

# CA Vantage SRM

## Mainframe storage administration for the modern users

Marek Stych  
CA Technologies

November 2018  
Session DM



# Agenda

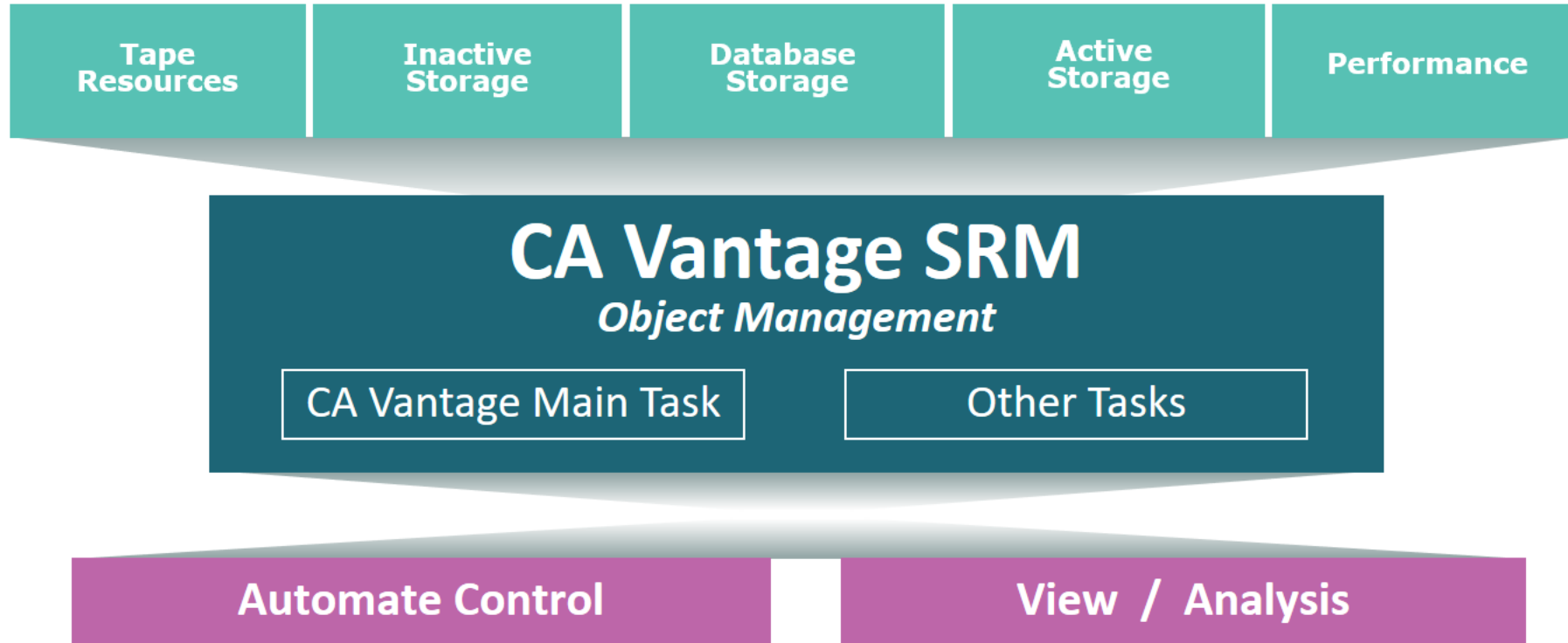
**CA VANTAGE SRM INTRODUCTION**

**ENHANCED SUPPORT FOR IBM SYSTEM STORAGE DS8870, DS8880**

**OPEN REST API FOR VANTAGE SRM**

**WEB CLIENT ENHANCEMENTS**

# CA Vantage Storage Resource Manager



# Object Management

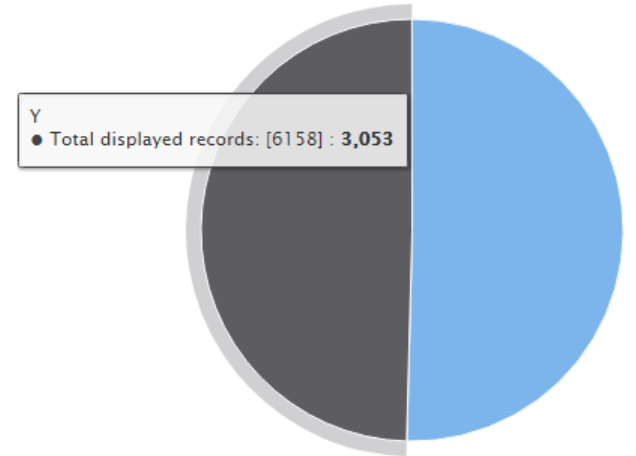
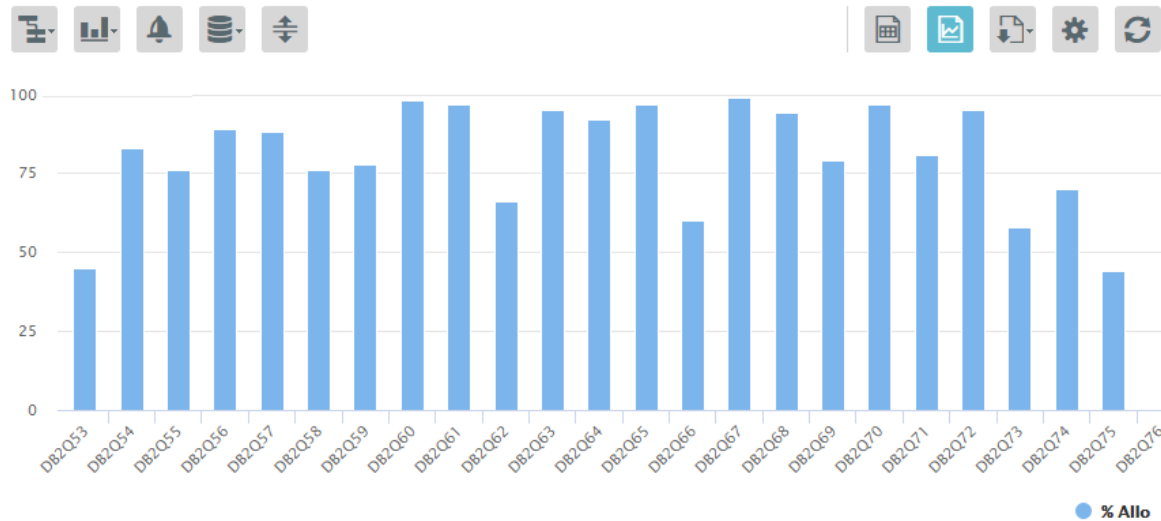
## Object Tree

