

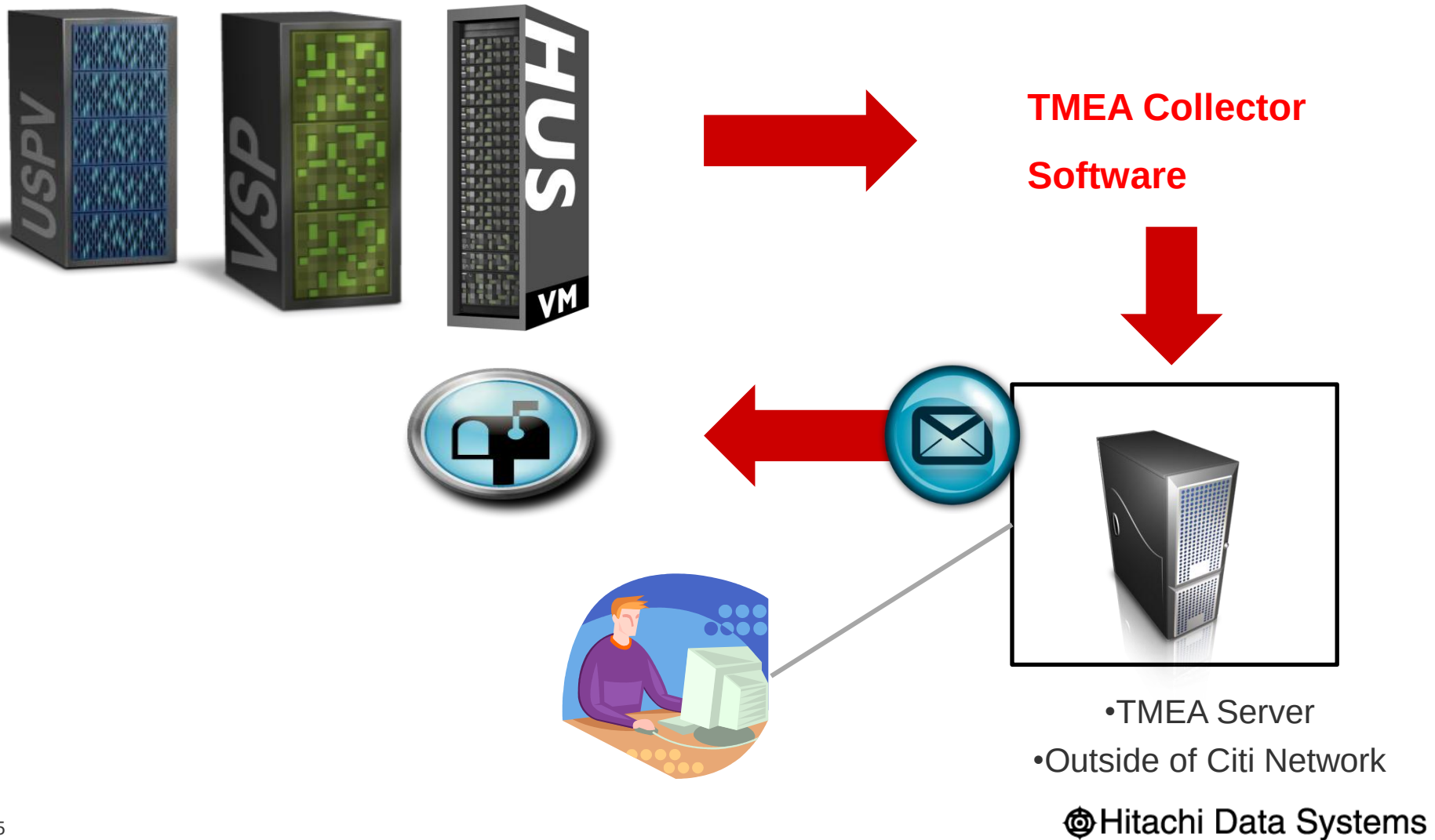
Tuning Manager Expert Assistant

HDS Global Account Team

- Background
 - GSS Service - developed in 2003
 - Used at many big name accounts
 - Part of Storage Performance Assessment since 2005
 - Used by HDS Techops when bench marking arrays
- Main Benefits:
 - Proactive Monitoring than Reactive
 - Time Savings
 - Storage expertise NOT needed
 - Array Optimization
 - Minimize issues during migrations/provisioning

