

Hitachi Disaster Recovery Solution

V6.0.0

User Guide

Guide to HDRS User Interface, common operations and commands

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Preface

About this document

This document describes HDRS User Interface and the most common HDRS commands and tasks used for day-to-day operations without requiring the assistance of technical support.

Document conventions

This document uses the following typographic convention:

Convention	Description
Bold	<ul style="list-style-type: none">Indicates text in a window, including window titles, menus, menu options, buttons, fields, and labels. Example: Click OK.Indicates emphasized words in list items.
<i>Italic</i>	Indicates a document title or emphasized words in text.
Monospace	Indicates text that is displayed on screen or entered by the user. Example: <code>pairdisplay -g oradb</code>

Intended audience

This document is intended for customers and Hitachi Vantara partners who license and use HNAS 5000 series, Hitachi storage systems and Hitachi Disaster Recovery Solution (HDRS)

Accessing product downloads

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Log in and select Product Downloads to access the most current downloads, including updates that may have been made after the release of the product.

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Getting Help

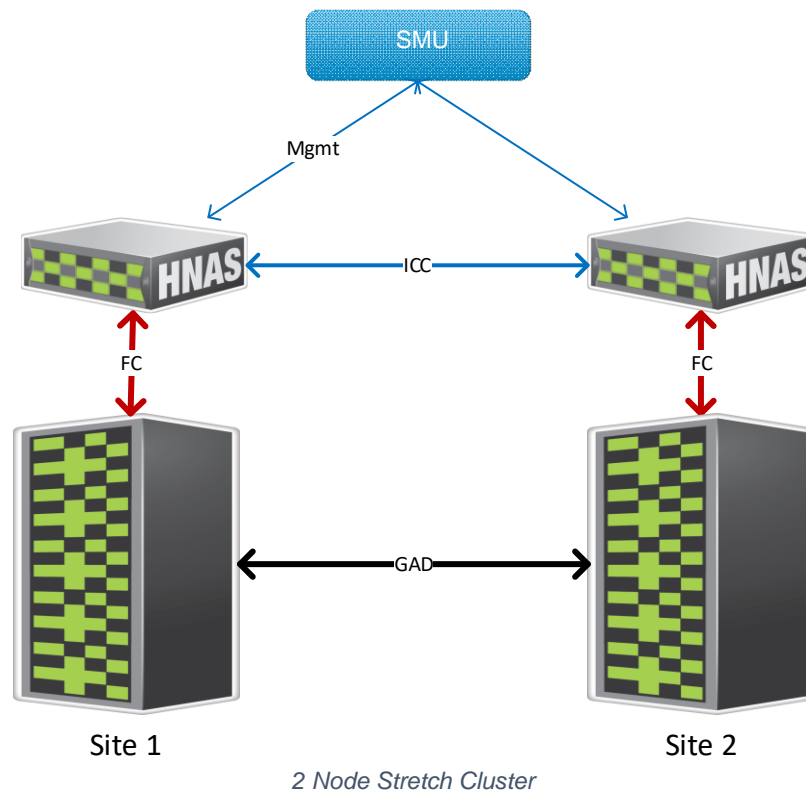
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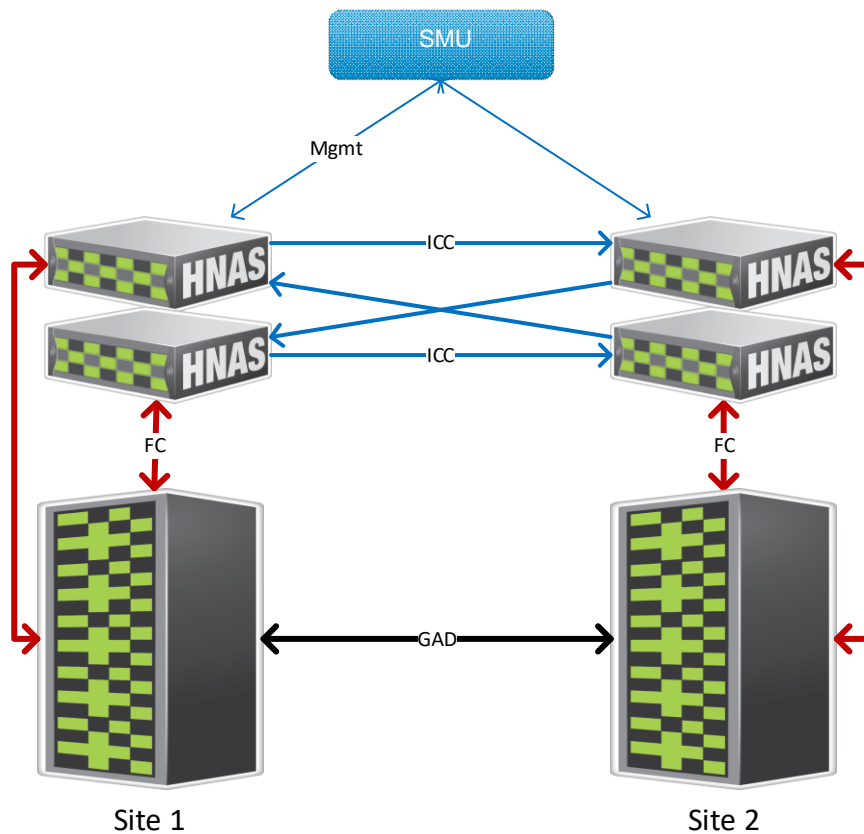
Chapter 1: HNAS Stretch Cluster Fundamentals