- Search
- + Data Set Groups (Applications)
- + Data Set Management
- + Database Management
- + DFSMS Constructs
- + Distributed Sys Views From z/OS
- + Encryption Key Management
- + Hardware Errors - Disk/Tape
- + Performance Management (DASD)
- + RAID Devices
- + Storage Groups
- + Tape Resource Management
- + UNIX for z-Series
- Volumes (DASD)
  - Online
    - + **Space and Other Attributes** ...
    - + Space and RAID Information ...
    - + DFSMS Complex ...
    - + VTOC Fmt 4 DSCB Information ...
    - + Excluded / Included Volumes ...
  - + Offline
    - + All DASD UCBs ...
  - + z/OS System Resources

## Space and Other Attributes

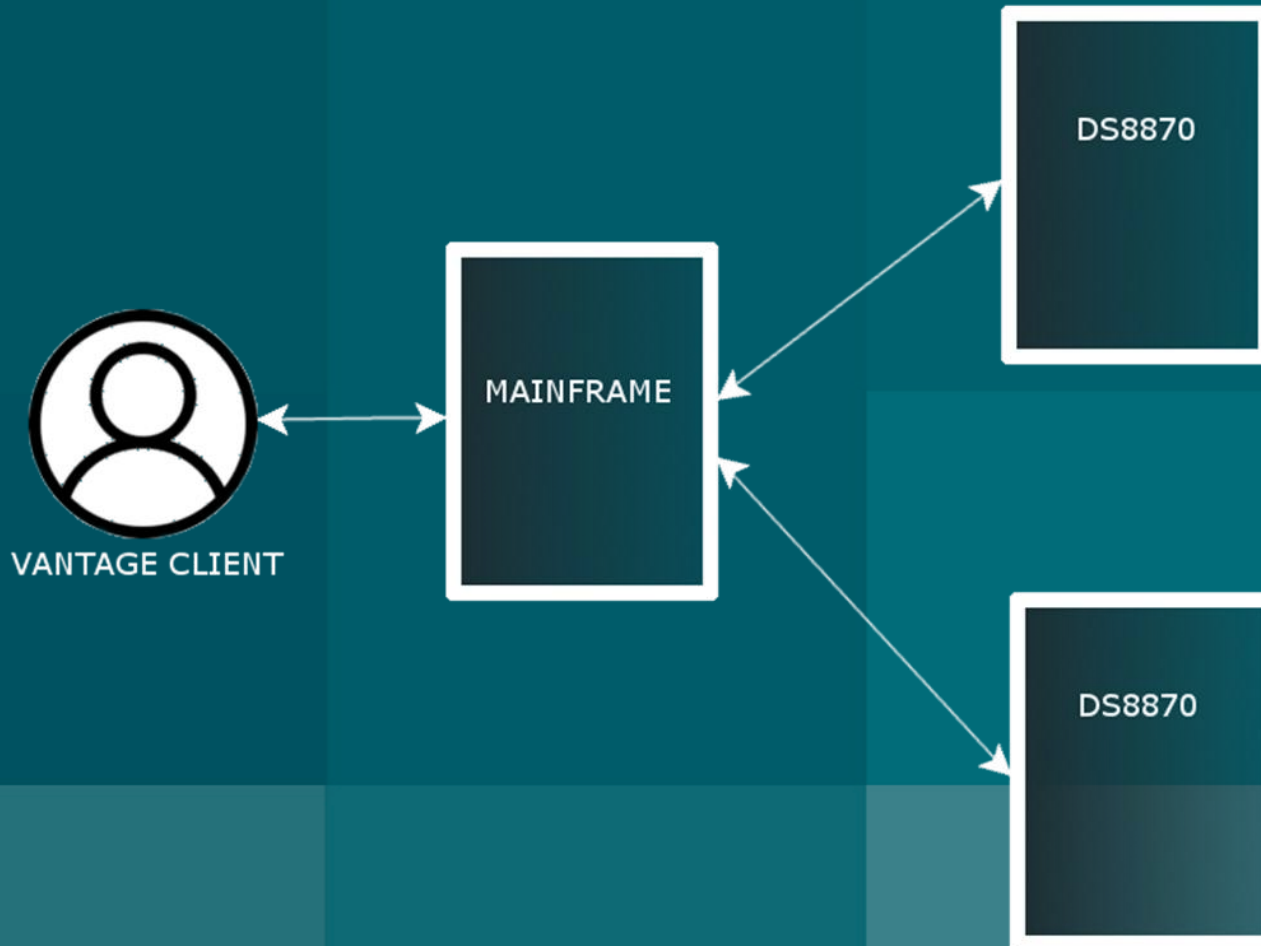
	Volume	CUA1	Onl	DevType	Model	% Allo	EAV	TotCyls	Vendor	Capacity Bytes	Allocated Bytes	Free Bytes	SMS
4	ACFQAD	26BC	Y	3390	9	93	N	10,017	EMC	8,514,049,320	7,980,387,768	533,661,552	N
5	ACFQAE	25CA	Y	3390	9	96	N	10,017	EMC	8,514,049,320	8,221,549,752	292,499,568	N
6	ACFQAF	25CB	Y	3390	9	77	N	10,017	EMC	8,514,049,320	6,639,547,536	1,874,501,784	N
7	ACFQAG	25CC	Y	3390	9	91	N	10,017	EMC	8,514,049,320	7,755,375,024	758,674,296	N

