

Hitachi Storage Command Suite

Logical Groups and LDEV Labels

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Hitachi Data Systems *WebTech Series*

- **Hitachi Storage Command Suite—Device Manager Logical Groups and LDEV Labels Best Practices**

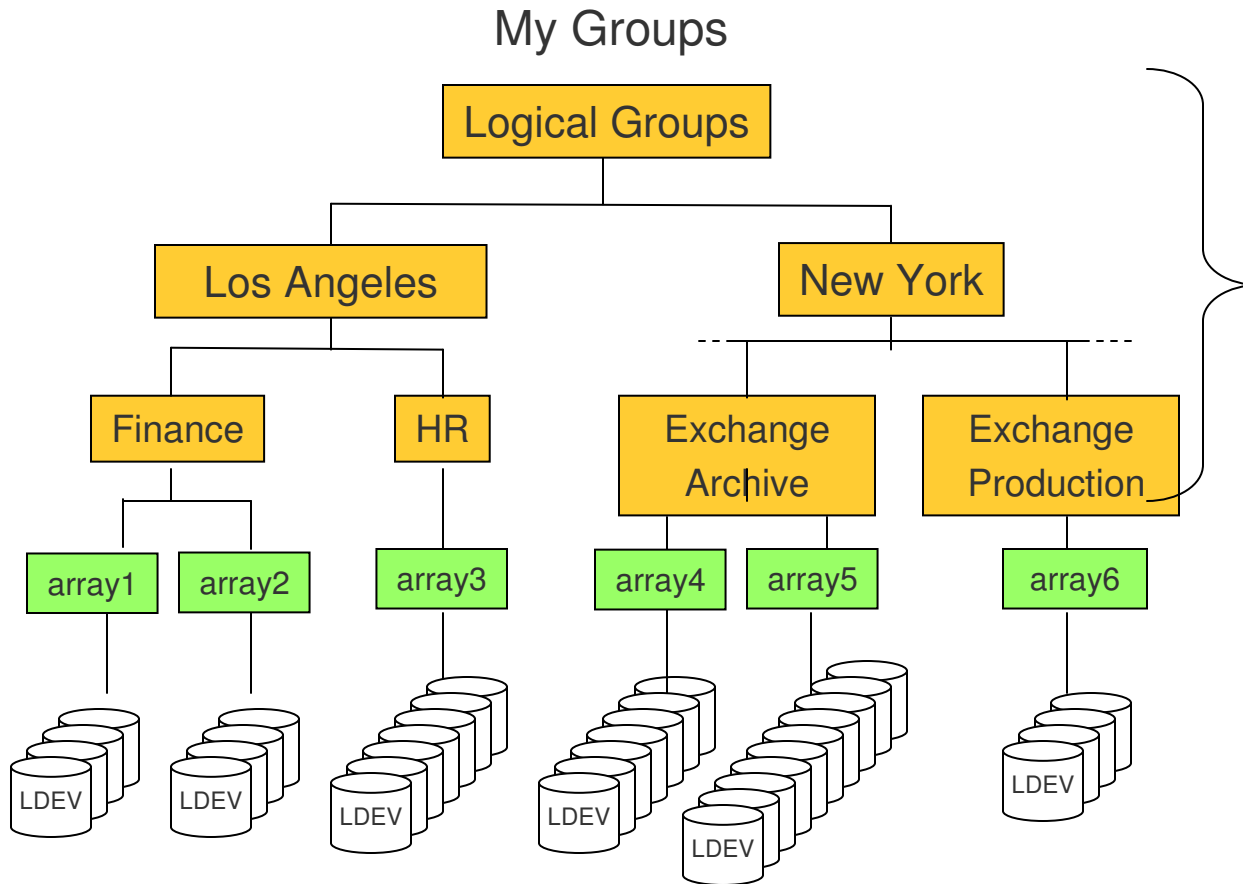
- Technical Session: This WebTech session introduces and outlines best practices for using two important features of the Hitachi Storage Command Suite: grouping and naming storage resources with meaningful labels using Logical Groups and Logical Device (LDEV) Labels. Logical Groups and LDEV Labels are shared among many of the products in the Hitachi Storage Command Suite and are one of the key integration points of the suite as a whole.
- You'll learn how to:
 - Explain what Logical Groups and LDEV Labels are and how they are used and leveraged by different products in the Hitachi Storage Command Suite
 - Use them to identify different types of used and available storage
 - Apply them to produce reports on storage asset utilization rates by individual application



