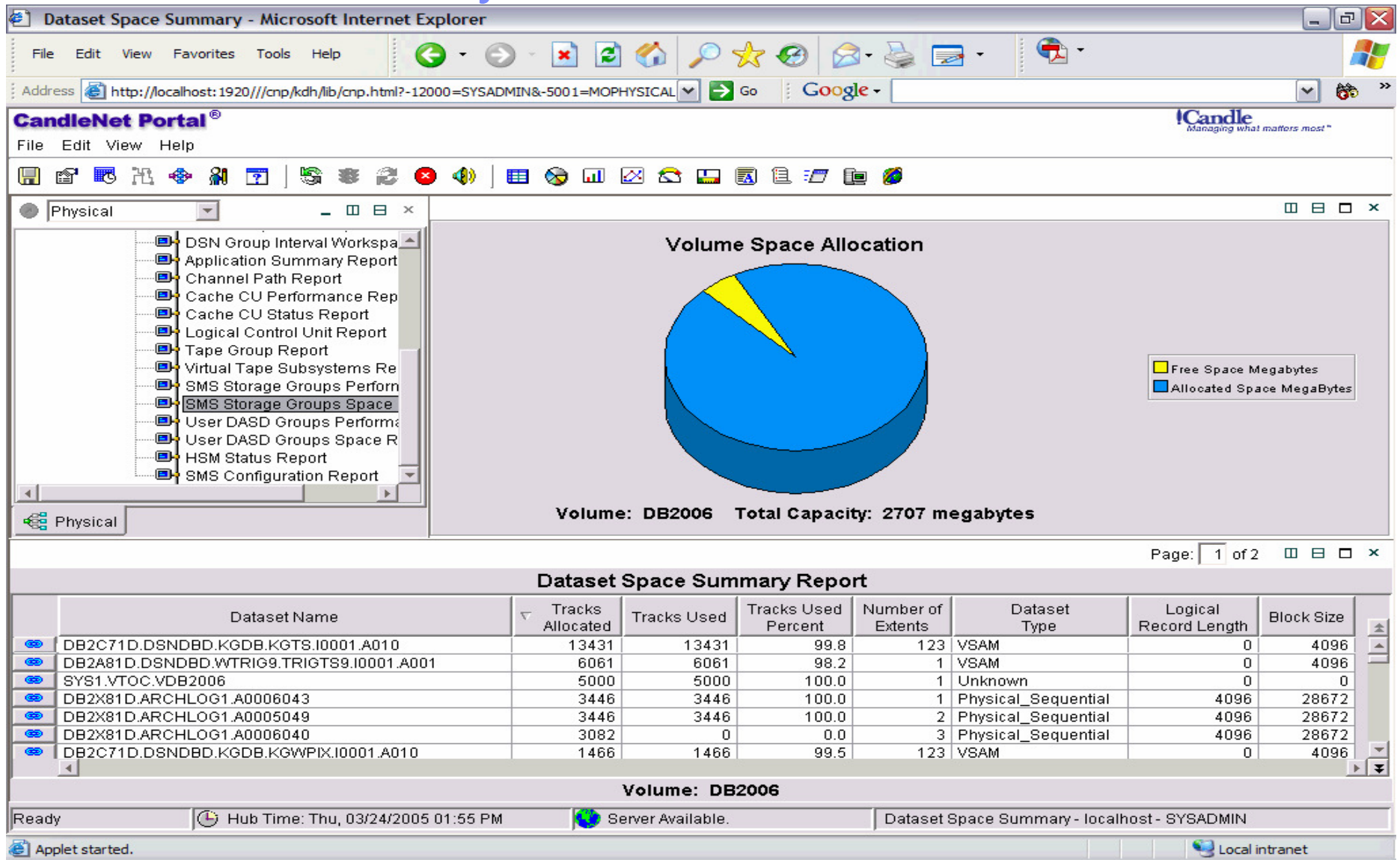


# Storage Group Volume Space





# Dataset Summary



# Take Action

Dataset Space Summary - Microsoft Internet Explorer

Address: http://localhost:1920///cnp/kdh/lib/cnp.html?-12000=SYSADMIN&-5001=MOPHYSICAL

**CandleNet Portal**  
File Edit View Help

Physical

- DSN Group Interval Workspa
- Application Summary Report
- Channel Path Report
- Cache CUI Performance Rep
- Cache C
- Logical
- Tape Gr
- Virtual T
- SMS Stc
- SMS Stc
- User DA
- User DA
- HSM Stc
- SMS Co

Link To

- Take Action...
- Edit Action...
- Link Wizard...
- Link Anchor...
- Export ...
- Split vertically
- Split horizontally
- Remove
- Print Preview...
- Print...
- Properties...

Volume Space Allocation

Free Space Megabytes  
Allocated Space MegaBytes

Volume: DB2006 Total Capacity: 2707 megabytes

Page: 1 of 2

**Dataset Space Summary Report**

	Tracks Allocated	Tracks Used	Tracks Used Percent	Number of Extents	Dataset Type	Logical Record Length	Block Size
DB2C71D.DSNDBD.KGDB.KGTS.I0001.A010	13431	13431	99.8	123	VSAM	0	4096
DB2A81D.DSNDBD.WTRIG9.TRIGTS9.I0001.A001	6061	6061	98.2	1	VSAM	0	4096
SYS1.VTOC.VDB2006	5000	5000	100.0	1	Unknown	0	0
DB2X81D.ARCHLOG1.A0006043	3446	3446	100.0	1	Physical_Sequential	4096	28672
DB2X81D.ARCHLOG1.A0005049	3446	3446	100.0	2	Physical_Sequential	4096	28672
DB2X81D.ARCHLOG1.A0006040	3082	0	0.0	3	Physical_Sequential	4096	28672
DB2C71D.DSNDBD.KGDB.KGWPIX.I0001.A010	1466	1466	99.5	123	VSAM	0	4096

Volume: DB2006

Ready Hub Time: Thu, 03/24/2005 01:56 PM Server Available. Dataset Space Summary - localhost - SYSADMIN

Applet started. Local intranet

# Take Action

Dataset Space Summary - Microsoft Internet Explorer

Address: http://localhost:1920///cnp/kdh/lib/cnp.html?~12000=SYSADMIN&~5001=MOPHYSICAL

CandleNet Portal®

File Edit View Help

Physical

DSN Group Interval Work...  
Application Summary R...  
Channel Path Report  
Cache CU Performance  
Cache CU Status Repor...  
Logical Control Unit Re...  
Tape Group Report  
Virtual Tape Subsystem  
SMS Storage Groups P...  
SMS Storage Groups S...  
User DASD Groups Pe...  
User DASD Groups Sp...  
HSM Status Report  
SMS Configuration Rep...

Take Action

Action

Name: HSM\_Migrate

Command: HMIGRATE DB2C71D.DSNDBD.KGDB.KGTS.I0001.A010

Arguments...

Destination System(s)

LPAR400J:SP22:STORAGE  
S3CMS10:SP22:STORAGE

Free Space Megabytes  
Allocated Space MegaBytes

Page: 1 of 2

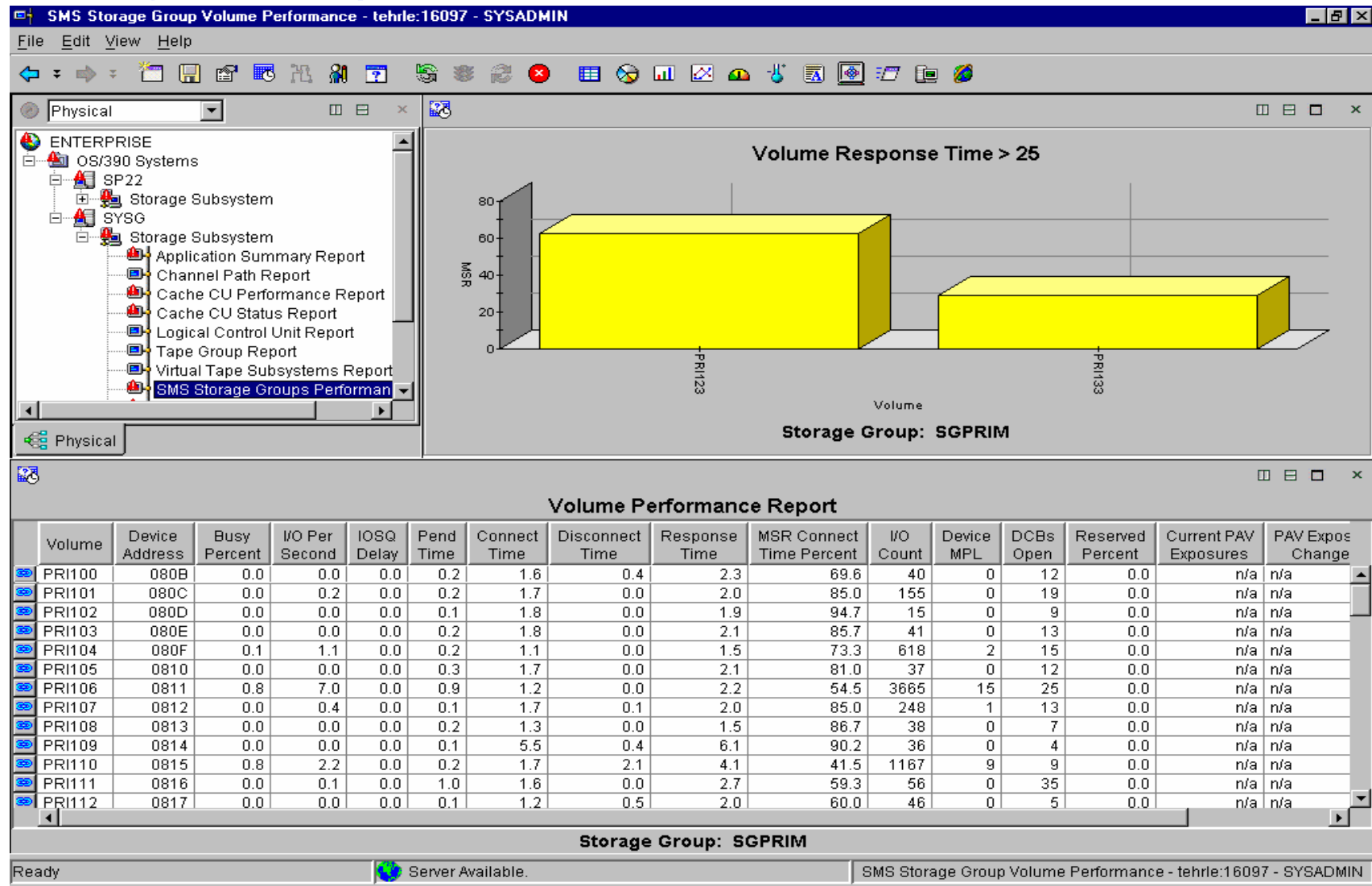
Dataset Name	Allocated	Free	Percent	Extent	Type	Logical Record Length	Block Size
DB2C71D.DSNDBD.KGDB.KGTS.I0001.A010	13431	13431	99.8	123	VSAM	0	4096
DB2A81D.DSNDBD.WTRIG9.TRIGTS9.I0001.A001	6061	6061	98.2	1	VSAM	0	4096
SYS1.VTOC.VDB2006	5000	5000	100.0	1	Unknown	0	0
DB2X81D.ARCHLOG1.A0006043	3446	3446	100.0	1	Physical_Sequential	4096	28672
DB2X81D.ARCHLOG1.A0005049	3446	3446	100.0	2	Physical_Sequential	4096	28672
DB2X81D.ARCHLOG1.A0006040	3082	0	0.0	3	Physical_Sequential	4096	28672
DB2C71D.DSNDBD.KGDB.KGWPIX.I0001.A010	1466	1466	99.5	123	VSAM	0	4096

Volume: DB2006

Ready Hub Time: Thu, 03/24/2005 01:57 PM Server Available. Dataset Space Summary - localhost - SYSADMIN

