



Utrzymanie środowiska pamięci masowych w oparciu o narzędzia Tivoli

Tivoli Productivity Center

TIVOLI SUMMER ACADEMY

25-27 sierpnia, Dwór Chotynia



Dzisiejsze sieci SAN



Zarządzanie punktowe

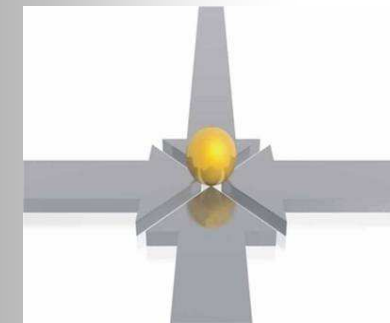




Czym cechuje się Tivoli Productivity Center?

To coś więcej niż narzędzie punktowe czy też typowy pakiet SRM. TPC:

- Zarządza całym *datacenter* przy pomocy pojedynczego interfejsu
- Umożliwia konfigurowanie, planowanie, implementację & jak też w niektórych przypadkach prowadzi za rękę
- Pozwala zarządzać *Change Configuration*
- Raportuje o środkach w sieci SAN, pojemnościach, użyciu i rozliczeniach
- Wykazuje trendy, pomaga zarządzać wydajnością
- Pozwala definiować alerty i śledzić problemy w sieci
- Umożliwia zarządzanie replikami i procesami replikacji
- Pokrywa szeroki zakres urządzeń i aplikacji
- Posiada rozbudowane możliwości raportowania





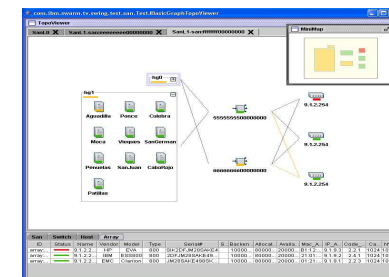
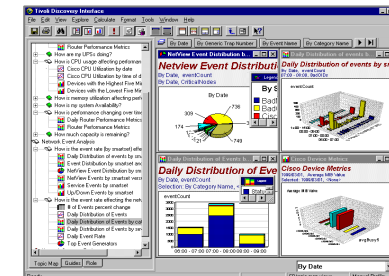
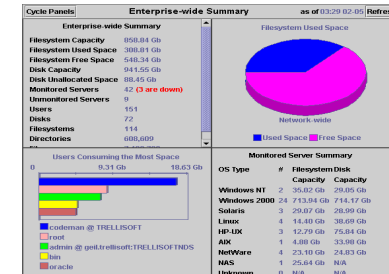
Historia TPC

- **MDM (Multiple Device Manager) 2004**
- **TPC (TotalStorage Productivity Center) w. 2 2005**
- **TPC (TotalStorage Productivity Center) w. 3 2006**
 - TPC V3.3.0.xxx
 - TPC V3.3.1.xxx
 - TPC V3.3.2.xxx
- **TPC (Tivoli Storage Productivity Center) w. 4 2009**
 - TPC V4.1.0.xxx
 - TPC V4.1.1.xxx



Wykonuje następujące zadania

- **Zarządzanie danymi (*data management*)**
 - Zbieranie i analiza danych – systemy plików i bazy danych
 - Raporty, *chargeback*, granice i kwoty
 - Zautomatyzowane działania
 - Wsparcie dla macierzy różnych producentów (IBM, EMC, HDS, HP, Engenio)
 - Raportowanie o bibliotekach IBM (*IBM Tape Library Asset reporting*)
- **Zarządzanie podsystemami dyskowymi (*disk management*)**
 - *Storage Provisioning* – IBM i nie tylko
 - Konfigurowanie urządzeń
 - Zarządzanie wydajnością – IBM i nie tylko
 - Zaawansowane zarządzanie wydajnością – IBM
- **Zarządzanie *SAN fabric* (*fabric management*)**
 - Wyświetlanie topologii sieci SAN
 - Raportowanie o zdarzeniach
 - Raportowanie o wydajności
 - Zarządzanie strefami
 - Wsparcie dla urządzeń różnych producentów (Brocade, Cisco, McData, etc.)



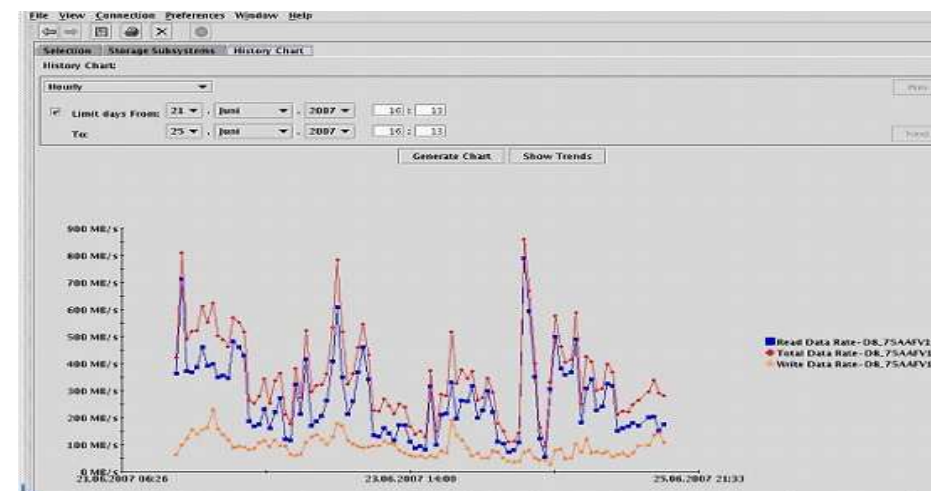


Zarządzanie dyskami

- Centralny punkt kontroli do zarządzania dyskami
 - Raportowanie o zasobach (środki, przypisania)
- Zarządzanie i *provisioning* z asystą, przy pomocy CIM / SMI – S
 - Tworzenie i przypisywanie LUN – ów
 - Na porty hostów
 - Do portów macierzy
 - Poziom RAID
 - Tworzenie / kasowanie wolumenów
 - Zintegrowane z zarządzaniem *fabricem* (*zoning*)
- Monitorowanie wydajności, wyświetlanie stanu i zdarzeń, prognozy, powiadomianie
 - IBM i nie – IBM
 - Dla IBM – zaawansowane
- Automatyzacja powiadomiania o zdarzeniach
 - Działają z TEC – em lub konsolami SNMP

Storage Subsystems

Subsystem	Label	Type	Status	Unused Capacity (GB)	Used Capacity (GB)
DS8000-2107-7570681-IBM	DB_7570681	DS8000	Normal	11,725	49,563
DS8000-2107-75AAFV1-IBM	DB_75AAFV1	DS8000	Normal	4,146	49,870
ESS-2105-20286-IBM		ESS	Normal	22,05	10,432,9
ESS-2105-20305-IBM		ESS	Normal	81,66	10,373,29
ESS-2105-24503-IBM	E800_24503	ESS	Normal	324,86	21,238,33
ESS-2105-24597-IBM	E800_24597	ESS	Normal	351,97	21,211,22





Topology Viewer

- Wielopoziomowe widoki sieci z możliwością przechodzenia w górę / dół, na poziomie
 - serwerów
 - sieci SAN
 - pamięci masowych
- Połączone widoki w postaci graficznej i tabelkowej
- Warstwy pokazujące zdrowie, strefy i wydajność
- Minimapka pokazująca całą sieć (kontekst)
- *Semantic zooming* (przejsięcie na poziom niżej i rozwinięcie widoku)
- Widok ogólny lub przejsięcie na kolejne poziomy aby pokazać np. strukturę logiczną danego obiektu

San	Switch	Host	Array										
array...	9.1.2.2...	HP	EVA	800	SIK2DFJM28SAKE4	10000...	80000...	20000...	B1:12...	9.1.9.3	2.2.1	1024	1024
array...	9.1.2.2...	IBM	ESS800	800	2DFJM28SAKE49...	10000...	80000...	20000...	21:01...	9.1.9.2	2.4.1	1024	1024
array...	9.1.2.2...	EMC	Clariion	800	JM28SAKE498SK...	10000...	80000...	20000...	01:21...	9.1.9.1	2.2.3	1024	1024



Topology Viewer

The screenshot shows the IBM TotalStorage Productivity Center interface. The window title is "IBM TotalStorage Productivity Center: stormserver.boeblingen.de.ibm.com -- Topology". The interface includes a menu bar (File, View, Connection, Preferences, Window, Help), a toolbar, and a navigation tree on the left. The main area is titled "Topology Viewer" and shows an "Overview" tab. The overview displays a summary of components: 1 Fabric, 1 Computer, 6 Switches, 4 Subsystems, and 34 Other. Below this is a table with columns for Label and Summary.

Label	Summary
Fabrics	1 Fabric (0 Virtual Fabrics)
Computers	1 Computer, 0 Virtual Computers, 0 Hypervisors
Switches	6 Switches, 0 Virtual Switches
Storage	4 Subsystems, 0 Tape Libraries
Other	34 Other



Topology Viewer – przykłady dla dysków

The screenshot displays the IBM TotalStorage Productivity Center interface. The main window shows a topology diagram with various components like Pools, Volumes, and Mapped Disks. A table at the bottom provides detailed information for the selected disks.

Switch	Subsystem	Disk	Pool	Volume	FCPort	Connection	Alert	Zone
	Swiss_mdg			Label	Operational...	Type	Size	Is Assigned
	DS6k_group							
	DS4k_group							
	DS4k_group			CU_Vol1	ok	FB	2.0 GB	false
	DS4k_group			TPC_merry_tgt	ok	FB	0.2 GB	false
	DS4k_group			x_TPC-R_MM_src	ok	FB	5.0 GB	false
	DS4k_group			xrecoveryvd	stopped	FB	0.98 GB	false
	DS4k_group			xvd_DS4K_Frodo	ok	FB	4.88 GB	true
	DS4k_group			xvd_DS4K_Pippin	ok	FB	2.0 GB	true



Topology Viewer – przykład dla sieci SAN

Performance: Critical

- Port Send Packet Rate: 254.19
- Port Receive Packet Rate: 260.11
- Port Send Data Rate: 0.03
- Port Receive Data Rate: 0.04
- Error Frame Rate: 0.0
- Link Failure Rate: 0.0

Computer	Switch	Subsystem	Tape Library	Other/Unknown	Switch FCPort	Connection	Alert	Zone					
All	All	DS4400_EBC		ok	IBM	DS4400	DS4000	600A0B800...	406.36	156.6	n/a	06.12.40.00	2097152
All	All	DS6K_EBC		ok	IBM	511	DS6000	13ABCTA	431.0	2491.0	n/a	5.2.2.374	2692096
All	All	DS8K_EBC		ok	IBM	921	DS8000	7511041	4732.87	3909.03	n/a	5.2.410.333	8749056
All	All	EMC-Sym_979		ok	EMC Corpo...	SYMMETRIX	EMC	000284700...	3329.7	272.86	n/a		5568
All	All	SVC-Gondor		ok	IBM	IBM System...	SVC	000002006...	47.84	64.05	200.64	4.2.0.1 (buil...	4194304



DataPath Explorer – raportowanie z uwzględnieniem kontekstu

- Ten komponent pozwala oszacować jak problemy w urządzeniu wpływają na inne elementy sieci SAN
- Wszystkie ścieżki pomiędzy serwerami i podsystemem (z uwzględnieniem wirtualizacji)
- Powłoki zdrowia i wydajności pozwalają ocenić wpływ wydajności bądź stanu urządzenia na jakość całej ścieżki
- Widok składa się z trzech obszarów pokazujących całą ścieżkę (serwer, fabric, dany podsystem)

The screenshot displays the DataPath Explorer interface. The top navigation pane shows the 'Toplogy' tree with 'Computers' and 'Fabrics' selected. The main area shows a topology diagram with callouts: 'Serwer' (Server), 'Pamięci masowe' (Mass Storage), 'Ścieżka danych' (Data Path), 'Fabric', 'Wydajność' (Performance), 'Wolumen' (Volume), and 'Informacje w formie tabelarycznej' (Information in tabular form). A table at the bottom shows data path details:

Data Path	Group	Initiator Entity	Initiator Disk	Initiator FCPort	Target Entity	Target Volume	Target FCPort
Data Path #0		ODCBETA159.wslab	Disk 11	210000E08B09942B	DS6000-1750-68474...	Hollis159_LUN1 (D1...	R1-I2-C1-T0



Raporty wydajnościowe

Wyswietla zasoby przypisane do tej ścieżki danych

Konfiguracja Topology Viewera

Ikonka zdrowia pokazuje stan całego urządzenia i wszystkich skojarzonych z nim obiektów

Ta ikonka pokazuje, czy port jest podłączony

Ikonka *Performance Health* pokazuje, czy uruchomione zostały alerty wydajnościowe, najświeższe metryki są również wyświetlane w czasie rzeczywistym

Performance: Normal	
Port Send I/O Rate:	0.0
Port Receive I/O Rate:	431.35
Port Send Data Rate:	0.0
Port Receive Data Rate:	26.9
Port Receive Response Time:	7.26
Port Send Response Time:	0.0



Raporty wydajnościowe dla podsystemu dyskowego

- Tworzymy raport wydajnościowy za określony czas
- Wykorzystujemy funkcję *constraint violations*
 - Zwraca wartości powyżej uprzednio zdefiniowanych progów
- Weryfikujemy alerty



Raporty wydajnościowe dla podsystemu dyskowego

1. W podmenu *Disk Manager* ▶ *Reporting* ▶ *Storage Subsystem Performance*

2. Wybieramy interesujący nas raport

- | | |
|-------------------------|--|
| ▪ Storage Subsystem | zestawienie metryk I / O dla całego urządzenia |
| ▪ Controller | j. w. na poziomie klastra (DS8000, DS6000, Sharki) |
| ▪ IO Group | j. w. na poziomie grupy I / O w SVC |
| ▪ Array | j. w. na RAID – u (DS8000, DS6000, Sharki) |
| ▪ Managed Disk Group | j. w. na poziomie MDG w SVC |
| ▪ Volume | j. w. na poziomie wolumenu |
| ▪ Node | j. w. na poziomie węzła SVC |
| ▪ Managed Disk | j. w. na poziomie MD w SVC |
| ▪ Port | j. w. na poziomie portu macierzy |
| ▪ Constraint Violations | raportuje o przekroczeniu zdefiniowanych progów |



Raporty wydajnościowe dla podsystemu dyskowego

The screenshot shows the IBM TotalStorage Productivity Center interface. The window title is "IBM TotalStorage Productivity Center: atshmc2.mainz.de.ibm.com -- Storage Subsystem Performance: By Storage Subsystem". The interface includes a menu bar (File, View, Connection, Preferences, Window, Help), a toolbar, and a navigation tree on the left. The main area is divided into several panels:

- Selection**: Contains a "Report Filter Specification" section with a "Generate Report" button (labeled with a pink box containing the number 4) and radio buttons for "Display latest performance data (by sample)" and "Display historic performance data using absolute time". A pink arrow points to the "Generate Report" button with the text "Select to create the report".
- Select Resources**: A dialog box (labeled with a pink box containing the number 1) for selecting resources.
- Edit Filter**: A dialog box for editing filters. It includes a table for filter conditions:

Column	Operator	Value 1	Value 2	Edit
Volume	LIKE	RAID5*		Edit...
Total I/O Rate (overall) (ops/s)	BETWEEN	1700	1900	
Overall Response Time (ms/op)	BETWEEN	4.2	4.7	

The "Edit Filter" dialog also includes a "Records must meet" section with radio buttons for "All conditions" and "At least one condition", and a checkbox for "Case-sensitive string comparisons". A red circle highlights the filter table.



Raporty wydajnościowe dla podsystemu dyskowego

IBM Tivoli Storage Productivity Center: sspcebc.mainz.de.ibm.com -- Storage Subsystem Performance: By Volume

File View Connection Preferences Window Help

Element Management

Navigation Tree

- Administrative Services
 - Services
 - Data Sources
 - Discovery
 - Configuration
- IBM Tivoli Storage Productivity Center
 - Data Manager
 - Data Manager for Databases
 - Data Manager for Chargeback
 - Disk Manager
 - Storage Subsystems
 - Storage Optimizer
 - SAN Planner
 - Monitoring
 - Alerting
 - Profile Management
 - Reporting
 - Groups
 - Storage Subsystems
 - Storage Subsystem Performance
 - By Storage Subsystem
 - By Controller
 - By I/O Group
 - By Node
 - By Array
 - By Managed Disk Group
 - By Volume
 - By Managed Disk
 - By Port
 - Constraint Violations
 - Fabric Manager
 - Tape Manager
 - Element Manager
 - Replication Manager

Selection Volumes

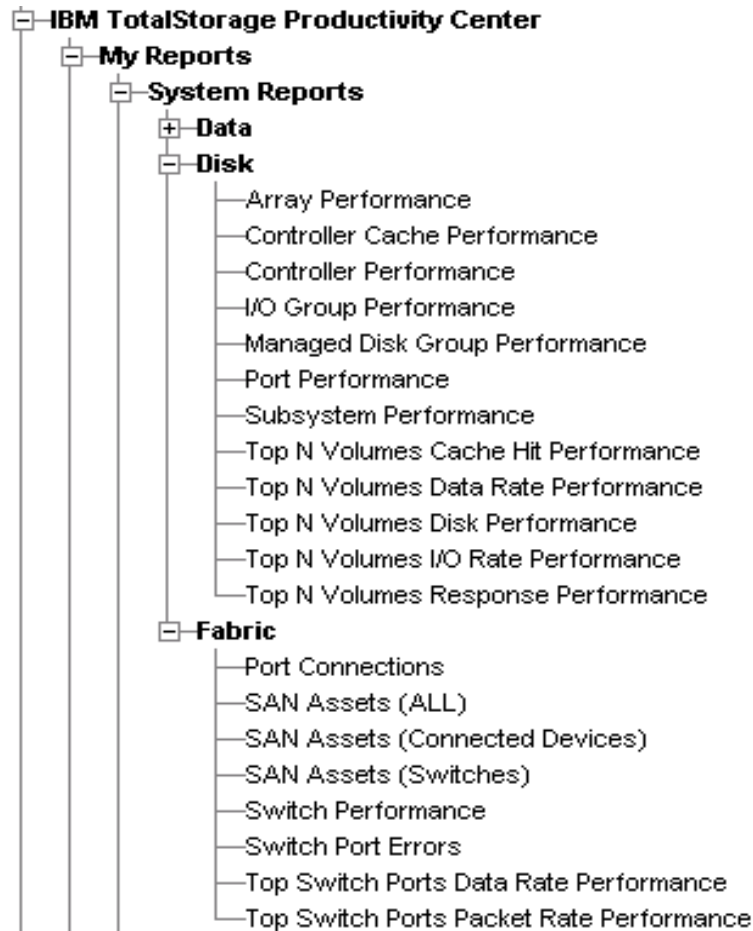
Storage Subsystem Performance: By Volume