Hitachi Disaster Recovery Solution (HDRS) provides a way to simplify the deployment and maintenance of HNAS 2 node and 4 node clusters attached to Hitachi storage replicating using Global Active Device technology (GAD) across 2 sites. This solution also significantly improves disaster readiness and eases recovery process.

A **Stretch Cluster** consists of two or more HNAS nodes spread across 2 separate sites, with each site having its own storage array. The data between the storage arrays is replicated using **Global Active Device** technology, or **GAD**, while the HNAS nodes replicate their nvram contents to each other using *InterCluster Connect (ICC) communications*. This minimizes the chances of data loss in a variety of failure scenarios, including a full site failure.



HDRS supports 2-node and 4-node stretch clusters. The product name for the 4-node solution is **GAD Enhanced for NAS (GEfN)**.



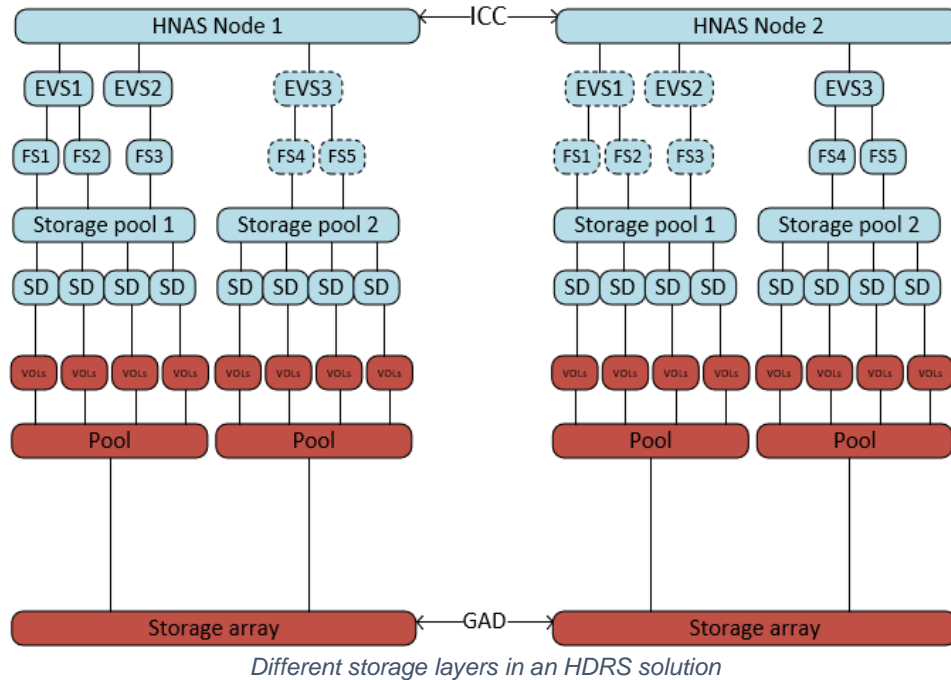
4 Node HNAS Stretched Cluster GEfN solution