## Space and Other Attributes



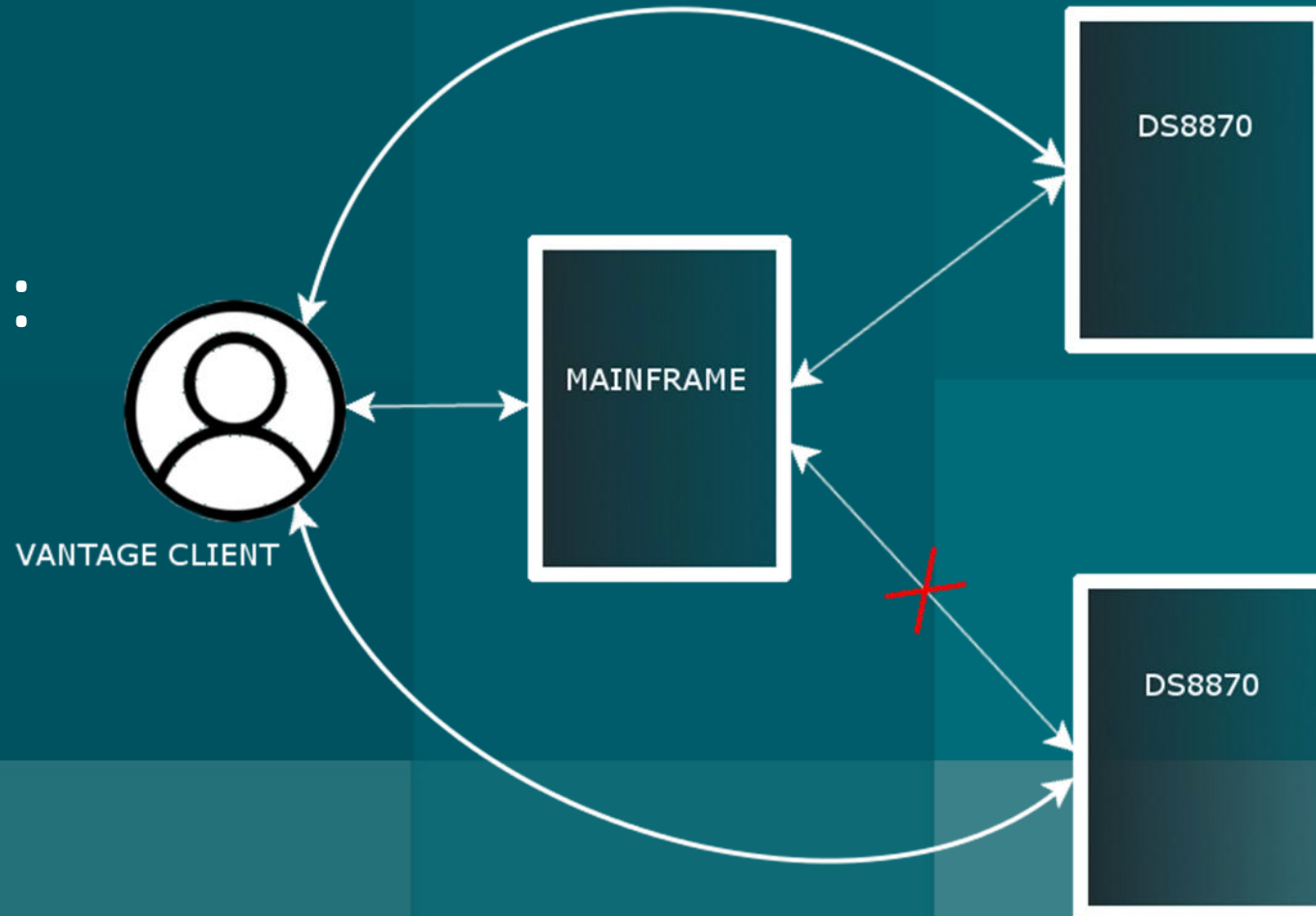
# ENHANCED support for IBM System Storage DS8870, DS8880

Motivation:



# ENHANCED support for IBM System Storage DS8870, DS8880

Motivation:



# NEW DATA OBJECTS IN VANTAGE

## DS88XX Boxes

- Box Serial Number
- Box Model Number
- Microcode Release
- IP Address and Port
- Box Capacity
- Box Allocated Capacity
- Box Free Capacity
- Box Raw Capacity

## DS88XX Volumes

- Volume Name
- Channel Unit Address
- Parent Box
- Pool ID
- Capacity [Cylinders]
- Storage Type CKD / FB
- Tier [High Capacity / Nearline / Enterprise]
- Easy Tier Managed [managed / non-managed]
- Thin Provisioning [None, Ese, Tse]

# NEW DATA OBJECTS IN VANTAGE

☰ DS88XX Boxes

	Serial	Model	Box Name	Release	State	Capacity	Allocated	Free	Raw	Type	IP	Port
1	75CWC11	2424-961	-None	7.5.1	ON	6,347,773	5,451,903	895,869	9,600,000	DS8	usefst08	8452
2	75CPK61	2424-961	-None	7.5.1	ON	6,347,773	5,469,947	877,826	9,600,000	DS8	usefst09	8452
3	75HBA41	2834-985	Elmsford - 75HBA41	8.2.4	ON	197,327,172	180,774,426	16,470,384	240,000,000	DS8	10.160.101.36	8452



☰ DS88XX Boxes

	Serial	Model	Box Name	Release
3	75HBA41	2834-985	Elmsford - 75HBA41	8.2.4

☰ Zoom  
 ☰ Statistics  
 ☰ Related Objects  
 ☰ Automation Scripts

☰ (Statistics) DS88XX Boxes

	Field Header	Total	Average	Minimum	Maximum
1	Box Net Capacity	210,022,718	70,007,572	6,347,773	197,327,172
2	Box Allocated Capacity	191,696,276	63,898,758	5,451,903	180,774,426
3	Box Available capacity	18,244,079	6,081,359	877,826	16,470,384
4	Box Raw Capacity	259,200,000	86,400,000	9,600,000	240,000,000





# NEW DATA OBJECTS IN VANTAGE

## DS88XX Pools

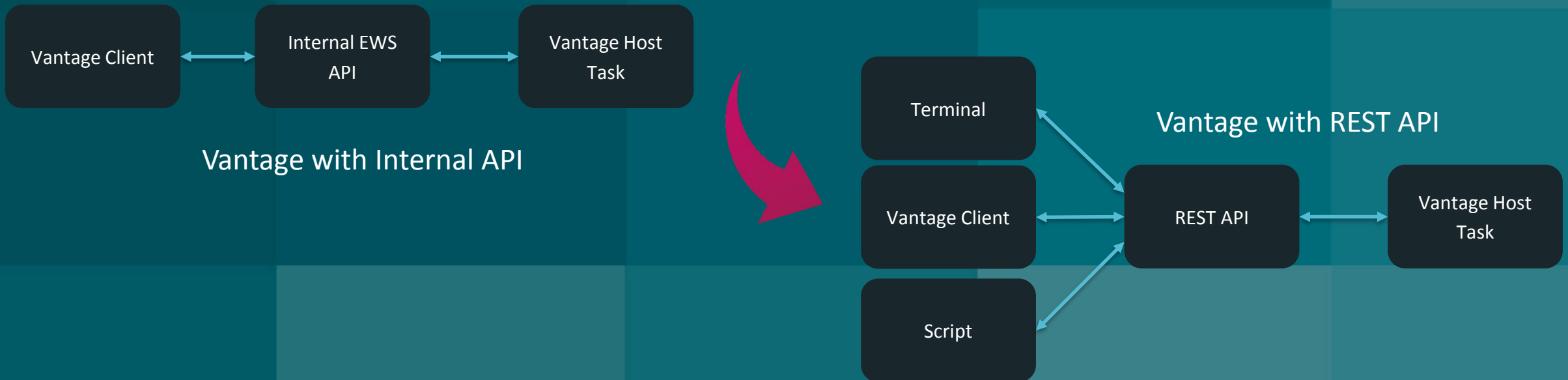
- Pool ID
- Pool Name
- Parent Box ID
- Type (CKD / FB)
- Capacity
- Allocated Capacity
- Free Capacity
- Overprovisioning ratio
- Tier type [Enterprise / Nearline / SSD]