1. Estate/Datacenter level dashboard
2. Array level view
3. Drill down into critical array components
4. RAG color coding
5. Host I/O profile
6. Assist with basic provisioning
7. EMEA – weekly “health checks” for arrays

- TMEA Functionality
 - Dashboard for estate level view – identify potential array problems via RAG color codes
 - Array level scorecard (one page per array) – identify potential issues with specific components **based on HDS best practices.**
 - Server level dashboard – See complete I/O profile for each server (cluster aware).
- How it works:
 - Fully automated collector process sends data to HDS from Arrays
 - Reports are sent to recipients via email (PDF or EXCEL)



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SUMMARY BY STORAGE ARRAY SCORE CARD

Date : 1/11/2013 ~ 7/11/2013

Time : 00:00 Hrs ~ 00:00 Hrs

Interval : 1 Minutue

Mins Observed: 10000 Mintues

Storage Array	Cache Write Pending %			VSD Processor Busy %			Array Group Busy %			Pool Array Group Busy %			Pool 0		Pool 1		Pool 3	
	<30%	30 ~ 70%	>70%	<40%	40 ~ 70%	>70%	<50%	50 ~ 70%	>70%	<50%	50 ~ 70%	>70%	Response Time	Free Space	Response Time	Free Space	Response Time	Free Space
bwd03s	50	20	30	100	0	0	50	20	0	50	20	0	5 ms	1.7 TB	5 ms	1.7 TB	5 ms	1.7 TB
JHBSPWDC06	70	10	20	100	0	0	70	10	0	70	10	0	3 ms	20 TB	3 ms	20 TB	3 ms	20 TB
JHBWDCW106	70	20	10	100	0	0	70	20	0	70	20	0	14 ms	4 TB	14 ms	4 TB	14 ms	4 TB
MPKSPWDC01	80	20	0	100	0	0	80	20	0	80	20	0	7 ms	14 TB	7 ms	14 TB	7 ms	14 TB
MPKWDCW101	100	0	0	100	0	0	100	0	0	100	0	0	6 ms	12 TB	6 ms	12 TB	6 ms	12 TB
trnhcmdv	90	10	0	100	0	0	90	10	0	90	10	0	8 ms	5 TB	8 ms	5 TB	8 ms	5 TB

LEGEND

	This is the % of time the Resource is below the Lower Threshold in the given monitoring period.
	This is the % of time the Resource is falling between Lower and Upper Threshold in the given monitoring period.
	This is the % of time the Resource is exceed Upper Threshold in the given monitoring period.

3/17/14 – Report

Storage Array Serial	Storage Array Name	Cache Write Pending %			Processor Busy		
		<40%	40-50%	>50%	<40%	40-70%	>70%
18661	USOEH011N8661	99.99	0.01	0.00	91.72	7.96	0.32
48555	USOMH013N8555	100.00	0.00	0.00	27.23	63.82	8.95
29044	USOMH014N9044	100.00	0.00	0.00	91.91	6.97	1.12
18666	USOUH027N8666	100.00	0.00	0.00	100.00	0.00	0.00
18667	USOUH028N8667	100.00	0.00	0.00	100.00	0.00	0.00
28392	USOUH032N8392	100.00	0.00	0.00	57.78	31.23	10.99
28425	USOUH033N8425	100.00	0.00	0.00	100.00	0.00	0.00
28896	USOUH042N8896	100.00	0.00	0.00	99.59	0.39	0.02
29131	USOUH044N9131	100.00	0.00	0.00	99.08	0.84	0.08

- 60 minutes in a hour
- 1440 minutes in a day
- 10,080 minutes in a day
- 10,080 * 64% = 6,451 minutes above lower threshold
- 10,080 * 9% = 907 minutes above 70% utilization

•TMEA identified USPV 48555 as potential issue

3/24/14 – Report

Storage Array Serial	Storage Array Name	Cache Write Pending %			Processor Busy		
		<40%	40-50%	>50%	<40%	40-70%	>70%
18661	USOEH011N8661	99.91	0.01	0.08	81.64	8.41	9.95
48555	USOMH013N8555	100.00	0.00	0.00	3.81	37.86	58.33
18666	USOUH027N8666	100.00	0.00	0.00	100.00	0.00	0.00
18667	USOUH028N8667	100.00	0.00	0.00	100.00	0.00	0.00
28392	USOUH032N8392	100.00	0.00	0.00	74.01	18.45	7.54
28425	USOUH033N8425	100.00	0.00	0.00	100.00	0.00	0.00
28896	USOUH042N8896	100.00	0.00	0.00	99.59	0.40	0.01
29131	USOUH044N9131	100.00	0.00	0.00	99.34	0.50	0.15