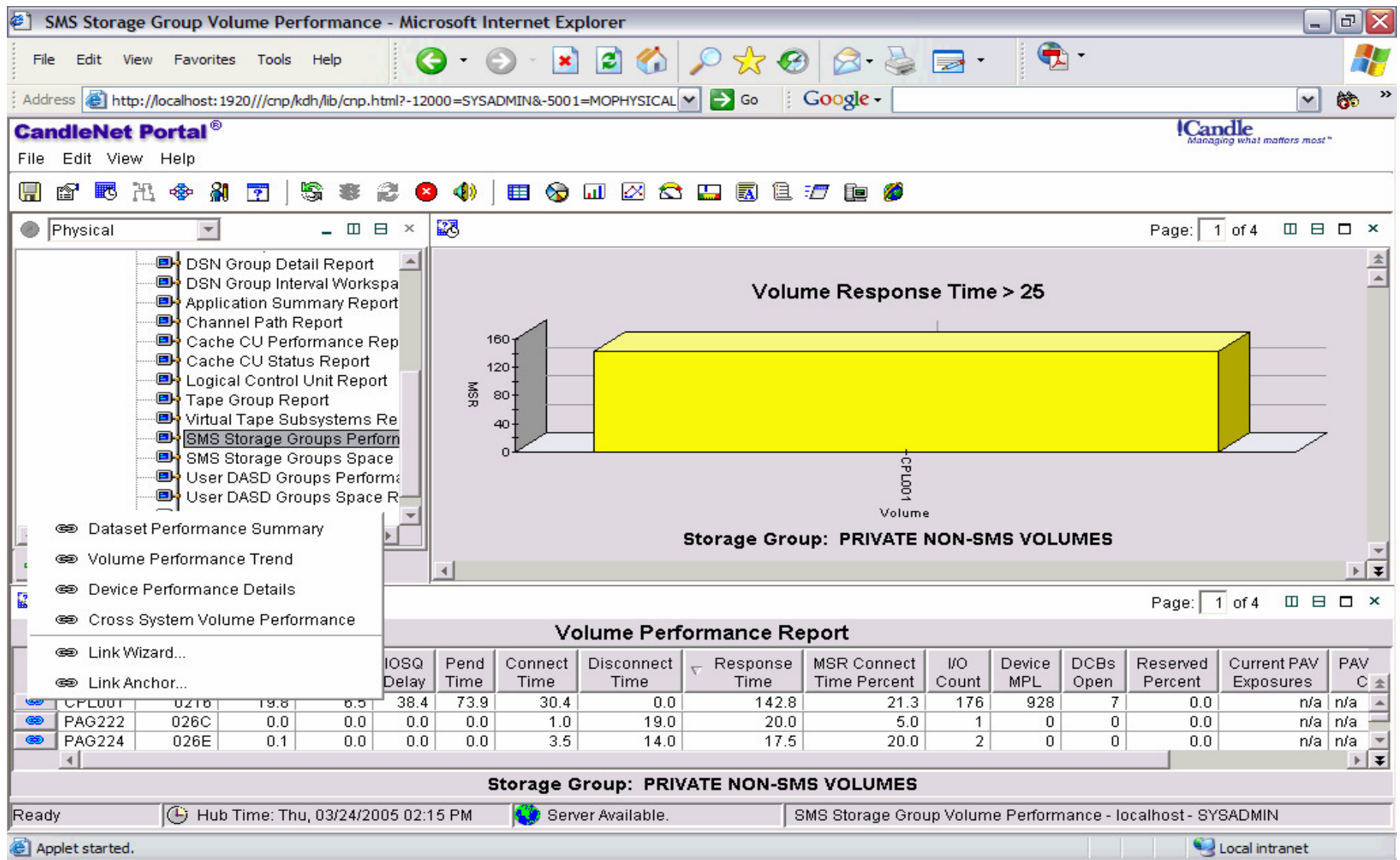
Applet started. Local intranet

# Storage Group Volume Performance

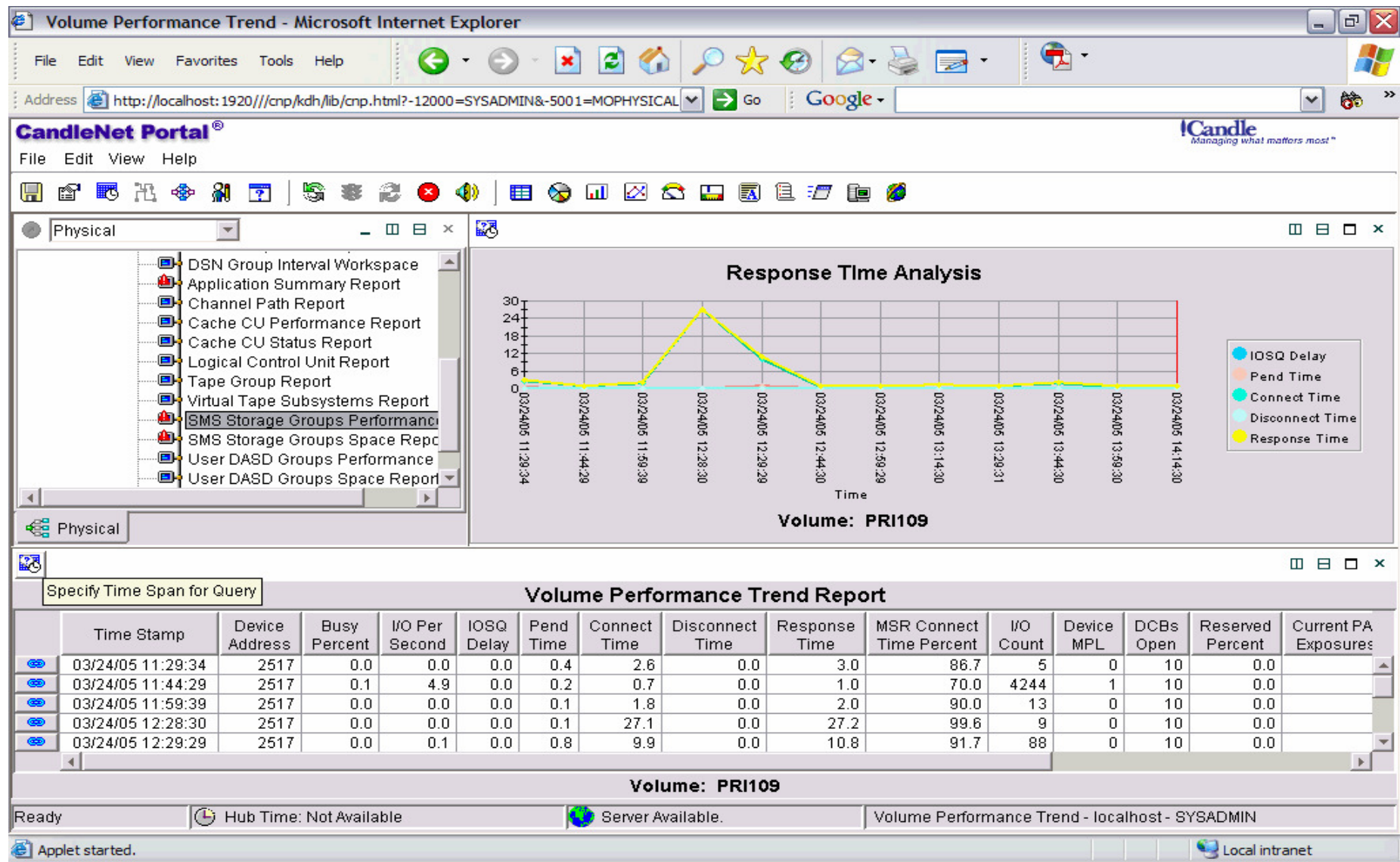




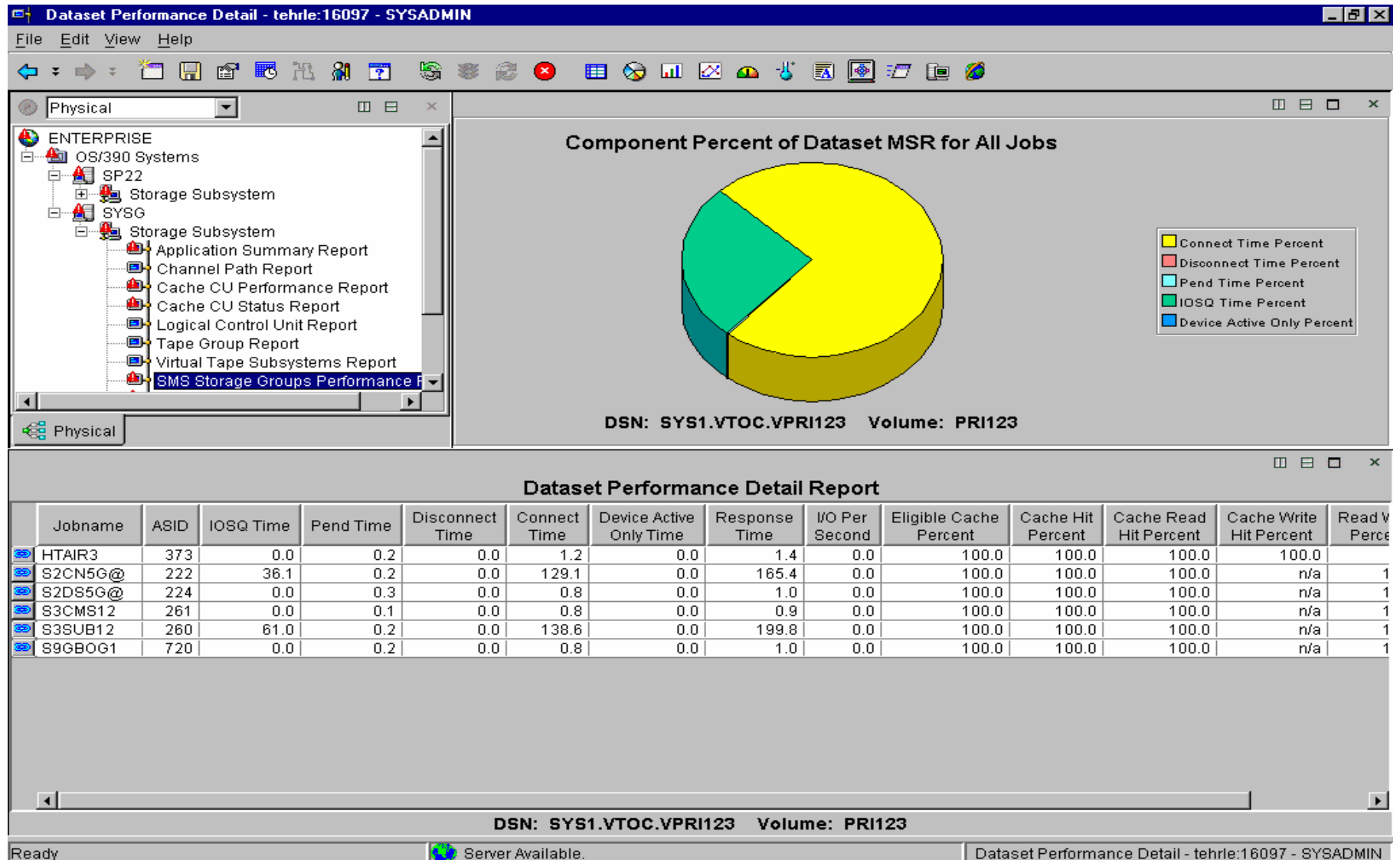
# Pre-Built Navigation Paths



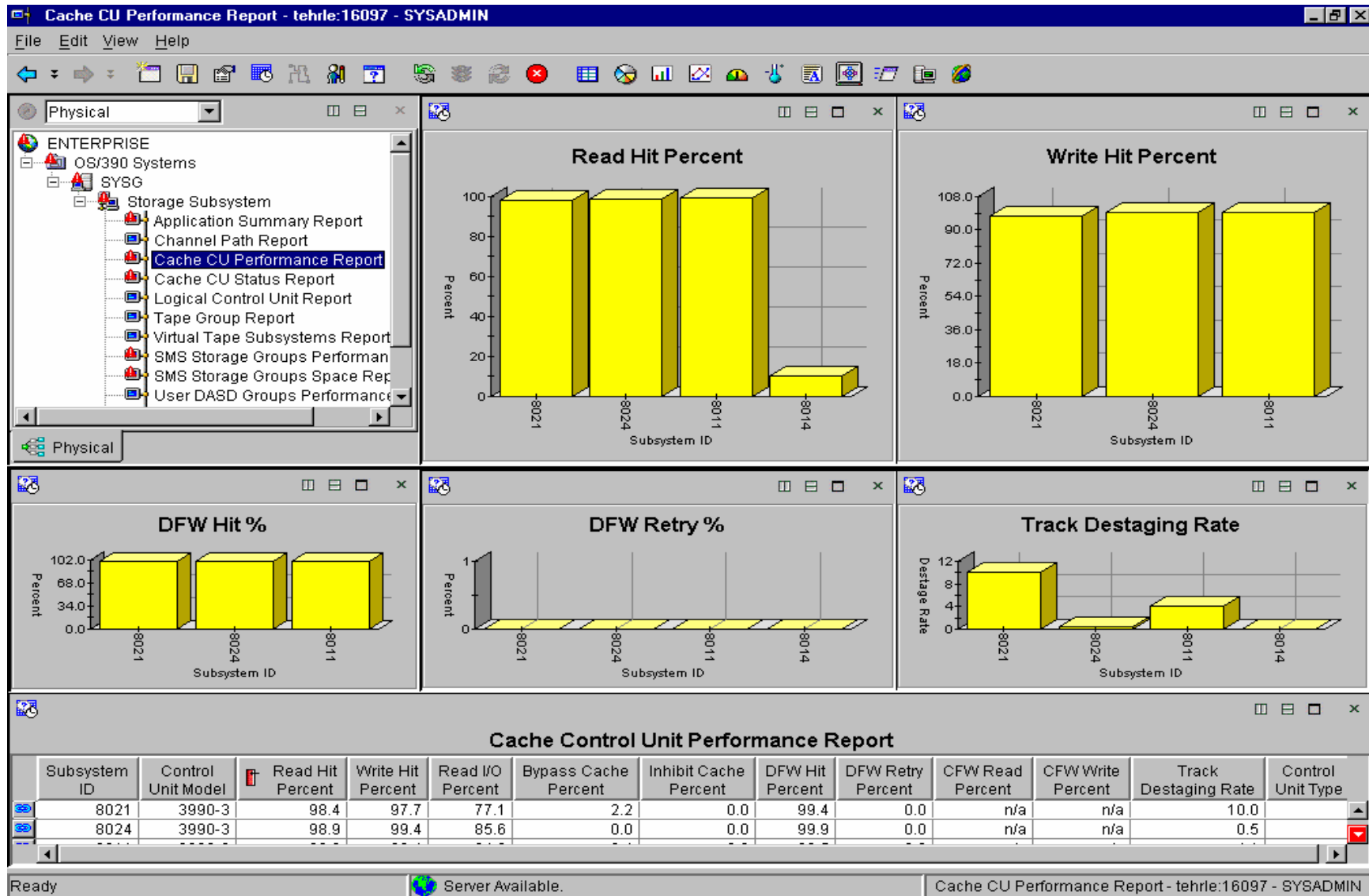
# Volume Performance Trend



# Dataset Performance

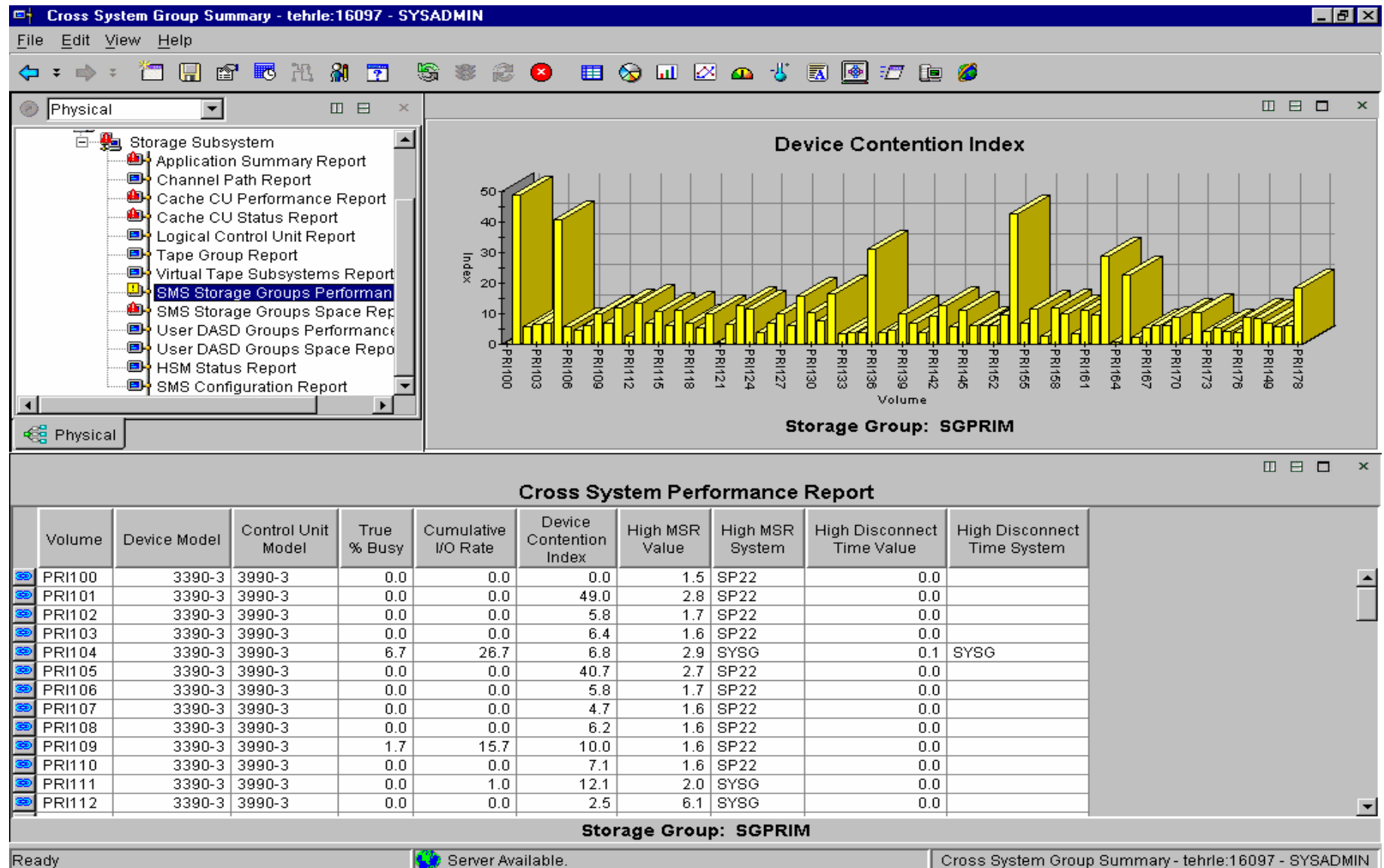


# Cache Statistics

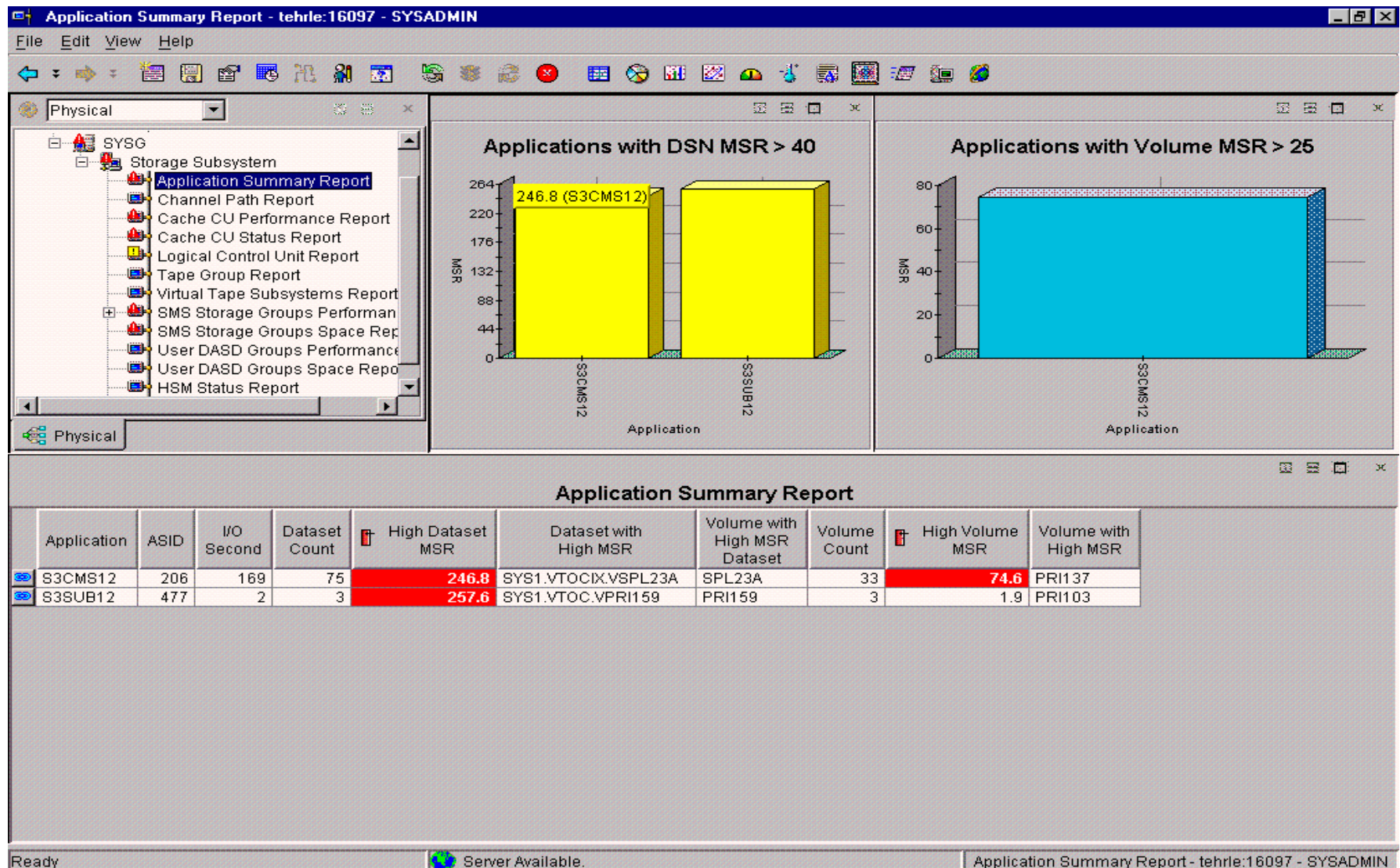




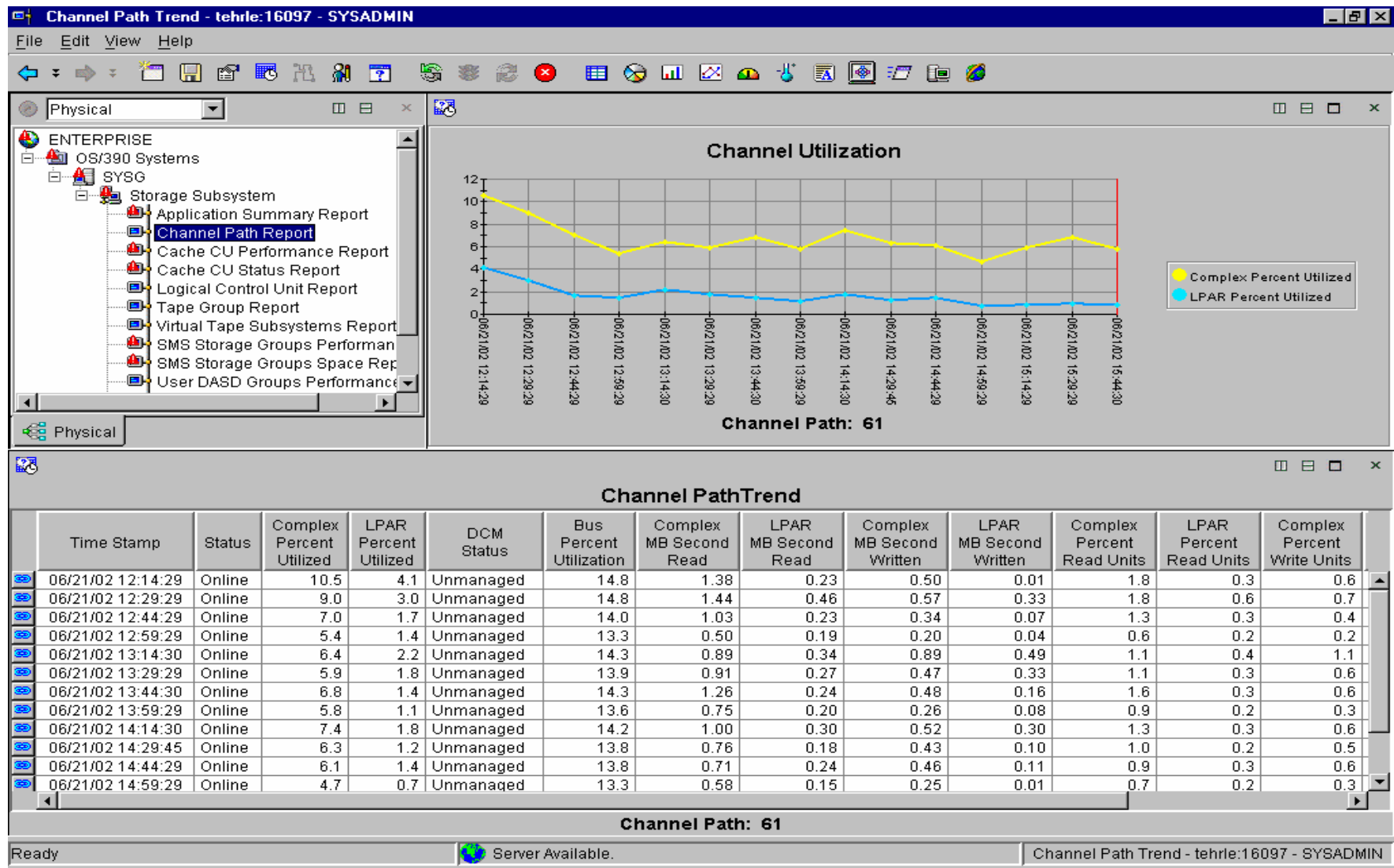
# Cross System Information



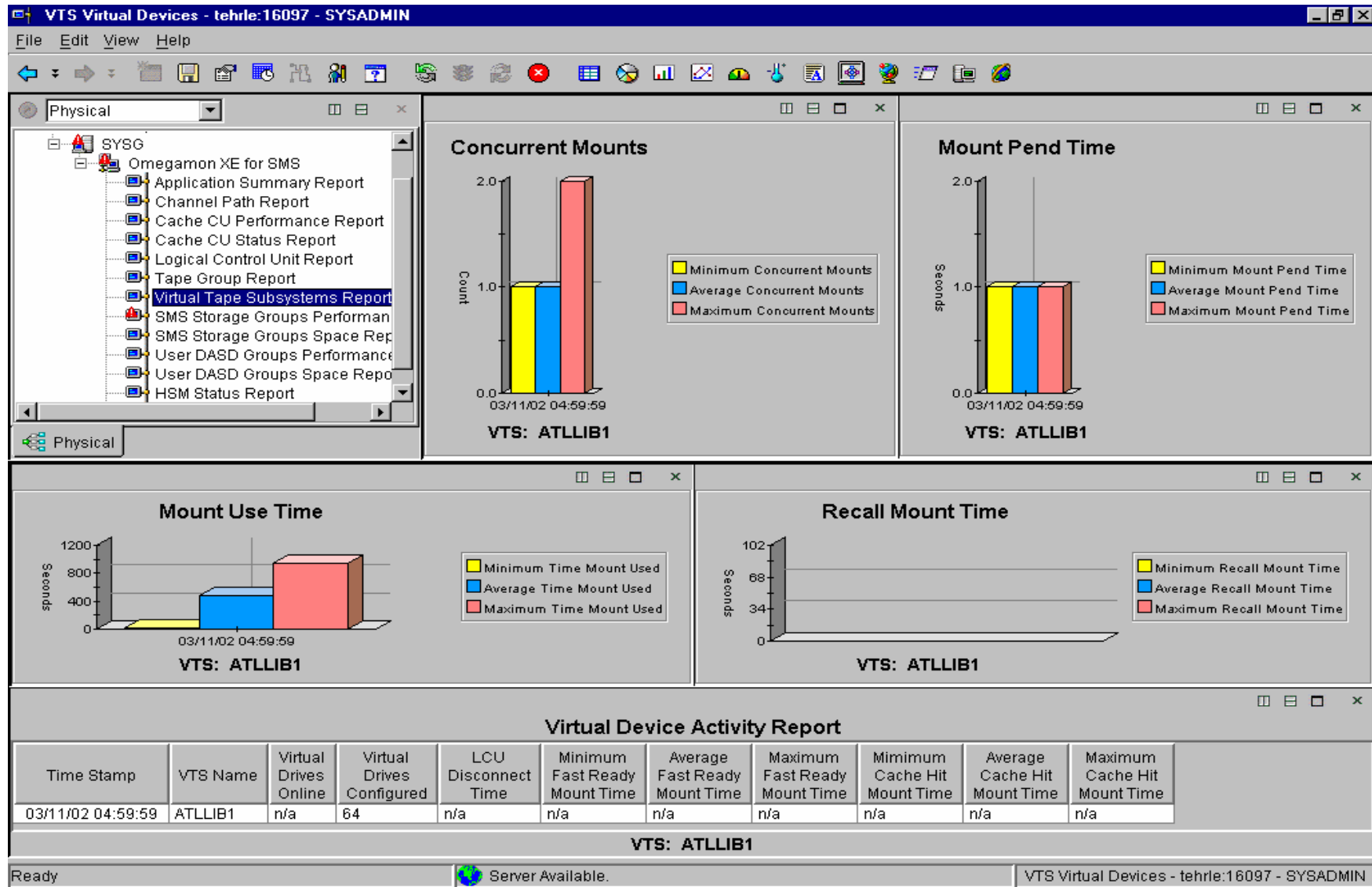
# Application Dataset Performance



# Channel Performance Trend

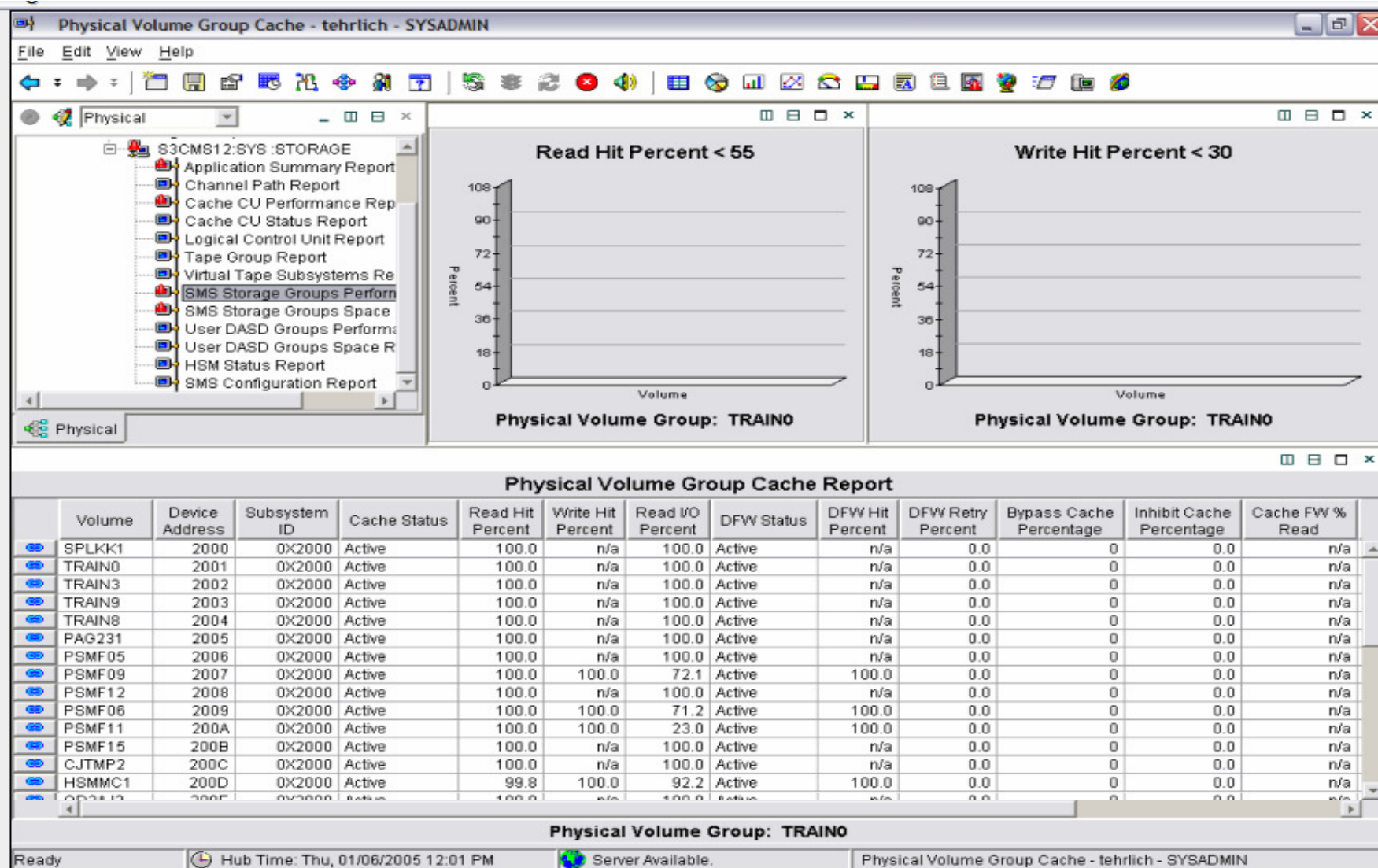


# VTs Information

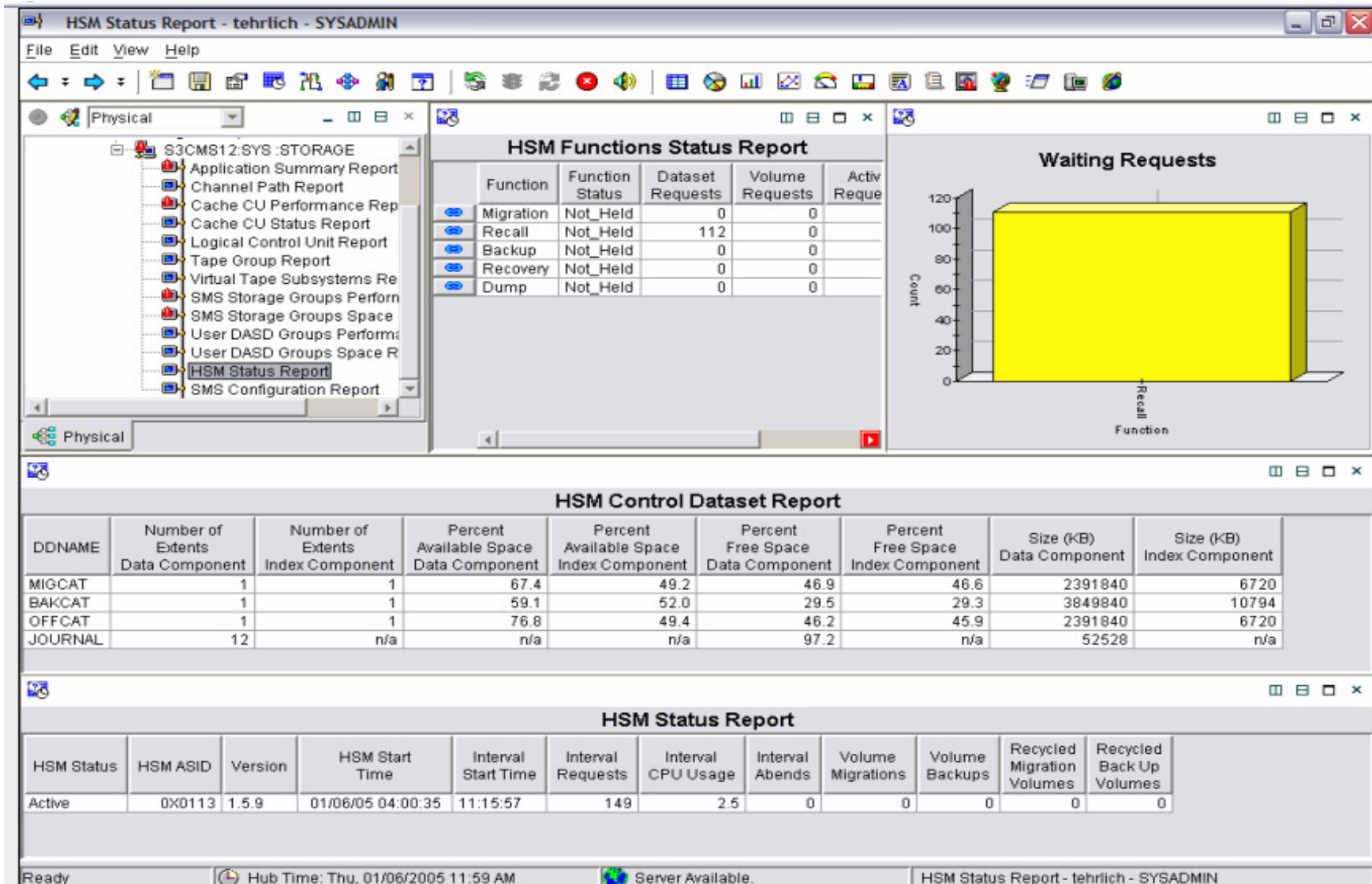




# Physical Volume Mapping



# DFHSM Activity



# DFSMS Configuration

SMS Configuration - Microsoft Internet Explorer

Address: http://localhost:1920///cnp/kdh/lib/cnp.html?~12000=SYSADMIN&-5001=MOPHYSICAL

CandleNet Portal®

File Edit View Help

Physical

- Enterprise
  - OS/390 Systems
    - MES1
      - Storage Subsystem
        - S3J1DSST:ME1:STORAGE
          - Application Summary
          - Channel Path
          - Cache CU Performance
          - Cache CU Status
          - Logical Control Unit
          - Tape Group
          - Virtual Tape Subsystems
          - SMS Storage Groups Performance
          - SMS Storage Groups Space
          - User DASD Groups Performance
          - User DASD Groups Space
          - HSM Status
          - SMS Configuration**

SMS Base Configuration

SMS Status	SMS Level	MVS Level	Last Update User ID	Last Updated	Default Management Class	Default Tracks per Cylinder	Default Track Size	Default Unit Type
Active	1.3.0	SP7.0.4	HANDLIN	12/10/98 12:11:00		15	56664	SYSALLDA

Storage Groups

Storage Group Name	Storage Group Type	Last Update User ID	Last Updated	Description
ALL	Pool	IBMUSER	07/27/87 15:22:00	SYSTEM1-POOL STORGRP FOR OPERATOR COMMAND T...
ATLSG1	Tape	H046638	09/22/95 08:06:00	ATL STORGRP 1
ATLSG2	Tape	H046638	09/22/95 08:06:00	ATL STORGRP 2
ATLSG3	Tape	H046638	08/15/95 12:56:00	ATL STORGRP 3
JRV01	Pool	HANDLIN	04/03/03 12:53:00	JOURNAL STORAGE GROUP
MTLSG1	Tape	IBMUSER	02/20/92 15:05:00	MTL STORGRP 1
SGACSU1	Pool	IBMUSER	07/27/87 15:11:00	SYSTEM1-POOL STORGRP FOR ACS ROUTINE TEST CAS...
SGACS02	Pool	IBMUSER	07/27/87 15:12:00	SYSTEM1-POOL STORGRP FOR ACS ROUTINE TEST CAS...
SGACS03	Pool	IBMUSER	07/27/87 15:13:00	SYSTEM1-POOL STORGRP FOR ACS ROUTINE TEST CAS...

Data Classes

Data Class Name	Last Update User ID	Last Updated	DATA CLAS
ACCTDSN4	USER5	08/25/87 08:27:00	DATA CLAS A
ACCTDSN5	USER5	08/25/87 08:28:00	DATA CLAS A
ACCTDSN6	USER5	08/25/87 08:28:00	DATA CLAS A
ACCTJOB4	USER5	08/25/87 08:23:00	DATA CLAS A
ACCTJOB5	USER5	08/25/87 08:23:00	DATA CLAS A
ACCTJOB6	USER5	08/25/87 08:24:00	DATA CLAS A
ACCTSTP4	USER5	08/25/87 08:25:00	DATA CLAS A
ACCTSTP5	USER5	08/25/87 08:25:00	DATA CLAS A
ACCTSTP6	USER5	08/25/87 08:26:00	DATA CLAS A
ATLDC004	IBMUSER	02/20/92 15:14:00	NON-COMPACT
ATLDC008	IBMUSER	02/20/92 15:17:00	COMPACTIO
B3000001	IBMUSER	08/18/92 19:54:00	BIG3 18TRK
B3000002	IBMUSER	08/18/92 19:56:00	BIG3 3490 1
B3000003	IBMUSER	08/18/92 19:56:00	BIG3 3490E
B3000004	IBMUSER	08/18/92 19:57:00	BIG3 3490E