## DS88XX LSS

- Logical Subsystem ID
- Parent Box ID
- Volume Count
- PPRC Consistency Group
- Type [CKD / FB]

# VANTAGE REST API - Introduction

- Modernization
- Faster development of Graphical User Interfaces
- Using Vantage without Graphical User Interface



# HOST CONFIGURATION CLIENT APPLICATION

The screenshot shows the Web Configuration Client interface. On the left, there are navigation menus for 'Hosts' and 'Parameters'. The 'Hosts' menu is expanded to show 'Production' and 'Development' environments. The 'Parameters' menu is expanded to show 'Typical Parameters' and 'Optional Parameters'. The main area displays a table with columns for 'Primary system', 'Backup system', 'Dev - Primary system', 'Dev - Backup system', and 'Test - Primary system'. The table contains several rows of parameters, with 'RAIDSUPP' highlighted in blue. Below the table, there is a summary row for 'RAIDSUPP' and a confirmation dialog box at the bottom right.

	Primary system	Backup system	Dev - Primary system	Dev - Backup system	Test - Primary system
<b>CIMSUPP</b>	N	N	N	N	N
<b>HWOBJINC</b>	Y	Y	Y	Y	Y
<b>RAIDSUPP</b>	N	N	N	N	N
<b>EMCINTVL</b>	0360	0360	0360	0360	0360
<b>PPRCNTVL</b>	9998	9998	9998	9998	9998
<b>CIMINTVL</b>	0000	0000	0000	0000	0000
<b>PAVINTVL</b>	0016	0016	0016	0016	0016

Summary row for RAIDSUPP:

CIMSUPP	RAIDSUPP	PPRCNTVL
N	N	9998


Confirmation dialog for RAIDSUPP:


**RAIDSUPP**  
Activate RAID Object Support

RESTORE DEFAULTS CANCEL APPLY

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# VANTAGE WEB UI INTRODUCTION


Mainframe Team Center • Management


styma01

Host Tree

- Public (3)
  - VANDEV14
  - VANMST01 CA11
  - VANQCVC6

Object Tree

- + Alert Management
- + Backup and Archive Management
- + CA SVSVIEW
- + CA Vantage Internal Management
- + Catalog Management
- + Data Set Groups (Applications)
- + Data Set Management
- + Database Management
- + DFSMS Constructs
- + Distributed Sys Views From z/OS
- + Encryption Key Management
- + Hardware Errors - Disk/Tape
- + Performance Management (DASD)
- + RAID Devices
- + Storage Groups
- + Tape Resource Management
- + UNIX for z-Series
- Online
  - Space and Other Attributes
  - Space and RAID Information
  - DFSMS Complex

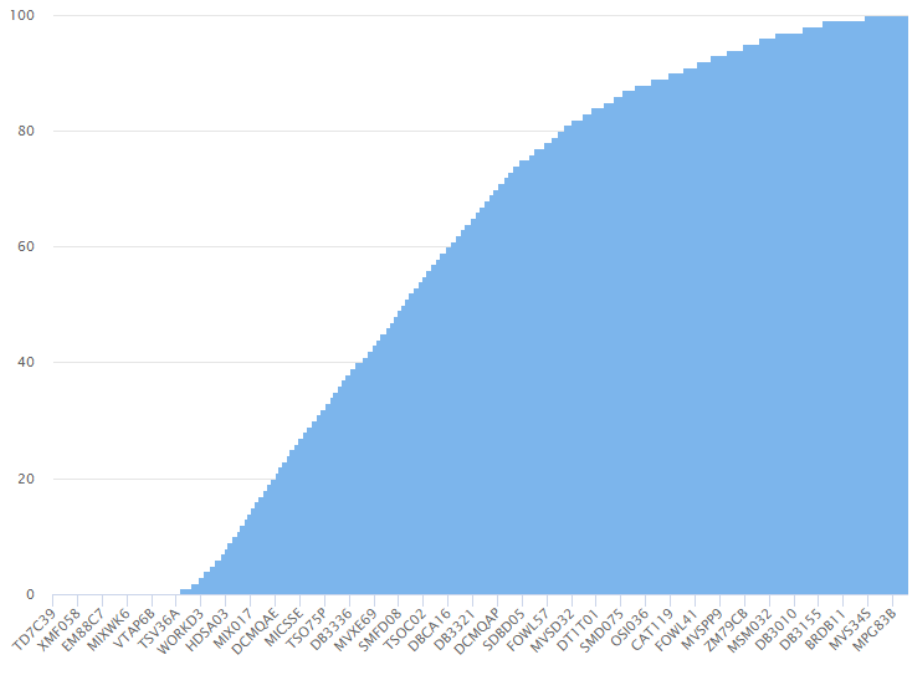
Online Volumes Dashboard

Dashboard description

Space and Other Attributes

Volume	CUA1	DevType	Model	% Allo	FrIndx	Exts	EAV	TotCyls	AlloCyls	FrCyls	FrTrks
2727	UTL009	2DA3	3390	3	76	226	38 N	3,339	2,538	801	12
2728	DB3050	211D	3390	9	76	109	107 N	10,017	7,657	2,360	35
2729	DB3279	22AE	3390	9	76	182	64 N	10,017	7,689	2,328	34
2730	DB3317	22D8	3390	9	76	235	64 N	10,017	7,680	2,337	35
2731	MCAT90	8808	3390	3	76	28	15 N	3,339	2,571	768	11
2732	TSO57B	86A7	3390	3	76	80	2 N	3,339	2,542	797	11
2733	TSO25	2A39	3390	9	76	196	25 N	10,017	7,634	2,383	35
2734	TSO86H	8991	3390	3	76	285	141 N	3,339	2,543	796	11
2735	DB3069	21C7	3390	9	76	219	72 N	10,017	7,665	2,352	35
2736	TSO90X	88A2	3390	3	75	179	29 N	3,339	2,526	813	12
2737	R1BR03	23BC	3390	9	75	0	1 N	10,017	7,559	2,458	35
2738	TSO86C	85D9	3390	3	75	365	91 N	3,339	2,534	805	12
2739	MR1CTB	2567	3390	9	75	0	2 N	10,017	7,559	2,458	35
2740	TSO99F	2E99	3390	3	75	416	191 N	3,339	2,526	813	12
2741	IDI004	8D3C	3390	27	75	184	283 N	32,760	24,873	7,887	115
2742	SRVPC1	8905	3390	54	75	121	7 N	65,520	49,506	16,014	240
2743	DB3158	208B	3390	3	75	112	89 N	3,339	2,517	822	12
2744	APCD23	2861	3390	9	75	216	84 N	10,017	7,527	2,490	37
2745	CCSQ...	25DD	3390	9	75	367	143 N	10,017	7,578	2,439	35
2746	DB2P1A	AC12	3390	A	75	103	532 Y	262,668	198,535	64,133	961
2747	CSCR22	2314	3390	9	75	31	6 N	10,017	7,518	2,499	37

