



Hitachi Storage Management Software

Hitachi Storage Management Array Services

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Business Application Modules

QoS Application Modules
Oracle - Exchange - Sybase -
SQL Server - NetApp

QoS for File Servers
SRM

Hitachi Dynamic Link Manager
Path failover and failback
load balancing

Storage Operations Modules

Chargeback

Path Provisioning

Global Reporter

Tuning Manager

Tiered Storage Manager

Storage Services Manager

Hitachi Volume Migration

Hitachi Server Priority Manager

HDS Array Services

Device Manager

Configuration

Reporting

**API
CIM/SMI-S**

**Provisioning &
Replication**

Hitachi Resource Manager

Hitachi Performance Monitor

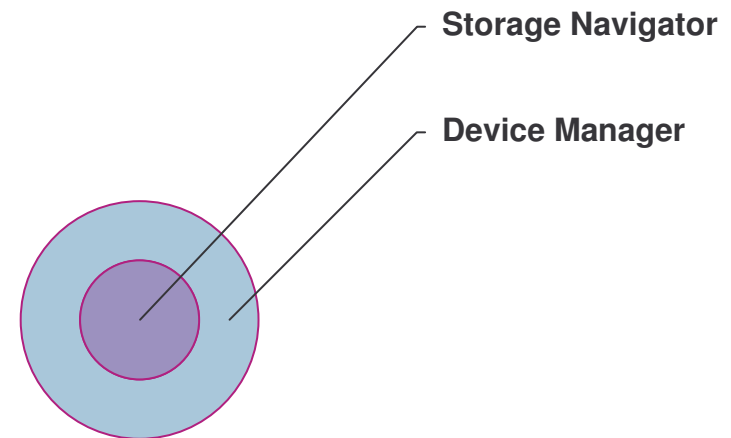
Hitachi Universal Volume Manager

Hitachi Virtual Partition Manager

Heterogeneous

Hitachi Storage Specific

- **Hitachi Storage Navigator**
 - Individual management of Hitachi storage systems
 - Different for modular vs. enterprise storage systems
 - No path awareness
- **Hitachi HiCommand Device Manager**
 - Encompasses Storage Navigator
 - Centralized management of Hitachi storage systems
 - Storage pool manager used by other HDS software products
 - Path aware
 - Provides CLI



HiCommand® Device Manager

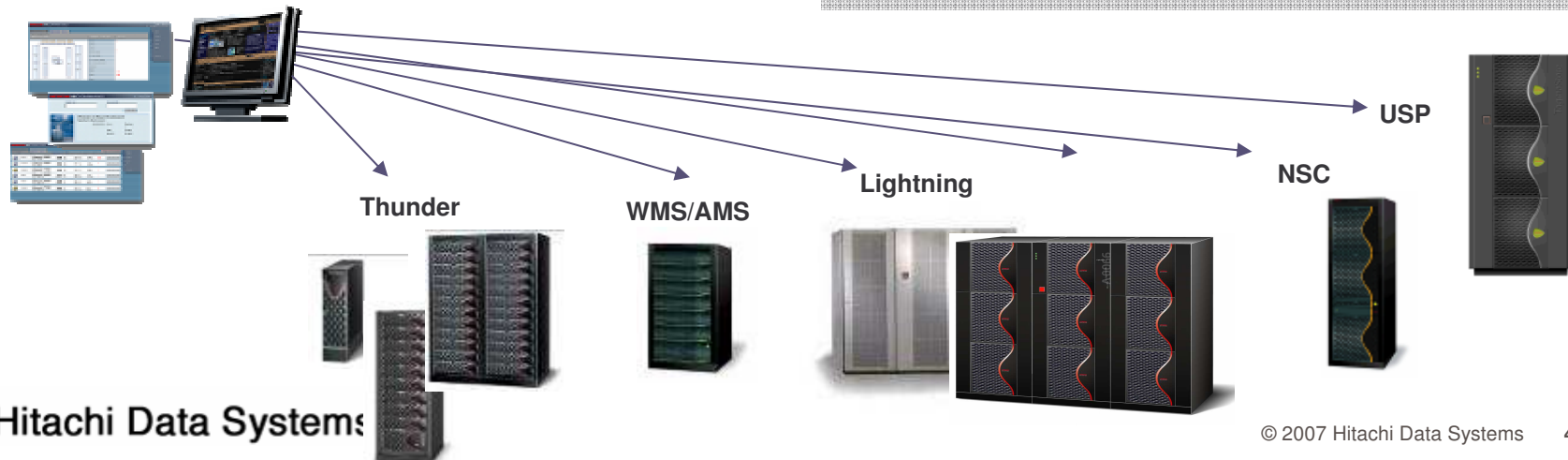
Centrally manages all tiers of Hitachi Storage