A 2-node *Stretch Cluster* is always site resilient as long as one node and one storage array is placed at each site. In other words, the cluster can sustain a full site failure without data loss. A standard 4-node is however not by default site-resilient. A *GEfN cluster* is a 4-node cluster that has been configured for site resiliency.

HNAS InterClusterConnect (ICC) is a private 10Gb ethernet network used by the HNAS cluster to replicate the nvram contents between the nodes.

Global Active Device (GAD) is used by the storage arrays to replicate the contents of the storage pools hosted by the arrays, using either fiber-channel or iSCSI

Another way to look at it is how the solution components interact at different levels. The replication happens at two levels: at the higher level HNAS nodes replicate using ICC, and at the lower level the storage arrays replicate using GAD.



All components are active/active in any node and storage array. The exception is the EVS and filesystem, that can only be active in one location and node at a time. However, in the case of a component failure the EVS and filesystem will have a standby copy in a different node ready to activate and be mounted as needed in a very short timeframe (usually under a minute). This makes the solution zero RPO (recovery point objective) and minimal RTO (recovery time objective).

Although it is possible to have multiple EVS's mount filesystems on the same storage pool across sites, this is not recommended as it could lead to the underlying storage being blocked at one of the sites in certain failure scenarios and the filesystem being unable to mount.

Chapter 2: HDRS User interface Basics

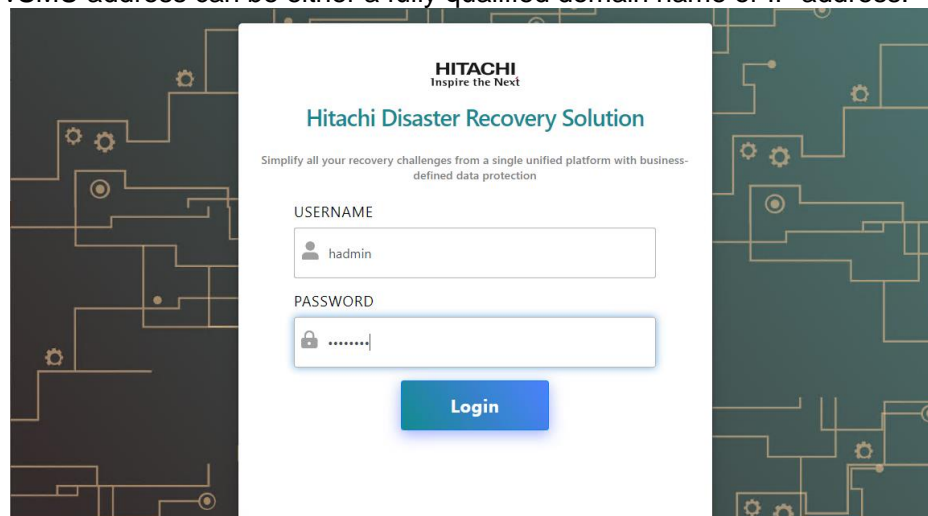
Login to the HDRS User Interface

Admin is the default user to manage HDRS configuration and operations. This is by default created during HDRS installation, and the password configured by the person doing the installation. This account is independent of any other accounts used by the HNAS Stretched Cluster or GEfN solution, including the vSMU. For more information, please refer to the Hitachi Disaster Recovery Solution 6.0 Implementation Guide.