- Introduction
 - Logical Groups and Storage Groups
 - Logical Device Labels
- General Considerations for Logical Group Names
- LDEV Labels
- Logical Group Best Practices
 - Device Manager Logical Group Layout
- Hitachi Storage Command Suite Usage Examples
 - Hitachi Tiered Storage Manager Migration using Logical Groups and LDEV Labels
 - Hitachi Replication Monitor Pair Create Using Logical Groups
 - Hitachi Tuning Manager Search Using LDEV Labels
- Summary

- Logical Groups and LDEV Labels provide the ability to group and name storage resources with meaningful logical path constructs and names.
 - A good analogy of the value of Logical Groups and LDEV Labels is to think about your file folders on your PC. If you were limited to only using numbers to name your file folders and files, it would be very difficult to organize and manage your files.
 - Logical Groups are analogous to file folders and LDEV labels are analogous to file names.
- Organizing your storage assets using a meaningful naming convention dramatically improves the efficiency and accuracy of your storage administration operations.

Logical Groups – Storage Groups – LDEVs



Hierarchy of meaningful, named groups with the lowest level representing a collection of LDEVs that may be managed by other Storage Mgmt features (replication, migration,...)

A **Storage Group** identifies the physical arrays that contains the LDEVs

A **Storage Group** cannot span two **Logical Groups**

What this looks like in Device Manager

The screenshot shows the Hitachi Device Manager web interface in Microsoft Internet Explorer. The browser address bar shows the URL: `http://172.17.250.58:23015 - Hitachi Device Manager - Microsoft Internet Explorer`.

The main content area is titled "Logical Groups" and displays a tree view on the left and a detailed view on the right.

Logical Groups Tree View:

- Logical Groups
 - LA
 - London
 - NY
 - Exchange_Archive
 - AMS 500@172.17.41.22
 - USP_V@172.17.41.74**
 - Exchange_Prod
 - File_Archive
 - HCAP
 - HNAS
 - SAP_Acct_Prod
 - SAP_HR_Prod
 - SAP_Payroll_Prod
 - VTL

Logical Group Details (USP_V@172.17.41.74):

- Name: USP_V@172.17.41.74
- Parent Group: /NY/Exchange_Archive
- Subsystem: Academy USP V
- Number of LUNs: 10

LUNs Table:

| Port Type | HSD/iSCSI Target | LUN | WWN/iSCSI Nickname |
|-----------|------------------|-----|--------------------|
| Fibre | emailarchive01 | 00 | |
| Fibre | emailarchive01 | 01 | |
| Fibre | emailarchive01 | 02 | |
| Fibre | emailarchive01 | 03 | |
| Fibre | emailarchive01 | 04 | |
| Fibre | emailarchive01 | 05 | |
| Fibre | emailarchive01 | 06 | |
| Fibre | emailarchive01 | 07 | |
| Fibre | emailarchive01 | 08 | |
| Fibre | emailarchive01 | 09 | |

Additional details visible in the interface include a capacity of 406.00 GB and a "Refresh Tree" button at the bottom left.

- Logical Groups and LDEV Labels are shared among many of the products in the Hitachi Storage Command Suite and are one of the key integration points of the suite
- When the Device Manager metadata attributes of Logical Groups and LDEV Labels are leveraged by other Hitachi Storage Command Suite components, these attributes allow the suite components improved efficiency of their features and functions.

General Considerations for Logical Group names

In naming logical groups consider the following:

- Develop a consistent strategy and convention for logical group naming covering all your storage.
 - Consider defining sub-fields within the string for sorting and search purposes.
 - Make them easily parsed and filterable because you will be sorting and filtering based on the name and fields within the name. Depending on whether you are going to use fixed or variable length strings, you might want to use a naming separation convention
- User friendly names
 - Because they should be meaningful to a human observer
- Also keep in mind the full set of use mean that you might be spanning more than one Hitachi Storage Command Suite component.
 - Think about sorting, filtering and selecting for provisioning and reporting from a cross component perspective.

- New with Hitachi Device Manager 6.0 a feature called LDEV Labels can be used to further identify the individual volumes that belong to each Logical Group.
- In addition to the higher level Logical Groups construct, Device Manager can associate an individual arbitrary string with each LDEV (allocated or unallocated).
- So by giving each LDEV a label, you in turn know what it is used for.
- An example of a naming convention is to have the label describe the relationship between the LDEV and its consumer, i.e. an application instance, filesystem, archive device, etc.
- LDEV labels coupled with logical groups can be used to explain how an LDEV is associated to an application.

- An LDEV Label can be up to 64 characters long and there are no restrictions on which characters can be used.
- It is important that they are meaningful to an administrator.
 - Hitachi best practice for LDEV Labels is to make the label application purpose or function descriptive as it relates to the logical group. Keep the name close to what the application administrator uses the storage for.