Number of Rows: 17

Subsystem	Volume	Time	Interval	Total I/O Rate (overall)	Overall Response Time
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	04.09.2009 05:40:00	302 s	1.704,79 ops/s	4,2 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	04.09.2009 05:10:00	301 s	1.708,85 ops/s	4,3 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	03.09.2009 06:15:00	301 s	1.712,82 ops/s	4,4 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	03.09.2009 02:10:00	301 s	1.713,61 ops/s	4,4 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	02.09.2009 04:00:01	299 s	1.721,48 ops/s	4,3 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	02.09.2009 03:10:01	300 s	1.709,92 ops/s	4,4 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	02.09.2009 00:15:01	300 s	1.700,61 ops/s	4,5 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	01.09.2009 07:05:00	302 s	1.710,38 ops/s	4,7 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	01.09.2009 06:45:00	301 s	1.704,87 ops/s	4,5 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	01.09.2009 06:25:01	300 s	1.719,91 ops/s	4,4 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	01.09.2009 05:30:00	300 s	1.711,04 ops/s	4,4 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	01.09.2009 00:40:01	299 s	1.705,32 ops/s	4,3 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	31.08.2009 02:25:00	300 s	1.701,98 ops/s	4,3 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	31.08.2009 00:20:00	301 s	1.739,34 ops/s	4,4 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	30.08.2009 23:35:00	300 s	1.716,24 ops/s	4,3 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	30.08.2009 23:30:00	300 s	1.705,21 ops/s	4,5 ms/op
DS8k_EBC	RAID5_4GB_4096 (ID:1000)	30.08.2009 23:25:00	301 s	1.703,28 ops/s	4,3 ms/op



Raporty systemowe bądź tworzone *ad hoc*



- Wydajność macierzy
- Wydajność kontrolera macierzowego
- Wydajność pamięci *cache* kontrolera macierzowego
- Wydajność I / O Group
- Wydajność *arraya*
- Wydajność Managed Disk Group
- Wydajność portu macierzy
- *Top 25 Volumes I/O Rate*
- *Top 25 Volumes Data Rate*
- *Top 25 Volumes Cache Hit*
- *Top 25 Volumes Response Time*
- *Top 25 Volumes Disk*
- Raporty dla przełączników SAN
- Raporty o błędach na portach przełączników SAN
- *Top 25 Switch Ports Ops Rate Report*
- *Top 25 Switch Ports Data Rate Report*



BIRT

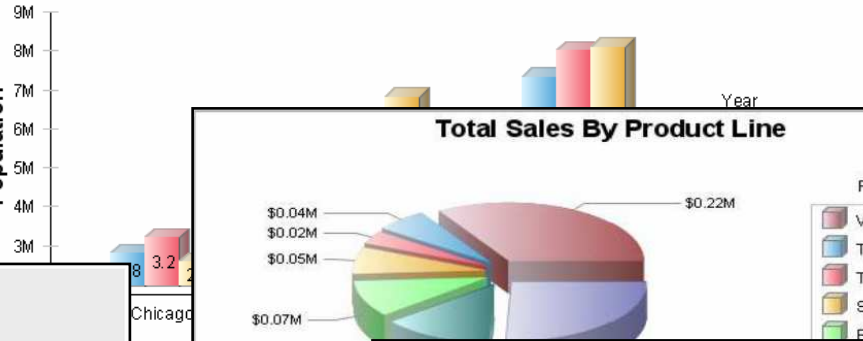
CLASSIC MODELS

Classic Models, Inc.
701 Gateway Boulevard
South San Francisco, CA 94080

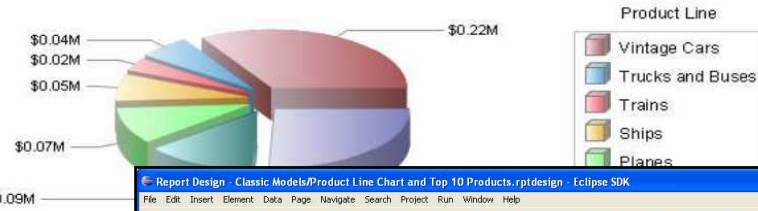
Annual Sales By Product Lines

Year	Classic Cars	Motorcycles	Planes	Ships	Trains	Trucks & Buses	Vintage Cars	Total
2003								
Q1	\$152,501	\$33,062	\$37,436	\$24,446	\$7,810	\$43,593	\$106,982	\$405,610
Q2	\$194,291	\$41,629	\$50,387	\$59,171	\$12,144	\$62,804	\$81,959	\$493,386
Q3	\$241,970	\$79,845	\$45,047	\$24,272	\$7,827	\$73,842	\$110,406	\$584,500
Q4	\$778,635	\$194,372	\$168,251	\$102,153	\$38,830	\$196,416	\$311,111	\$1,789,678
Total	\$1,369,398	\$348,909	\$390,822	\$201,044	\$65,822	\$376,657	\$616,539	\$3,273,101
2004								
Q1	\$317,396	\$85,681	\$65,159	\$66,762	\$21,078	\$67,942	\$136,849	\$760,730
Q2	\$252,165	\$88,101	\$69,780	\$39,719	\$4,862	\$73,696	\$119,597	\$631,322
Q3	\$419,674	\$127,310	\$105,973	\$66,859	\$21,728	\$106,833	\$200,420	\$1,048,801
Q4	\$739,276	\$234,150	\$204,551	\$141,609	\$38,278	\$200,230	\$366,660	\$1,925,757
Total	\$1,728,423	\$527,243	\$445,464	\$305,951	\$86,897	\$448,702	\$823,927	\$4,366,611
2005								
Q1	\$392,920							
Q2	\$225,273							
Total	\$618,193							
Grand Total	\$3,716,003							

Demographics Trend by City



Total Sales By Product Line



CLASSIC MODELS

Classic Models, Inc.
701 Gateway Boulevard,
San Francisco, CA 94107

Employee Directory

Name	Position	Email	Phone	Office Code
Diane Murphy	President	dmurphy@classicmodels.com	x5000	Office Code: 1
Mary Patterson	VP Sales	mpatterson@classicmodels.com	x4811	Office Code: 1
William Patterson	Sales Manager	wpatterson@classicmodels.com	x4871	Office Code: 1
Gerard Bondur	Sale Manager (EMEA)	gbondur@classicmodels.com	x5409	
Anthony Bow	Sales Manager (APAC)	abow@classicmodels.com	x5405	
William Patterson	Sales Manager (APAC)	wpatterson@classicmodels.com	x4871	Office Code: 6
Andy Fixter	Sales Rep	afixter@classicmodels.com	x101	
Peter Marsh	Sales Rep	pmarsh@classicmodels.com	x102	
Gerard Bondur	Sale			
Anthony Bow	Sale			

Eclipse SDK Report Design interface showing a report titled "Product Line Sales" and "Top 10 Selling Products". The report includes a bar chart and a table with columns for Product Name and Total Revenue. The interface also shows various toolbars and a properties editor.

CLASSIC MODELS

CM Sales & Marketing - US Operations (Corporate Confidential)
701 Gateway Blvd - South San Francisco CA 94080 - 650-123-4567

Sales Dashboard Report

Historical Sales

Month	Units Sold
2005	
January	3200
February	3100
March	3000
April	2900
May	2800
June	2700
July	2600
August	2500
September	2400
October	2300
November	2200
December	2100
2004	
January	2000
February	1900
March	1800
April	1700
May	1600
June	1500
July	1400
August	1300
September	1200
October	1100
November	1000
December	900
2003	
January	800
February	750
March	700
April	650
May	600
June	550
July	500
August	450
September	400
October	350
November	300
December	250
2002	
January	200
February	180
March	160
April	140
May	120
June	100
July	80
August	60
September	40
October	20
November	10
December	5

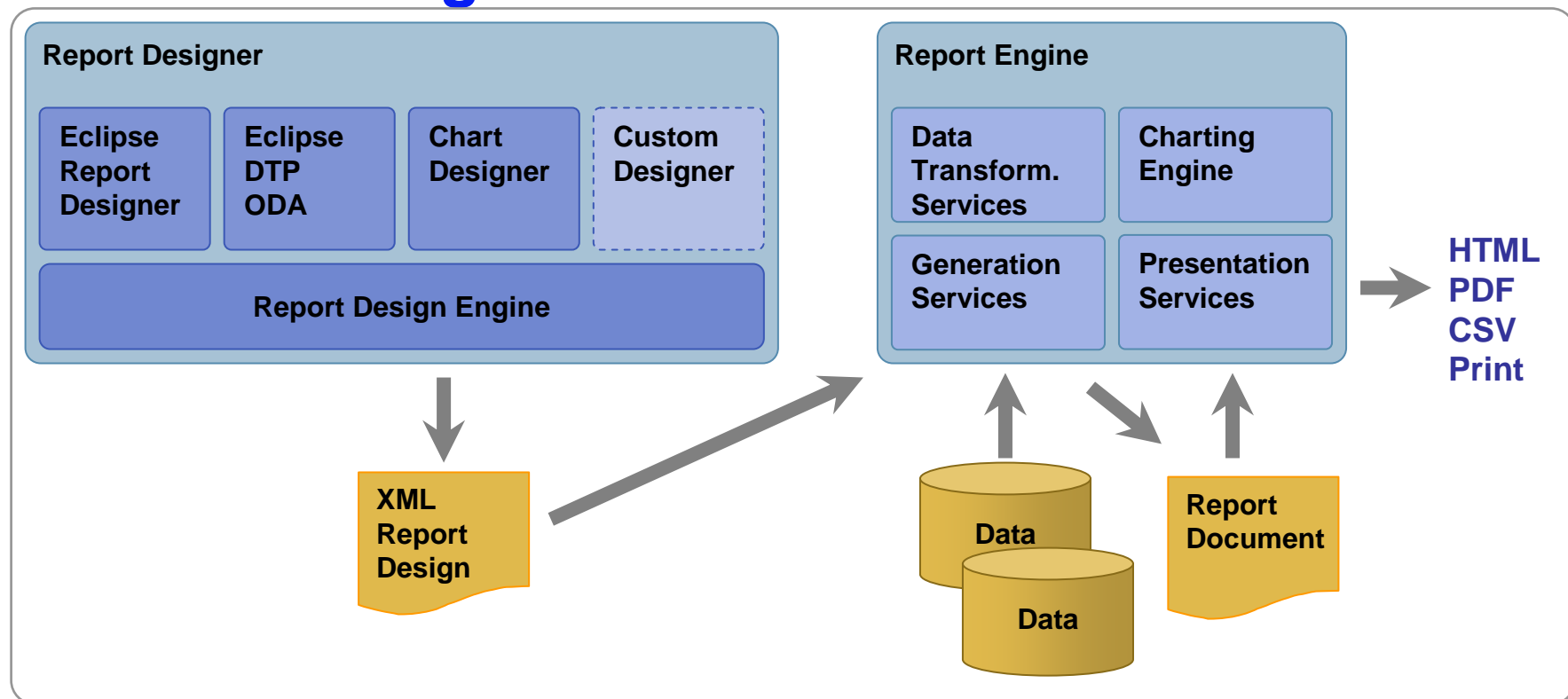
Sales By Product Line

Line	2003	2004	2005
Classic Cars	\$1,514,407	\$1,838,276	\$739,739
Motorcycles	\$597,220	\$590,590	\$295,325
Planes	\$397,755	\$929,809	\$209,074
Ships	\$244,821	\$376,872	\$128,179
Trains	\$72,802	\$124,760	\$56,917
Trucks and Buses	\$402,480	\$551,976	\$201,975
Vintage Cars	\$5,777,984	\$4,597,740	\$1,980,825



BIRT – co nieco o architekturze

- Dwa komponenty: **Report Designer** oraz **Runtime Engine**



Raporty w TPC

The screenshot displays the Tivoli Integrated Portal interface. The browser title is "Tivoli Integrated Portal - Windows Internet Explorer". The address bar shows the URL: <https://localhost:16316/ibm/console/login.do?action=secure>. The page header includes "Tivoli", "View: All tasks", "Welcome tpcadmin", and "Help | Logout".

The left navigation pane shows a tree structure with the following items:

- Welcome
- My Startup Pages
- Security
- Users and Groups
- Troubleshooting
- Reporting (circled in red)
 - Common Reporting (circled in red)
 - Tivoli Storage Productivity Center
- Settings

The main content area is titled "Berichte" and "Tivoli Common Reporting". It includes a "Navigation" pane with a search box and a tree structure:

- Report Sets
 - TPC 4.1 Samples
 - Asset Reports
 - Capacity Reports
 - Tivoli Products
 - Tivoli Common Reporting

The "Reports" table lists the following items:

Title	Description
TPC Storage-Pool Capacity	View As: HTML, PDF, Microsoft Excel, Adobe PostScript
TPC Storage-Subsystem Capacity	Create Snapshot...
TPC Storage-Virtualizer Capacity	Properties..., Parameters..., Data Sources...

A context menu is open over the first report, showing options: View As, Create Snapshot..., Properties..., Parameters..., Data Sources..., Refresh, Cut, Copy, Delete, and Schedules... The "View As" sub-menu is open, showing options: HTML, PDF, Microsoft Excel, and Adobe PostScript.

Below the reports table, there is a "Report Snapshots" section with a table:

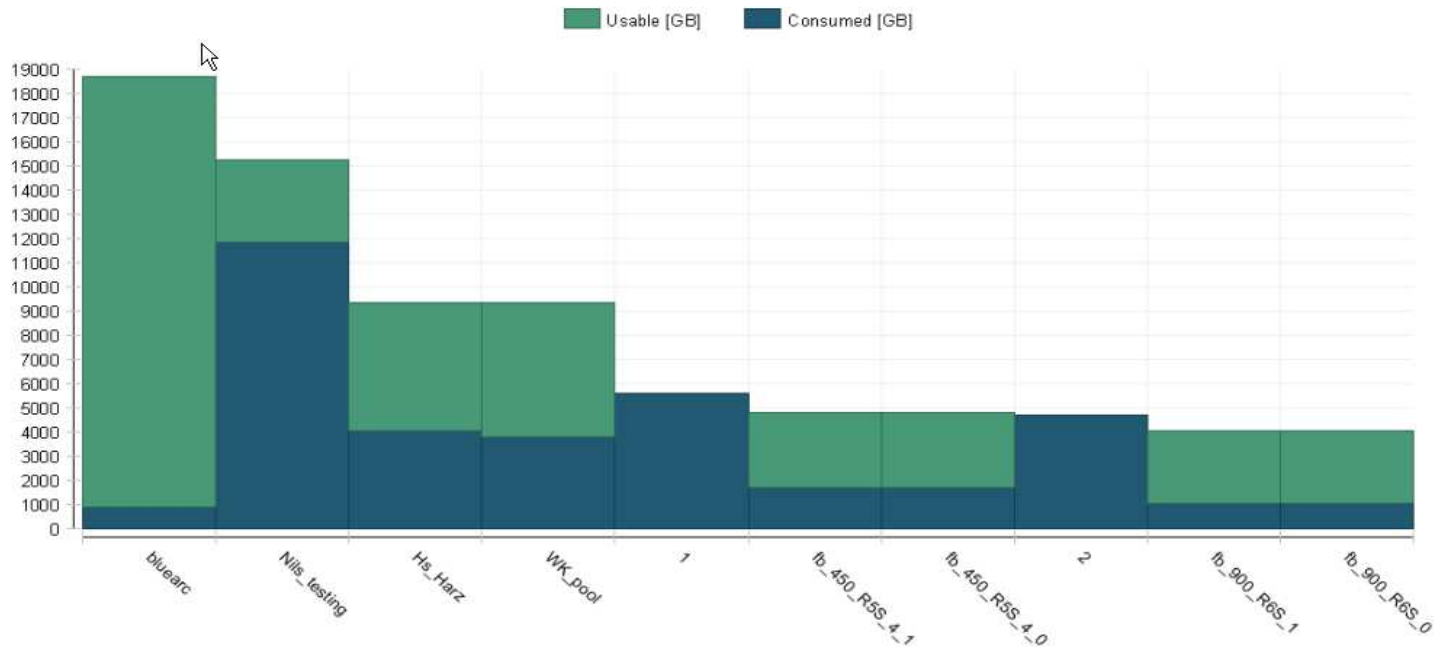
Status	Start	End	User
Completed	2 Oct 2009 15:27:57	2 Oct 2009 15:29:00	tpcadmin



Raporty w TPC

TPC Pool Capacity

TPC: Storage-Pool Capacity Report



Subsystem Type	Subsystem Name	Pool Name	Available Space [GB]	Total Space [GB]	Space Allocation [%]	# Backend Volumes	# Volumes	RAID Level	Extent Size
XIV	XIV-2810-6000050-IBM	bluearc	17775	18640	4.64			raid10	
XIV	XIV-2810-6000050-IBM	Nils_testing	3391	15216	77.71			raid10	
XIV	XIV-2810-6000050-IBM	Hs_Harz	5279	9328	43.41			raid10	



Raporty w TPC

TPC Pool Capacity

Subsystem Type	Subsystem Name	Pool Name	Available Space [GB]	Total Space [GB]	Space Allocation [%]	# Backend Volumes	# RAID Level	Extent Size
XIV	XIV-2810-6000050-IBM	bluearc	17775	18640	4.64		raid10	
XIV	XIV-2810-6000050-IBM	Nils_testing	3391	15216	77.71		raid10	
XIV	XIV-2810-6000050-IBM	Hs_Harz	5279	9328	43.41		raid10	
XIV	XIV-2810-6000050-IBM	WK_pool	5535	9328	40.66		raid10	
FAST	3992-Base1-SV7Lower-600A0B80004211DA00000000485FA5EA-LSI	1	0	5586	100.00		raid6	
DS8000	DS8000-2107-75NA551-IBM	fb_450_R5S_4_1	3098	4748	34.75			
DS8000	DS8000-2107-75NA551-IBM	fb_450_R5S_4_0	3098	4748	34.75			
FAST	3992-Base1-SV7Lower-600A0B80004211DA00000000485FA5EA-LSI	2	0	4655	100.00		raid6	
DS8000	DS8000-2107-75NA551-IBM	fb_900_R6S_1	2976	3976	25.15			
DS8000	DS8000-2107-75NA551-IBM	fb_900_R6S_0	2976	3976	25.15			
DS8000	DS8000-2107-75NA551-IBM	ckd_900_R6S_1	3925	3925	0.00			
DS8000	DS8000-2107-75NA551-IBM	ckd_900_R6S_0	3756	3925	4.31			