1. In your web browser, enter the URL as follows:

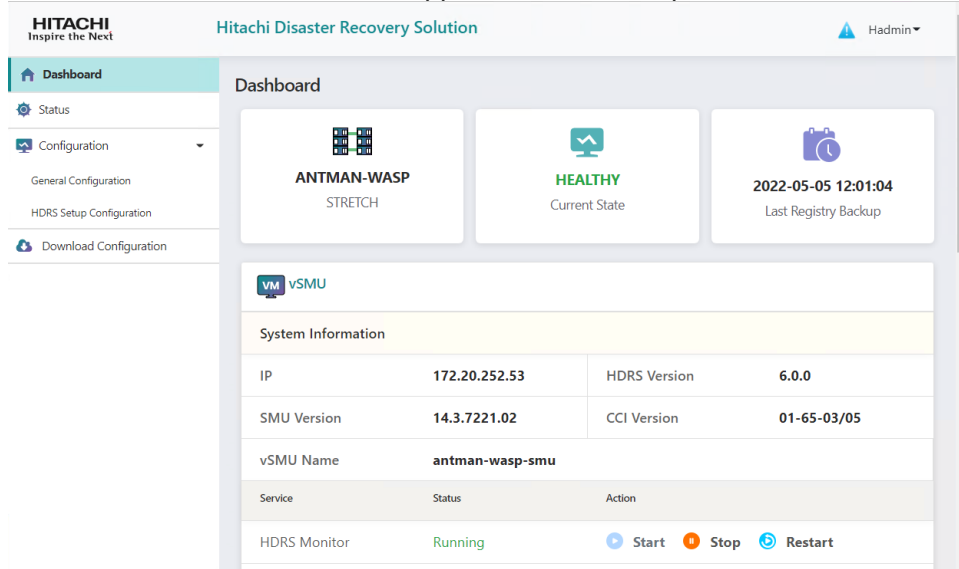
Error! Hyperlink reference not valid. `_address>/hdrs`

vSMU address can be either a fully qualified domain name or IP address.



2. Enter the username as **hadmin**
3. Enter the **hadmin** credentials. Credentials are generated at the time of installation.
4. Click on **Login**.

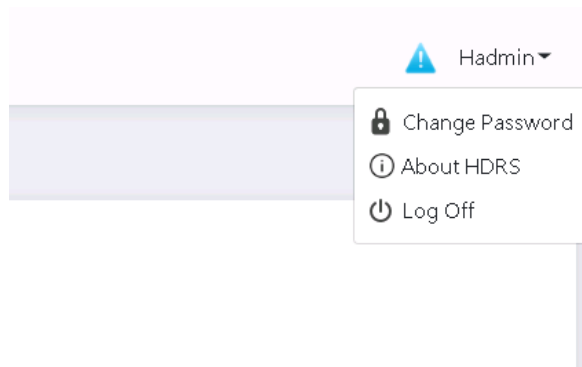
The main HDRS UI Window will appear as in the sample screen below:



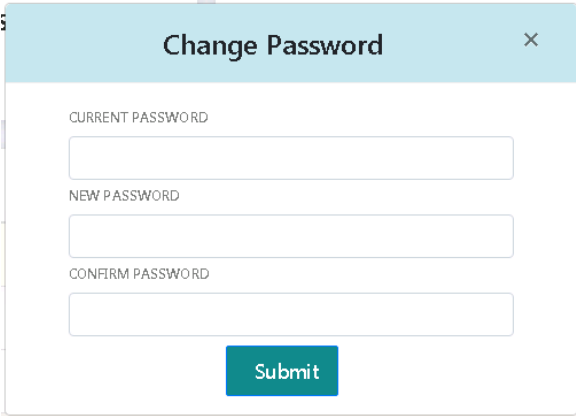
Changing the Hadmin Password

The Hadmin password affects only the UI that is used to log in to HDRS UI. It is not to be confused with the HDRS user account that it uses to log in to the storage and NAS components. The procedure for changing this password is described in HDRS Setup Configuration section.