B3000005	IBMUSER	08/18/92 19:58:00	BIG3 3490E
B3000006	IBMUSER	08/18/92 19:59:00	BIG3 3490E

Management Classes

Management Class Name	Last Update User ID	Last Updated	SYSTEM1 M
ACCTDSN4	IBMUSER	07/27/87 12:53:00	SYSTEM1 M
ACCTDSN5	IBMUSER	07/27/87 12:53:00	SYSTEM1 M
ACCTDSN6	IBMUSER	07/27/87 12:53:00	SYSTEM1 M
ACCTJOB4	IBMUSER	07/27/87 12:52:00	SYSTEM1 M
ACCTJOB5	IBMUSER	07/27/87 12:52:00	SYSTEM1 M
ACCTJOB6	IBMUSER	07/27/87 12:52:00	SYSTEM1 M
ACCTSTP4	IBMUSER	07/27/87 12:52:00	SYSTEM1 M
ACCTSTP5	IBMUSER	07/27/87 12:52:00	SYSTEM1 M
ACCTSTP6	IBMUSER	07/27/87 12:52:00	SYSTEM1 M
S1PXXM01	USER3	09/24/87 10:18:00	SYSTEM1 M
S1PXXM02	USER3	09/24/87 10:19:00	SYSTEM1 M
S1PXXM05	USER3	09/24/87 10:20:00	SYSTEM1 M
S1PXXM06	IBMUSER	07/27/87 12:51:00	SYSTEM1 M
S1PXXM07	IBMUSER	07/27/87 12:51:00	SYSTEM1 M
S1P01M01	IBMUSER	07/27/87 12:47:00	SYSTEM1 M
S1P01M02	IBMUSER	07/27/87 12:47:00	SYSTEM1 M
S1P02M01	IBMUSER	07/27/87 12:47:00	SYSTEM1 M

Storage Classes

Storage Class Name	Last Update User ID	Last Updated	SYSTEM1 STORCLAS
ACCTDSN4	IBMUSER	07/27/87 16:06:00	SYSTEM1 STORCLAS
ACCTDSN5	IBMUSER	07/27/87 16:06:00	SYSTEM1 STORCLAS
ACCTDSN6	IBMUSER	07/27/87 16:06:00	SYSTEM1 STORCLAS
ACCTJOB4	IBMUSER	07/27/87 16:04:00	SYSTEM1 STORCLAS
ACCTJOB5	IBMUSER	07/27/87 16:05:00	SYSTEM1 STORCLAS
ACCTJOB6	IBMUSER	07/27/87 16:05:00	SYSTEM1 STORCLAS
ACCTSTP4	IBMUSER	07/27/87 16:05:00	SYSTEM1 STORCLAS
ACCTSTP5	IBMUSER	07/27/87 16:05:00	SYSTEM1 STORCLAS
ACCTSTP6	IBMUSER	07/27/87 16:05:00	SYSTEM1 STORCLAS
ATLSCSG1	IBMUSER	02/20/92 15:07:00	STORCLAS FOR ATL
ATLSCSG2	IBMUSER	02/20/92 15:10:00	STORCLAS FOR ATL
ATLSCSG3	IBMUSER	02/20/92 15:09:00	STORCLAS FOR ATL
ATLTPDS0	IBMUSER	02/20/92 15:12:00	STORCLAS FOR TAF
DCME0001	IBMUSER	08/21/92 11:24:00	DCME STORCLAS 1
DCME0002	IBMUSER	08/21/92 11:25:00	DCME STORCLAS 2
DCME0003	IBMUSER	08/21/92 11:26:00	DCME STORCLAS 3
DCME0004	IBMUSER	08/21/92 11:26:00	DCME STORCLAS 4

Ready

Hub Time: Sun, 02/13/2005 04:41 PM

Server Available.

SMS Configuration - localhost - SYSADMIN

Opening http://localhost:1920///cnp/kdh/lib/classes/candle/ks3/resources/help/attr\_SMS\_ST\_CL.properties

Local intranet

# IBM Tivoli OMEGAMON for Storage on z/OS

## Summary

- **z/OS Storage monitor for**
  - DFSMS Storage Group Space & Performance
  - User DASD group Space & Performance
  - Tape, Tape Library, VTS performance & configuration
  - Storage Controller performance, availability & Cache
  - zSeries Channels (incl. FICON), LCUs
  - DFHSM activity & control
  - DFSMS constructs
  - RAID device Logical ↔ Physical volume mapping
  - Applications
- **Alerts to enhance problem notification, identification, isolation and resolution**
- **Custom workspaces to address unique problems and environments**
- **Automated actions to reduce problem resolution time**



## New stuff !!

- **New Functions in OMEGAMON XE for Storage on z/OS 4.1.0**
  - Storage Toolkit
  - Dataset Attributes Database
  - Direct Situation Analysis
  - Problem Volume Workspaces
  - Cross-product Navigation

## Storage Toolkit

- GUI to issue DFSMSHsm and DFSMSdss requests
  - Available on dataset reports and charts
  - Available on volume reports and charts