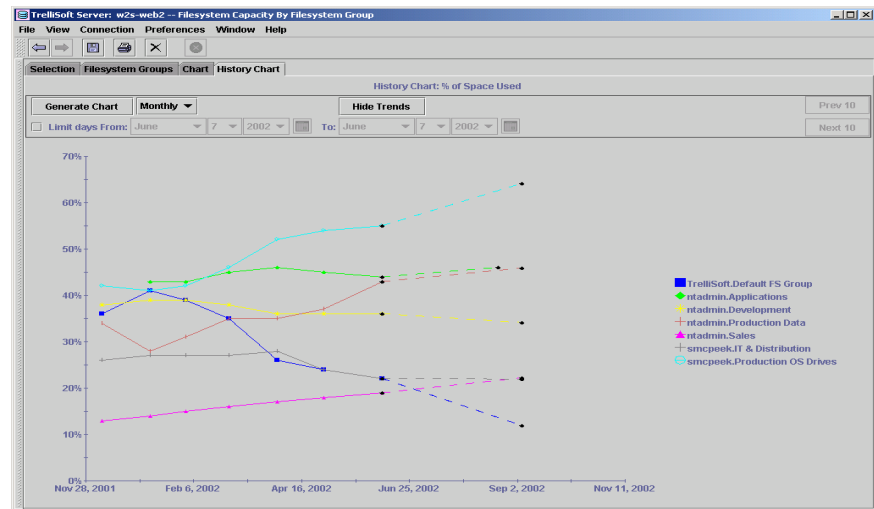


Zarządzanie danymi – cykl życia danych

• Ocena

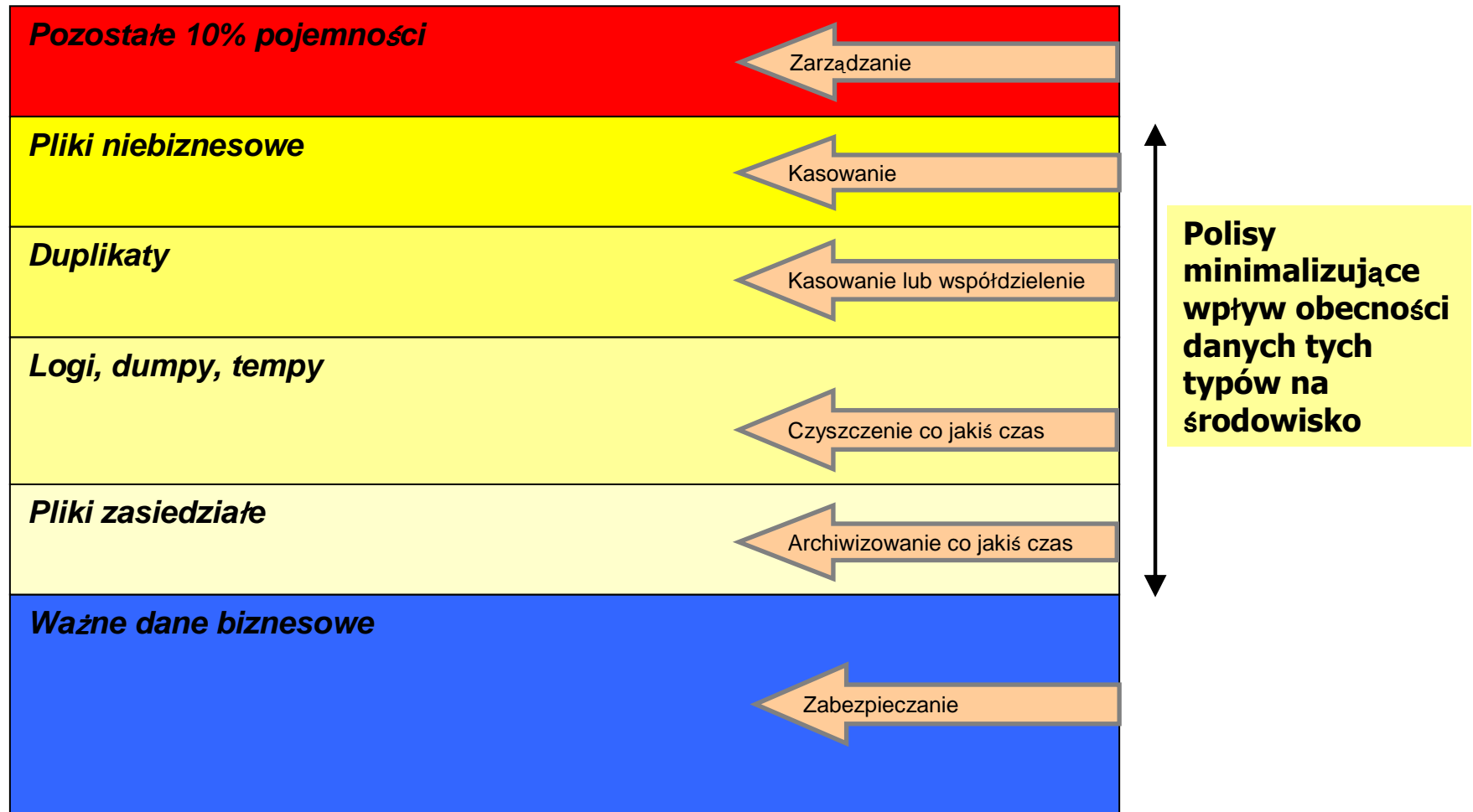
- Co mamy w sieci i jaka jest utylizacja?
- Analiza na poziomie plików i systemu plików
- Wykrywanie sierot, staroci, plików niewłaściwych i duplikatów
- Raportowanie całościowe – od dysków do plików
- NAS / Netware
- Wsparcie VMWare ESX / AIX
- Jak też baz danych (DB2, Oracle, MS SQL, Sybase)

Storage Subsystem	LUN Name	Capacity	LUN WWN
TOTAL = 2			
DB_7570681	bsux0014_0000 (0:000)	102,400 MB	0000
DB_7570681	bsux0002_0001 (0:000)	240,00 GB	0001
DB_7570681	reg02105b_0002 (0:002)	102,400 MB	0002
DB_7570681	bsux0017_0003 (0:003)	45,00 GB	0003
DB_7570681	bsux0014_0004 (0:004)	40,00 GB	0004
DB_7570681	reg03105b_0005 (0:005)	45,00 GB	0005
DB_7570681	reg03106p_0006 (0:006)	38,00 GB	0006
DB_7570681	vw5047a_0009 (0:009)	102,400 MB	0009
DB_7570681	bsux0044_0010 (0:010)	32,00 GB	0010
DB_7570681	bsux0037_0011 (0:011)	32,00 GB	0011
DB_7570681	reg32103b_0012 (0:012)	32,00 GB	0012
DB_7570681	bsux0027_0014 (0:014)	125,00 GB	0014
DB_7570681	reg03103p_0016 (0:016)	45,00 GB	0016
DB_7570681	bsux0062_0021 (0:021)	160,00 GB	0021
DB_7570681	reg32102p_0022 (0:022)	32,00 GB	0022
DB_7570681	bsux0014_0025 (0:025)	40,00 GB	0025
DB_7570681	bsux0020_0027 (0:027)	32,00 GB	0027
DB_7570681	bsux0024_0029 (0:029)	25,00 GB	0029
DB_7570681	bsux0065_0032 (0:032)	32,00 GB	0032
DB_7570681	bsux100_0035 (0:035)	20,00 GB	0035
DB_7570681	bsux0065_0037 (0:037)	80,00 GB	0037
DB_7570681	bsux0020_0040 (0:040)	50,00 GB	0040
DB_7570681	reg32103b_0042 (0:042)	45,00 GB	0042
DB_7570681	15m01ip_0046 (0:046)	135,00 GB	0046
DB_7570681	vw5072b_0051 (0:051)	80,00 GB	0051
DB_7570681	bsux0011_0053 (0:053)	80,00 GB	0053
DB_7570681	bsux0133_0054 (0:054)	25,00 GB	0054
DB_7570681	bsux0063_0055 (0:055)	35,00 GB	0055





Zarządzanie danymi – klasyfikacja



Zarządzanie pojemnością

The screenshot displays the IBM TotalStorage Productivity Center interface for a Data Server named 'dublin'. The interface is divided into several sections:

- Navigation Tree:** A hierarchical menu on the left side, including 'Administrative Services', 'Data Manager', 'Monitoring', 'Alerting', 'Policy Management', 'Reporting', 'Capacity', 'Usage', and 'Backup'.
- Enterprise-wide Summary:** A table providing a high-level overview of storage metrics as of 22/01/04 16:04.

Enterprise-wide Summary	
Filesystem Capacity	1.35 TB
Filesystem Used Space	521.57 GB
Filesystem Free Space	852.06 GB
Disk Capacity	3.16 TB
Disk Unallocated Space	1.71 TB
LUN Capacity	612.39 GB
Usable LUN Capacity	505.61 GB
Monitored Servers	57
Unmonitored Servers	9
Storage Subsystems	2
Users	233
Disks	532
LUNs	80
Filesystems	182
Directories	737,144
Files	8,014,969
- Filesystem Used Space:** A 3D pie chart showing the distribution of space. The legend indicates 'Free Space' (blue) and 'Used Space' (red). The chart shows that used space is approximately 38% of the total capacity.
- Users Consuming the Most Space:** A horizontal bar chart showing the top users. The x-axis represents space consumption in GB, ranging from 0 to 149.01 GB. The top user is 'codeman @ IBM' with 74.51 GB.

User	Space Consumed (GB)
codeman @ IBM	74.51
root	~15
bin	~10
ntadmin @ IBM	~5
oracle	~3
admin @ austx.ibm:IBM-NW51	~2
codeman	~1
- Monitored Server Summary:** A table listing the operating systems of monitored servers.

OS Type	Number	Filesystem Capacity	Disk Capacity
Windows NT	3	58.55 GB	58.25 GB
Windows	27	928.86 GB	971.38 GB
MS Virtual Server	3	34.79 GB	36.93 GB
Solaris	5	79.29 GB	352.82 GB
Linux	6	84.32 GB	91.61 GB
HP-UX	5	29.84 GB	362.75 GB
AIX	2	118.54 GB	172.00 GB
NetWare	5	21.58 GB	43.01 GB
Network Appliance	1	25.64 GB	59.36 GB
Other NAS	0	N/A	N/A
IBM SAN File System	0	N/A	N/A
Unknown	0	N/A	N/A

Zarządzanie pojemnością

The screenshot displays the IBM TotalStorage Productivity Center for Data Server interface. The window title is "IBM TotalStorage Productivity Center for Data Server: dublin -- Disk Capacity: By Storage Subsystem". The interface includes a menu bar (File, View, Connection, Preferences, Window, Help), a toolbar, and a navigation tree on the left. The navigation tree is expanded to "Disk Capacity" > "By Storage Subsystem". The main pane shows a table titled "Disk Capacity: By Storage Subsystem" with the following data:

Name	Disk Capacity	Disk Free Space	Number of Disks	Number of LUNs	LUN
TOTAL =>	1.24 TB	691.13 GB	142	80	
barnes.tivlab.austin.ibm.com	1.08 TB	585.38 GB	128	36	
SRMSVC1	162.00 GB	105.75 GB	14	44	

The taskbar at the bottom shows the Start button, several application icons, and the system tray with the time 20:18.



Zarządzanie pojemnością

IBM TotalStorage Productivity Center for Data Server: dublin -- Filesystem Capacity: By Filesystem

File View Connection Preferences Window Help

Navigation Tree

- Administrative Services
- Data Manager
 - My Reports
 - Monitoring
 - Alerting
 - Policy Management
 - Reporting
 - Groups
 - Asset
 - Storage Subsystems
 - Availability
 - Capacity
 - Disk Capacity
 - Filesystem Capacity
 - By Filesystem**
 - By Filesystem Group
 - By Cluster
 - By Computer
 - By Computer Group
 - By Domain
 - Network-wide
 - Filesystem Used Space
 - Filesystem Free Space
 - Usage
 - Usage Violations
 - Backup
- Data Manager - Databases
- Data Manager - ChargeBack
 - Parameter Definition
 - Online Execution

Selection Filesystems

Filesystem Capacity: By Filesystem

Number of Rows: 146

Computer	Mount Point	Capacity	Percent Used Space	Used Space	Free Space	File Count	Dire
TOTAL =>		1.30 TB	37%	499.76 GB	825.68 GB	7,401,882	
na-f720.ibm.com	/vol/vol2	12.06 GB	100%	12.06 GB	0	2,552	
w2s-sysmgr	E:/	34.36 GB	97%	33.37 GB	1021.00 MB	171,377	
adrian	/opt	64.00 MB	97%	62.61 MB	1.39 MB	1,112	
w2s-prod1	G:/	118.71 GB	96%	114.28 GB	4.42 GB	2,085,453	
w2w-sailor	C:/	27.92 GB	96%	26.93 GB	1016.34 MB	107,178	
w2s-prod1	C:/	7.97 GB	92%	7.33 GB	649.66 MB	40,806	
hans	/opt	1.67 GB	89%	1.50 GB	177.51 MB	23,404	
w2s-prod1	E:/	7.97 GB	85%	6.85 GB	1.13 GB	1,463	
SQUIDWARD.austx.ibm:TRELL	DATA1NSS:/	4.39 GB	81%	3.60 GB	813.62 MB	687,496	
w2s-prod2	C:/	5.89 GB	78%	4.64 GB	1.25 GB	27,802	
adrian	/usr	2.19 GB	78%	1.72 GB	481.25 MB	28,606	
bake	E:/	25.88 GB	77%	20.06 GB	5.82 GB	99,480	
hp11-32b.ibm.com	/usr	376.00 MB	76%	283.38 MB	86.99 MB	15,228	
quake	E:/	25.91 GB	73%	19.05 GB	6.86 GB	114,990	
na-f720.ibm.com	/vol/vol0	7.54 GB	71%	5.42 GB	2.12 GB	1,244,443	
w2w-dist	C:/	9.52 GB	70%	6.69 GB	2.83 GB	19,655	
dublin	E:/	6.00 GB	69%	4.14 GB	1.86 GB	N/A	
nts-wsm	E:/	7.98 GB	68%	5.50 GB	2.49 GB	60,792	
browser380	/	370.41 MB	68%	241.43 MB	109.86 MB	20,713	
browser380	/home	8.56 GB	66%	5.40 GB	2.72 GB	68,435	
maul	/	5.91 GB	66%	3.89 GB	1.96 GB	130,164	
emm	/	4.99 GB	66%	3.15 GB	1.58 GB	126,458	
smc	/	5.08 GB	65%	3.15 GB	1.67 GB	97,853	
hans	/usr	1.66 GB	63%	1.05 GB	627.91 MB	34,005	
adrian	/home/db2inst	984.00 MB	63%	629.23 MB	354.77 MB	8	
w2s-prod2	E:/	19.19 GB	61%	11.80 GB	7.39 GB	15,793	
w2w-twss1	C:/	9.32 GB	61%	5.69 GB	3.63 GB	57,329	
w2s-hh	C:/	8.00 GB	60%	4.86 GB	3.14 GB	42,178	

Windows taskbar: Start, Computer Management..., windows, C:\WINNT\system3..., IBM TotalStorage..., 20:50



Zarządzanie pojemnością

IBM TotalStorage Productivity Center for Data Server: dublin -- Filesystem Capacity: By Filesystem

File View Connection Preferences Window Help

Navigation Tree

- Administrative Services
 - Data Manager
 - My Reports
 - Monitoring
 - Alerting
 - Policy Management
 - Reporting
 - Groups
 - Asset
 - Storage Subsystems
 - Availability
 - Capacity
 - Disk Capacity
 - Filesystem Capacity
 - By Filesystem
 - By Filesystem Group
 - By Cluster
 - By Computer
 - By Computer Group
 - By Domain
 - Network-wide
 - Filesystem Used Space
 - Filesystem Free Space
 - Usage
 - Usage Violations
 - Backup
 - Data Manager - Databases
 - Data Manager - ChargeBack
 - Parameter Definition
 - Online Execution

Selection Filesystems

Filesystem Capacity: By Filesystem

Number of Rows: 146

Computer	Mount Point	Capacity	Percent Used Space	Used Space	Free Space	File Count	Dir
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na-f720.ibm.com	/vol/vol2	12.06 GB	100%	12.06 GB	0	2,552	
w2s-sysmgr	E:/	34.36 GB	97%	33.37 GB	1021.00 MB	171,377	
adrian	/opt	64.00 MB	97%	62.61 MB	1.39 MB	1,112	
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w2w-sailor	C:/	27.92 GB	96%	26.93 GB	1016.34 MB	107,178	
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w2w-twss1	C:/	9.32 GB	61%	5.69 GB	3.63 GB	57,329	
w2s-bh	C:/	8.00 GB	60%	4.86 GB	3.14 GB	42,178	

Start | Computer Managem... | windows | C:\WINNT\system3... | IBM TotalStorage... | 20:50



Zarządzanie pojemnością

IBM TotalStorage Productivity Center for Data Server: dublin -- Filesystem Capacity: By Filesystem