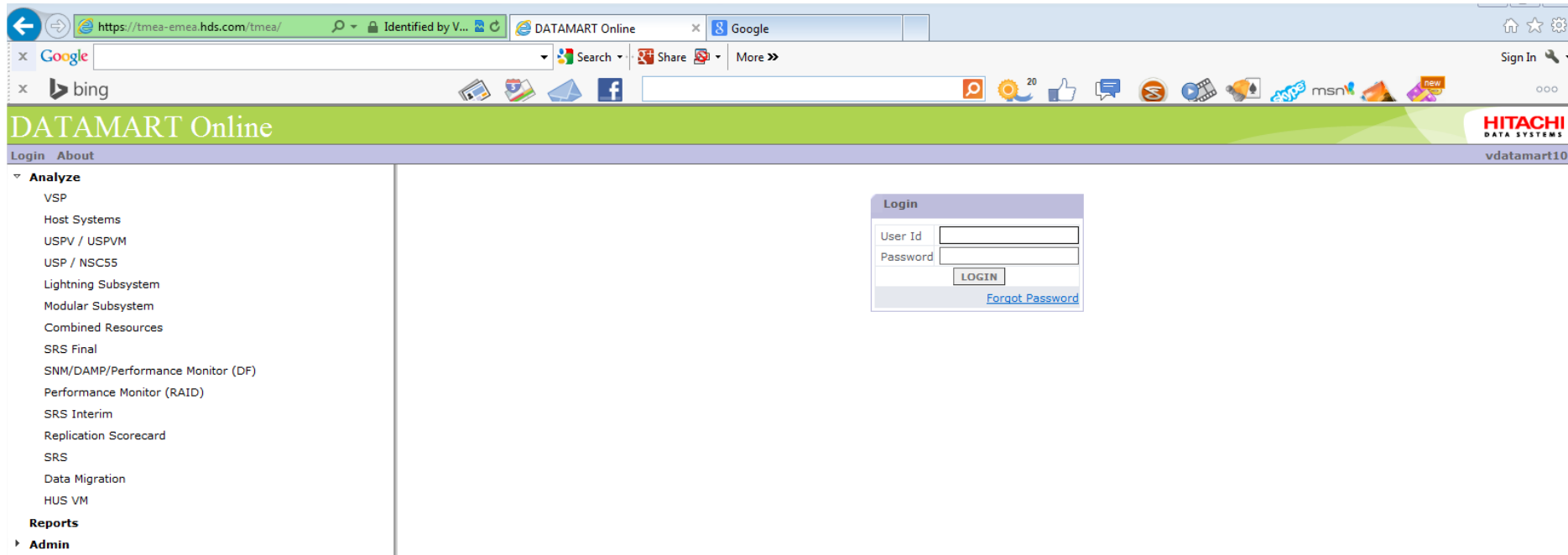
- 60 minutes in a hour
- 1440 minutes in a day
- 10,080 minutes in a day
- 10,080 * 38% = 3,830 minutes above lower threshold
- 10,080 * 58% = 5,443 minutes above 70% utilization

•Next week report shows it got worse

- The TMEA Collector Server – lightweight server application
 - Collects Throughput, Utilization, and Response Time metrics minutely
 - Collects configuration information every 4 hours (default)
 - Collects from Enterprise via CM Dev, Modular via API over TCP
 - Compresses and encrypts data to be uploaded
 - Uploads data to `datamartftp.hds.com/SerNum/datefolder` hourly (default)
- The minutely data is aggregated into customer serial number instance to each of 3 intervals
 - Minute stored for 15 days (LDev table is huge!)
 - 10 Minute stored for 120 days
 - Hour stored as long as the ScoreCards Service continues

- ☐ Score Card
 - ☐ Owner
 - ☐ Dashboard
 - ☐ Executive Summary
-
- ☐ Ch2Dr – Channel to Drive
 - ☐ CM – Cache Memory
 - ☐ CHA – Channel / Client Host Adaptor