- Requests can be scheduled
  - Execute immediately
  - Execute at some time in the future
  - Execute on a time interval
- Manage requests through GUI
  - Cancel execution
  - Delete output
  - Resubmit
- View request status and output from workspaces
  - Product provided solutions to flag requests with return code 4 and higher
- DFSMSdss requests execute in a started task created for that request
  - STC is auto-started to execute a single DFSMSdss request
- DFSMSHsm requests execute in the TEMS address space

# Create a Dataset Request...

Dataset Group Details Primary - TEHRlich - SYSADMIN \*ADMIN MODE\*

File Edit View Help

View: Physical

Logical Control Unit  
Tape Group  
Virtual Tape Subsystems  
SMS Storage Groups Performance  
SMS Storage Groups Space  
User DASD Groups Performance  
User DASD Groups Space  
HSM Status  
Dataset Attributes System Status  
Dataset Group Summary  
SMS Configuration  
Storage

Physical

Response Time

Dataset Name

Dataset Group Primary Entries

Dataset

Take Action...  
Link To...  
Launch...  
Link Anchor...  
Export...  
Dataset Actions...  
Split vertically  
Split horizontally  
Remove  
Print Preview...  
Print...  
Properties...

Backup  
Migrate  
Move & Copy  
Recall  
Recover  
Release Space

Total Allocations

Dataset Name

Tracks

Dataset Group: S3410P14

I/O Activity

Dataset Name

I/O Requests

Dataset Group: S3410P14

Dataset Name	Dataset Type	Volume Count	Maximum MSR	Average MSR	Total I/Os	Maximum I/Os	Total Track Allocation	Total Track Used	Total Track Free	Primary Volume	Catalog
TDSMST.S3410SM2.S3410P14.RKSDSA2	Non-VSAM Data Set	1	n/a	n/a	n/a	n/a	1	1	0	PRI139	ICFCAT.VT...
TDSMST.S3410SM2.S3410P14.RKM5LPR2	Non-VSAM Data Set	1	n/a	n/a	n/a	n/a	173	173	0	PRI182	ICFCAT.VT...
TDSMST.S3410SM2.S3410P14.RKDFPRFT	Non-VSAM Data Set	1	n/a	n/a	n/a	n/a	173	173	0	PRI171	ICFCAT.VT...
TDSMST.S3410SM2.S3410P14.RKDFDSB3	Non-VSAM Data Set	1	n/a	n/a	n/a	n/a	13	5	8	PRI187	ICFCAT.VT...
TDSMST.S3410SM2.S3410P14.RKANSQL	Non-VSAM Data Set	1	n/a	n/a	n/a	n/a	753	187	566	PRI169	ICFCAT.VT...
TDSMST.S3410SM2.S3410P14.RKANMOD	Non-VSAM Data Set	1	n/a	n/a	n/a	n/a	1785	34	1751	PRI142	ICFCAT.VT...

Dataset Group: S3410P14

Hub Time: Tue, 05/23/2006 04:25 PM Server Available Dataset Group Details Primary - TEHRlich - SYSADMIN \*ADMIN MODE\*

# Create a Dataset Request...

Select a request type and choose options

**Dataset Group Details Primary - TEHRlich - SYSADMIN \*ADMIN MODE\***

File Edit View Help

View: Physical

Logical Control Unit  
Tape Group  
Virtual Tape Subsystems  
SMS Storage Groups Performance  
SMS Storage Groups Space  
User DASD Groups Performance  
User DASD Groups Space  
HSM Status  
Dataset Attributes System Support  
**Dataset Group Summary**  
SMS Configuration  
Storage Toolkit

Physical

Response Time

Dataset Name

TDSMST.S3410SM2.S3410P14.RKDFDSB3

Dataset Group: S3410P14

Dataset Group Primary Entries

Dataset Name	...
TDSMST.S3410SM2.S3410P14.KPDCTLL	...
TDSMST.S3410SM2.S3410P14.RGENHI...	...
TDSMST.S3410SM2.S3410P14.RGENHI...	...
TDSMST.S3410SM2.S3410P14.RGENHI...	...
TDSMST.S3410SM2.S3410P14.RKANCMD	...
TDSMST.S3410SM2.S3410P14.RKANDA...	...
TDSMST.S3410SM2.S3410P14.RKANMOD	...