File View Connection Preferences Window Help

Navigation Tree

- Administrative Services
- Data Manager
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 - Groups
 - Asset
 - Storage Subsystems
 - Availability
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 - Disk Capacity
 - Filesystem Capacity
 - By Filesystem**
 - By Filesystem Group
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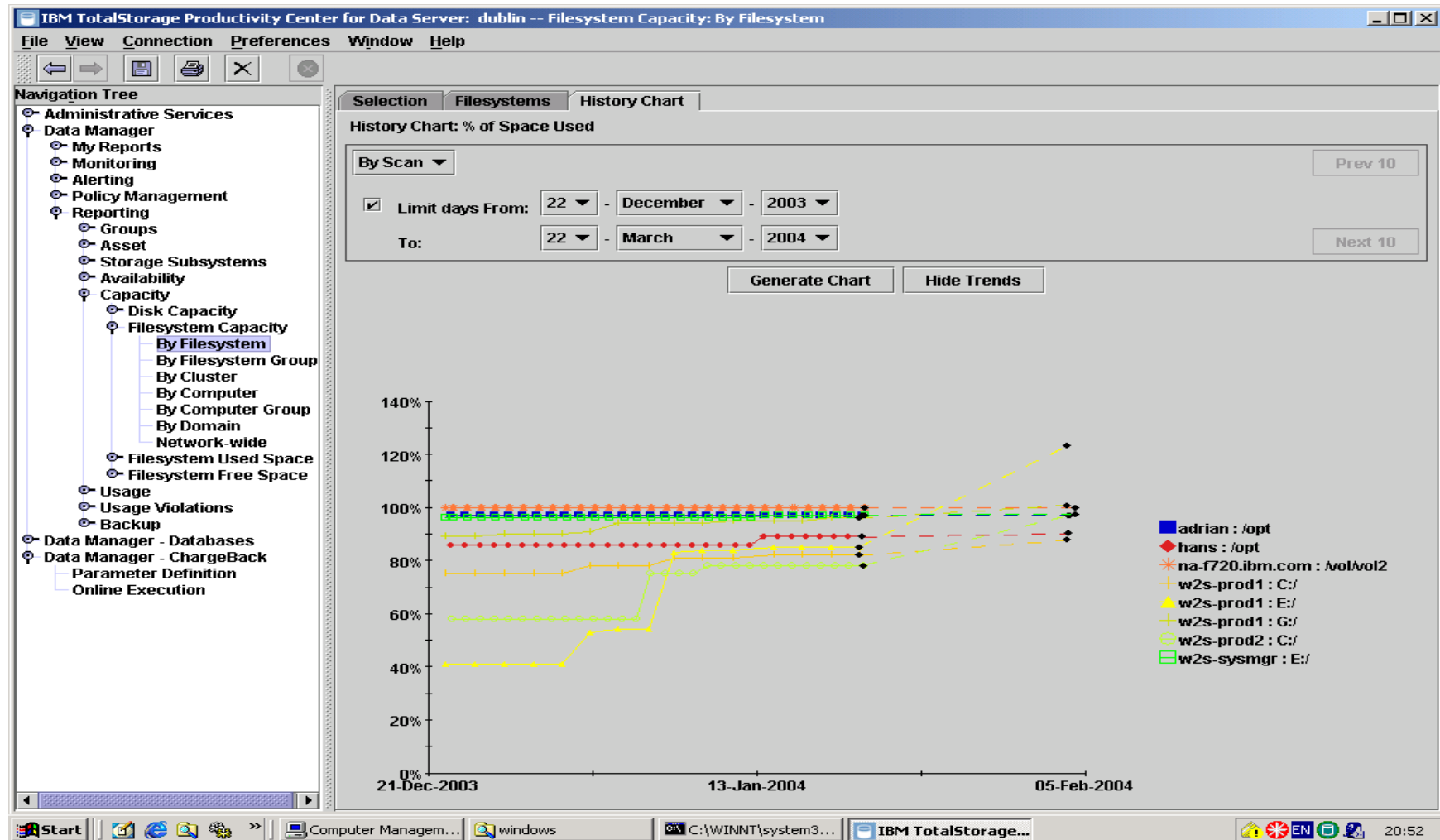
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w2s-hh	C:/	8.00 GB	60%	4.86 GB	3.14 GB	42,178	

Chart space usage for selected
Chart space usage for all
History Chart: File Count for selected
History Chart: Free Space for selected
History Chart: Free Space % for selected
History Chart: Used Space for selected
History Chart: Used Space % for selected
History Chart: Capacity for selected

Start | Computer Managem... | windows | C:\WINNT\system3... | IBM TotalStorage... | 20:50



Zarządzanie pojemnością





Można identyfikować i definiować kolejne progi

- Np. ilość wolnej przestrzeni spada poniżej 10 %

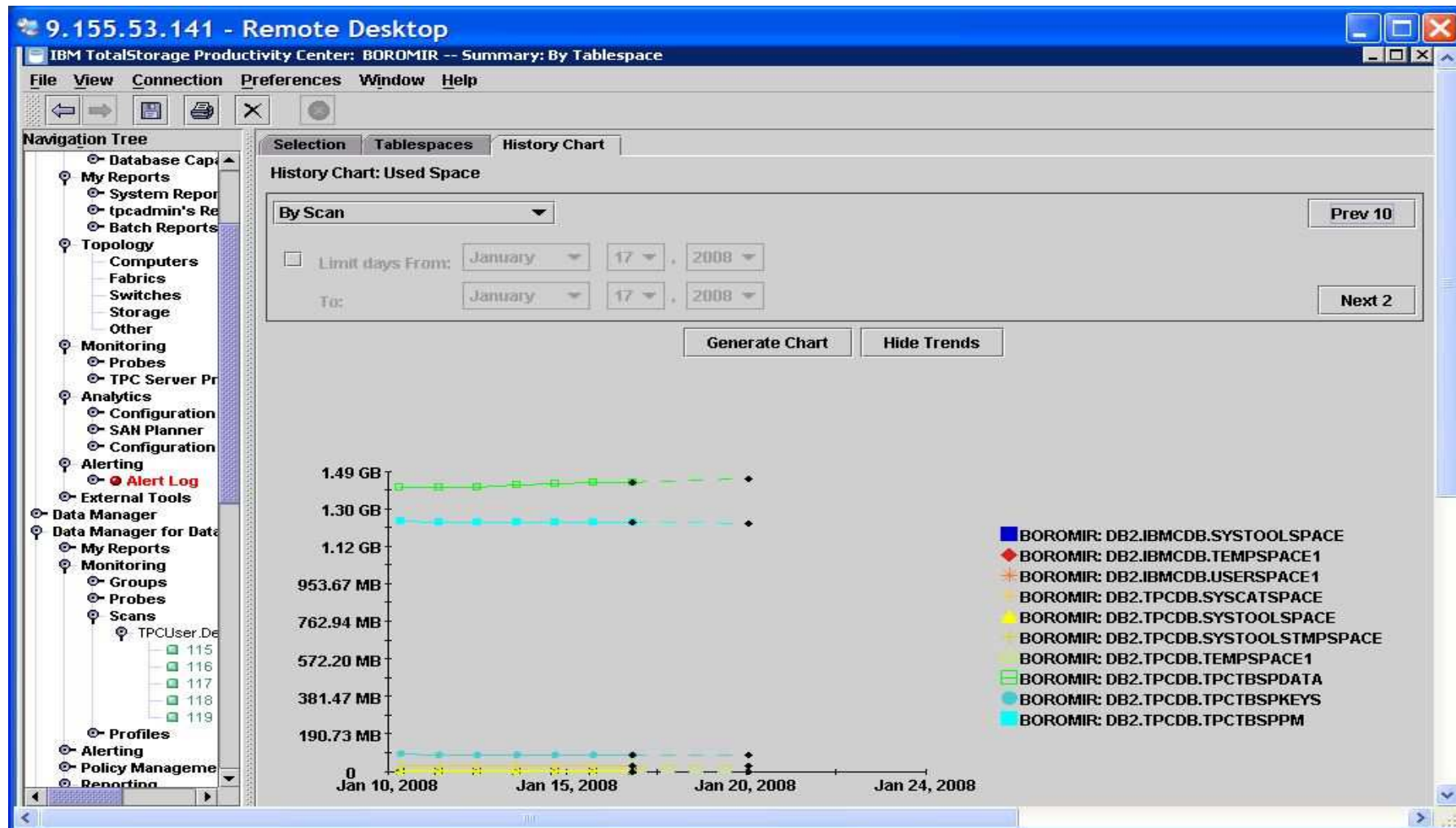
The screenshot shows the 'Edit Alert' configuration window for 'student0.Loved ones FS Freespace LT 10'. The 'Triggering-Condition' section is circled in red, showing the condition 'Filesystem Freespace Less Than' with a value of '10' and units of 'Percent'. A yellow callout box with a blue border points to the 'Enabled' checkbox, which is also circled in red. The 'Current Selections' list shows the computer 'ODCBETA161.wsclab.washington.ibm.com' and its drives C:/, D:/, S:/, and T/.

The screenshot shows the alert details for 'Loved ones FS Freespace LT 10'. The 'Alert Text' field contains the following message, which is circled in red:

```
ALR0009W: The free space on file system V:/ on host odcbeta161.wsclab.washington.ibm.com has fallen below the threshold value of 10%. The free space is 75.86MB or 1.48% of the file system capacity.
```




Nie tylko pliki, bazy danych też



Analiza historyczna

- Służy do podawania informacji o zmianach w konfiguracji środowiska
- **Change Monitoring** – wykrywa zmiany w środowisku i powiadamia o nich użytkownika
- Ręcznie bądź automatycznie, poprzez tworzenie migawek bazy danych w zadanym momencie i porównywanie ich ze stanem obecnym

The screenshot shows the IBM TotalStorage Productivity Center Configuration History window. The interface includes a navigation tree on the left, an overview section with summary cards for various components, a configuration history panel with a time range selector and snapshots, and a topology/alert table at the bottom. Three callout boxes provide context: 'Wskazuje wykryte zmiany' points to the Configuration History panel; 'Porównujemy migawki' points to the snapshots list; and 'Podsumowanie wykrytych zmian' points to the topology/alert table.

Wskazuje wykryte zmiany

Porównujemy migawki

Podsumowanie wykrytych zmian

Label	Summary
Switches	6 Switches
Other	43 Other
Computers	12 Computers
Storage	"2 Subsystems, 0 Tape Libraries" -> "4 Subsystems, 1 Tape Library"
Fabrics	"2 Fabrics (4 Virtual Fabrics)" -> "3 Fabrics (4 Virtual Fabrics)"



Analiza historyczna

Configuration History

Subsystems (Normal) [1]
DS6000-...

Subsystems (Unknown) [4]
0200612... 6848562
FAST20... SVC-214...

Tape Libraries (Unknown) [1]
Tape-35...

Nowe urządzenia

Subsystem	Tape Library	Alert	Group	Label	Operational	Vendor	Model	Type	Serial#	Allocat
			Normal							
			Unknown							
			Unknown	020061200716XX01			2145	Storage Su...	020061200...	
			Unknown	6848562			1750500	Storage Su...	6848562	
			Unknown	FAST200-1N92-FAST20...	degraded		FAST200	DS4000	600A0B800...	
			Unknown	SVC-2145-Gburg1N92-IBM	ok		IBM Syste...	SVC	000002006...	269.64



Analiza historyczna

Urządzenia usunięte

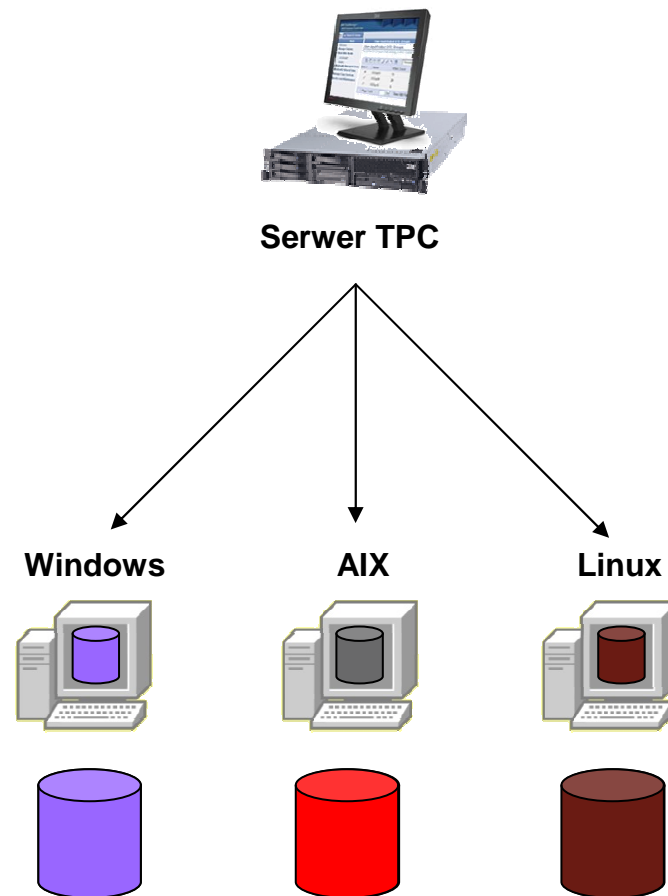
Podsumowanie zmian

Type	Serial#	Allocat
Storage Subsystem -> Removed	020061200716XX01	
Model	2145 -> Removed	
Health	Unknown -> Removed	
Element Manager	http://9.82.39.192:9080 -> Removed	
Label	020061200716XX01 -> Removed	
Serial#	020061200716XX01 -> Removed	

Type	Serial#	Allocat
Storage Su...	020061200...	
Storage Su...	6848562	
000	6847412	1888.0
	000002006...	269.73



Storage Resource Agent



- Lekki (3 MB na dysku, 5 MB pamięci), natywny agent (Windows / AIX / Linux) dający funkcję sondy, podobną do tej jakie daje istniejący agent CAS
- Sonda to plik wykonywalny (C / C++)
- Zbiera dane dla TPC for Data jak również z karty HBA i z portów karty HBA
- Raporty wsadowe, skany plików, sondy NetWare i NetApp na razie jeszcze w agencie CAS
- Serwer wysyła agenta do wskazanej maszyny



Storage Optimization Engine

- **Dostarcza informacji o ruchu we / wy i wykorzystaniu przestrzeni dyskowej, która może być wykorzystana do znalezienia przeciążeń i do podania zaleceń odnośnie migracji, celem rozproszenia obciążenia**
- **Na wejściu**
 - **Jakie podsystemy**
 - **Progi wydajnościowe**
 - **Konfiguracja podsystemu z bazy TPC**
 - **Profil wydajnościowy podsystemu z bazy TPC**
- **Na wyjściu**
 - **Raport pokazujący *hot spots***
 - **Raport ze wskazówkami dotyczącymi optymalizacji**
 - **Które wolumeny migrować gdzie**



Storage Optimization Engine

IBM TotalStorage Productivity Center: Senthil -- Create Optimization

File View Connection Preferences Window Help

Element Management

Navigation Tree

- Administrative Services
- IBM TotalStorage Productivity Center
 - Configuration Utility
 - Rollup Reports
 - Asset
 - Database Asset
 - Capacity
 - Database Capacity
 - My Reports
 - System Reports
 - senthil's Reports
 - Batch Reports
 - Topology
 - Computers
 - Fabrics
 - Switches
 - Storage
 - Other
 - Monitoring
 - Probes
 - TPC Server Probes
 - Analytics
 - Configuration History
 - Storage Optimizer
 - senthil.coderev
 - senthil.codetest
 - 1 - Jun 18, 2008 10:35:46 AM
 - 2 - Jun 27, 2008 2:23:23 PM
 - senthil.demo
 - senthil.sendb
 - senthil.seritest
 - senthil.test
 - SAN Planner
 - Configuration Analysis
 - Alerting
 - Alert Log
 - External Tools
 - Data Manager
 - Data Manager for Databases
 - Data Manager for Chargeback
 - Disk Manager
 - Fabric Manager
 - Tape Manager
 - Element Manager
 - Unit Test Manager
 - Static DDI Test
 - Editable DDI Test
 - Editable DDI Test II

Create Optimization

This panel will allow for the analysis of a set of storage subsystems or storage pools, and generate a report

Creator: senthil Name: unnamed

Description:

Create Optimization Report

HeatMap Table

Previously Run Optimization Reports

Job ID	Job Status	Date	View Report
One	Senthil	Senthil	View Report
Two	Senthil	Senthil	View Report
Three	Senthil	Senthil	View Report
Four	Senthil	Senthil	View Report
Five	Senthil	Senthil	View Report



Przykład raportu

Optimization Report : Optimize DS6K pools

Select all recommendations

Select one or more recommendations to display the resulting performance improvements after optimization

Recommen...	Source Sub...	Target Subsystem	Source Volume	...	Source Pool	Target Pool	Reason
1	DS6000-17...	DS6000-1750-684...	Hollis_TPC_DEM...		Extent Pool 1	Extent Pool 2	Utilization of Pool HDD is 21

Zaleceń może być kilka. Podświetlenie ich powoduje pokazanie detali w Heat Maps poniżej.

HeatMap based on : Utilization Host Adaptor Hard Disk Controller Device Adaptor Space

Performance Heat Maps Performance Tables

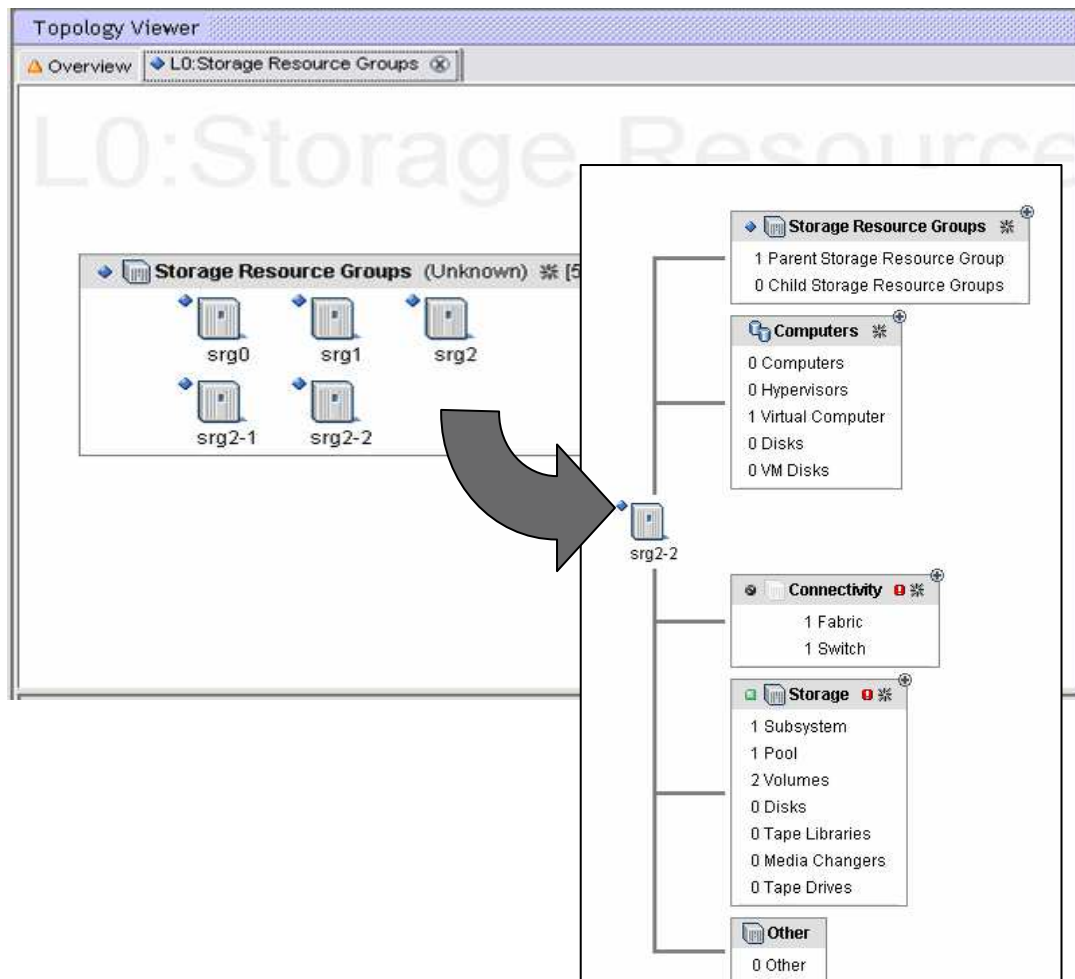
Metryki dla Heat Maps

Before optimization for subsystem: DS6000-1750-6847412-

After optimization for subsystem: DS6000-1750-6847412-



Storage Resource Groups



Można grupować zasoby na bazie aplikacji, line of business, bądź w jakikolwiek inny arbitralny sposób

Tworzenie polis, przeglądanie statusu, zarządzanie alertami dla wszystkich elementów w grupie

Szczególnie przydatne w rozległych, złożonych strukturach – grupowanie zasobów umożliwia sprawniejsze zarządzanie



Storage Resource Groups

Zbiory heterogenicznych elementów na potrzeby zbiorczego przeglądania statusu, SAN Plannera i raportowania

- Logiczne grupowanie elementów różnego typu (np. zasobów pod aplikację)
- Może obejmować komputery, *fabrics*, przełączniki, podsystemy dyskowe, pule *storage*'owe, wolumeny, obiekty inne lub typu „*unknown*” i same SRG
- Można grupować karty HBA jako komputer (bez Data Agenta => „*unknown*”)
- Można przypisywać zestawy polis SAN Plannera
- Łatwa konfiguracja przy pomocy Topology Viewera



SRG i SAN Planner

Create Plan

The planner automatically allocates storage for one or more hosts, and optionally sets up multipath options and zoning for

Creator: student0 Name: unnamed
Description: Tier 1A disk for computer odcbeta160

To create a plan, specify host(s) and/or storage subsystem(s) within the same fabric(s).