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- Single console, single product for managing all tiers of Hitachi storage
 - One common interface, browser and CLI
- Full SAN path awareness to Discover, Configure, Monitor, Report, Provision
 - Centrally manage Hitachi replication software - ShadowImage™, QuickShadow™, and TrueCopy™
 - Centrally manage LUN security
 - Storage Pool manager for advanced HDS functions
 - Single Sign-on access to HiCommand Tuning Manager, HiCommand Dynamic Link Manager and other Hitachi software

Benefits

- Improved productivity of IT resources
 - Single point management
 - Integrated data center and enterprise operations
- Improved alignment with business functions using logical grouping
- Risk mitigation
 - Proactive alerts on storage arrays to prevent outages
 - Reduced manual error-prone storage processes
 - Disaster recovery management to minimize downtime



HiCommand® Device Manager – Storage View

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The screenshot displays the HiCommand Device Manager web interface. The top navigation bar includes 'File', 'Go', and 'Help' menus, along with a 'Logged in as: system' status and 'Close'/'Logout' buttons. The left sidebar contains an 'Explorer' pane with 'Resources' (All Storage, Hosts, Subsystems) and a 'Dashboard' section with various monitoring widgets (HDvM, HPvM, HTvM, HGLAM, HRPvM, HTSM, HSSM). The main content area is titled 'All Storage' and shows a tree view of storage resources. The selected resource is 'Open-Allocated' under 'USP@172.17.42.166'. The right pane displays details for this resource, including a 'List Objects' table with columns for LDEV, Type, ArrayGroup, SLPR, CLPR, Port, and HSD. The table shows 5 rows of data. Below the table are buttons for 'Allocate Storage', 'Unallocate Storage', 'Move to Group', 'Filter', and 'Filter Off'. A 'Refresh Tree' button is located at the bottom left of the main content area.

HiCommand Device Manager

File Go Help Logged in as: system Close Logout

Explorer

- Resources
 - All Storage
 - Hosts
 - Subsystems
 - My Groups
 - Administration
 - Tasks
 - Alerts
 - Reports
 - Settings
- Dashboard
 - HDvM
 - HPvM
 - HTvM
 - HGLAM
 - HRpM
 - HTSM
 - HSSM

All Storage

- All Storage
 - AMS500@172.17.42.204
 - NSC55@172.17.43.16
 - USP@172.17.42.166
 - Open-Allocated
 - Open-Unallocated
 - Mainframe-Unspecified

Open-Allocated

All Storage > USP@172.17.42.166 > Open-Allocated

LUN Scan List Objects

List Objects - Open-Allocated Help

Subsystem

Name USP@172.17.42.166

Number of LDEVs 274

Open-Allocated Capacity 3.33 TB

Rows/Page: 100 Page 1 of 3

	LDEV	Type	ArrayGroup	SLPR	CLPR	Port	HSD
☐	0:00	-	1-1-1	0	0	CL3-F	SAnbootluns
☐	0:02	-	1-1-1	0	0	CL3-F	SAnbootluns
☐	0:03	-	1-1-1	0	0	CL3-A	DL506952
☐	0:04	-	1-1-1	0	0	CL3-A	DLW7232
☐	0:05	-	1-1-1	0	0	CL2-C	DLW7232

Allocate Storage Unallocate Storage Move to Group Filter Filter Off

Refresh Tree

HiCommand® Device Manager – Hosts View

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The screenshot shows the HiCommand Device Manager interface in a Microsoft Internet Explorer browser window. The address bar displays the URL <http://10.208.17.22:23015>. The browser window title is "HiCommand Device Manager - Microsoft Internet Explorer".

The application interface has a purple header bar with the "HiCommand Device Manager" title and the Hitachi Data Systems logo. Below the header, there is a navigation menu on the left and a main content area on the right.

Navigation Menu:

- Explorer**
 - Resources
 - All Storage
 - Hosts**
 - Subsystems
 - My Groups
 - Administration
 - Tasks
 - Alerts
 - Reports
 - Settings
- Dashboard**
 - HDvM
 - HPvM
 - HTnM
 - HGLAM
 - HRpM
 - HTSM
 - HSSM

Main Content Area:

- Hosts View:** The "Hosts" tab is selected in the Explorer. A list of hosts is displayed, including host_0 through host_29. A "Refresh Tree" button is at the bottom of this list.
- Hosts Detail View:** The "Hosts" section on the right shows a "List Objects - Hosts" button and a "Help" link. Below this is an "Object List" table.