- Design the name to be logical in nature and not physically related, as the LDEV label metadata follows the LDEV during a volume migration.
 - Over time or as requirements and systems change, a volume might be migrated to a different HDD type or tier of storage – it is for this reason that you might not want to have the label reflecting a physical characteristic because it may require extra effort to reflect changes in its status.
 - On the other hand, if you don't migrate or don't mind re-labeling, then putting the tier in the label is fine.
- What about uniqueness? Should each LDEV label have a unique ID?
 - Recommendation is to not have unique LDEV label names for every LDEV, due to the number of potential LDEVs that require management

Example LDEV labels

- arcemail – e-mail archive vols
- arcfile - file archive vols
- arcimag - image archive vols
- systmvol - system vols
- oracldata - data vols
- oracltabl - db tablespace vols
- oracllog - db log vols
- sisvol – Hitachi ShadowImage® svols
- cowsvol – Hitachi Copy-on-Write svols
- hursvol - Hitachi Universal Replicator svols

What this looks like in Device Manager

The screenshot shows the Hitachi Device Manager web interface in Microsoft Internet Explorer. The browser address bar shows the URL: `http://172.17.250.58:23015 - Hitachi Device Manager - Microsoft Internet Explorer`. The interface includes a menu bar (File, Edit, View, Favorites, Tools, Help) and a toolbar with various utility icons. The main content area is titled "Hitachi Device Manager" and shows a navigation pane on the left with "Explorer" and "Dashboard" sections. The "Explorer" section displays a tree view of logical groups, with "Exchange_Archive" expanded to show "USP_V@172.17.41.74" selected. The main pane displays details for this group, including a table of LUNs.

Logical Group Details:

| | |
|----------------|----------------------|
| Name | USP_V@172.17.41.74 |
| Parent Group | /NY/Exchange_Archive |
| Subsystem | Academy USP V |
| Number of LUNs | 10 |

LUN Details Table:

| | LDEV | Label | Host |
|--------------------------|----------|-----------|---------------------------|
| <input type="checkbox"/> | 00:00:10 | arcemail | emailarchive01 : 10.00.00 |
| <input type="checkbox"/> | 00:00:11 | arcemail | emailarchive01 : 10.00.00 |
| <input type="checkbox"/> | 00:00:12 | arcemail | emailarchive01 : 10.00.00 |
| <input type="checkbox"/> | 00:00:13 | arcemail | emailarchive01 : 10.00.00 |
| <input type="checkbox"/> | 00:00:20 | arcemail | emailarchive01 : 10.00.00 |
| <input type="checkbox"/> | 00:00:21 | arcemail | emailarchive01 : 10.00.00 |
| <input type="checkbox"/> | 00:00:22 | arcemail | emailarchive01 : 10.00.00 |
| <input type="checkbox"/> | 00:00:23 | arcemail | emailarchive01 : 10.00.00 |
| <input type="checkbox"/> | 00:00:24 | systemvol | emailarchive01 : 10.00.00 |
| <input type="checkbox"/> | 00:00:25 | systemvol | emailarchive01 : 10.00.00 |

The interface also shows a "Dashboard" section with various monitoring widgets (HDvM, HPvM, HTvM, HGLM, HRpM, HTSM, HSSM) and a "Logged in as: system" status bar. The Windows taskbar at the bottom shows the Start button, several open applications, and the system tray with the time 8:23 PM.

- To start with, a default logical group called All Storage is built during initial configuration by the Add Subsystem function. The administrator can create his own logical structure reflecting names and subdivisions of storage meaningful to his administration tasks.
 - You can create your own logical hierarchy for storage groups, or use the group hierarchy created by the LUN Scan operations and reconfigure it as needed.
 - Think about which purpose/function distinctions make a difference in how the volume needs to be handled and segment along these lines.
 - Think about how you want to group or search on host storage groups?
 - What do you want to be able to report on? This is going to be especially important as logical groups and LDEV labels are leveraged by other existing and future Hitachi Storage Command Suite components

Logical Groups Example: Easier Storage Allocation

- Probably 70%-90% of all provisioning activities are repeat allocations (i.e. same host WWNs and ports/HSDs)
- The Device Manager Add Storage wizard ties into Logical Groups to provide consistency and efficiencies when choosing Host Storage Domains (HSDs), LUN Security, Controller ports during storage allocation.
- When allocating storage from the All Storage screens (by hitting the “Allocate Storage” button) the wizard is much more complicated than if you use “Add Storage” button from the Logical Groups screens.