Space and Other Attributes



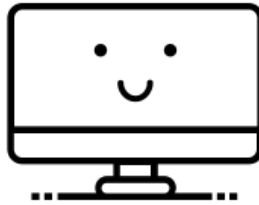
LSPACEPO (VANDEV14)
Type: DATA | Mode: LI | Displaying 2727 - 2747 of 6159

# VANTAGE WEB UI ENHANCEMENT



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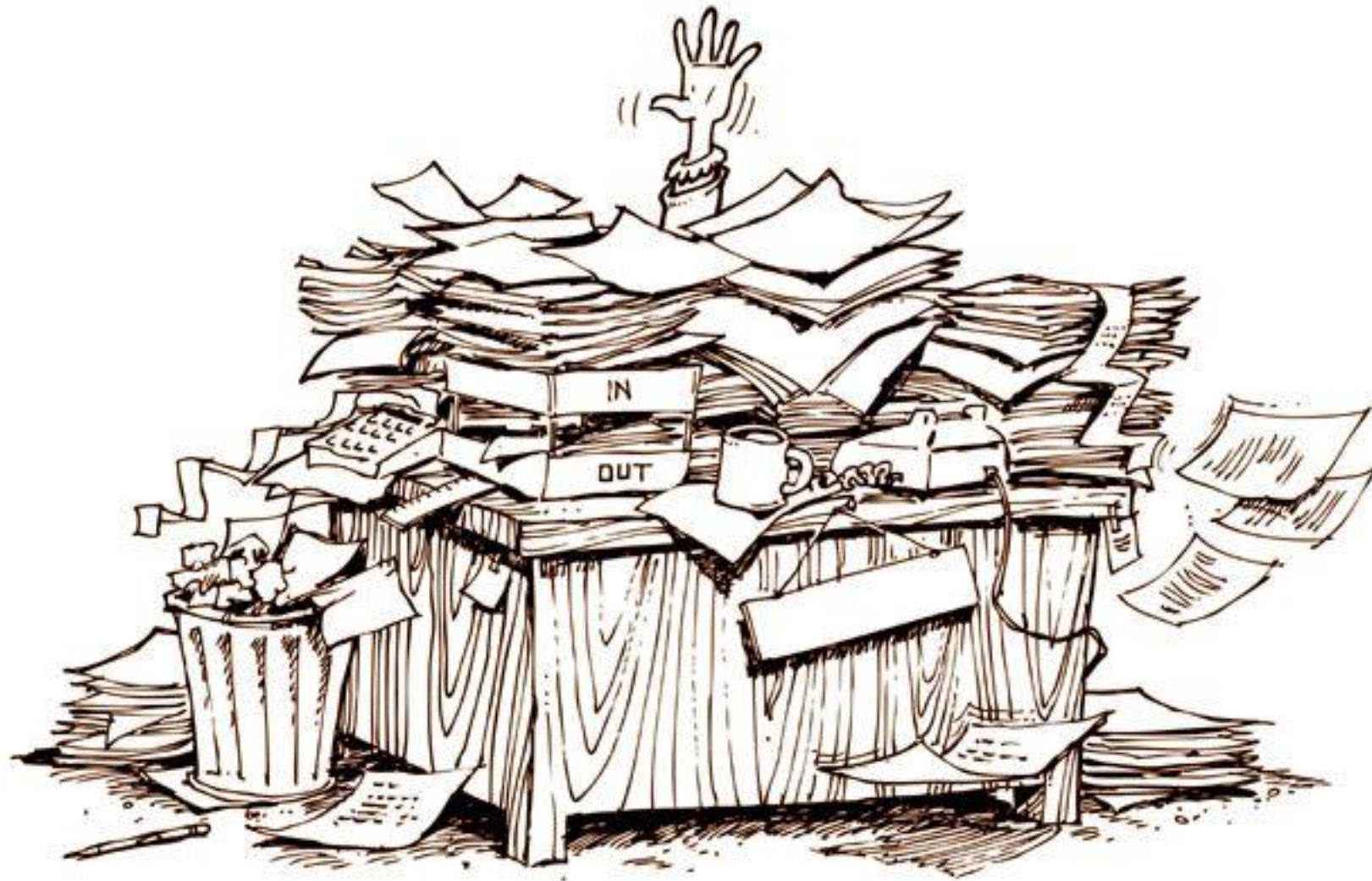
**EXPERIENCE  
IS EVERYTHING**