Host	IP Address	Capacity	Type
host_0		33.94 GB	
host_1		32.08 GB	
host_10		27.71 GB	
host_11		9.16 GB	
host_12		20.63 GB	
host_13		13.75 GB	
host_14		8.43 GB	
host_15		41.76 GB	
host_16		9.16 GB	

At the bottom of the main content area, there are buttons for "Remove Host", "Filter", and "Filter Off".

Hitachi HiCommand® Tiered Storage Manager

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Features

- Identify, classify, and move volumes to match price / performance / availability application requirements
- Multi-dimensional tiering
 - Versus linear hardware boundaries
- Non-disruptive data movement
 - Between any storage in Universal Storage Platform's domain
 - Internal or external
 - Hitachi and/or 3rd party
 - Proven array based volume movement technology used over 3 product generations

HiCommand Tiered Storage Manager

Domains > ams55 > Tiers > ams 500 all

Summary Information

Name	ams 500 all	Capacity per Domain	1%
Total Capacity	29.99 GB		
Free Capacity (%)	26.99 GB (90%)	No. Volumes	11
Used Capacity (%)	2.99 GB (10%)		

Volume List

LDEV	I/O Consumer	Volume Status	Can Migrate	Migration Group	Subsystem	Ctrl. Array Group	Array Group	Arra
1192		Free	Yes		AMS500@172.17.42.204	E204-3		
1181	Unknown	Used	Yes		AMS500@172.17.42.204	E204-1		1
1182	Unknown	Used	Yes		AMS500@172.17.42.204	E204-1		1
1183	Unknown	Used	Yes		AMS500@172.17.42.204	E204-1		1
1184		Free	Yes		AMS500@172.17.42.204	E204-1		1
1185		Free	Yes		AMS500@172.17.42.204	E204-1		1
1186		Free	Yes		AMS500@172.17.42.204	E204-1		1
1187		Free	Yes		AMS500@172.17.42.204	E204-1		1
1188		Free	Yes		AMS500@172.17.42.204	E204-1		1
1189		Free	Yes		AMS500@172.17.42.204	E204-1		1
118A		Free	Yes		AMS500@172.17.42.204	E204-1		1

Benefits

- Removes complexity in managing storage tiers
- Simplifies steps to migrate data prior to storage reassignment or removal, such as migrating hardware coming off lease
- Eliminates restrictive data migration windows and requirements
- Respond to business initiatives by faster storage provisioning
- Help respond to data retention standards and compliance issues

HiCommand® Tiered Storage Manager – Managing and Migrating Between Storage Tiers

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The screenshot displays the HiCommand Tiered Storage Manager web interface. The left sidebar contains a navigation menu with 'Resources', 'Domains', 'Administration', 'Tasks', 'Search', and 'Settings'. The 'Domains' section is expanded, showing a tree structure with 'nsc55' and 'sa166' domains. Under 'sa166', there are 'Tiers' and 'Migration Groups'. The 'ams 500 all' tier is selected. The main content area shows the 'ams 500 all' tier details, including a 'Summary Information' section and a 'Volume List' table.

Summary Information

Name	ams 500 all		
Total Capacity	29.99 GB	Capacity per Domain	1%
Free Capacity (%)	26.99 GB (90%)	No. Volumes	11
Used Capacity (%)	2.99 GB (10%)		