Selected Elements:

- Fabrics
 - B_Side_With_Brocade
- Computers
 - ODCBETA160.wsclab.washington.ibm.com (1 Fabrics)
- Storage Resource Groups
 - Tier 1A
- Subsystems
 - DS6000-1750-6847412-IBM
 - Extent Pool 1

Effective Provisioning Profile: Custom

Volume Planner Specify how the storage will be allocated and its performance characteristics

Total Capacity: 1 GB

Divide capacity between 1 and 1

Divide capacity among volumes of size 1 GB to 1

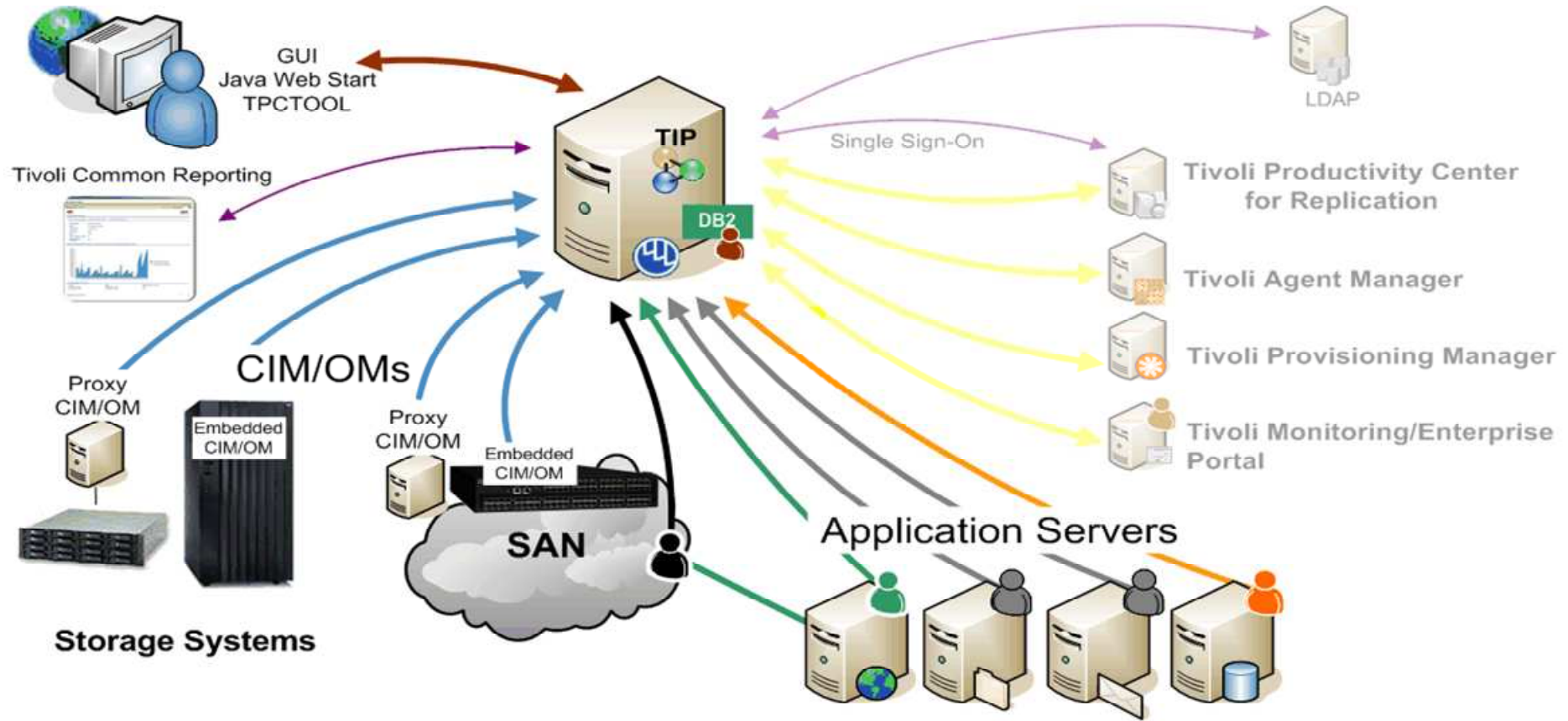
Workload Profile: Space Only

RAID Level: RAID 5

Volume Name Prefix: JLH-SRG-Test1

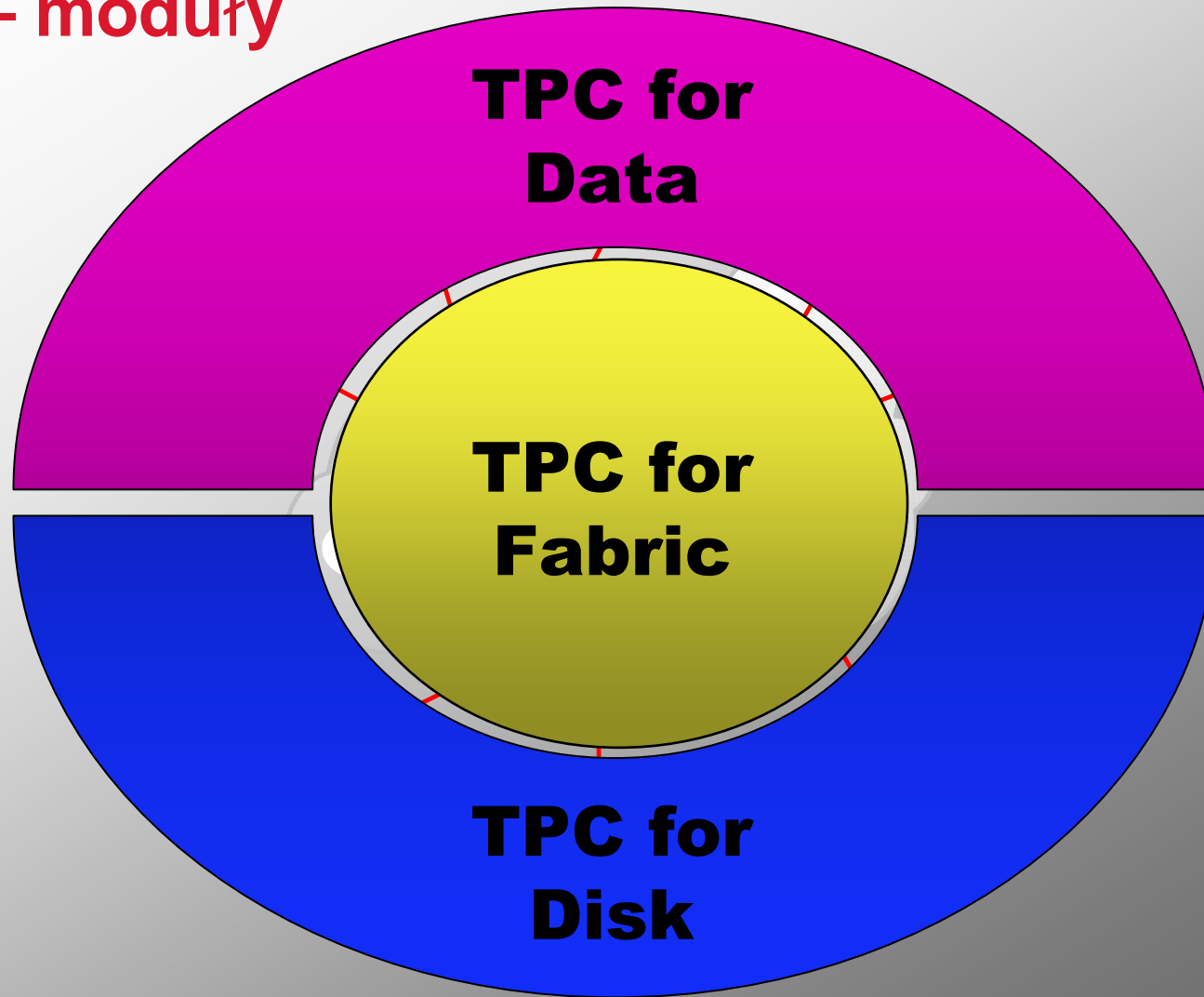
W tym miejscu można użyć SAN Plannera

Architektura TPC



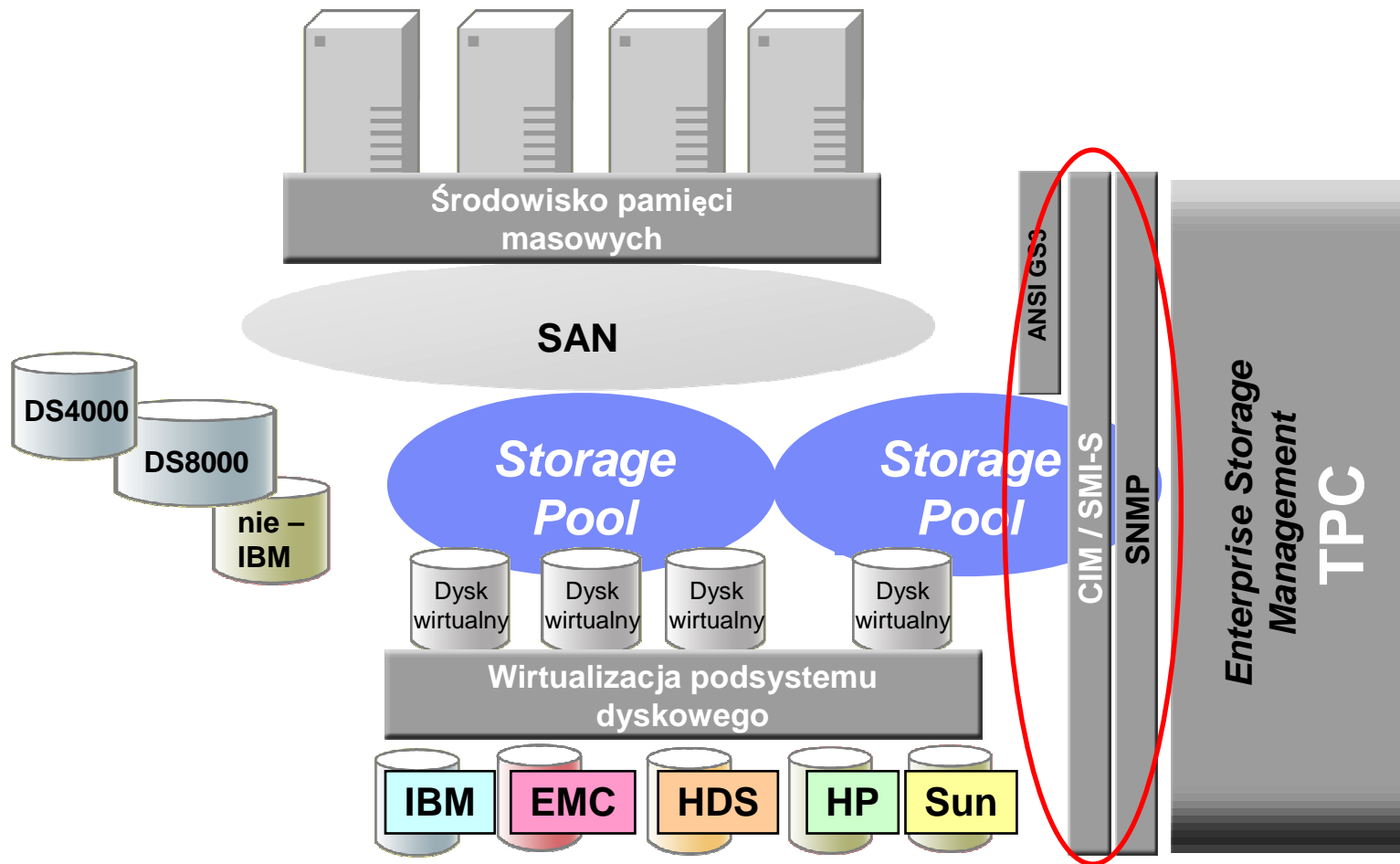


TPC – moduły





IBM Tivoli Storage Productivity Center bazuje na standardach otwartych



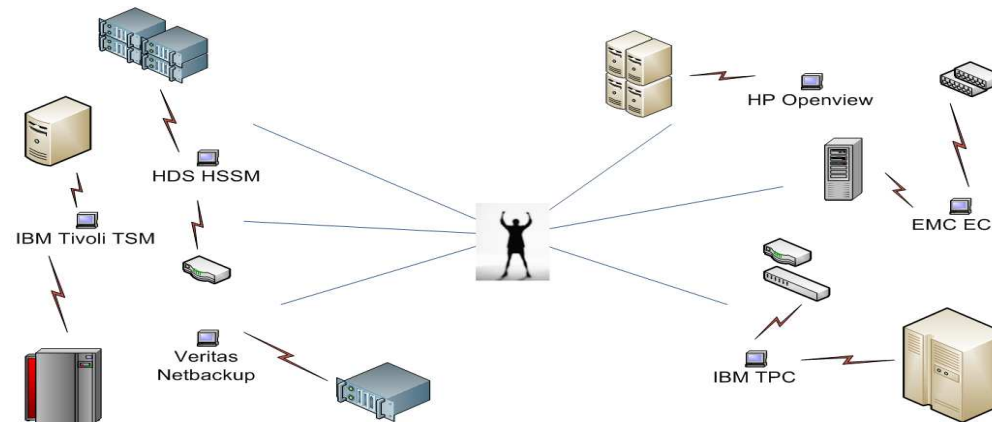


Storage Enterprise Resource Planner (SERP)



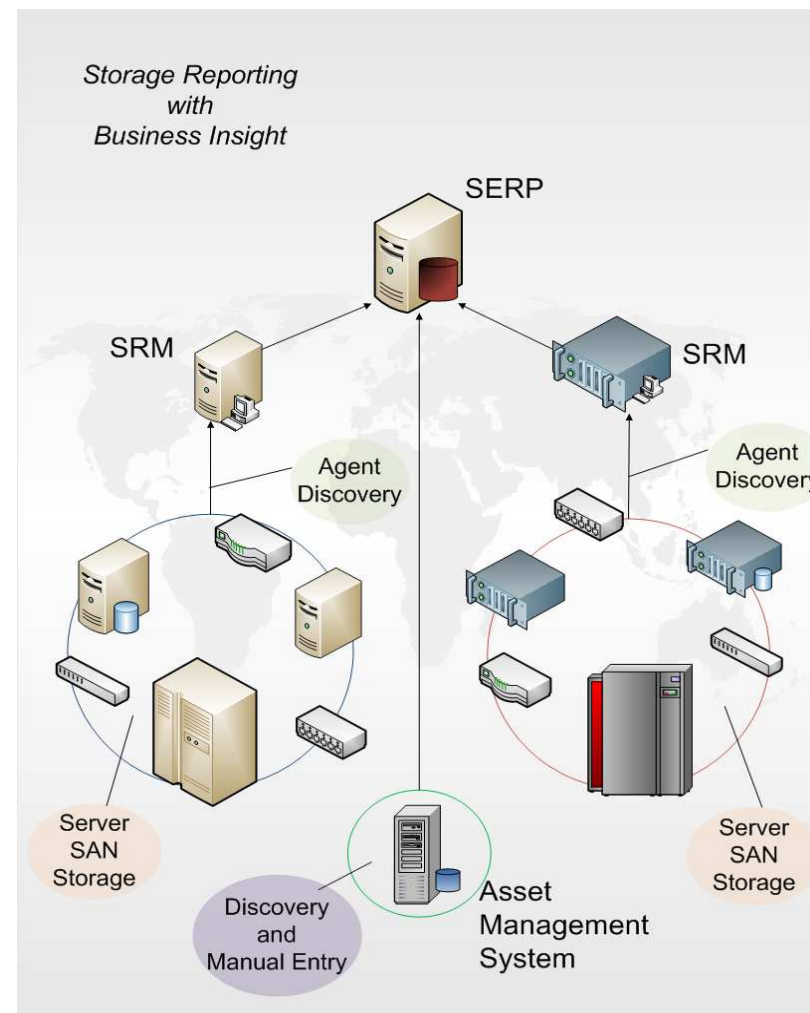
Potrzeby w zakresie raportowania

- Powszechne bolączki
 - Zróżnicowane technologie
 - Wielość produktów punktowych
 - Albo niemożność uzyskania jednego obrazu całości, albo wymagany duży wysiłek i długi czas
- Potrzeby
 - Jeden ekran raportujący o urządzeniach
 - Kontekst przekształcający informacje natury technicznej w biznesową
 - Możliwości głębszej analizy bez konieczności wykupywania usług



SERP – co to jest?