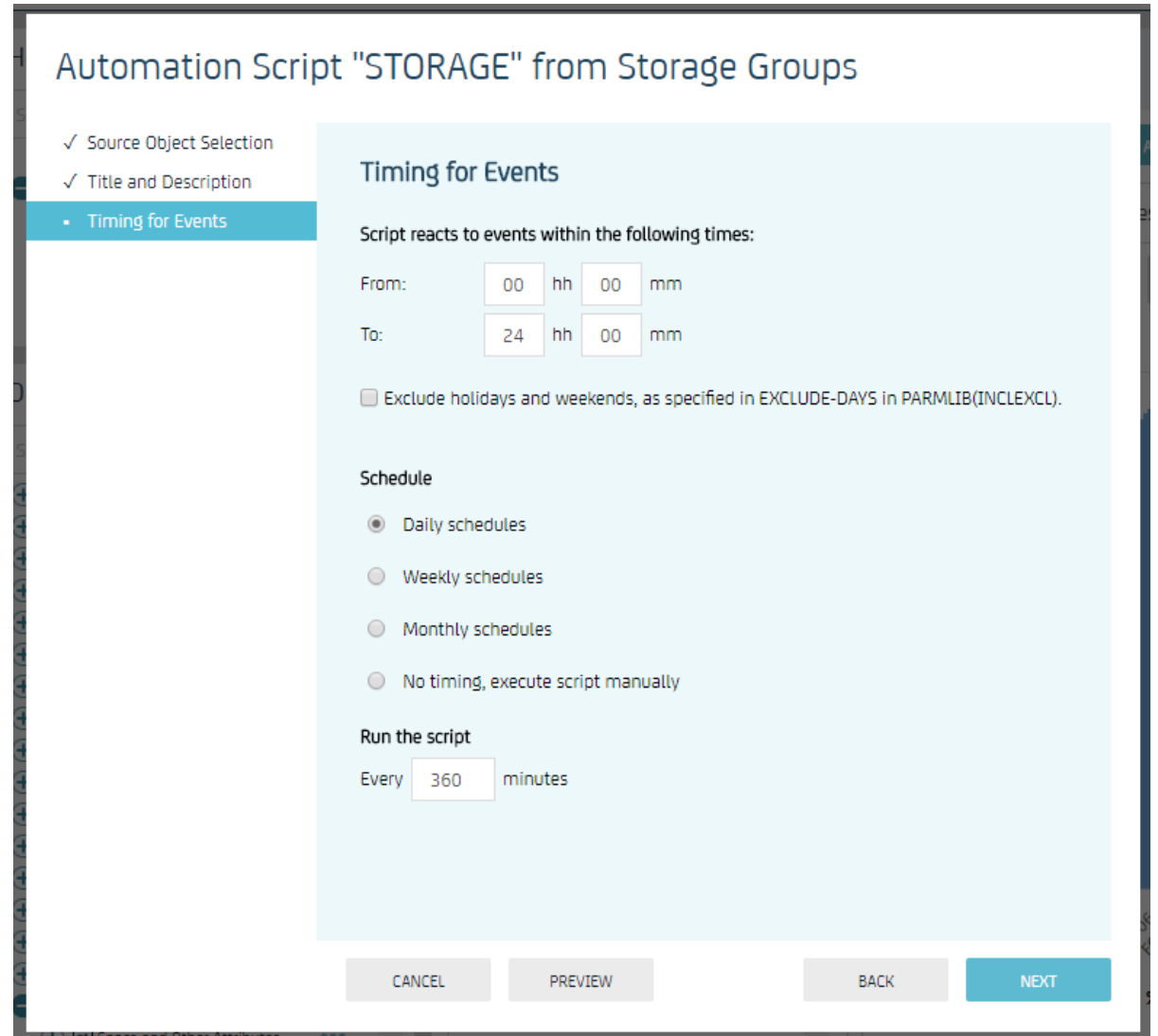
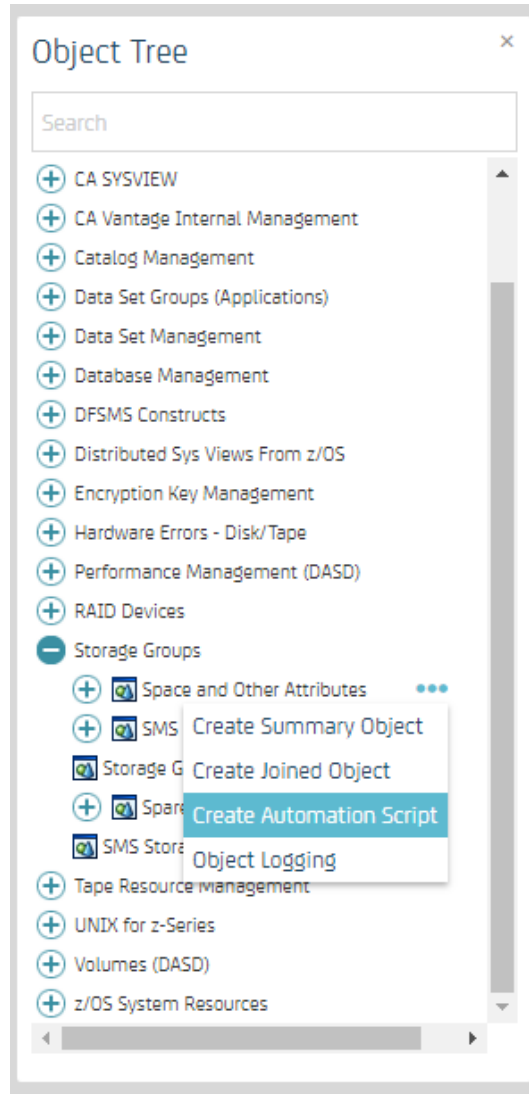
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**AUTOMATION**

# WEB UI AUTOMATION - INTRODUCTION



# WEB UI AUTOMATION



# WEB UI AUTOMATION

Automation Script "STORAGE" from Storage Groups

- ✓ Source Object Selection
- ✓ Title and Description
- ✓ Timing for Events
- Filter and Sort

### Filter and Sort

A filter is required. Use sort when you select Record Inclusion as the Violation Type, or when 'Select all records' is not specified in the Record Inclusion.

Filter:

Filter Columns:

Available Columns:

- SG Name (Storage Group Name)
- Type (Type Of Storage Group)
- % Allo (Pct Allocated)
- % Free (Pct Free)
- Vol Cnt (Number Of Volumes)
- Capacity Bytes (Capacity Bytes)
- Allocated Bytes (Allocated Bytes)
- Free Bytes (Free Bytes)
- L-FreeExt Bytes (Largest Free Extent Bytes)
- Cap Cyls (Capacity Cylinders)
- Allo Cyls (Allocated Cylinders)
- Free Cyls (Free Cylinders)
- L-FreeExt Cyls (Largest Free Extent Cylinders)
- Extents (Extents)
- % Allo All Vols (Pct Allocated All Volumes)
- CapByte All Vol (Bytes Total Capacity All Volumes)
- % Allo TMS (Pct Allocated on track managed part)
- % Allo CMS (Pct Allocated on cylinder managed part)
- TMS Capacity (Capacity on Track Managed Space)

Sort:

Select subset of filtered records  
Enables further refinement of the selected records to a subset.  
Multiple phases can be generated.



# WEB UI AUTOMATION

Automation Script "STORAGE" from Storage Groups

- ✓ Source Object Selection
- ✓ Title and Description
- ✓ Timing for Events
- ✓ Filter and Sort
- ✓ Conditions for Performing Actions
- ✓ Record Inclusion
- ✓ **Select Actions**
  - ✓ Perform Object Action
  - Send Email Message

### Select Actions

Actions

- Perform Object Action
- Submit a Job
- Issue z/OS Operator Command
- Send Email Message
- Send Message to Unicenter and/or the z/OS Operator

You can limit the number of actions to be performed during the time period that you specified previously.