How to Access TMEA



URL → https://tmea-emea.hds.com/tmea/

US

Username: citinam

** Password: start123

Systems Displayed: All NAM Arrays

EMEA

Username: citiemia

** Password: start123

Systems Displayed: All EMEA Arrays

APAC

Username: citiapac

** Password: start123

Systems Displayed: All APAC Arrays

GLOBAL

Username: citiglobal

** Password: start123

Systems Displayed: All the Arrays Globally

- ☐ Weekly Score Card Delivery
- ☐ Daily / Weekly Adhoc Reports
- ☐ Online Access

rpt-alerter@hds.com	 Summary Scorecard Assessment for Citibank[citi_emea_resSummary] generated on 2014-03-10 03:30:00	📎 120 KB	Mon 3/10/2014 2:35 AM	
rpt-alerter@hds.com	 Summary Scorecard Assessment for Citibank[citi_nam_resSummary] generated on 2014-03-10 02:30:00	📎 203 KB	Mon 3/10/2014 2:03 AM	
rpt-alerter@hds.com	 Summary Scorecard Assessment for Citibank[citi_apac_resSummary] generated on 2014-03-09 19:00:00	📎 91 KB	Sun 3/9/2014 6:02 PM	
rpt-alerter@hds.com	 Summary Scorecard Assessment for Citibank[citi_emea_resSummary] generated on 2014-03-03 03:30:00	📎 126 KB	Mon 3/3/2014 2:35 AM	
rpt-alerter@hds.com	 Summary Scorecard Assessment for Citibank[citi_nam_resSummary] generated on 2014-03-03 02:30:00	📎 209 KB	Mon 3/3/2014 1:37 AM	
rpt-alerter@hds.com	 Summary Scorecard Assessment for Citibank[citi_apac_resSummary] generated on 2014-03-02 19:00:00	📎 120 KB	Sun 3/2/2014 6:03 PM	

- ☐ Fully Automated
- ☐ Global Dash Board
- ☐ Executive Dash Board
- ☐ Single pane of Glass

Daily Adhoc Report Delivery

rpt-alerter@hds.com	✉ By Port for Citibank[53789] for 2014-03-07 00:46:00 to 2014-03-14 00:46:00	📎 1 MB	Fri 3/14/2014 7:24 AM	📄
rpt-alerter@hds.com	✉ By Port for Citibank[53762] for 2014-03-07 00:05:00 to 2014-03-12 00:05:00	📎 1 MB	Fri 3/14/2014 7:19 AM	📄
rpt-alerter@hds.com	✉ Pool for Citibank[53789] for 2014-03-07 00:46:00 to 2014-03-14 00:46:00	📎 118 KB	Fri 3/14/2014 7:18 AM	📄
rpt-alerter@hds.com	✉ By MPB for Citibank[53789] for 2014-03-07 00:46:00 to 2014-03-14 00:46:00	📎 75 KB	Fri 3/14/2014 7:15 AM	📄
rpt-alerter@hds.com	✉ Pool for Citibank[53762] for 2014-03-07 00:05:00 to 2014-03-12 00:05:00	📎 104 KB	Fri 3/14/2014 7:14 AM	📄