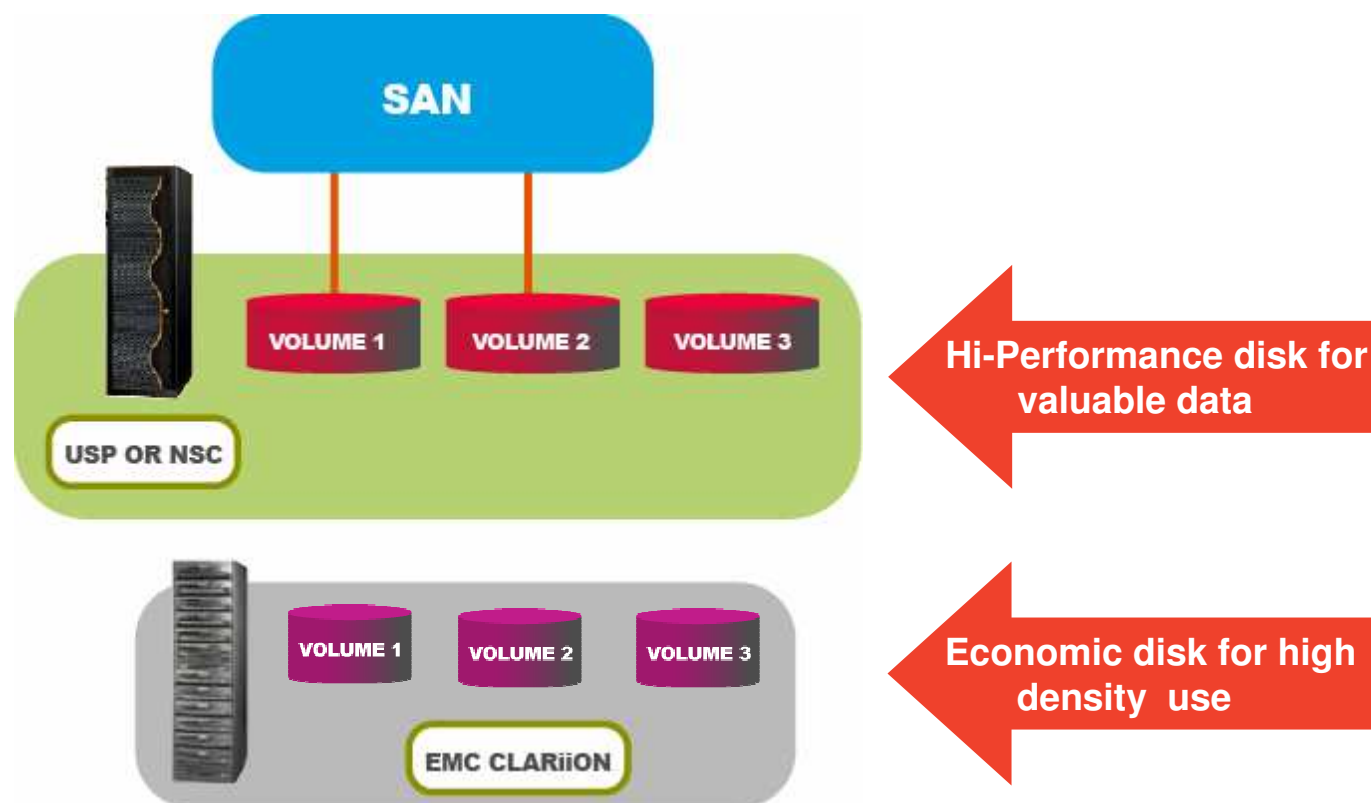
Volume List

LDEV	I/O Consumer	Volume Status	Can Migrate	Migration Group	Subsystem	Ctrl. Array Group	Array Group	Arra
3:92		Free	Yes		AMS500@172.17.42.204	E204-3	1	
3:B1	Unknown	Used	Yes		AMS500@172.17.42.204	E204-1	1	
3:B2	Unknown	Used	Yes		AMS500@172.17.42.204	E204-1	1	
3:B3	Unknown	Used	Yes		AMS500@172.17.42.204	E204-1	1	
3:B4		Free	Yes		AMS500@172.17.42.204	E204-1	1	
3:B5		Free	Yes		AMS500@172.17.42.204	E204-1	1	
3:B6		Free	Yes		AMS500@172.17.42.204	E204-1	1	
3:B7		Free	Yes		AMS500@172.17.42.204	E204-1	1	
3:B8		Free	Yes		AMS500@172.17.42.204	E204-1	1	
3:B9		Free	Yes		AMS500@172.17.42.204	E204-1	1	
3:BA		Free	Yes		AMS500@172.17.42.204	E204-1	1	

Non-disruptively migrate data between tiers of storage

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Demote data down tiers as it ages. Also promote data up tiers of storage as its value to the business increases (e.g. promote data from external low cost disk to high performance USP disk for month end processing)



Hitachi Storage Management Software - Summary

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- Hitachi Data Systems is a bigger player in software than most people think; able to leverage Hitachi, Ltd. R&D breadth and depth
- The HiCommand® Storage Management strategy has enabled Hitachi Data Systems to take a leadership position in the storage management marketplace
- We believe that customers are looking for a staged approach to storage management automation:
 - Hardware manageability
 - Discovery and aggregation
 - Superior reporting and forecasting
 - Automated path, provisioning, performance, problem mgmt, with Utility model of management
- Our Application Optimized Storage™ approach manages storage from the application perspective
- Our strategy continues to be based on Open Standards (CIM/SMI-S), in a collaborative environment
- Complete world-wide solutions