- Wykorzystuje się istniejące narzędzia do zbierania informacji o zasobach w sieci SAN
 - Narzędzia SRM dostarczają informacji
 - Nie ma potrzeby osadzania agentów
 - Informacja historyczna jest utrzymywana
- Źródła danych *Asset Management* są wykrywane, dane importowane
- Dane z narzędzi SRM i systemów *Asset Management* są korelowane celem stworzenia obrazu biznesowego pamięci masowych
- Umożliwia globalne podejście do raportowania w zakresie pamięci masowych



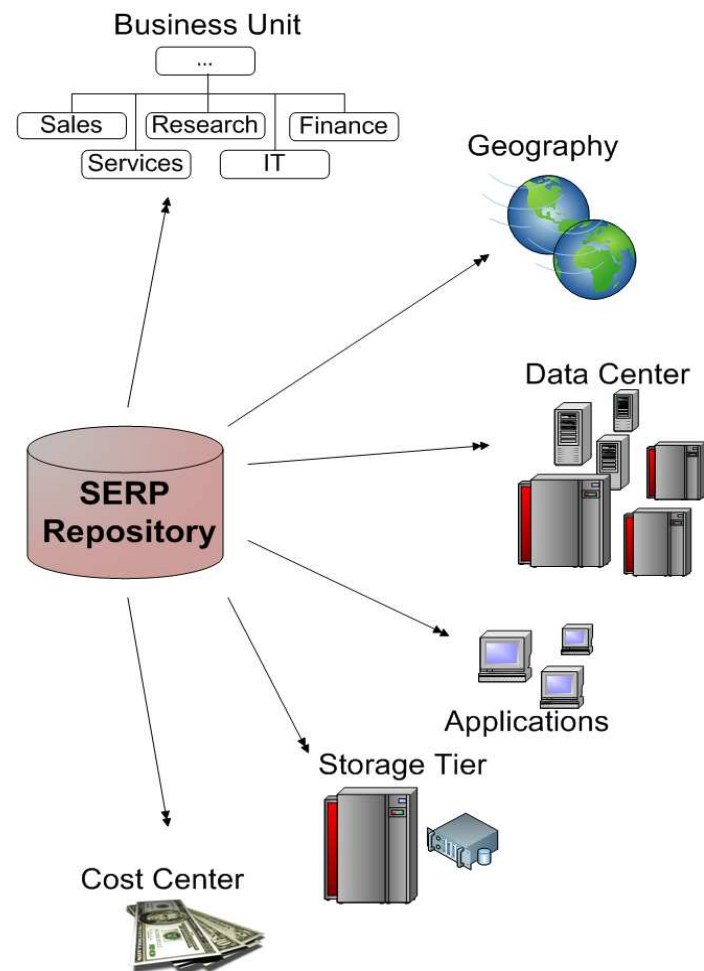


Źródła danych

- Narzędzia SRM
 - IBM TPC™
 - EMC ControlCenter™
 - NetApp Operations Manager™
 - HDS HDvM™
 - HDS HSSM™
- *Data Extractor agentless host discovery and data collection*
- Narzędzia stworzone własnoręcznie
 - Komponent Universal Collector akceptuje dane wejściwe
- Źródła danych natury biznesowej
 - Peregrine™
 - Remedy™
 - SAP™
 - Excel™
 - inne

Korelacja i związki logiczne

- Możliwa jest korelacja zasobów *storage*'owych w
 - Hierarchie własności w obrębie danej linii biznesowej
 - Regiony geograficzne
 - *Data centers*
 - Aplikacje
 - Storage tier at the array volume level
 - *Cost centers*
- Cecha *predictive intelligence* umożliwia projekcję zmian i potrzeb w przyszłości na bazie danych historycznych





Zakres raportowania

- SERP wychwytuje dane i tworzy raporty dla części sprzętowej
 - Serwerów
 - Przełączników
 - Macierzy
 - NAS – ów
 - itp.
- I uwzględnia
 - Klastry
 - Pojemności i użycia
 - Połączenia
 - Wirtualizacje
 - Dane „zielone”
- Przechowuje dane na potrzeby raportów



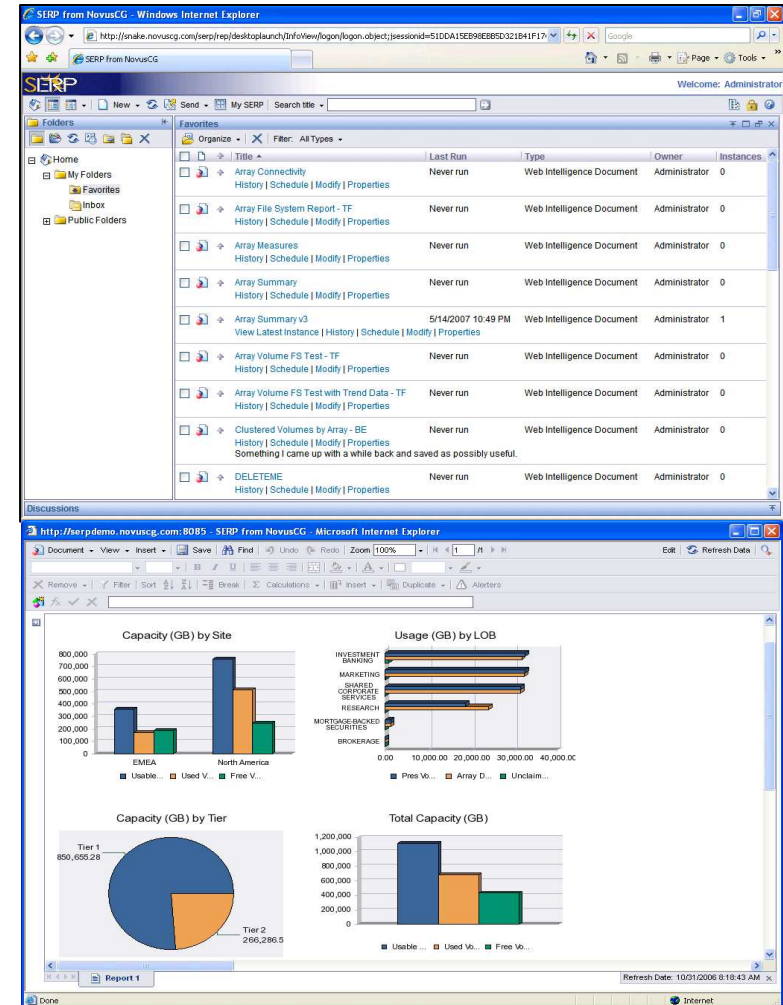
Do czego się go wykorzystuje

- Aby odzyskać trochę przestrzeni i poprawić użycie
- Pomaga w *capacity planningu*
- Umożliwia budowanie i realizowanie strategii hierarchizowania *storage'u* (poprawa użycia i lepsze TCO)
- *Configuration Management*
- *Information Lifecycle Management*
- Aby lepiej powiązać koszty z elementami infrastruktury
- Docelowo – aby obniżyć koszty infrastruktury



Interfejs

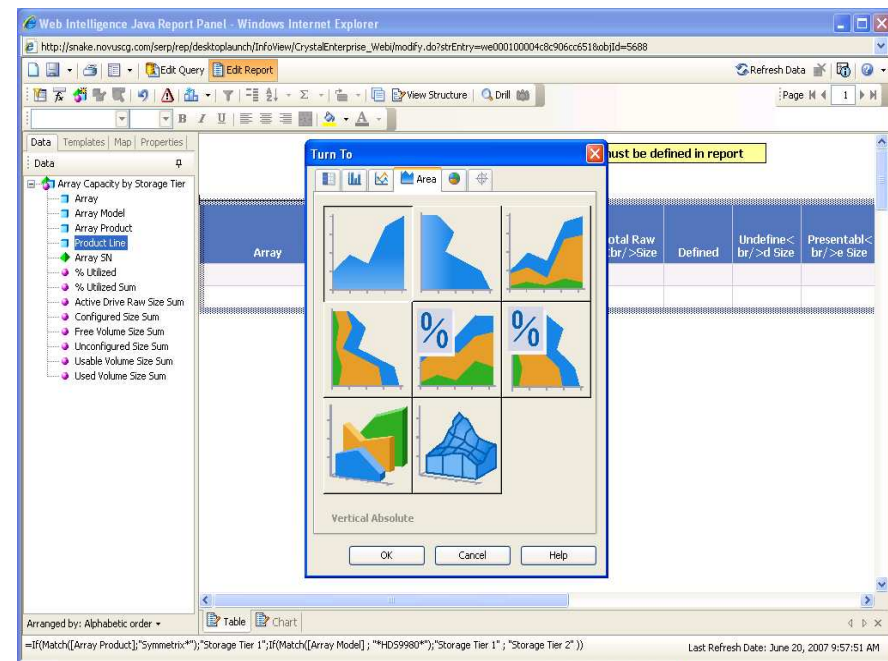
- Widok typu „drzewo” z raportami typu *personal* i *public*
 - Grupowanie i arbitralne nazewnictwo
 - Opcja wyszukiwania
 - Można przysyłać raporty przez pocztę elektroniczną
- Widok typu „deska rozdzielcza”
 - Modyfikowalne zakładki
 - Postać graficzna bądź tabelaryczna
 - Trendy w większości raportów





Interfejs – tworzenie raportów

- Użytkownik tworzy raporty minimalnym wysiłkiem, bez potrzeby korzystania z dodatkowego kodu, metodą przeciągnij – i – upuść
 - Najpierw tworzymy „*query*” przeciągając obiekty na prawą stronę
 - Potem przełączamy się na widok „*edit report*” aby wybrać format
 - Zapisujemy raport i gotowe





SERP Administrator Dashboard

Executive Summary

Capacity Planning

Reclamation

Storage Utilization

Hardware Details

Config Exceptions

SAN Connectivity

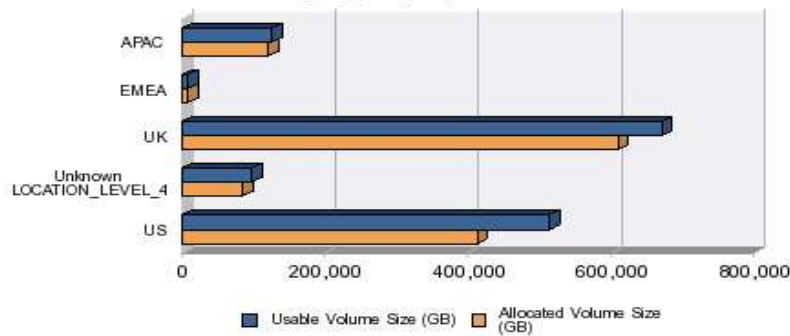
SERP Stats

Global Summary

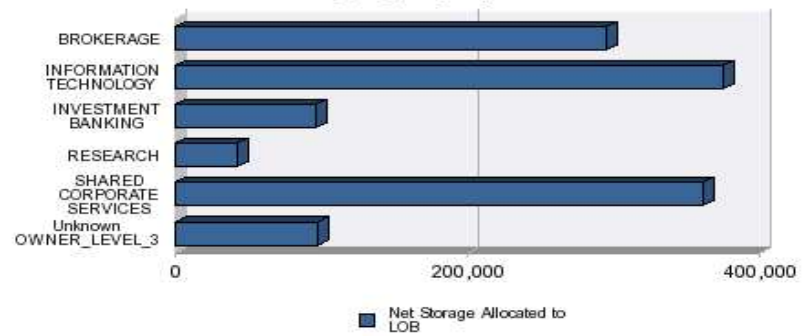
Document View Insert Save Find Undo Redo Zoom 100% 1 / 1

Analysis context:

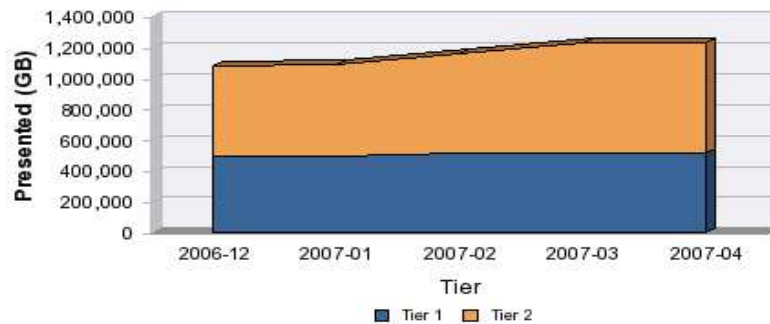
Storage (GB) by Location



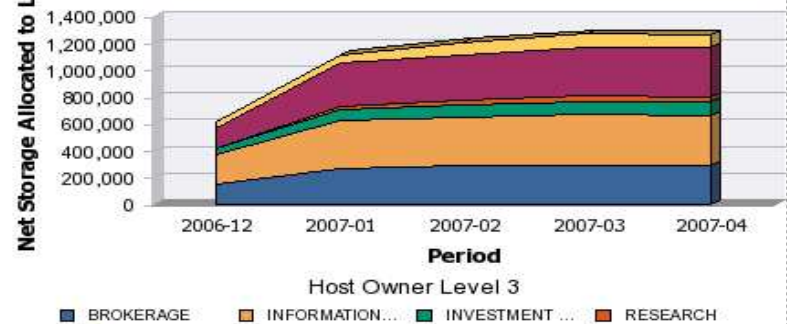
Storage (GB) by LOB



Tier Capacity Trend (GB)



Allocation Trend (GB)





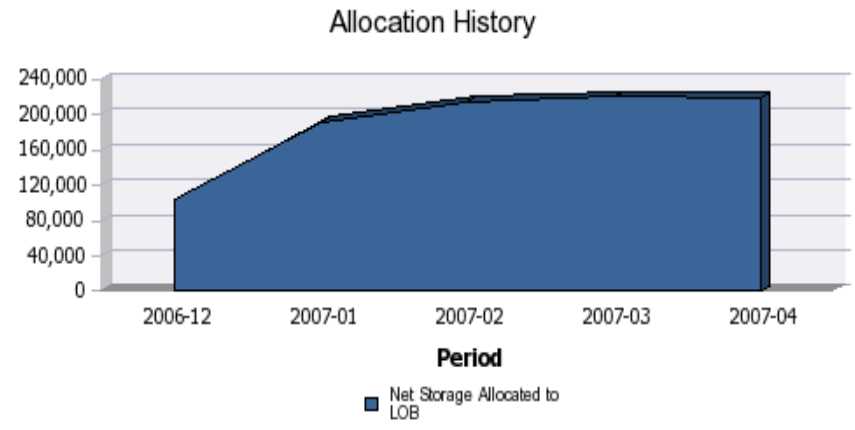
Forecast Allocations to LOBs

Forecast Allocations to LOBs

Query refreshed: 8/6/07 3:06 PM
Date of last import: 4/7/07 12:00 AM

BROKERAGE

Period	Net Storage Allocated to LOB	MOM Net Change Allocated (GB)	MOM Pct Change Allocated
2006-12	103,389	0	
2007-01	190,757	87,368.01	84.50%
2007-02	213,659	22,901.64	12.01%
2007-03	219,740	6,080.94	2.85%
2007-04	218,154	-1,585.21	-0.72%



Period Used for Forecast: 2006-12 to 2007-04

MOM Growth Rate	Forecast Allocated: 3 Month	Forecast Allocated: 6 Month	Forecast Allocated: 12 Month
24.66%	422,601	818,649	3,072,076



Reclamation - Orphaned LUNs

This report identifies volumes that are presented to hosts, but have no host device on them. This usually indicates

Array Location Level 1	Array	Array Volume	Array Volume Type	Volume Size (GB)
DATA CENTER 10	ARRAY_ALIAS_103	0000	PRIMARY	1
DATA CENTER 14	ARRAY_ALIAS_91	0005	PRIMARY	535
DATA CENTER 3	ARRAY_ALIAS_84	0015	PRIMARY	105
DATA CENTER 3	ARRAY_ALIAS_84	0016	PRIMARY	105
DATA CENTER 3	ARRAY_ALIAS_84	0020	PRIMARY	175
DATA CENTER 3	ARRAY_ALIAS_84	0021	PRIMARY	5
DATA CENTER 3	ARRAY_ALIAS_84	0022	PRIMARY	10
DATA CENTER 3	ARRAY_ALIAS_84	0023	PRIMARY	10
DATA CENTER 3	ARRAY_ALIAS_84	0031	PRIMARY	30
DATA CENTER 3	ARRAY_ALIAS_84	0032	PRIMARY	40
DATA CENTER 3	ARRAY_ALIAS_84	0033	PRIMARY	40
DATA CENTER 3	ARRAY_ALIAS_84	0034	PRIMARY	40
DATA CENTER 3	ARRAY_ALIAS_84	0035	PRIMARY	1
DATA CENTER 30	ARRAY_ALIAS_53	178	PRIMARY	30
DATA CENTER 30	ARRAY_ALIAS_53	178	PRIMARY	30



Reclamation - Underutilized File Systems

Reclamation - Underutilized File Systems

Query refreshed: 11/28/07 8:38 AM
Date of last import: 4/7/07

This report identifies file systems that are under 35% utilized. The utilization threshold can be changed filtering on the Pct Utilized column.

DATA CENTER 1

Host	Host File System	Host File System Type	Host File System Storage Type	Array FS Size (GB)	Array FS Used (GB)	Array FS Free (GB)	Pct Utilized: File Systems
			Sum:				

DATA CENTER 10

Host	Host File System	Host File System Type	Host File System Storage Type	Array FS Size (GB)	Array FS Used (GB)	Array FS Free (GB)	Pct Utilized: File Systems
sgpds05998n01	O:\	NTFS	Array	200	0	200	0.17%
sgpds05998n02	O:\	NTFS	Array	200	0	200	0.17%
sgpds00009	/Sybase_dumps/ttssg-dev1	VXFS	Array	190	29	161	15.17%
sgpds00005	/apps/sopsg-dev1/backup	VXFS	Array	188	43	145	22.68%
sgpds00005	/apps/bc2sg-dev1/backup/BC2SG	VXFS	Array	188	51	137	26.86%
sgpds00004	/apps/tassg-uat1/backup/TASSGT	VXFS	Array	138	9	129	6.44%
sgpds00002	/apps/tdbsg-dev1/backup	VXFS	Array	150	37	113	24.85%
sgpps05985n01	O:\	NTFS	Array	136	30	106	22.38%



Executive Summary | Capacity Planning | **Reclamation** | Storage Utilization | Hardware Details | Config Exceptions | SAN Connectivity

Orphaned LUNs | Low FS Utilization | **Volumes Not in Device Groups** | Cost Savings Projections

Reclamation - Not in Device Group

Document | View | Insert | Save | Find | Undo | Redo | Zoom 100% | 1

Query refreshed: 8/6/07 4:26 PM
Date of last import: 4/7/07

This report identifies volumes that are presented to hosts, but are not in a device group. This can indicate that a volume is reclaimable.

Array Location Level 1	Array	Array Volume	Array Volume Type	Volume Size (GB)
DATA CENTER 10	ARRAY_ALIAS_103	0001	PRIMARY	1
DATA CENTER 10	ARRAY_ALIAS_103	0002	PRIMARY	2
DATA CENTER 10	ARRAY_ALIAS_103	0003	PRIMARY	2
DATA CENTER 10	ARRAY_ALIAS_103	0004	PRIMARY	2
DATA CENTER 10	ARRAY_ALIAS_103	0005	PRIMARY	2
DATA CENTER 10	ARRAY_ALIAS_103	0017	PRIMARY	50
DATA CENTER 10	ARRAY_ALIAS_103	0018	PRIMARY	50
DATA CENTER 10	ARRAY_ALIAS_103	0019	PRIMARY	50
DATA CENTER 10	ARRAY_ALIAS_103	0020	PRIMARY	50
DATA CENTER 10	ARRAY_ALIAS_103	0021	PRIMARY	50
DATA CENTER 10	ARRAY_ALIAS_103	0022	PRIMARY	50
DATA CENTER 10	ARRAY_ALIAS_103	0023	PRIMARY	50
DATA CENTER 10	ARRAY_ALIAS_103	0024	PRIMARY	50
DATA CENTER 10	ARRAY_ALIAS_103	0025	PRIMARY	50



Reclamation - Cost Savings Projections

Reclamation - Cost Savings Projections

Query refreshed: 8/6/07 2:55 PM

Date of last import:

This report estimates the potential capital expenditures that can be avoided if orphaned storage was reclaimed.