**Dataset Copy and Move**

Options General Schedule

This action uses a DFDSS service

**Source dataset options**

☐ Process multi-volume datasets  
☐ Process VSAM sphere components  
☐ Force unmovable dataset

Disposition ☒ Keep ☐ Delete ☐ Uncat

**Target destination and options**

Volser   
Dataset   
Storage Class   
Management Class

☐ Bypass SMS ACS routine ☐ Catalog ☐ Reblock

PDS conversion format ☐ PDS ☐ PDSE ☒ None

OK Cancel Test Help

Dataset Group: S3410P14

Hub Time: Tue, 05/23/2006 04:27 PM Server Available Dataset Group Details Primary - TEHRlich - SYSADMIN \*ADMIN MODE\*

Tracks Used  
Tracks Free

Total I/Os

S3410P14

Track	Total Track Used	Total Track Free	Primary Volume	Catalog
1	1	0	PRI139	ICFCAT.VT...
73	173	0	PRI143	ICFCAT.VT...
73	173	0	PRI182	ICFCAT.VT...
73	173	0	PRI171	ICFCAT.VT...
3	5	8	PRI187	ICFCAT.VT...
53	187	566	PRI169	ICFCAT.VT...
85	34	1751	PRI142	ICFCAT.VT...

# Create a Dataset Request

Optionally schedule the request, if immediate execution is not wanted Click OK

**Dataset Group Details Primary - TEHRlich - SYSADMIN \*ADMIN MODE\***

File Edit View Help

View: Physical

Logical Control Unit  
Tape Group  
Virtual Tape Subsystems  
SMS Storage Groups Perform  
SMS Storage Groups Space  
User DASD Groups Perform  
User DASD Groups Space  
HSM Status  
Dataset Attributes System Su  
Dataset Group Summary  
SMS Configuration  
Storage Toolkit

Physical

Response Time

Dataset Name

TDSMST.S3410SM2.S3410P14.RKDFDSB3

Dataset Group: S3410P14

Dataset Group Primary Entries

Dataset Name	...
TDSMST.S3410SM2.S3410P14.KPDCTLL	No
TDSMST.S3410SM2.S3410P14.RGENHI...	No
TDSMST.S3410SM2.S3410P14.RGENHI...	No
TDSMST.S3410SM2.S3410P14.RGENHI...	No
TDSMST.S3410SM2.S3410P14.RKANCMD	No
TDSMST.S3410SM2.S3410P14.RKANDA...	No
TDSMST.S3410SM2.S3410P14.RKANMOD	No

**Dataset Copy and Move**

Options General Schedule

Start Time and Date

☒ In  
0 Days 0 Hours 0 Mins

☐ At  
01:00 (hh:mm) am pm  
May 23 2006

☐ At  
01:00 (hh:mm) am pm  
☐ Every  
☐ Mon ☐ Tue ☐ Wed ☐ Thur ☐ Fri ☐ Sat ☐ Sun

OK Cancel Test Help

Dataset Group: S3410P14

Hub Time: Tue, 05/23/2006 04:30 PM Server Available Dataset Group Details Primary - TEHRlich - SYSADMIN \*ADMIN MODE\*

Tracks Used  
Tracks Free

Total I/Os

I/O Requests

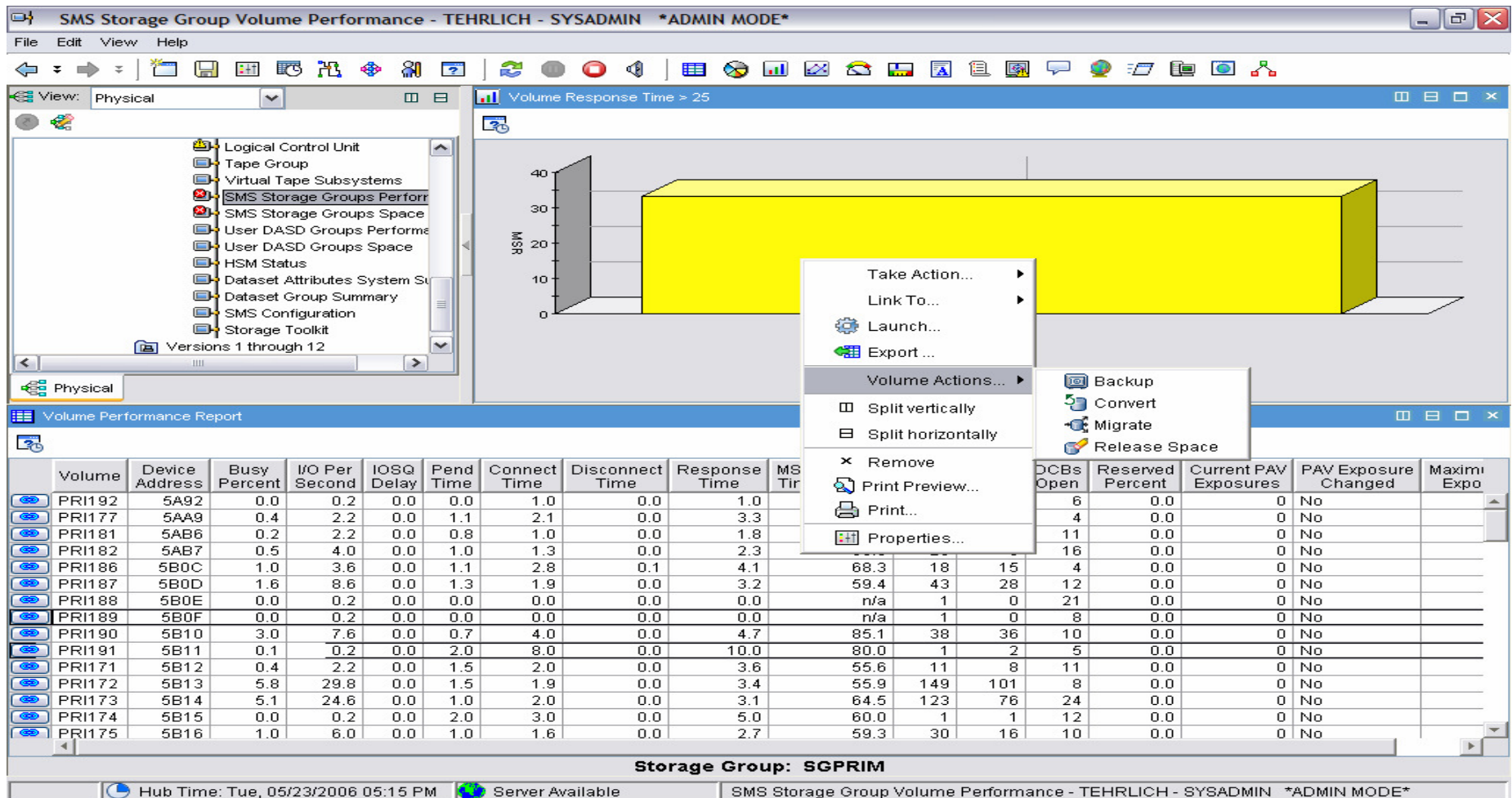
S3410P14

Track	Total Track Used	Total Track Free	Primary Volume	Catalog
1	1	0	PRI139	ICFCAT.VTS
73	173	0	PRI143	ICFCAT.VTS
73	173	0	PRI182	ICFCAT.VTS
73	173	0	PRI171	ICFCAT.VTS
3	5	8	PRI187	ICFCAT.VTS
53	187	566	PRI169	ICFCAT.VTS
85	34	1751	PRI142	ICFCAT.VTS



# Create a Volume Request...

Right click a report row or a bar in the chart and select 'Volume Actions'



# Create a Volume Request

Select a request and choose options

**Volume Space Release**

This action uses a DFDSS service

Minimum secondary allocation for release:  Tracks

Minimum unused space prior to release:  Tracks

Wait for volume between retries:  Seconds

Try to obtain volume access:  Times

Exclude datasets qualified by:

Dataset Name or Pattern

OK Cancel Test Help

Volume	Device Address	Busy Percent	I/O Per Second	...
PRI192	5A92	0.0	0.2	
PRI177	5AA9	0.4	2.2	
PRI181	5AB6	0.2	2.2	
PRI182	5AB7	0.5	4.0	
PRI186	5B0C	1.0	3.6	
PRI187	5B0D	1.6	8.6	
PRI188	5B0E	0.0	0.2	
PRI189	5B0F	0.0	0.2	
PRI190	5B10	3.0	7.6	
PRI191	5B11	0.1	0.2	0.0 2.0 8.0 0.0 10.0 80.0 1 2 5
PRI171	5B12	0.4	2.2	0.0 1.5 2.0 0.0 3.6 55.6 11 8 11
PRI172	5B13	5.8	29.8	0.0 1.5 1.9 0.0 3.4 55.9 149 101 8
PRI173	5B14	5.1	24.6	0.0 1.0 2.0 0.0 3.1 64.5 123 76 24
PRI174	5B15	0.0	0.2	0.0 2.0 3.0 0.0 5.0 60.0 1 1 12
PRI175	5B16	1.0	6.0	0.0 1.0 1.6 0.0 2.7 59.3 30 16 10

Storage Group: SGRIM

Hub Time: Tue, 05/23/2006 05:19 PM Server Available SMS Storage Group Volume Performance - TEHRLICH - SYSADMIN \*ADMIN MODE\*

# Manipulate Existing Requests

The screenshot shows the 'Storage Toolkit Action Requests - TEHRlich - SYSADMIN \*ADMIN MODE\*' window. The 'Physical' view is selected, showing a tree of storage-related items. The 'Storage Toolkit' item is selected, and a context menu is open with the following options:

- Take Action...
- Link To...
- Launch...
- Link Anchor...
- Export ...
- Delete Request
- Submit Request
- Delete All Results
- Split vertically
- Split horizontally
- Remove
- Print Preview...
- Print...
- Properties...

The 'Return Code' graph shows a single data point at 0. The 'Action Requests' table below the graph contains the following data:

Creator Name	Action Name	Des	Run Count	Last Return Code	Date Created	Last Completed	Command
SYSADMIN	Sun Apr 23 09:38:05 2006	DFSMSshm Dataset Recall	1	0	04/23/06 09:38:05	04/23/06 09:39:52	RECALL %SUBI

The status bar at the bottom indicates: Hub Time: Tue, 05/23/2006 04:23 PM, Server Available, and Storage Toolkit Action Requests - TEHRlich - SYSADMIN \*ADMIN MODE\*.



## Dataset Attributes Database

- **Attribute and catalog information on potentially all datasets on dasd**
- **Collection controlled via GUI interface**
  - Schedule time of collection (off hours suggested)
    - Start time
    - End time
  - Schedule frequency
  - Determine if catalog information desired
  - Exclude volumes or storage groups
    - JES spool volumes
    - Paging packs
  - Determine size of product provided reports
- **Product provided workspaces with largest or worst cases**
- **Custom SQL to select your own set of datasets for a report**
- **Create situations to monitor a single dataset or a group of datasets**
- **View space in units of tracks, megabytes, or gigabytes**

## Dataset Attributes Supplied Views

- **Largest datasets by allocated space**
- **Largest datasets by unused space**
- **Datasets with most extents**
- **Datasets with most ca/ci splits**
- **Largest datasets by DSORG**
- **Largest datasets with inefficient blocksize**
- **Datasets by creation date**
- **Datasets by reference date**
- **Largest datasets by SMS construct**
- **Largest unreferenced datasets**
- **Largest datasets unreferenced in more than 366 days**
- **Largest datasets created within the last day**
- **Largest datasets by catalog**
- **Largest uncataloged datasets by volume**

# Dataset Attributes Collection Options

The screenshot displays the 'Dataset Attributes System Summary - TEHRLICH - SYSADMIN \*ADMIN MODE\*' window. The 'Dataset Attributes Data Collection' dialog box is open, showing the following settings:

- Data Collection Settings:**
  - ☒ Start data collection at (hh:mm) 02:00 am
  - Every: ☒ Mon ☒ Tue ☒ Wed ☒ Thur ☒ Fri ☐ Sat ☐ Sun
  - ☒ Stop data collection at (hh:mm) 04:00 am
  - ☒ Collect catalog data
  - Number of data rows to collect for 'top N' reports: 25
- Exclusions:**
  - Volumes: (Empty list box)
  - Storage Groups: (Empty list box)
- Data Collection Status:**
  - Collection is waiting
  - Force Start button

The background window shows a tree view of system components, including Logical Control Unit, Tape Group, Virtual Tape Subsystem, SMS Storage Groups, User DASD Groups, HSM Status, Dataset Attributes System, Dataset Group Summary, SMS Configuration, and Storage Toolkit. The 'Physical' view is selected. Below the tree view, there are two tables:

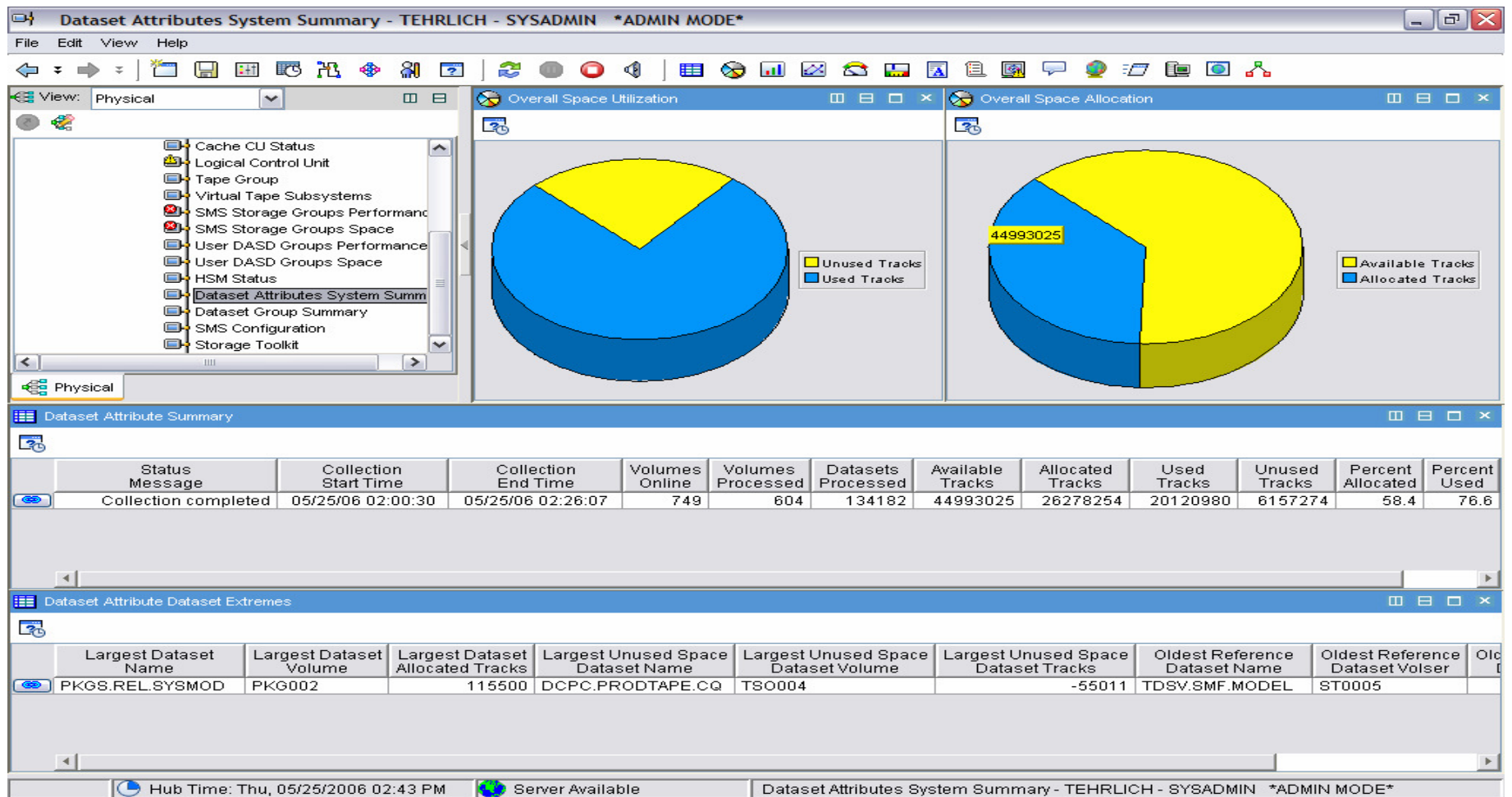
Status Message	Collection Start Time
Collection not started	

Largest Dataset Name	Largest Dataset Volume	Largest Dataset Allocation

At the bottom of the window, the status bar shows: Hub Time: Tue, 05/23/2006 06:16 PM, Server Available, and Dataset Attributes System Summary - TEHRLICH - SYSADMIN \*ADMIN MODE\*.