1. Click on the **Hadmin** username displayed on right top corner. This will show a drop-down menu.
2. Select the option Change Password as shown in following image.



3. The **Change Password** pop up window will appear on screen. Enter *Current Password*, *New Password*, *Confirm Password*, and click Submit.

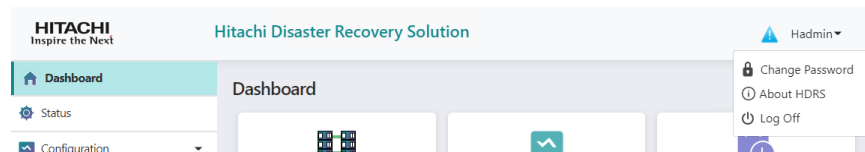


The image shows a 'Change Password' pop-up window. It has a light blue header with the title 'Change Password' and a close button (X). Below the header are three text input fields labeled 'CURRENT PASSWORD', 'NEW PASSWORD', and 'CONFIRM PASSWORD'. At the bottom center of the form is a teal 'Submit' button.

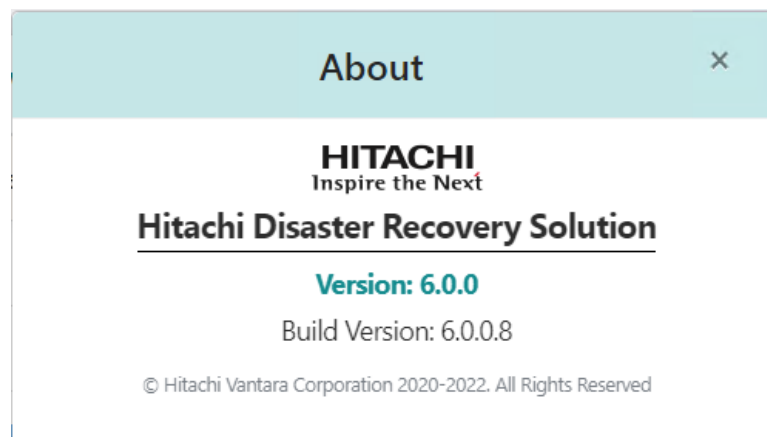
4. Once submitted the password will be changed.
5. The login screen will reappear. Enter the new credentials.

Viewing the HDRS Version

1. Click on the **Hadmin** username displayed on right top corner. A drop-down menu will appear.
2. Select the option About HDRS as shown in following image.