Tier	Cost per GB (Fully Loaded)	Total Volume Size (Detail Query)	Cost Savings Estimate
Tier 1	\$35	52,831.23	\$1,849,093
Tier 2	\$10	11,310.57	\$113,106
Sum:		64,141.79	\$1,962,199



Host Total Storage Utilization Summary by Location

Host Total Storage Utilization Summary by Location Query refreshed: 8/6/07 4:26 PM
Date of last import: 4/7/07 12:00 AM

DATA CENTER 1

Host	Assigned from Arrays	Configured on Arrays	Unconfigured	Local Storage	Non FS Storage	Total FS Size (GB)	Total FS Used (GB)	Total FS Free (GB)	All FS Used %
parccapp1		0	0	0	0	0	0	0	0.00%
pardsm0201		0	0	70	10	60	17	43	28.58%
parpsm00012n01	361	361	0	34	0	395	323	71	81.91%
parpsm00012n02	361	361	0	34	0	395	332	63	84.02%
parpsm08001	250	250	0	34	0	284	219	65	77.00%
parpsmeu001n01	506	506	0	34	0	540	70	470	12.90%
parpsmeu001n02	506	506	0	34	0	540	70	469	13.04%
Sum:	1,984	1,984	0	240	10	2,213	1,031	1,182	

DATA CENTER 10

Host	Assigned from Arrays	Configured on Arrays	Unconfigured	Local Storage	Non FS Storage	Total FS Size (GB)	Total FS Used (GB)	Total FS Free (GB)	All FS Used %
sgpdcs00001n1	320	320	0	342	505	157	32	125	20.20%
sgpdcs00001n2	320	320	0	342	505	157	28	129	17.86%
sgpdsm02954	50	50	0	68	0	118	14	103	12.24%
sgpdsm02955	50	50	0	68	0	118	15	103	12.88%



Executive Summary | Capacity Planning | Reclamation | **Storage Utilization** | Hardware Details | Config Exceptions | SAN Connectivity

Host Summary | Host Storage Details | Host Utilization Trend | File Systems | NAS Utilization | Switch Utilization | Switch Utilization Trend

Host Utilization Monthly

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Host Utilization Monthly Query refreshed: 8/6/07 5:37 PM
Date of last import: 4/7/07 12:00 AM

Host: bkkpsm00012n01	2006-12	2007-01	2007-02	2007-03	2007-04
Presented Volume Size:	425	1,286	1,286	361	361
Host Claimed:	741	741	566	361	361
% of Storage Reserved by FS:	0.00%	57.63%	57.63%	99.99%	99.99%
% FS Used:	0.00%	69.82%	53.94%	59.80%	59.80%
% of Array Storage Used by FS:	0.00%	40.24%	31.08%	59.80%	59.80%

Host: bkkpsm00012n02	2006-12	2007-01	2007-02	2007-03	2007-04
Presented Volume Size:	591	1,286	1,286	361	361
Host Claimed:	741	741	566	361	361
% of Storage Reserved by FS:	0.00%	57.63%	57.63%	99.99%	99.99%
% FS Used:	0.00%	69.82%	53.94%	59.80%	59.80%
% of Array Storage Used by FS:	0.00%	40.24%	31.08%	59.80%	59.80%

Host: bkkpsm02050	2006-12	2007-01	2007-02	2007-03	2007-04
Presented Volume Size:					
Host Claimed:	0	0	0	0	0



Hosts with Unknown Owners or Locations

Unknown Owners or Locations - Hosts

Query refreshed: 8/6/07 3:08 PM
Date of last import: 4/7/07

These are hosts whose owners and/or locations could not be identified from the asset system.

Host	Host Name	Host SN	Host Location Level 1	Host Owner Level 1
bkkpsm02050	bkkpsm02050		DATA CENTER 6	Unknown OWNER_LEVEL_1
bkkpsm02051	bkkpsm02051		DATA CENTER 6	Unknown OWNER_LEVEL_1
bkkpsm05105	bkkpsm05105		DATA CENTER 6	Unknown OWNER_LEVEL_1
engpsr0022	engpsr0022		DATA CENTER 6	Unknown OWNER_LEVEL_1
engsc1n2	engsc1n2		DATA CENTER 6	Unknown OWNER_LEVEL_1
engsc1n3	engsc1n3		DATA CENTER 6	Unknown OWNER_LEVEL_1
engsun32	engsun32		DATA CENTER 6	Unknown OWNER_LEVEL_1
hkgpsm05999	hkgpsm05999		DATA CENTER 24	Unknown OWNER_LEVEL_1
hss201n1	hss201n1		DATA CENTER 6	Unknown OWNER_LEVEL_1
hss203n1	hss203n1		DATA CENTER 6	Unknown OWNER_LEVEL_1
ldncss02146	ldncss02146		DATA CENTER 35	Unknown OWNER_LEVEL_1
ldncss02220	ldncss02220		DATA CENTER 35	Unknown OWNER_LEVEL_1
ldncss02234	ldncss02234		DATA CENTER 37	Unknown OWNER_LEVEL_1
ldndcs02231n01	ldndcs02231n01		DATA CENTER 35	Unknown OWNER_LEVEL_1
ldndcs02231n02	ldndcs02231n02		DATA CENTER 35	Unknown OWNER_LEVEL_1



Configuration Exceptions - Arrays

Query refreshed: 8/6/07 4:40 PM
Date of last import: 4/7/07

Product	Symmetrix
Microcode Gold Standard	5670

Array	Array Location Level 1	Array Owner Level 1	Array Model	Microcode Version	Microcode Patch Level	Microcode Patch Date
ARRAY_ALIAS_10	DATA CENTER 37	CC1330	Symmetrix-8730	5568	62	11/6/03
ARRAY_ALIAS_16	DATA CENTER 35	CC1330	Symmetrix-1000S-M2	5671	60	11/30/06
ARRAY_ALIAS_45	DATA CENTER 36	CC1330	Symmetrix-8730	5568	62	11/6/03
ARRAY_ALIAS_47	DATA CENTER 36	CC1330	Symmetrix-8730	5568	62	11/6/03
ARRAY_ALIAS_54	DATA CENTER 37	CC1330	Symmetrix-8830	5568	62	11/6/03
ARRAY_ALIAS_59	DATA CENTER 35	CC1330	Symmetrix-1000S-M2	5671	60	11/30/06
ARRAY_ALIAS_6	DATA CENTER 37	CC1330	Symmetrix-8830	5568	62	11/6/03
ARRAY_ALIAS_9	DATA CENTER 37	CC1330	Symmetrix-8830	5568	62	11/6/03



Executive Summary | **Capacity Planning** | Reclamation | Storage Utilization | Hardware Details | Config Exceptions | SAN Connectivity

Data Center Analysis | LOB Analysis | Forecast Array Allocation | Forecast LOB Allocation | Forecast Switch Util | Array Capacity and Allocation | **Capacity Analysis**

Capacity Analysis

Document | View | Insert | Save | Find | Undo | Redo | Zoom 100% | 1

Capacity Analysis

Query refreshed: 8/13/07 12:33 PM
Date of last import: 4/7/07 12:00 AM

Array Location Level 3	Host Owner Level 3	Assigned from Arrays to
AUSTRALIA	INFORMATION TECHNOLOGY	1,202
BRAZIL	INFORMATION TECHNOLOGY	4,488
BRAZIL	Unknown OWNER_LEVEL_3	9,580
CHINA	BROKERAGE	10,684.93
CHINA	INFORMATION TECHNOLOGY	13,027.16
CHINA	Unknown OWNER_LEVEL_3	1,224
FRANCE	INFORMATION TECHNOLOGY	1,984
FRANCE	Unknown OWNER_LEVEL_3	380
GERMANY	INFORMATION TECHNOLOGY	1,984
GERMANY	Unknown OWNER_LEVEL_3	300
INDIA	INFORMATION TECHNOLOGY	850
JAPAN	BROKERAGE	36,801.88
JAPAN	INFORMATION TECHNOLOGY	27,547.45
JAPAN	RESEARCH	310
JAPAN	SHARED CORPORATE SERVICES	15,768
JAPAN	Unknown OWNER_LEVEL_3	10,562.73
SINGAPORE	BROKERAGE	17,917



Executive Summary | **Capacity Planning** | Reclamation | Storage Utilization | Hardware Details | Config Exceptions | SAN Connectivity

Data Center Analysis | LOB Analysis | Forecast Array Allocation | Forecast LOB Allocation | Forecast Switch Util | Array Capacity and Allocation | **Capacity Analysis**

Capacity Analysis

Document | View | Insert | Save | Find | Undo | Redo | Zoom 100% | 1

Available Objects

- Remove
- Add
- Edit

Available Objects

- Array
- Array Location Level 1
- Array Location Level 2
- Array Location Level 3
- Array Location Level 4
- Array Location Level 5
- Current Trend
- Host
- Host Cluster
- Host Owner Level 1
- Host Owner Level 2
- Host Owner Level 3
- Assigned from Arrays to Host (GE)
- Assigned from Arrays to Host - P
- Variables

Array Location Level	Host Owner Level 3	Assigned from Arrays to Host
AUSTRALIA	INFORMATION TECHNOLOGY	1,202
BRAZIL	INFORMATION TECHNOLOGY	4,488
BRAZIL	Unknown OWNER_LEVEL_3	9,580
CHINA	BROKERAGE	10,684.93
CHINA	INFORMATION TECHNOLOGY	13,027.16
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Capacity Analysis

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Available Objects

- Array
- Array Location Level 1
- Array Location Level 2
- Array Location Level 3
- Array Location Level 4
- Array Location Level 5
- Current Trend
- Host
- Host Cluster
- Host Owner Level 1
- Host Owner Level 2
- Host Owner Level 3
- Assigned from Arrays to Host (G)
- Assigned from Arrays to Host - P
- Variables

Array Location Le		Assigned from Arrays to
AUSTRALIA	INFORMATION TECHNOLOGY	1,202
BRAZIL	INFORMATION TECHNOLOGY	4,488
BRAZIL	Unknown OWNER_LEVEL_3	9,580
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Capacity Analysis

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Available Objects

- Remove Add Edit
- Available Objects
 - Array
 - Array Location Level 1
 - Array Location Level 2
 - Array Location Level 3
 - Array Location Level 4
 - Array Location Level 5
 - Current Trend
 - Host
 - Host Cluster
 - Host Owner Level 1
 - Host Owner Level 2
 - Host Owner Level 3
 - Assigned from Arrays to Host (G
 - Assigned from Arrays to Host - P
- Variables

Array Location Level 3	Host	Assigned from Arrays to Host (G
AUSTRALIA	sydpsm00012n01	381
AUSTRALIA	sydpsm00012n02	381
AUSTRALIA	sydpsm08000	300
AUSTRALIA	sydpsmel001	140
BRAZIL	spbpsm00012n01	4,488
BRAZIL	unknown	9,580
CHINA	hkbpsm00012	611
CHINA	hkbpsmeu001	506
CHINA	hkbpsmeu350	150
CHINA	hkgdsm02990n01	200.49
CHINA	hkgdsm02990n02	200.49
CHINA	hkgdsm02998	50
CHINA	hkgdsm02999	50
CHINA	hkgdsm05501	1,041
CHINA	hkgdss0003	128
CHINA	hkgdss0004	970
CHINA	hkaocs0001n1	128



Capacity Analysis

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- Available Objects
- Remove Add Edit
 - Available Objects
 - Array
 - Array Location Level 1
 - Array Location Level 2
 - Array Location Level 3
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Capacity Analysis

Array Location	Level 3	Assigned from Arrays to Host
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BRAZIL	INFORMATION TECHNOLOGY	4,488
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Capacity Analysis

Document | View | Insert | Save | Find | Undo | Redo | Zoom 100% | 1 / 1

Available Objects

- Remove
- Add
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Available Objects

- Array
- Array Location Level 1
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- Array Location Level 5
- Current Trend
- Host
- Host Cluster
- Host Owner Level 1
- Host Owner Level 2
- Host Owner Level 3
- Assigned from Arrays to Host (G)
- Assigned from Arrays to Host - P
- Variables

Host Owner Level 3	Assigned from Arrays t
BROKERAGE	867,741.95
INFORMATION TECHNOLOGY	1,044,896.64
INVESTMENT BANKING	222,055.25
RESEARCH	84
SHARED CORPORATE SERVICES	93
Unknown OWNER_LEVEL_3	76

- Set as section
- Insert ▶
- Format ▶
- Quick Filter...
- Turn table to...**
- Swap axis
- Break ▶
- Sort ▶
- Calculation ▶
- Remove ▶



Capacity Analysis

Document View Insert Save Find Undo Redo Zoom 100% 1 / 1

- Available Objects
- Remove Add Edit
- Available Objects
 - Array
 - Array Location Level 1
 - Array Location Level 2
 - Array Location Level 3
 - Array Location Level 4
 - Array Location Level 5
 - Current Trend
 - Host
 - Host Cluster
 - Host Owner Level 1
 - Host Owner Level 2
 - Host Owner Level 3
 - Assigned from Arrays to Host (G)
 - Assigned from Arrays to Host - P
- Variables

Host Owner Level 3	Ass
BROKERAGE	
INFORMATION TECHNOLOGY	
INVESTMENT BANKING	
RESEARCH	
SHARED CORPORATE SERVICES	
Unknown OWNER_LEVEL_3	