# Dataset Attributes System Summary



# Dataset Space Summary

Dataset Space Summary - TEHRLICH - SYSADMIN \*ADMIN MODE\*

File Edit View Help

View: Physical

Cache CU Status  
Logical Control Unit  
Tape Group  
Virtual Tape Subsystems  
SMS Storage Groups Performance  
SMS Storage Groups Space  
User DASD Groups Performance  
User DASD Groups Space  
HSM Status  
Dataset Attributes System Summ  
Dataset Group Summary  
SMS Configuration  
Storage Toolkit

Physical

Top Datasets by Allocated Space

Dataset Name	Volser	Allocated Tracks	Used Tracks	Unused Tracks	Extents	DSORG
PKGS.REL.SYSMOD	PKG002	115500	115500	0	28	PDSE
HSM.BCDSA.DATA	HSMBCD	80205	69210	10995	1	VSAM
CLIENT.BEAR.BSWA.MONITOR	CLNT05	60000	60000	0	4	Physical_Sequential
SYS1.HASPACE	SPL13B	50040	50040	0	1	PS_Unmovable
SYS1.HASPACE	SPL13C	50040	50040	0	1	PS_Unmovable
SYS1.HASPACE	SPL13E	50040	50040	0	1	PS_Unmovable
SYS1.HASPACE	SPL331	50040	50040	0	1	PS_Unmovable
SYS1.HASPACE	SPOOL2	50040	50040	0	1	PS_Unmovable
SYS1.HASPACE	SPOOL3	50040	50040	0	1	PS_Unmovable
SYS1.HASPACE	SPL112	50040	50040	0	1	PS_Unmovable
SYS1.HASPACE	SPL13A	50040	50040	0	1	PS_Unmovable
SYS1.HASPACE	SPOOL1	50040	50040	0	1	PS_Unmovable
PAGE.SYSL.LOCAL02.DATA	PAGL02	50025	50025	0	1	VSAM
PAGE.SYSA.LOCAL02.DATA	PAGA02	50025	50025	0	1	VSAM

Top Datasets by Extents

Dataset Name	Volser	Extents
DB2C81.DSND8D.DSND07.DSN32K01.I0001.A001	DB2S10	123
OMVS.DOKAM.USER.DIR	OMV005	123
OMVS.RGATS.USER.DIR	OMV011	123

Top Datasets by CA Splits

Dataset Name	Volser	CA Splits	CI Splits	As
HSM.BCDSA.DATA	HSMBCD	1868	69722	HSM.BCDSA
HSM.OCDS.DATA	HSMOCD	1656	1869	HSM.OCDS
HSM.MCDS.DATA	HSMMC1	1156	46595	HSM.MCDS

Top Datasets by Unused Space

Dataset Name	Volser	Unused Tracks	Allocated Tracks	Used Tracks	E
DCPC.PRODTAPE.CQ	TSO004	-55011	51	55062	
PAGE.SYSG.LOCAL06.DATA	PAGG06	50025	50025	0	
PAGE.SYSG.LOCAL02.DATA	PAGG02	50025	50025	0	
PAGE.SYSG.LOCAL04.DATA	PAGG04	50025	50025	0	
PAGE.SYSG.LOCAL03.DATA	PAGG03	50025	50025	0	
PAGE.SYSG.LOCAL05.DATA	PAGG05	50025	50025	0	

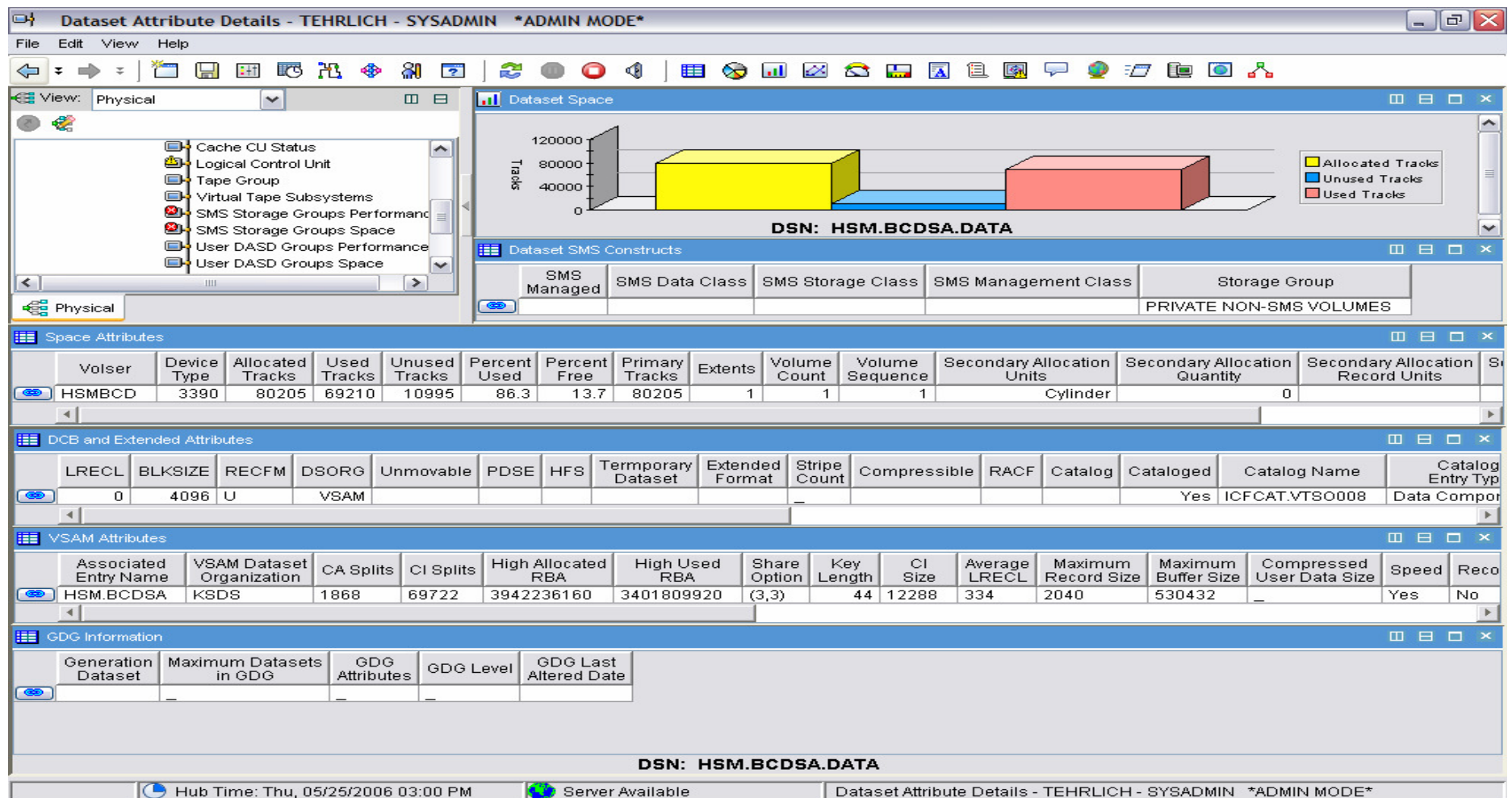
Top Datasets by CI Splits

Dataset Name	Volser	CI Splits	CA Splits	As
HSM.BCDSA.DATA	HSMBCD	69722	1868	HSM.BCDSA
HSM.MCDS.DATA	HSMMC1	46595	1156	HSM.MCDS
TDSV.VC.CSI.DATA	ST0011	33282	172	TDSV.VC.C:
ALORI3.DDIR.D	PRI174	29276	261	ALORI3.DD
TDSV.VD.CSI.DATA	ST0003	23429	100	TDSV.VD.C:
VKUMA.OG340.@SYSAVK.RKOGCKP.DATA	PRI174	22923	109	VKUMA.OG:

Hub Time: Thu, 05/25/2006 02:58 PM Server Available Dataset Space Summary - TEHRLICH - SYSADMIN \*ADMIN MODE\*

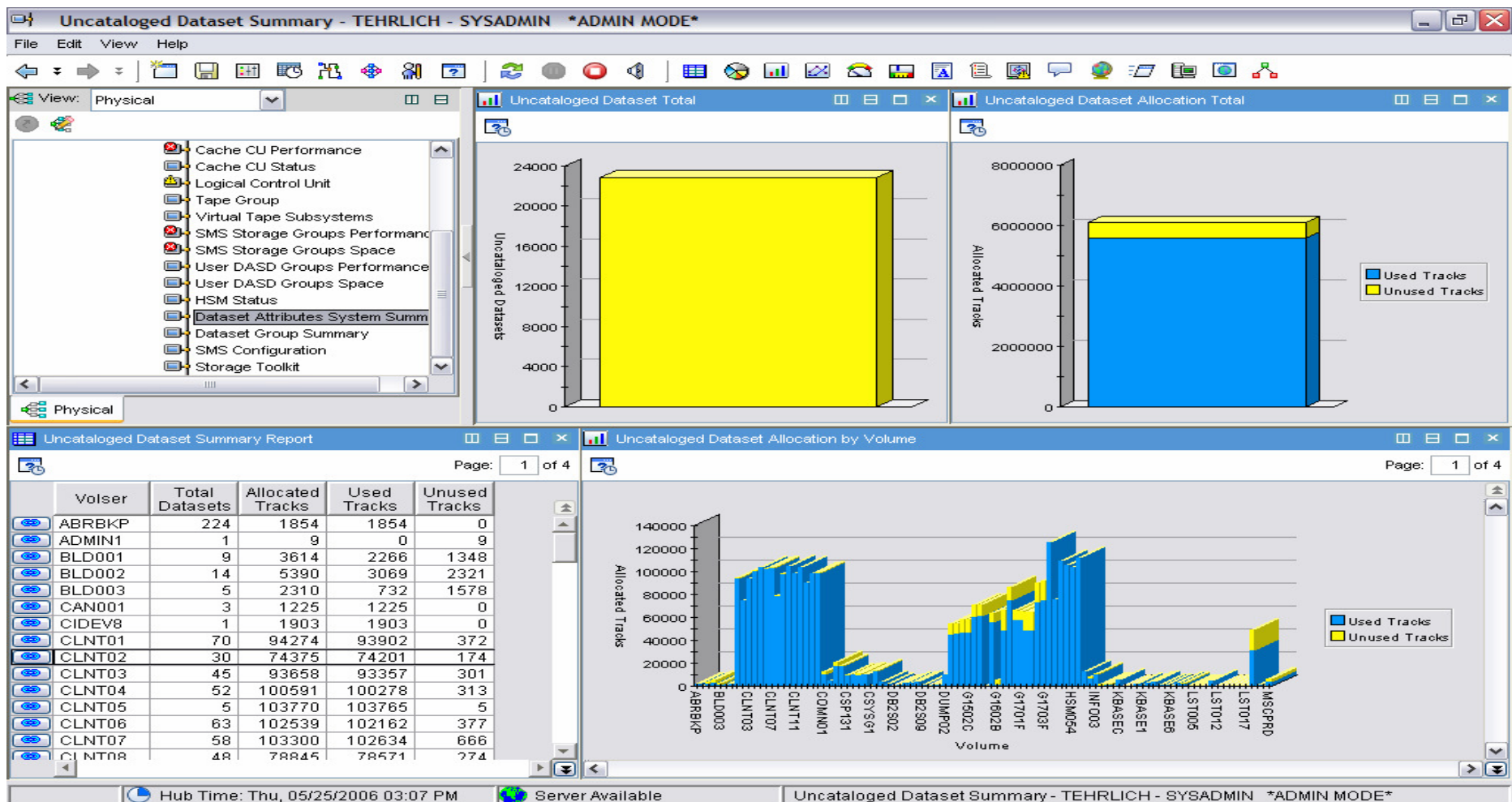


# Dataset Attribute Details

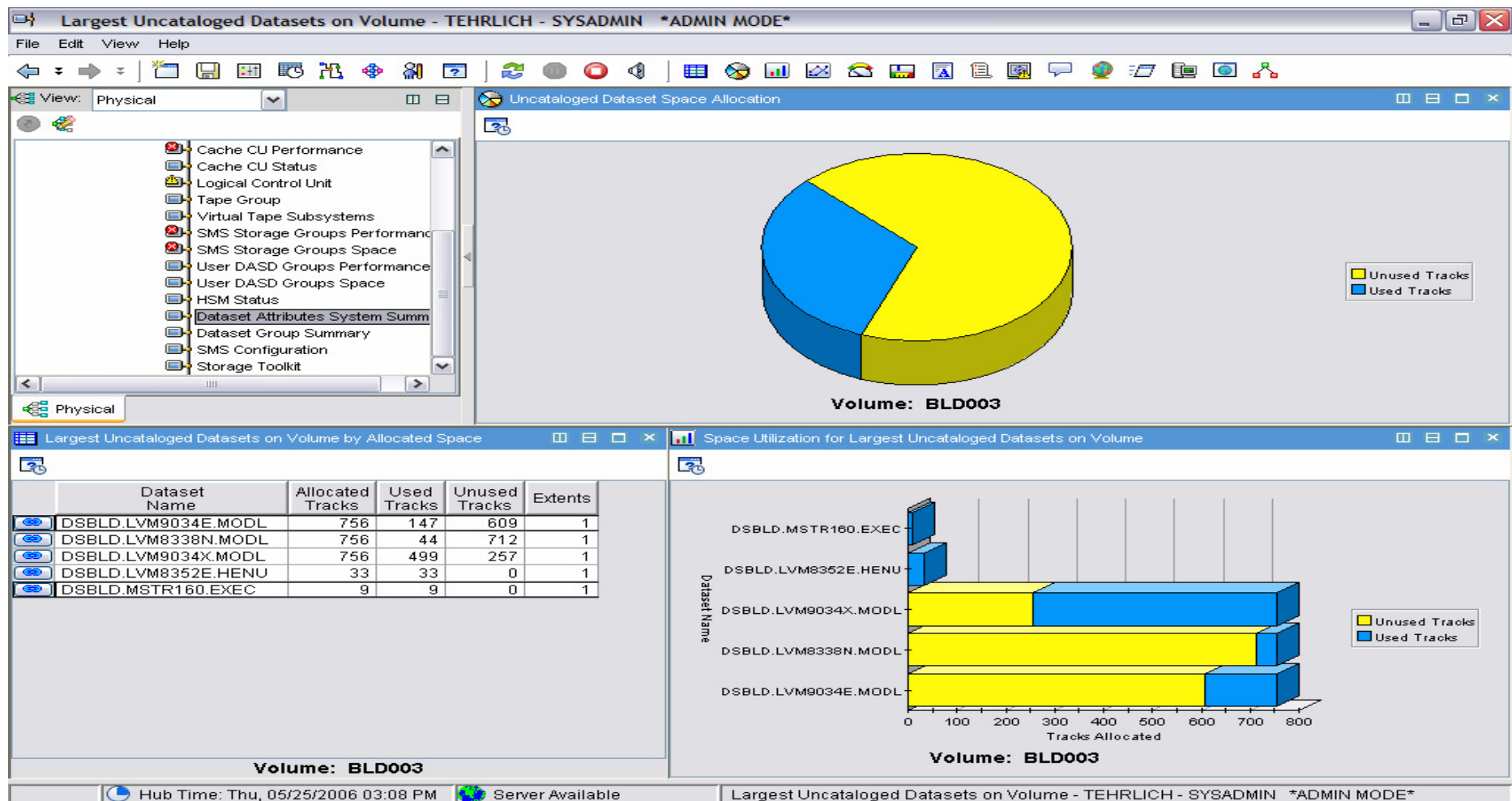




# Uncataloged Dataset Summary



# Largest Uncataloged Datasets on Volume



# Custom Query to Generate a Report

Query Editor

View: Physical

Physical

Largest Uncataloged Datasets on Volume - TEHRLICH - SYSADMIN \*ADMIN MODE\*

Volume: BLD003

Hub Time: Thu, 05/25/2006 03:14 PM Server Available Largest Uncataloged Datasets on Volume - TEHRLICH - SYSADMIN \*ADMIN MODE\*

Description: Return Dataset Attributes Dataset Detail Data

Data Source: TEMS S3410P14:CMS ip.pipe:#9.42.46.25[20292]

Last Modified: Thu, 05/25/2006 12:12 PM

Last Modified by: SYSADMIN

Specification

Dataset Name 1,tdsms

	Managed System	Dataset Name	Volser	Dev Typ
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	== \$NODE\$	1,tdsmsl	== pri100	
3				
4				

Add attributes... Advanced...