rpt-alerter@hds.com	✉ Cache for Citibank[53789] for 2014-03-07 00:00:00 to 2014-03-14 00:00:00	📎 23 KB	Fri 3/14/2014 7:13 AM	📄
rpt-alerter@hds.com	✉ By MPB for Citibank[53762] for 2014-03-07 00:05:00 to 2014-03-12 00:05:00	📎 70 KB	Fri 3/14/2014 7:12 AM	📄
rpt-alerter@hds.com	✉ Cache for Citibank[53762] for 2014-03-07 00:05:00 to 2014-03-12 00:05:00	📎 22 KB	Fri 3/14/2014 7:11 AM	📄
rpt-alerter@hds.com	✉ By Port for Citibank[53744] for 2014-03-07 00:00:00 to 2014-03-12 00:00:00	📎 573 KB	Fri 3/14/2014 7:11 AM	📄
rpt-alerter@hds.com	✉ Pool for Citibank[53744] for 2014-03-07 00:00:00 to 2014-03-12 00:00:00	📎 25 KB	Fri 3/14/2014 7:10 AM	📄
rpt-alerter@hds.com	✉ By MPB for Citibank[53744] for 2014-03-07 00:00:00 to 2014-03-12 00:00:00	📎 27 KB	Fri 3/14/2014 7:08 AM	📄
rpt-alerter@hds.com	✉ Cache for Citibank[53744] for 2014-03-07 00:00:00 to 2014-03-12 00:00:00	📎 21 KB	Fri 3/14/2014 7:07 AM	📄
rpt-alerter@hds.com	✉ By Port for Citibank[53630] for 2014-03-07 00:08:00 to 2014-03-12 00:08:00	📎 596 KB	Fri 3/14/2014 7:07 AM	📄
rpt-alerter@hds.com	✉ Pool for Citibank[53630] for 2014-03-07 00:08:00 to 2014-03-12 00:08:00	📎 72 KB	Fri 3/14/2014 7:06 AM	📄
rpt-alerter@hds.com	✉ By MPB for Citibank[53630] for 2014-03-07 00:08:00 to 2014-03-12 00:08:00	📎 50 KB	Fri 3/14/2014 7:04 AM	📄
rpt-alerter@hds.com	✉ Cache for Citibank[53630] for 2014-03-07 00:08:00 to 2014-03-12 00:08:00	📎 24 KB	Fri 3/14/2014 7:04 AM	📄
rpt-alerter@hds.com	✉ Pool for Citibank[53584] for 2014-03-07 00:08:00 to 2014-03-12 00:08:00	📎 59 KB	Fri 3/14/2014 7:03 AM	📄
rpt-alerter@hds.com	✉ By Port for Citibank[53584] for 2014-03-07 00:08:00 to 2014-03-12 00:08:00	📎 573 KB	Fri 3/14/2014 7:03 AM	📄
rpt-alerter@hds.com	✉ By MPB for Citibank[53584] for 2014-03-07 00:08:00 to 2014-03-12 00:08:00	📎 52 KB	Fri 3/14/2014 7:02 AM	📄
rpt-alerter@hds.com	✉ Cache for Citibank[53584] for 2014-03-07 00:08:00 to 2014-03-12 00:08:00	📎 23 KB	Fri 3/14/2014 7:00 AM	📄
rpt-alerter@hds.com	✉ Cache for Citibank[53562] for 2013-11-14 00:00:00 to 2013-11-29 00:00:00	📎 15 KB	Fri 3/14/2014 7:00 AM	📄