Add like storage option

http://172.17.250.58:23015 - Add Storage - USP_V@172.17.41.74 - Microsoft Internet Explorer

HDvM

Add Storage - USP_V@172.17.41.74

i All the volumes contained in this storage group have the same LUN security and have LUNs with the same port. In such a case, you can use existing LUN security, or add storage to another port with the same LDEV and the same security.

Select one of the following storage addition operations.

Storage addition operations

- Storage is added with the same port and the same security. (only LDEV and LUN are specified)
- Storage is added to another port with the same LDEV and the same security. (only a port and LUN are specified)
- The usual storage addition. (all parameters are specified)

Done Internet

start | Inbox - Micr... | extra desktop | Logical Grou... | 3 Internet ... | EN | Desktop >> | 10:45 AM

Example: Used for finding and selecting Application LDEVs

- An example of how Hitachi Tiered Storage Manager would leverage Hitachi Device Manager logical groups and LDEV labels can be described as follows:
- Looking at this Device Manager screen you can see how the logical groups and LDEV labels are laid out.
 - If 1TB SATA drives are being introduced to an array and you need to migrate the set of e-mail archive volumes from 500GB SATA to the newly installed 1 TB HDDs, all that is required is to choose the Microsoft® Exchange_Archive logical group as the first filter, then for the second (ANDed) filter choose LDEVs that = arcemail.
 - In this scenario one wouldn't want to move the binaries of the email archive application that presently reside on the volumes with the "system" LDEV label designation.
- This is a simple way to find an appropriate set of exchange archive files for migration

Used for finding and selecting Application LDEVs

HTSM

Add Volumes

Volume Selection

Use this form to add volumes to the Migration Group. In the display of the search results select the volume(s) that show...

Filter Conditions

Edit preferred filter condition below.

Show entries matching
All of the conditions below:

| Attribute: | Value: |
|---------------|---|
| Logical Group | is NY/Exchange_Archive/USP_V@172.17.41.74 |
| Label | is arcemail |

Allow moving volumes from other Migration Groups.

Reset Search

Hitachi Replication Monitor Pair Create using Logical Groups

- With the introduction of Hitachi Replication Manager 6.0, the exact same Device Manager Logical Group (by business application) can be leveraged when selecting an application set of PVOLs while using the new pair create wizard.
- This ability to easily identify and select volumes using the Logical Group filter allows you to quickly create in-system or remote pairs of application volumes.
- This illustrates the powerful metadata repository integration within the Hitachi Storage Command Suite

Used for Replication pair creation

The screenshot displays the Hitachi HRpM Pair Configuration Wizard in Microsoft Internet Explorer. The browser address bar shows the URL: `http://172.17.250.58:23015 - Pair Configuration Wizard - Microsoft Internet Explorer`. The page title is "HRpM - Pair Configuration Wizard".

The navigation bar indicates the current step: **2. Pair Association**, with other steps being 1. Introduction, 3. Group Management, 4. Task Management, 5. Confirm, and 6. Finish.

Below the navigation bar, there is a message: "Add new pair group or modify existing pair group (copy group). If you want to save the settings as workflow, click 'Save' before clicking 'Cancel'."

The main content area is titled "Copy Topology" and shows a diagram of a replication pair labeled "NY_email_archive_ur_LA" with a "UR" (Unidirectional Replication) label below it. To the right of the diagram are "Add Group" and "Delete Group" buttons.

The "Detail of NY_email_archive_ur_LA" section is divided into two main panels:

- Pair List:** Includes a "Filter By:" section with "Volume Type" set to "Primary" and "Resource" and "Selection" dropdowns. Below is a table of pairs:

| Port/HSD/LUN | Subsystem | Capacity | Logical Group | L |
|---|----------------------------|-----------|--------------------|---|
| <input checked="" type="checkbox"/> CL3-A/emailarchive01/00 | USP_V@172.17.41.74 (10071) | 100.00 GB | USP_V@172.17.41.74 | a |

- Volume Selection:** Includes a "Select Volume:" section with "Type" set to "Primary". Below is a "Filter By:" section with "Site" set to "NY", "Host Name" set to "emailarchive01", "Subsystem" set to "USP_V@172.17.41.74 (10071)", and "Logical Group" set to "USP_V@172.17.41.74". A "Candidates:" list shows several options, all checked:

- HSD: emailarchive01
- CL3-A/emailarchive01/01::100.00 GB 0:11
- CL3-A/emailarchive01/02::100.00 GB 0:12
- CL3-A/emailarchive01/03::100.00 GB 0:13
- CL3-A/emailarchive01/05::1.00 GB 0:21

The Windows taskbar at the bottom shows the start button, several open applications (Adobe, Microsoft, Internet Explorer), and the system tray with the time 8:21 PM.