OK Cancel Apply Help

## Direct Situation Analysis

- **Direct navigation from a situation event workspace to applicable information for that situation**
- **Not for every situation, only where it will be useful**
  - Cache destaging rate is high – navigate to volume destaging or cache control unit trend for that control unit
  - Volume response time is high – navigate to dataset response or volume performance trend for that volume
- **Provide the information needed to resolve situations without navigating through the standard workspaces**

# Volume Free Space Situation

KS3\_Vol\_Free\_Space\_Pct\_Critical - TEHRlich - SYSADMIN \*ADMIN MODE\*

File Edit View Help

View: Physical

Physical

Command View

Take Action

Action

Name: <Select Action>

Command:

Arguments...

Destination Systems

Run

Initial Situation Values

	Percent Free Space	Volume	Device Address	Device Type	Free Space Megabytes	Total Capacity Megabytes	Largest Free Extent MB	Fragmentation Index	Allocated & MegaBy
	0.0	DB2S10	5AD9	3390	6	8120	0	1000	
	0.9	PP070P	3846	3390	27	2707	27	0	
	0.0	VM430R	5A00	3390	0	2707	0	0	
	0.0	VM430W	5A01	3390	0	2707	0	0	

Current Situation Values

	Percent Free Space	Volume	Device Address	Device Type	Free Space Megabytes	Total Capacity Megabytes	Largest Free Extent MB	Fragmentation Index	Allocated & MegaBy
	0.9	PP070P	3846	3390	27	2707	27	0	
	0.0	VM430R	5A00	3390	0	2707	0	0	
	0.0	VM430W	5A01	3390	0	2707	0	0	

Dataset Space Event

Volume Space Trend

Link Wizard...

Link Anchor...

Advice

KS3\_Vol\_Free\_Space\_Pct\_Critical

[Situation Description](#)

[Suggested Actions](#)

**Situation Description**

The free space on a volume is below the critical threshold.

**Suggested Actions**

The percentage of free space on a volume is below the critical threshold. If datasets on the volume will require more space on this volume, then either migrate some datasets to another volume or release space from datasets that may be over-allocated.

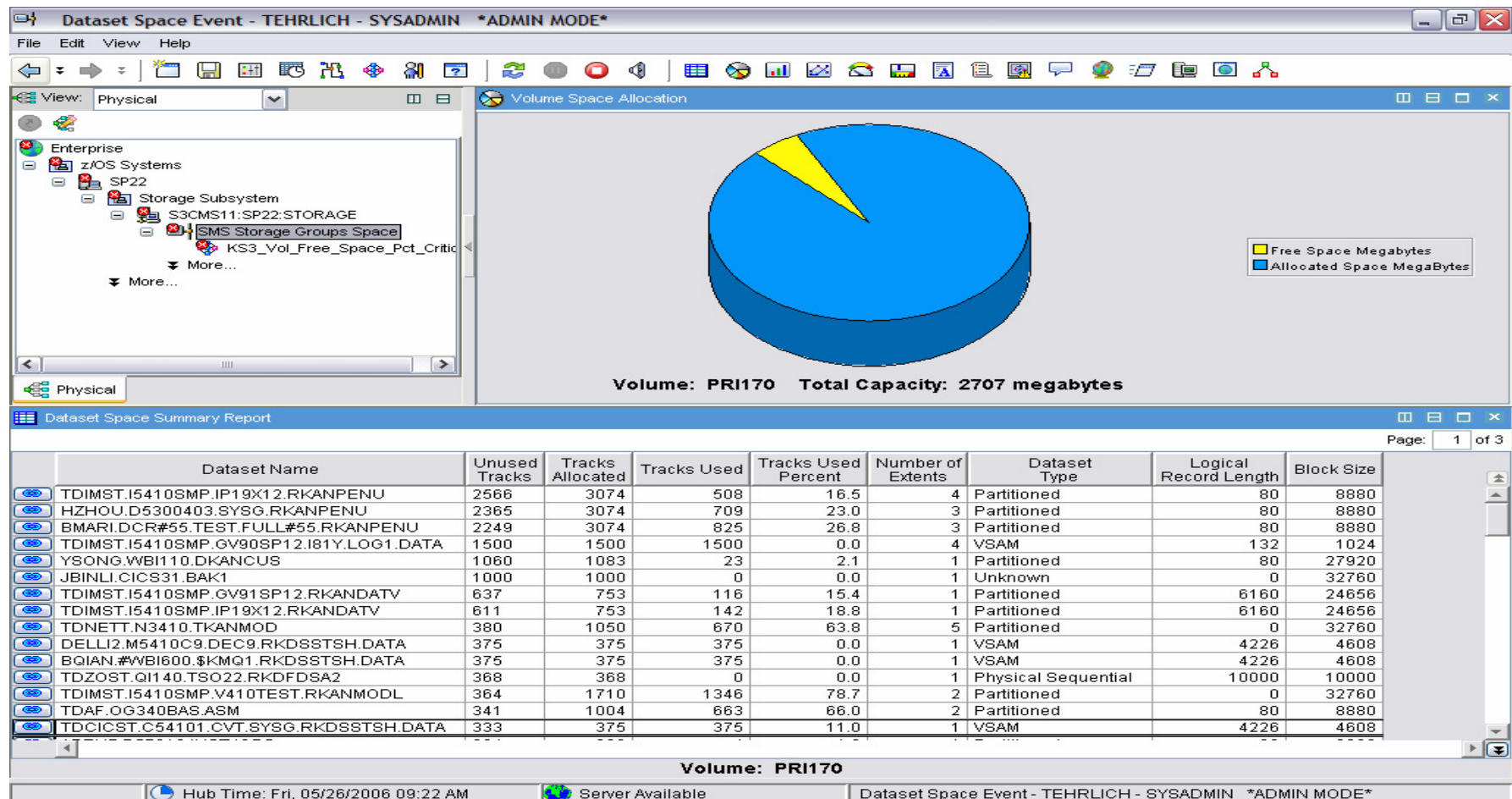
Expert Advice

Hub Time: Thu, 05/25/2006 05:38 PM Server Available KS3\_Vol\_Free\_Space\_Pct\_Critical - TEHRlich - SYSADMIN \*ADMIN MODE\*



# New Dataset Event Workspace

Datasets sorted in descending order by unused space



# Cache CU Staging Situation

KS3\_Cachecu\_Trk\_Stag\_Critical - TEHRLICH - SYSADMIN \*ADMIN MODE\*

File Edit View Help

View: Physical

S3CMS11:SP22:STORAGE

- Application Summary
- Channel Path
- Cache CU Performance
- KS3\_Cachecu\_Trk\_Stag\_Cri**
- Cache CU Status
- Logical Control Unit
- Tape Group
- Virtual Tape Subsystems
- SMS Storage Groups Performance
- SMS Storage Groups Space
- KS3\_Vol\_Free\_Space\_Pct\_C
- User DASD Groups Performance

Physical

Command View

**Take Action**

Action

Name: <Select Action>

Command:

Arguments...

Destination Systems

Run

**Initial Situation Values**

Track Staging Rate	Subsystem ID Fullword	Control Unit Type	Active Volumes	Bypass Cache Percent	Cache MB Available	Cache MB Configured	Cache Status	CFW Read Percent
<b>113.4</b>	0X2585	2105	240	0.0	7364.4	8192.0	Active	100.0

**Current Situation Values**

Track Staging Rate	Subsystem ID Fullword	Control Unit Type	Active Volumes	Bypass Cache Percent	Cache MB Available	Cache MB Configured	Cache Status	CFW Read Percent
<b>123.4</b>	0X8003	2107	65	0.0	11709.9	13920.0	Active	n/a
	0X2585	2105	118	0.0	3459.2	4096.0	Active	n/a

Cache CU Volume Staging

Cache CU Staging Trend

Link Wizard...

Link Anchor...

**Expert Advice**

**KS3\_Cachecu\_Trk\_Stag\_Critical**

[Situation Description](#)

[Suggested Actions](#)

**Situation Description**

The track stages per second exceeds the critical threshold

**Suggested Actions**

The movement of tracks from the physical device to cache has exceeded the critical threshold. If performance is impacted, it may be necessary to move the logical volume causing the activity or to move datasets on the logical volume.