TMEA Online Access....sample screen

The screenshot shows a web browser window with the URL <https://tmea-emea.hds.com/tmea/>. The browser's address bar and tabs are visible, showing the DATAMART Online application. The page header features the DATAMART Online logo and a navigation bar with links for Logout and About. The main content area is divided into two sections: a left sidebar and a main panel. The sidebar contains a tree view under the 'Analyze' section, with 'Citibank' selected. Below 'Citibank' is the 'Reports' section, which includes a list of report types: Basic Reports (Cache, VSD, Front End Port, LDEV Group, HDP-HDT Pool, Array Group, LDEV), and Modeling. The main panel displays the 'VSP List' and a message: 'VSP US0UH053N3758(53758) selected for analysis.' The bottom right corner of the page shows the user is logged in as 'Citi SAN OPS NAM on vdatamart10'.

DATAMART Online

Logout About

Logged in as: Citi SAN OPS NAM on vdatamart10

Analyze

- Citibank**
- Reports**
 - Basic Reports
 - Cache
 - VSD
 - Front End Port
 - LDEV Group
 - HDP-HDT Pool
 - Array Group
 - LDEV
 - Modeling

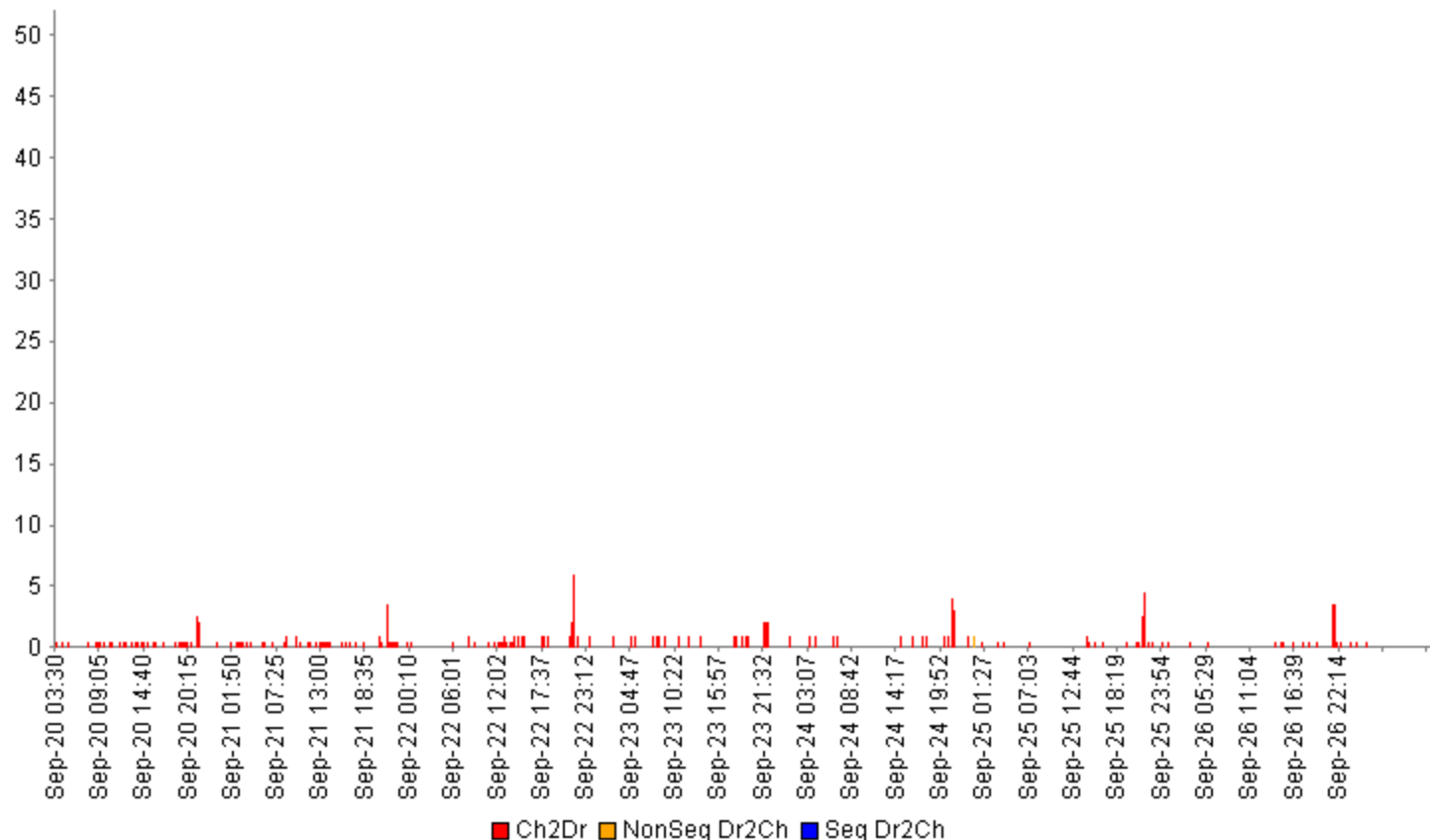
VSP List

VSP US0UH053N3758(53758) selected for analysis.

7 days – backend transfer data - sample

CERVI00008D1-CERVI00008D2-Owner Back End TPS

Subsystem Details - Owner Back End TPS - CERVI00008D1-CERVI00008D2 (65706)



Generated by TMEA. <http://www.hds.com>

- ❑ There will be a Difference in frontend , Backend workload in any given VSP array.
- ❑ not every IO goes the backend
- ❑ The backend IO is the most accurate Load to the HDT/HDP Pools
- ❑ Cache Plays major role in arresting significant IO by means of Read Hit and Write Hit at LDEV Level
- ❑ Not all servers / LDEV qualify for all Tiers in HDT examples
 1. Lun with low IO assign into Tier Policy4
 2. Lun with Medium IO assign into the Tier Policy 3
 3. Lun with heavy IO assign with Tier Policy 2
- ❑ monitor the HDT Pool periodically for it's Capacity vs Performance Utilization..

- ❑ The Above will eliminate the host that are not good candidates for HDT

examples

1. Backup Servers
2. Host with very low IO
3. Host with more Seq IO workload

- ❑ The below are the host that are best candidates for the HDT

examples

1. ESX Servers
2. VIO Servers
3. Host with more Random IO workload

Live demo

Questions/Discussion