Used to zero in on performance problems

- Hitachi Tuning Manager search using LDEV Labels
- You can use LDEV Labels as filters in Tuning Manager as well. In this example you are responding to a complaint about a slow database and want to examine the performance of your database log files. The LDEV Label naming scheme makes this easy.
- Note, Tuning Manager does not yet support Logical Groups, but that is a planned future enhancement.

Used to zero in on performance problems



- Use of Logical Groups and LDEV Labels provide an enhanced organizational aspect to managing LDEVs by meaningful names and it makes provisioning and reporting easier.
 - For example, by defining Logical Groups according to how a company runs its business (by department and application) it simplifies application mobility as it relates to in-system and remote replication (Hitachi Replication Manager) and data migration between tiers (Hitachi Tiered Storage Manager).
 - This is because the same Hitachi Device Manager logical group and LDEV label filters can be used as selection criterion by Hitachi Tiered Storage Manager to build migration groups or by Hitachi Replication Manager to build an application set of PVOLs in order to form a copy group
 - Applying LDEV Labels can further identify the individual volumes that belong to each Logical Group. The combination of using Logical Groups and LDEV labels enables administrative scalability to manage more storage with the same amount of resources – and reduce the risk of manual error

- **White Papers and Manuals**

- Hitachi Device Manager Web Client Users Guide (product manual)
- Logical Groups and LDEV Labels whitepaper (est. avail: Sept-Oct)

- **Hitachi Data Systems Global Solution (GSS) Services**

- Implementation Service for Hitachi Device Manager Software. The service provides assistance with initial project planning, software installation and configuration tasks, and knowledge transfer so customers can roll out the software's capabilities and use Device Manager software more effectively to manage their enterprise storage environments.
- Note: This service is delivered remotely. An onsite version is available at additional cost. Please contact your local GSS representative to determine which option is best for your specific requirements.

- **Academy**

- TSC1465 - Introduction to Storage Management with Hitachi Device Manager Software**

- This two hour web-based training course provides Storage Administrators an overview of basic storage management benefits of Hitachi Device Manager software. In addition, it describes how Device Manager integrates with other storage management solutions.

- TSI1360 - Managing Hitachi Storage Systems with Device Manager Software**

- This three day instructor-led training course provides the fundamentals of Hitachi Device Manager. The course trains participants in standard workflow techniques for successfully managing storage with Device Manager and includes extensive lab exercises with hands on training on Hitachi Data Systems enterprise and modular storage systems. In addition to addressing the configuration, administration, operations, and management of storage with Device Manager, a special focus is placed on best practices. Pair Volume Operations, Command Line Interface (CLI), and external storage. Maintenance and troubleshooting functions are discussed.

- GCI0975 - Hitachi Device Manager Quickstart Training**

- This one day workshop explains the four phases of the Device Manager Software Quick Start Service methodology and allows the student to apply new skills in a simulated customer engagement. This workshop is designed for Hitachi Data Systems Global Solution Services (GSS) consultants and Certified Solution Provider (CSP) partners to successfully deliver the Device Manager Quick Start Service in the customer's environment.

- TSE0507 - Hitachi Device Manager Software Differences**

- This five hour virtual instructor-led course provides an overview of the enhanced usability and new features of Hitachi Device Manager software versions 5.8, 5.9 and 6.0. Hitachi Services Oriented Storage Solution(s) and Tiered Storage strategies will also be described. In addition, Hitachi Dynamic Provisioning, Storage Navigator, API/CLI and SMI-S enhancements will be discussed.

- *Upcoming sessions*
 - *September 17, 2008, 9am PT*
Heterogeneous Storage Capacity Reporting and Planning
 - *September 24, 2008, 9am PT*
Upgrading from Hitachi Storage Navigator to Hitachi Device Manager
 - *October 1, 2008, 9am PT*
How Hitachi Replication Maximizes a VMware Site Recovery Manager Deployment
 - *October 8, 2008, 9am PT*
Creating Real Time Alerts in Hitachi Tuning Manager 6.0
 - *October 15, 2008, 9am PT*
Mainframe Storage Virtualization: Making Modular Storage Useful to z/OS
- *Please check www.hds.com/webtech for:*
 - *Link to the recording, the presentation, and Q&As (available next week)*
 - *Schedule and registration for upcoming WebTech sessions*

Questions/Discussion

Thank You