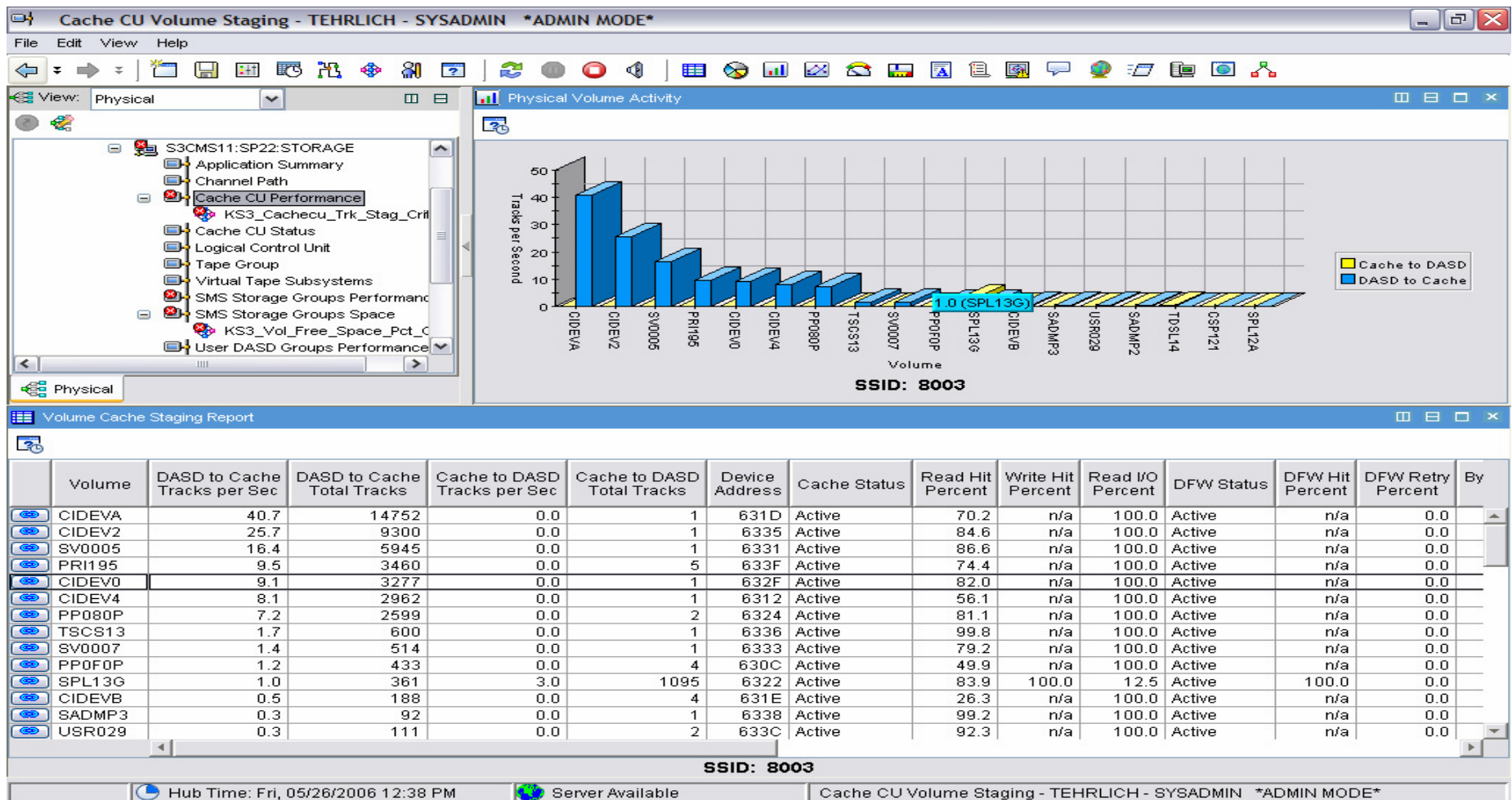
Expert Advice

Hub Time: Fri, 05/26/2006 12:37 PM

Server Available

KS3\_Cachecu\_Trk\_Stag\_Critical - TEHRLICH - SYSADMIN \*ADMIN MODE\*

# New Cache CU Volume Staging Workspace



## Problem Volume Workspaces

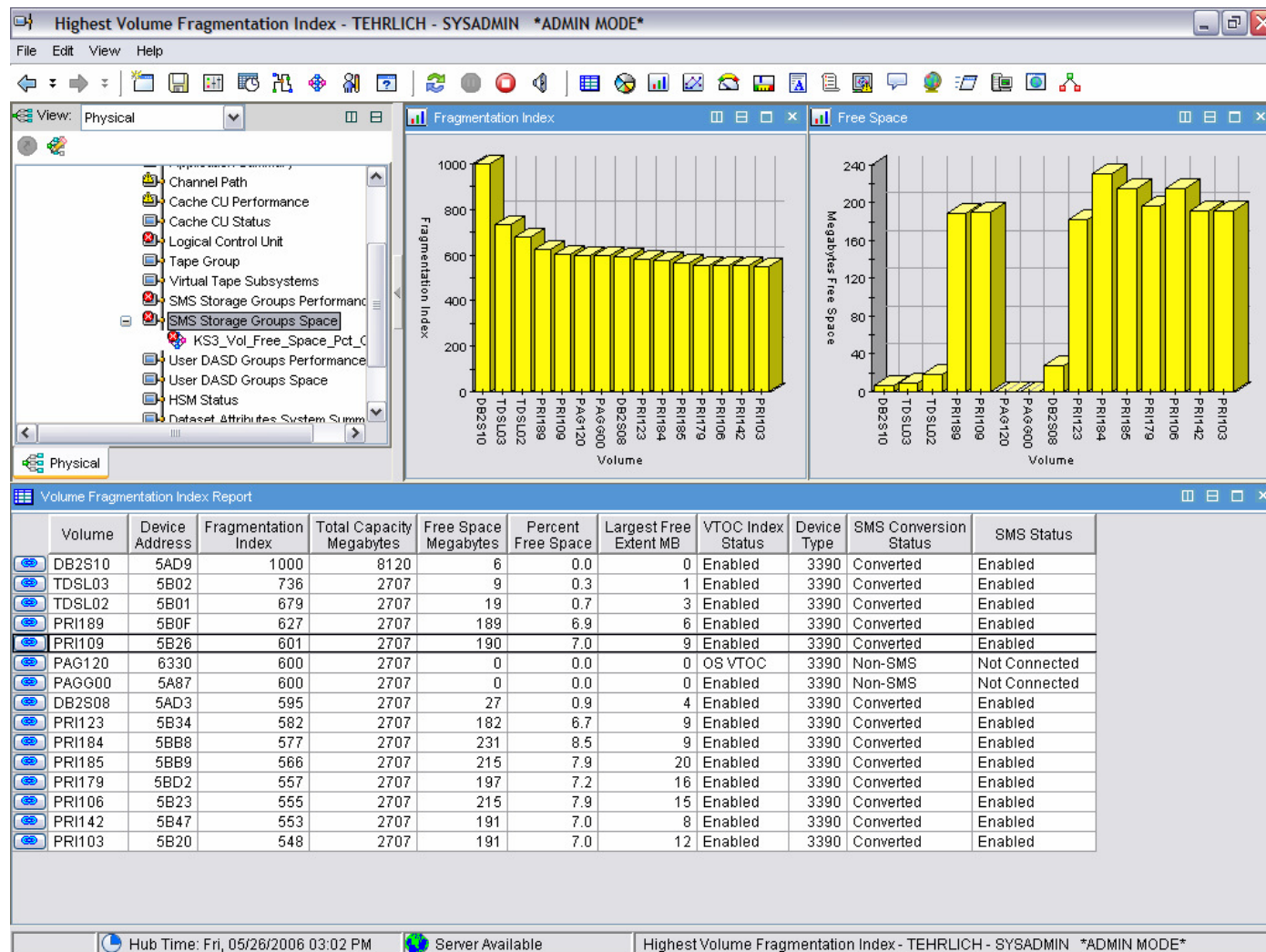
- **New workspaces that show the volumes with the worst values for a number of metrics**
  - Worst 15 volumes included in the reports
  - Views sorted so that worst volumes are at top of report
- **Cache metrics shown for the z/OS image and by SSID**
  - Lowest volume read hit percent
  - Lowest volume write hit percent
  - Lowest volume DFW hit percent
  - Highest volume destaging rate
  - Highest volume staging rate

## Problem Volume Workspaces

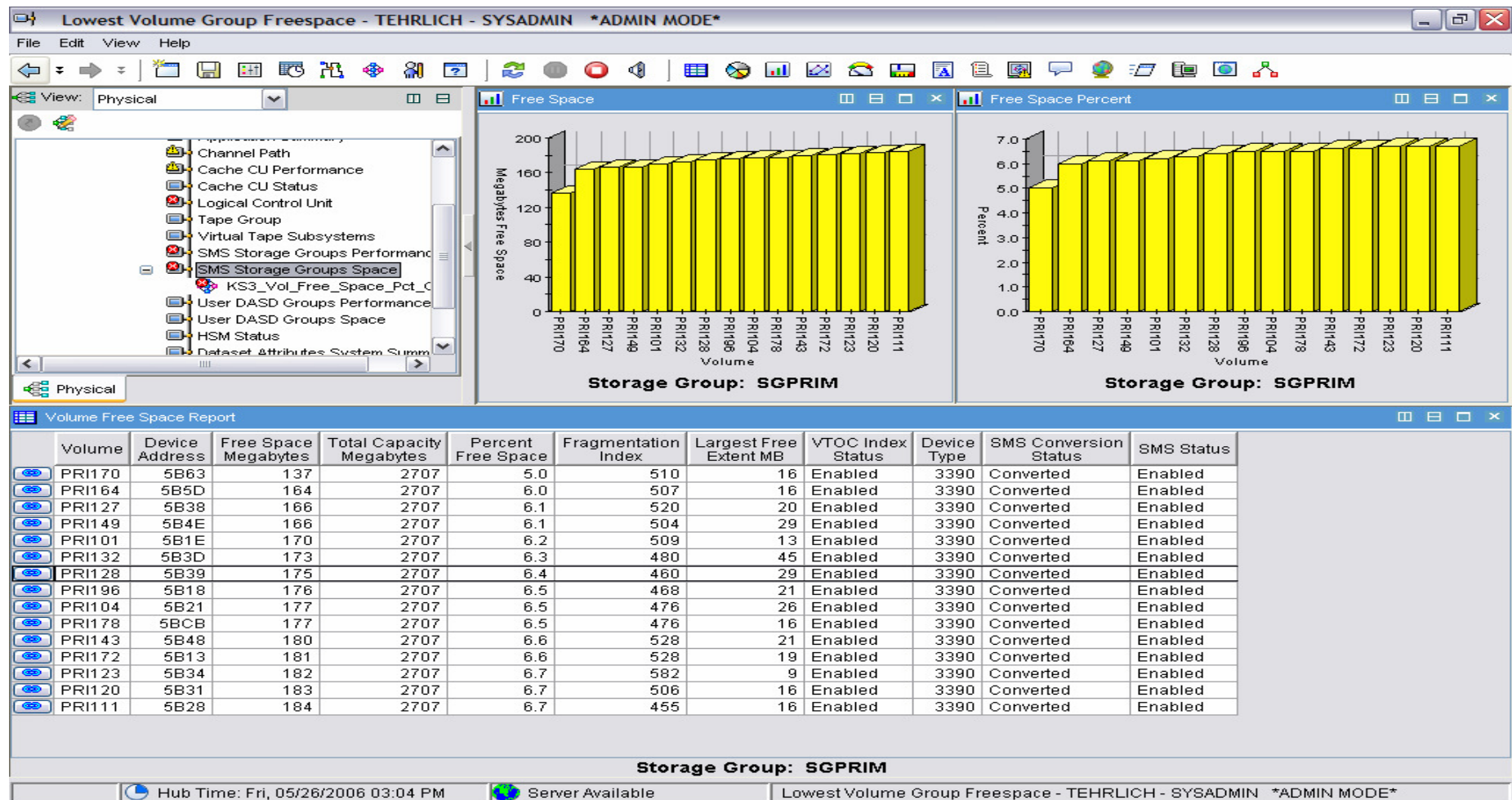
- **Performance metrics shown for the z/OS image and by channel, LCU, storage group, and user dasd group**
  - Highest volume response time
  - Highest volume MPL
  - Highest volume I/O rate
  - Highest volume busy percent
  - Lowest volume connect percent
- **Space metrics shown for the z/OS image and by storage group and user dasd group**
  - Lowest volume freespace
  - Lowest volume freespace percent
  - Highest volume fragmentation index



# Highest Volume Fragmentation Index



# Storage Group Lowest Volume Freespace

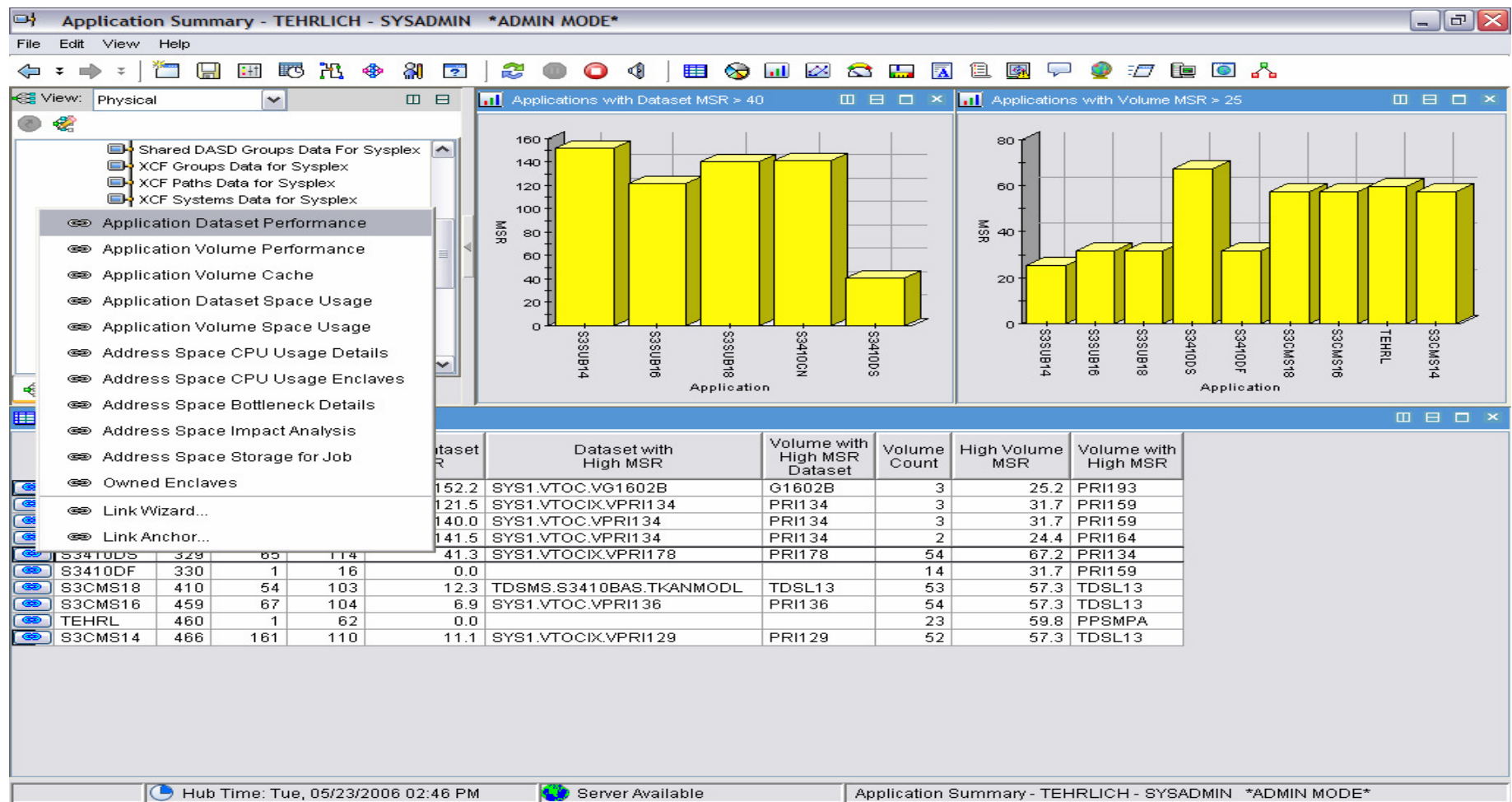


## Cross Product Navigation

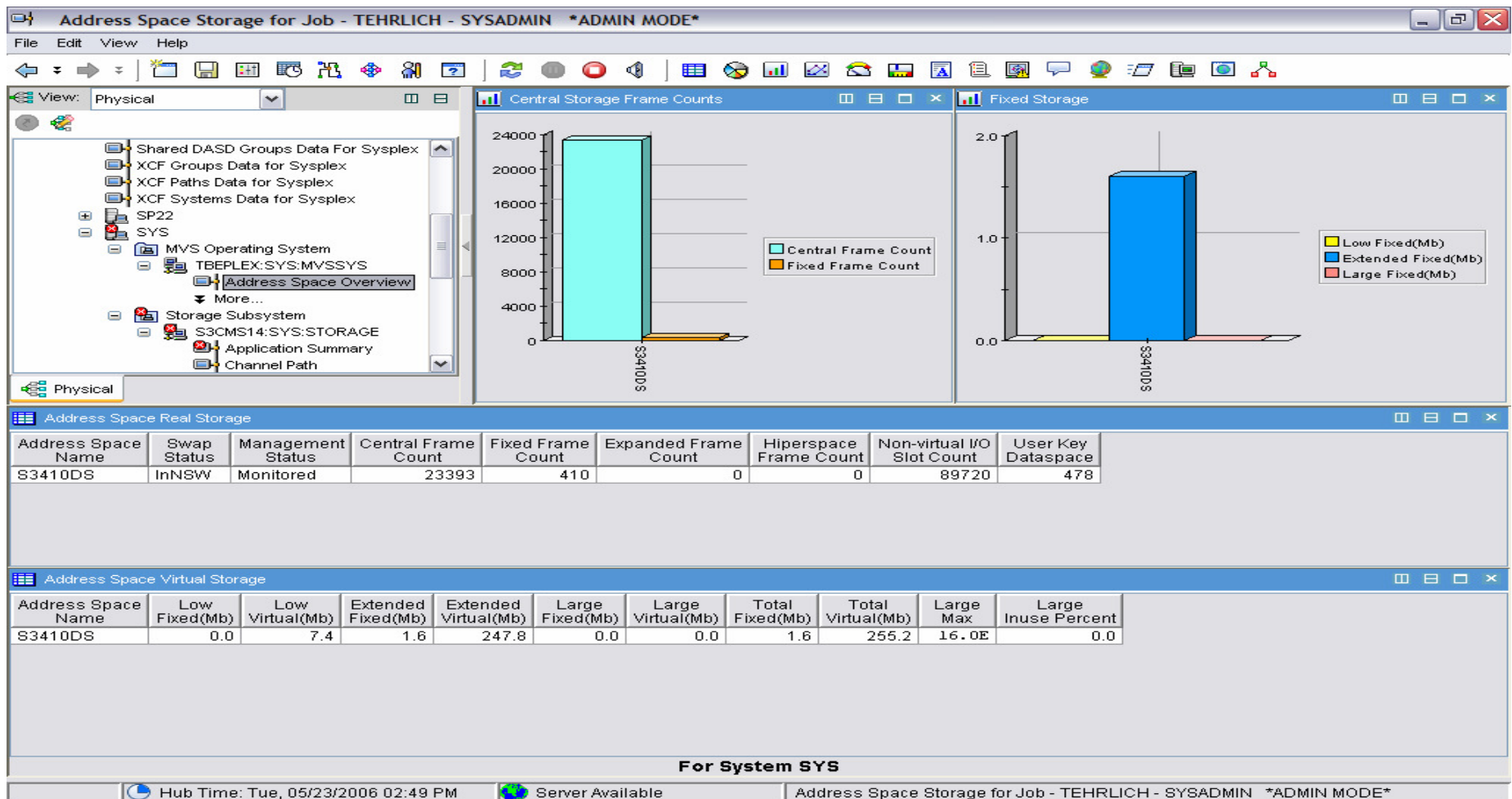
- **Product provided navigation from Application Summary workspace to six OMEGAMON on z/OS application detail workspaces**
  - OMEGAMON on z/OS must be executing on the same z/OS image as OMEGAMON XE for Storage
- **Users can build their own navigation between workspaces owned by different products**

# Cross-product Navigation

- Navigation to six OMEGAMON XE for z/OS workspaces to obtain non-storage information about a monitored application



# Navigation to Address Space Storage for Job





## Questions and Answers



धन्यवाद

Hind Hindi

多謝

Traditional Chinese

ขอขอบคุณ

Thai

Спасибо

Russian

Gracias

Spanish

Thank You

English

شكراً

Arabic

Obrigado

Brazilian Portuguese

Grazie

Italian

多谢

Simplified Chinese

Danke

German

Merci

French

நன்றி

Tami Tamil

ありがとうございました

Japanese

감사합니다

Korean

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