The actions are executed in the order shown above.

# WEB UI AUTOMATION

Automation Script "STORAGE" from Storage Groups

- ✓ Source Object Selection
- ✓ Title and Description
- ✓ Timing for Events
- ✓ Filter and Sort
- ✓ Conditions for Performing Actions
- ✓ Record Inclusion
- ✓ Select Actions
  - Perform Object Action

### Perform Object Action

List of actions (required - chose one)

- Create Alert
- Add SMS Volume
- Add SMSVols to LWM**
- Add SMS Volume VFO
- Add SMS to LWM VFO
- Export to CSV

Low Water Mark %

Simulate (Y/N)

Check = yes, blank = no

Block selection of lines (maximum number of rows available for Object Action)

CANCEL PREVIEW BACK NEXT

# WEB UI AUTOMATION

Automation Script "STORAGE" from Storage Groups

- ✓ Source Object Selection
- ✓ Title and Description
- ✓ Timing for Events
- ✓ Filter and Sort
- ✓ Conditions for Performing Actions
- ✓ Record Inclusion
- ✓ Select Actions
  - ✓ Perform Object Action
  - Send Email Message

### Send Email Message

List of messages [+Add new message](#) [Edit message](#) [Delete message](#)

Marek.Stych@ca.com	Marek.Stych@ca.com
Storage groups were running out of space	Vantage.Admin@Vantage.com
	Storage groups were running out of space
	Storage Group Allocation test. Run on %%TODAY%% %%TIME%%
	Storage Groups with allocation over 90%: /**REPEAT*
	Storage Group Name: %%POOLNAME%%
	Allocation percentage: %%POOLUPCT%%
	Allocated bytes: %%POOLUBYX%%
	-----
	/**REPEATEND*

[CANCEL](#) [PREVIEW](#) [BACK](#) [NEXT](#)

# WEB UI AUTOMATION

Automation Script "STORAGE" from Storage Groups

- ✓ Source Object Selection
- ✓ Title and Description
- ✓ Timing for Events
- ✓ Filter and Sort
- ✓ Conditions for Performing Actions
- ✓ Record Inclusion
- ✓ Select Actions
  - ✓ Perform Object Action
  - ✓ Send Email Message
  - Save and Activate Script

### Save and Activate Script

Execute the script every time it is activated.

Save, activate, execute

Save, activate


Save

If you do not activate the script, you must modify the settings or execute it manually.

Load Script  
The script can be loaded or refreshed in the memory.

Enable Script when Loaded (for 24-hour scripts only)  
The script is enabled when it is loaded within its active period. Enabled scripts react to schedules and events.

CANCEL PREVIEW BACK FINISH



Reply Reply All Forward IM



Thu 11/1/2018 2:59 PM

Vantage.Admin@Vantage.com

Storage groups were running out of space

To Stych, Marek

Storage Group Allocation test.  
Run on 01NOV2018 09:58

Storage Groups with allocation over 90%:  
Storage Group Name: DEMOED  
Allocation percentage: 93  
Allocated bytes: 222831667580

Storage Group Name: OMVSVOL  
Allocation percentage: 92  
Allocated bytes: 194276490480

Storage Group Name: SGCAPRD  
Allocation percentage: 95  
Allocated bytes: 37906742736

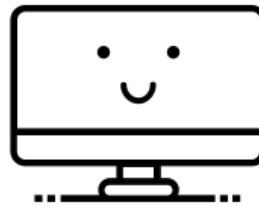
Storage Group Name: SGDB2BK  
Allocation percentage: 92  
Allocated bytes: 983038973832

# VANTAGE WEB UI ENHANCEMENT



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**JOINED OBJECTS**

# JOINED OBJECTS IN VANTAGE

## DS88XX Pools

- **Pool ID**
- Pool Name
- Parent Box ID
- Type (CKD / FB)
- Capacity
- Allocated Capacity
- Free Capacity
- Overprovisioning ratio
- Tier type [Enterprise / Nearline / SSD]

## DS88XX Volumes

- Volume Name
- Channel Unit Address
- Parent Box
- **Pool ID**
- Capacity [Cylinders]
- Storage Type CKD / FB
- Tier [High Capacity / Nearline / Enterprise]
- Easy Tier Managed [managed / non-managed]
- Thin Provisioning [None, Ese, Tse]

# JOINED OBJECTS IN VANTAGE

## DS88XX Pools

- **Pool ID**
- Pool Name
- Parent Box ID
- Type (CKD / FB)
- **Capacity**
- **Allocated Capacity**
- Free Capacity
- **Overprovisioning ratio**
- Tier type [Enterprise / Nearline / SSD]

## DS88XX Volumes

- **Volume Name**
- Channel Unit Address
- **Parent Box**
- **Pool ID**
- **Capacity [Cylinders]**
- Storage Type CKD / FB
- Tier [High Capacity / Nearline / Enterprise]
- Easy Tier Managed [managed / non-managed]
- Thin Provisioning [None, Ese, Tse]

# JOINED OBJECTS IN VANTAGE

## My Volumes & Pools Joined Object

- Volume Name
- Parent Box
- Capacity [Cylinders]
- **Pool ID**
- Capacity
- Allocated Capacity
- Overprovisioning ratio

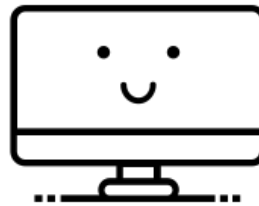


# VANTAGE WEB UI ENHANCEMENT



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**EXPERIENCE  
IS EVERYTHING**



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**PUBLIC, PRIVATE AND  
FACTORY DASHBOARDS**

# DASHBOARDS IN WEB UI

Host Tree

Search

- Public (3)
  - ➔ VANDEV14
  - ➔ VANMST01 CA11
  - ➔ VANQCVC6

Dashboards

Search

- My Dashboards
  - Alerts
  - Space and Other Attributes
  - Space and Other Attributes
- Factory Dashboards
  - Alerts
  - Automation Script Schedules
  - Coupling Facility
  - DASD and SGs analyses
  - Dependent widget example
  - Logger
  - SYSVIEW CEC Overview
  - SYSVIEW CICS Overview
  - SYSVIEW LPAR Alert Summary and WTD Displ
  - SYSVIEW LPAR Overview
  - SYSVIEW LPAR Performance Overview
  - SYSVIEW MQ Subsystem Overview
  - SYSVIEW TCP/IP Overview
  - Unused data sets
  - Vantage CPU & Memory
  - Vantage state
  - Volume types in SG