Capacity Analysis

Turn To

Chart and Table Types

- Tables
- Bar Charts**
- Line Charts
- Area Charts
- Pie Charts
- Radar Charts

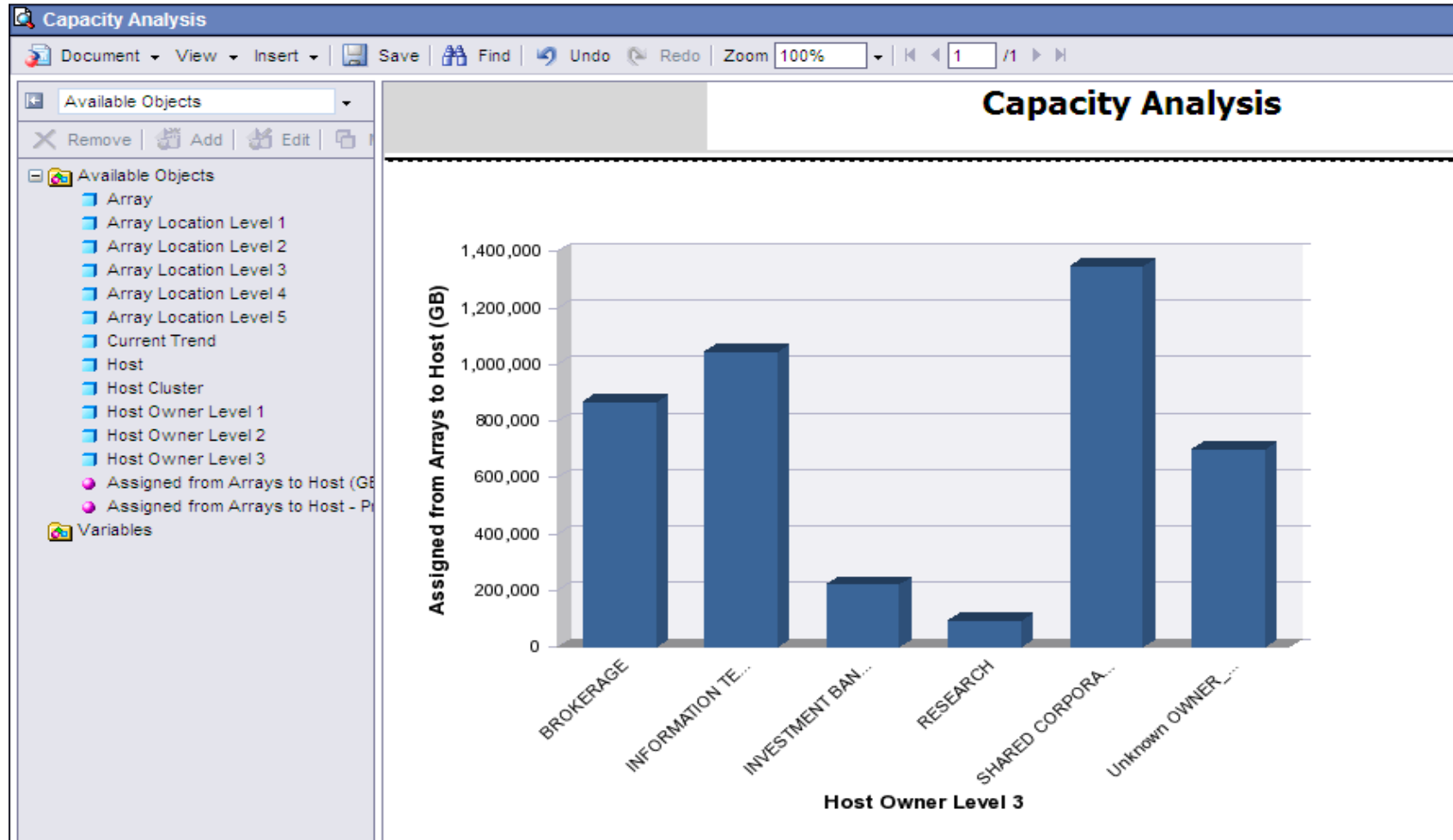
Available Formats

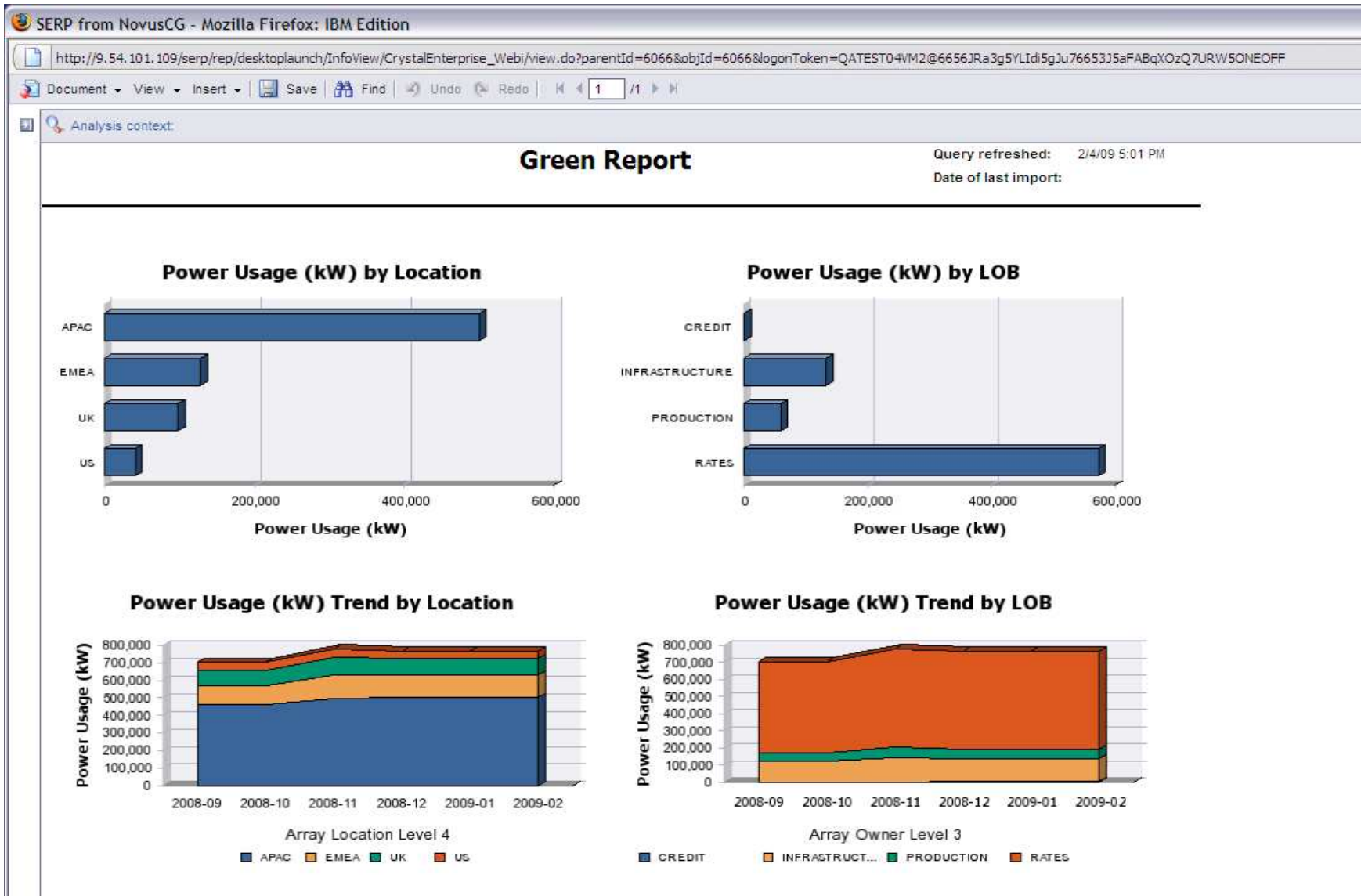
- Vertical Grouped
- Horizontal Grouped
- Vertical Stacked
- Horizontal Stacked
- Vertical Percent
- Horizontal Percent
- 3D Bar
- Vertical Bar & Line
- Horizontal Bar & Line

More Information Vertical Grouped

Vertical grouped bar charts are useful if you want to compare similar groups of data with measures displayed from bottom to top.

OK Cancel Apply







Storage Resource Analysis (SRA)



SRA – Enterprise Storage Resource Analysis

- **Analiza** zasobów pamięci masowych
- **Działa w układzie** SaaS (*Software as a Service*)
- **Intuicyjny** interfejs do raportowania w oparciu o portal webowy – nie wymaga czasochłonnych szkoleń
- **Przekrojowa** analiza pamięci masowych
- **Natychmiastowe** raportowanie *on – line*
- **Szybkie** ROI

W skrócie – korzyści operacyjne i biznesowe



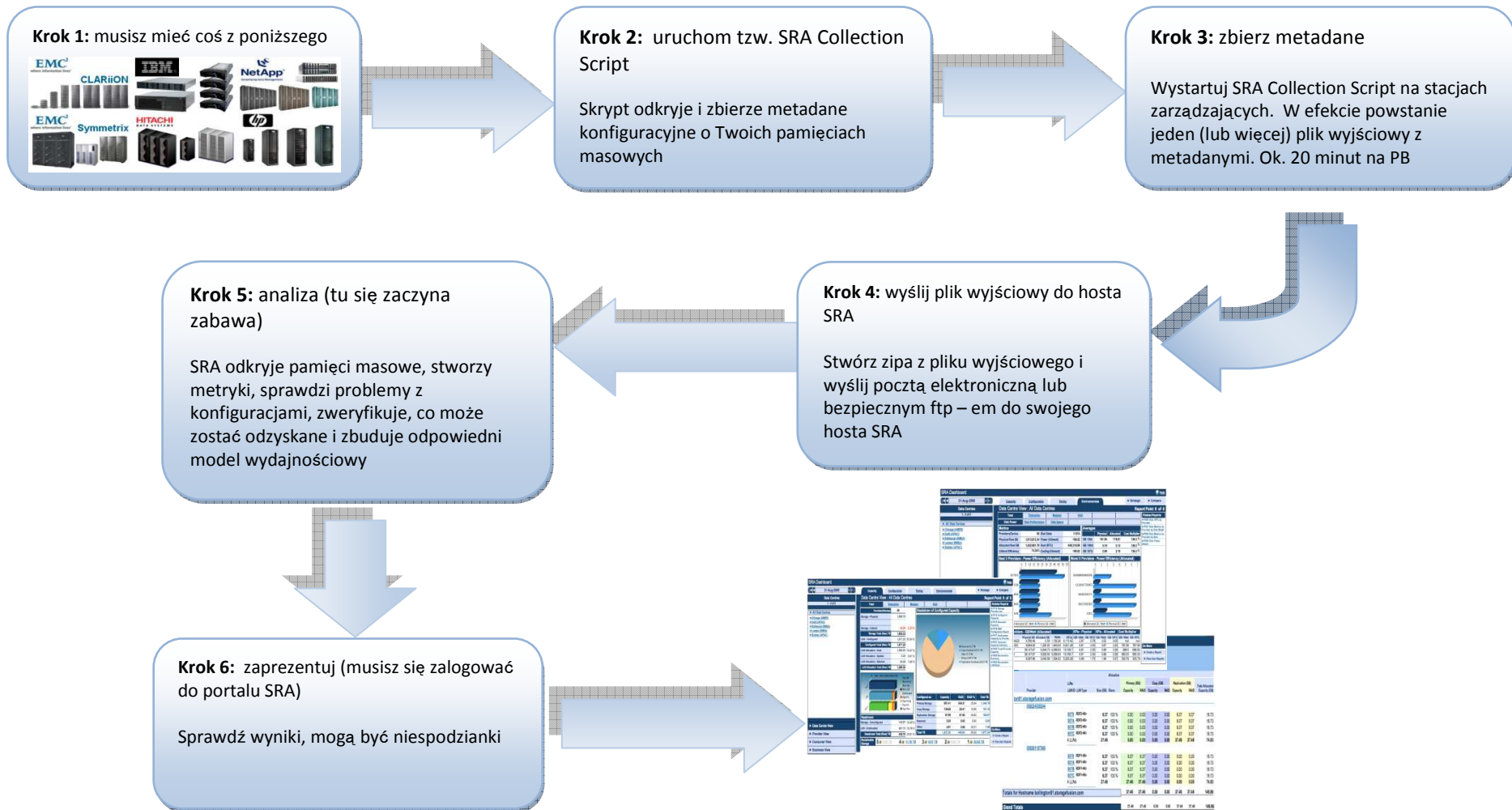
Zestawienie najważniejszych cech

- Identyfikuje miejsca, skąd można odzyskać zasoby (przestrzeń)
- Kategoryzuje je zależnie od tego jak łatwo tą przestrzeń odzyskać
- Szczegółowa analiza ostrzeżeń i błędów
- Oblicza zużycie mocy elektrycznej
- Zapewnia zarówno standardowe funkcje raportowania jak i *ad hoc*
 - PDF
 - Word
 - Excel
 - Itp.

Narzędzie analityczne, ale nie wymaga zakupu czy implementacji software'u – wszystko dostarczane online w modelu SaaS



Zbierz, przeanalizuj i zaprezentuj





SRA Dashboard Help

31-Aug-2009

Capacity Configuration Tiering Environmentals Strategic Compare

Data Centre View : All Data Centres

Report Point 6 of 6

Data Centres
1 - 5 of 5

- All Data Centres
- Chicago (AMER)
- Delhi (APAC)
- Edinburgh (EMEA)
- London (EMEA)
- Sydney (APAC)

Data Centre View

- Provider View
- Consumer View
- Business View

Total	Enterprise	Modular	NAS
Providers/Devices	56		
Storage - Physical	1,868.76		
Storage - Internal	42.54	2.33 %	
Storage Total (Raw) TB	1,826.22		
LUN - Configured	1,677.25	91.84 %	
Configured Total (Raw) TB	1,677.25		
LUN Allocation - Host	1,360.04	74.47 %	
LUN Allocation - System	0.20	0.01 %	
LUN Allocation - External	29.28	1.60 %	
LUN Allocation Total (Raw) TB	1,389.52		

Headroom	Capacity	RAID	RAID %	TB
Storage - Unconfigured	148.97	10.49 %		
LUN - Unallocated	287.73	15.76 %		
Headroom Total (Raw) TB	436.70	23.91 %		

Reclaimable Storage

5★ 0.00 TB

4★ 11.76 TB

3★ 0.07 TB

2★ 0.00 TB

1★ 53.93 TB

Breakdown of Configured Capacity

Configured as:	Capacity	RAID	RAID %	TB
Primary Storage	997.41	349.37	25.94	1,346.78
Copy Storage	136.69	20.41	12.99	157.10
Replication Storage	97.99	67.58	40.82	165.57
Reserved	0.20	0.00	0.00	0.20
Other	4.91	2.68	35.31	7.59
Total TB	1,237.20	440.04	26.24	1,677.24

Related Reports

- P110 Storage Provider List
- P210 Configured Capacity
- P215 Allocated Capacity
- P216 RAID Configuration Report
- P217 Unallocated Capacity by Provider
- P221 Consumer Capacity Summary
- P520 Tiered Provider Capacity
- P600 Reclamation Summary
- P605 Reclamation LUN Detail

Do More

- Create a Report
- View User Reports

1. Lewy ekran pokazuje widok wszystkich *datacenters*, w rozbiciu na regiony. Nazwy regionów przydziela klient w pierwszym ładowaniu.
2. Dane na lewym ekranie można oglądać w rozbiciu na *datacenter*, macierze lub serwery.
3. Tu mamy informację o pojemności, w relacji do tego, co wskazaliśmy na lewym ekranie. Pozostałe zakładki opisują konfigurację i hierarchię.
4. „Capacity” zawiera streszczenie ile przestrzeni surowej mamy, ile zaalokowanej, zarezerwowanej i dostarczonej przez zewnętrzne urządzenia.
5. Te słupki pokazują, że można odzyskać zasoby.
6. A tu mamy informację o rodzaju alokacji i typie RAID, w tym widok na to ile idzie na kopie lokalne, a ile na zdalne.
7. A tu raporty w formie tabelarycznej zależnie od wyboru na głównym ekranie.



SRA Dashboard 31-Aug-2009 5

Capacity Configuration Tiering Environmentals Strategic Compare

Data Centres 1 - 5 of 5

- All Data Centres
- Chicago (AMER)
- Delhi (APAC)
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Data Centre View : All Data Centres Report Point 6 of 6

Total Enterprise Modular NAS

A total of 1868.76 TB of storage is provided by 56 providers or devices from 15 product lines.

Product Breakdown of Arrays and Devices

Disks Installed

Disk Vendor	Model	Size (GB)	Qty	Total Actual Size (GB)
Seagate	ST3146807FC	136.73	3036	415,112.28
Seagate	STM3320620AS	298.02	740	220,534.80
IBM	IC35L146-XC-DY-10	136.73	1373	187,730.29
Seagate	ST3146854FC	136.73	1110	151,770.30
Seagate	ST3300007FC	279.40	433	120,980.20
All Others			5,186	808,661.32

LUNs/Qtrees Configured by Category

Total Physical Disk Capacity 1,868.76 TB

Exceptions Found

Category	Count
Errors	9
Warnings	22
Information	10

Top 3 Exceptions

Code	Culprits
5006	372
1502	247
2006	103

Related Reports

- P110 Storage Provider List
- P130 Configured LUNs Provided
- P135 Virtualised LUNs Details
- P141 Allocated LUNs Consumed
- P150 Disks by Provider
- P216 RAID Configuration Report
- P400 Exception Summary
- P410 Exceptions by Provider
- P420 Exceptions by Code
- P450 UnAllocated LUNs

Do More

- Create a Report
- View User Reports

1. Zakładka „Capacity” pokazuje graficzne rozbięcie tego, co udostępniają macierze, w oparciu o wybór z lewego ekranu.
2. Tu mamy „Top 5” – podsumowanie dla twardych dysków w macierzach, posortowane na pojemność i z wyszczególnieniem producenta.
3. Błędy w konfiguracji logicznej są wylistowane w tabeli “Exceptions” na dole ekranu. Można to rozwinąć celem uszczegółowienia.
4. Raporty są aktualizowane stosownie do informacji na ekranie – np. raport P150, który listuje wszystkie urządzenia dyskowe.
5. Raporty odnoszą się do konkretnej daty zebrania danych. Jeśli występował wielokrotny upload, można je sobie wybierać z listy.



SRA Dashboard Help

31-Aug-2009

Capacity Configuration **Tiering** Environmentals Strategic Compare

Data Centres
1 - 5 of 5

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Data Centre View

Provider View

Consumer View

Business View

Data Centre View : All Data Centres Report Point 6 of 6

Total	Enterprise	Modular	NAS		
Performance Tiers					
1	Enterprise Class Array	15K FC Disks	138.82 TB		
2	Enterprise Class Array	10K FC Disks	525.89 TB		
3	Enterprise Class Array	SATA/SAS Disks	0.00 TB		
4	Enterprise Class Array	SCSI Disk	107.39 TB		
5	Modular Array	15K FC Disks	66.66 TB		
6	Modular Array	10K FC Disks	533.06 TB		
7	Modular Array	SATA/SAS Disks	217.07 TB		
8	Modular Array	SCSI Disks	0.00 TB		
9	Network Attached Storage	15K FC Disks	29.48 TB		
10	Network Attached Storage	10K FC Disks	26.78 TB		
11	Network Attached Storage	SATA/SAS Disks	32.11 TB		
12	Network Attached Storage	PATA Disks	0.00 TB		
990	Enterprise Class Array	Unknown Disks	0.00 TB		
991	Modular Array	Unknown Disks	0.00 TB		
992	Network Attached Storage	Unknown Disks	0.00 TB		
999	Unknown Provider	Unknown Disks	0.00 TB		

Capacity by Tier

Breakdown of Allocation by Tier

Related Reports

- P510 Tiered Capacity Summary
- P520 Tiered Provider Capacity

Do More

- Create a Report
- View User Reports

1. „Tiering” jest rozdzielony na standardowy, „wydajnościowy” model hierarchii i model dla danego klienta (“*custom*”).
2. Standardowy *tiering* wykorzystuje model ogólny, który klasyfikuje poziomy na podstawie rodzaju macierzy i szybkości / interfejsu HDD.
3. Poziomy są rozbite na rodzaj LUN - u, wykorzystanie do replikacji, kopie lokalne i narzut systemowy.



SRA Dashboard Help

31-Aug-2009 Capacity Configuration Tiering Environmentals Strategic Compare

Data Centres
1 - 5 of 5

▶ All Data Centres

- ▶ Chicago (AMER)
- ▶ Delhi (APAC)
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- ▶ London (EMEA)
- ▶ Sydney (APAC)

▶ Data Centre View

▶ Provider View

Data Centre View : All Data Centres Report Point 6 of 6

Total	Enterprise	Modular	NAS	
Disk Power	Disk Performance	Disk Space		

Metrics		Averages		
Providers/Device	56 Disk Slots			
Physical Raw GB	1,913,613.24	Power (Kilowatt)	189.93	
Allocated Raw GB	1,422,661.78	Heat (BTU)	648,316.99	
Utilised Efficiency	74.34%	Cooling (Kilowatt)	189.93	
		GB / Slot	161.94	118.81
		GB / Watt	0.18	0.13
		GB / BTU	2.99	2.19
				136.3 %

Best 5 Providers - Power Efficiency (Allocated)

Worst 5 Providers - Power Efficiency (Allocated)

Worst 5 Providers - GB/Watt (Allocated)					KPIs - Physical		KPIs - Allocated		Cost Multiplier	
Provider	Physical GB	Allocated GB	Watts	BTUs	GB / Watt	GB / BTU	GB / Watt	GB / BTU	GB / Watt	GB / BTU
600A0B80004A520	4,785.48	0.00	1,792.26	6,115.42	2.67	0.78	0.00	0.00	null	null
CK200017700053	9,844.56	1,250.00	1,445.04	4,931.28	6.81	2.00	0.87	0.25	787.56	787.56
000283295771	38,147.67	5,544.73	5,599.53	19,108.7	6.81	2.00	0.99	0.29	688.0	688.00
000270305993	38,147.67	5,526.00	5,599.53	19,108.7	6.81	2.00	0.99	0.29	690.33	690.33
23522	9,297.88	3,040.58	1,554.52	5,305.28	5.98	1.75	1.96	0.57	305.79	305.79

Related Reports

- ▶ P800 Disk KPI's by Provider
- ▶ P801 Disk Metrics by Provider by Disk Model
- ▶ P802 Disk Metrics by Provider by Disk
- ▶ P805 Disk Power Details

Do More

- ▶ Create a Report
- ▶ View User Reports

1. Środowiskowe są podzielona na metryki "Disk Power", "Disk Performance" i "Disk Space".
2. "Metrics" wskazuje na sumę pojemności dysków w wybranym obszarze.
3. "Averages" pokazuje jak efektywnie wykorzystywana jest pamięć masowa w porównaniu do ilości slotów, oraz wymogów na zasilanie i chłodzenie.
4. Te wykresy pokazują najlepsze i najgorsze macierze w kontekście zużywanej mocy na GB.



SRA – efekty

- Eliminacja żmudnych procesów raportowania
- Eliminacja błędów i nieścisłości
- Brak narzutu operacyjnego



- Rezultaty tego samego dnia
- Przezroczystość
- Nie stopujemy biznesu
- Wykrywa kandydatów do kuracji
- Uzupełnia istniejące narzędzia i procesy



Dziękuję

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