DASD and SGs analyses

SMS volume and storage group analyses

DASHBOARD ACTION

Volumes Managed By DFSMS

Volume	CUA1	Vendor	DevType	Model	Capacity Byt...	Allocated Bytes	% Allo	SMS	SMS Status	
1	ADG001	2586	EMC	3390	9	8,514,049,320	3,750,193,512	44	Y	ENABLE
2	ADG002	244E	EMC	3390	9	8,514,049,320	5,936,233,968	69	Y	ENABLE
3	ADG003	244F	EMC	3390	9	8,514,049,320	6,830,051,904	80	Y	ENABLE
4	ADG004	2450	EMC	3390	9	8,514,049,320	7,412,954,472	87	Y	ENABLE
5	ADG005	2451	EMC	3390	9	8,514,049,320	6,641,134,128	78	Y	ENABLE
6	ADG006	2587	EMC	3390	9	8,514,049,320	7,225,793,280	84	Y	ENABLE
7	ADG007	2452	EMC	3390	9	8,514,049,320	6,220,630,584	73	Y	ENABLE

LSPACEPO (VANQCVC6) Type: DATA | Mode: LI | Displaying 1 - 7 of 3067

Volumes Not Managed By DFSMS

Volume	CUA1	Vendor	DevType	Model	Capacity Byt...	Allocated Bytes	% Allo	SMS	SMS Stat	
1	ACFQAA	2A14	EMC	3390	9	8,514,049,320	8,027,192,232	94	N	NOTSI
2	ACFQAB	2A15	EMC	3390	9	8,514,049,320	8,119,724,544	95	N	NOTSI
3	ACFQAC	26BB	EMC	3390	9	8,514,049,320	6,655,583,448	78	N	NOTSI
4	ACFQAD	26BC	EMC	3390	9	8,514,049,320	7,967,638,368	93	N	NOTSI
5	ACFQAE	25CA	EMC	3390	9	8,514,049,320	8,221,549,752	96	N	NOTSI
6	ACFQAF	25CB	EMC	3390	9	8,514,049,320	6,639,547,536	77	N	NOTSI
7	ACFQAG	25CC	EMC	3390	9	8,514,049,320	7,755,375,024	91	N	NOTSI

LSPACEPO (VANQCVC6) Type: DATA | Mode: LI | Displaying 1 - 7 of 3092

Overall On-line DASD Utilization

Legend: % Allo

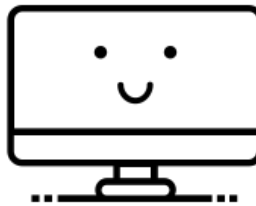
Navigation: < 1 - 230 > CUSTOM RANGE

# VANTAGE WEB UI ENHANCEMENT



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**EXPERIENCE  
IS EVERYTHING**

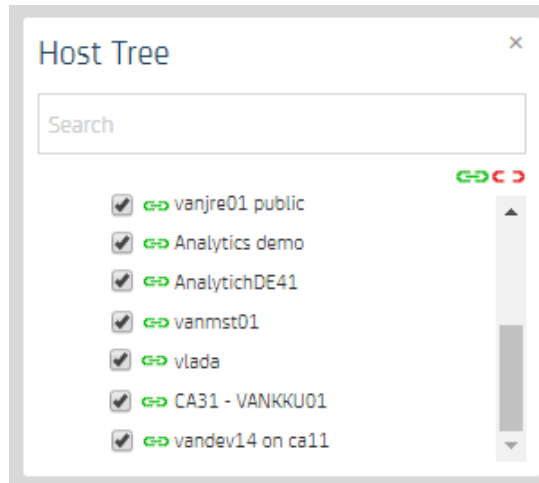


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**MULTI HOST  
ENHANCEMENT**

# MULTI HOST ENHANCEMENT – LIMIT RECORDS

## Data from all connected Hosts



## PAIN

- There can be millions of records
- Records are added into object host by host.
- Sort is applied only to the data from each host independently

## SOLUTION

- Set Limit Records for object
- Set valid filter and sort
- Data are sorted independently on the host

## BENEFITS

- You can work with data from all the LPARs at the same time
- You can very easily identify the information you are interested in
  - All the datasets not used for more the 90 days on all LPARS
  - Storage groups with allocation over 95% on any LPAR
  - There are many more examples

# MULTI HOST SORTING

	SG Name	% Allo	Allocated Bytes (MB)	SubsystemVan
1	SGTISO	94	75,248.93	MSTY
2	SGDISKDB	88	21,545.08	MSTY
3	SMDVOLS	87	575,091.70	MSTY
4	PMADASD	100	2,706.54	VD14
5	SGZOSMF	99	87,775.44	VD14
6	SGFSG	97	7,904.23	VD14
7	SGUTG	97	573,306.68	VD14
8	SGTISO	96	2,394,905.92	VD14
9	SGTSPRD	96	7,861.65	VD14
10	SGVANT	96	614,910.28	VD14
11	SGCAPRD	95	36,150.69	VD14
12	SGLOANT	94	50,015.47	VD14
13	OMVSVOL	92	185,276.50	VD14
14	DEMOED	92	211,785.19	VD14
15	SGDTGPC	92	7,546.01	VD14
16	SGEAV	92	163,628.75	VD14
17	SGDB2BK	92	937,499.02	VD14



	SG Name	% Allo	Allocated Bytes (MB)	SubsystemVan
1	PMADASD	100	2,706.54	VD14
2	SGZOSMF	99	87,775.44	VD14
3	SGFSG	97	7,904.23	VD14
4	SGUTG	97	573,306.68	VD14
5	SGTISO	96	2,394,905.92	VD14
6	SGTSPRD	96	7,861.65	VD14
7	SGVANT	96	614,910.28	VD14
8	SGCAPRD	95	36,150.69	VD14
9	SGTISO	94	75,248.93	MSTY
10	SGLOANT	94	50,015.47	VD14
11	OMVSVOL	92	185,276.50	VD14
12	DEMOED	92	211,785.19	VD14
13	SGDTGPC	92	7,546.01	VD14
14	SGEAV	92	163,628.75	VD14
15	SGDB2BK	92	937,499.02	VD14
16	SGDISKDB	88	21,545.08	MSTY
17	SMDVOLS	87	575,091.70	MSTY

# Summary

**SUPPORTING NEW HARDWARE**

**OPEN VANTAGE REST API**

**AUTOMATION SUPPORT**

**MULTI HOST ORIENTED**

# Questions and Answers

# We want your feedback!

- Please submit your feedback online at ....
  - <http://conferences.gse.org.uk/2018/feedback/DM>
- Paper feedback forms are also available from the Chair person
- This session is DM