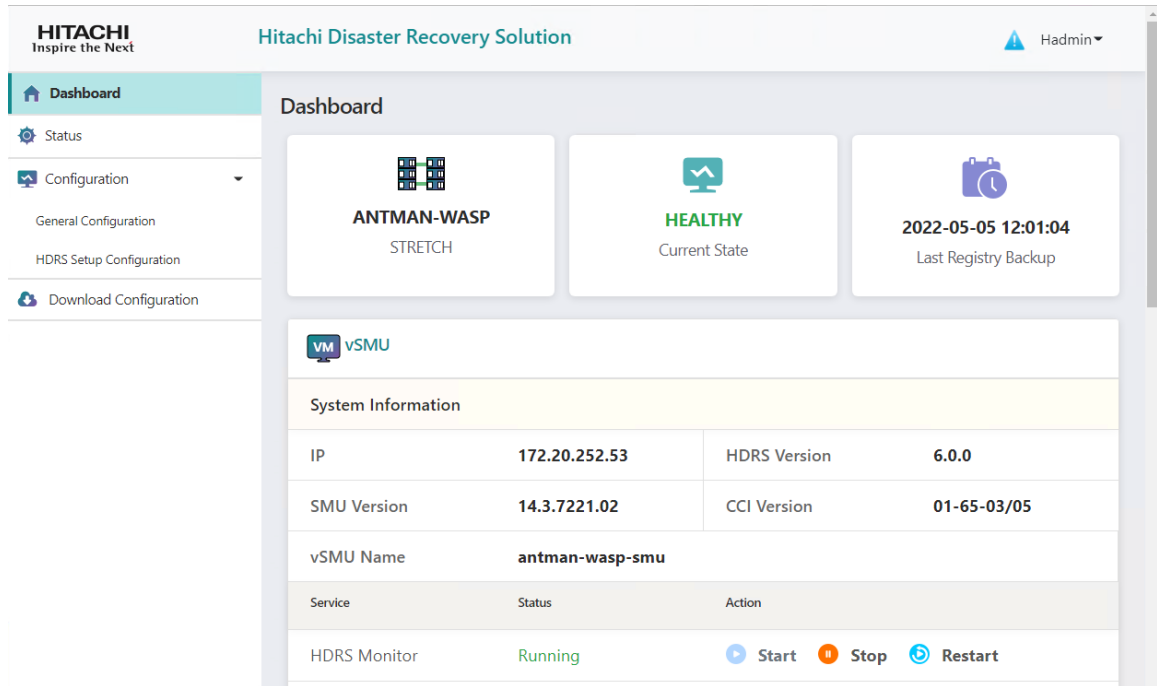


3. The About HDRS popup window will display the version, build, and owner information.



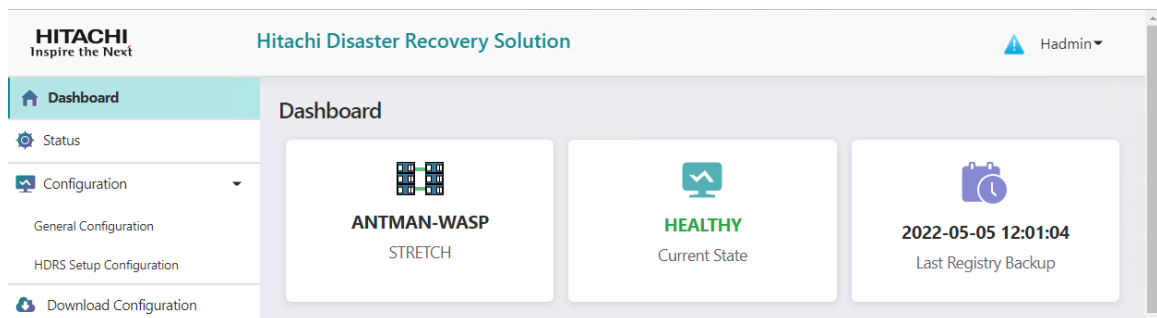
Chapter 3: Dashboard

Upon successful login, the dashboard page appears. The dashboard page provides the health and system configuration information. Each of the section interface is described in this section.



The information is reflected based on the last time the status was refreshed by the **hdrsmonitor** based on the *sleeptime* parameter as defined in the General Configuration. See the **Status Page** section for more information.

Dashboard Header



HNAS Cluster

The HNAS Cluster area in the left-most part of the column displays the HNAS Cluster name (*ANTMAN-WASP* in this example) and the configuration type that has been deployed. There are two supported types: **STRETCH** and **STRETCH-iSCSI**.

Stretch refers to a deployment where storage replication is done using fiber-channel, while *Stretch-iSCSI* refers to a deployment where it uses iSCSI for replication.

Each of these configurations are defined and described in the **HDRS Implementation Guide**.

Current State

This area in the middle of the dashboard indicates the current health of the HDRS system based on the last status collected. The states reflected under this block are:

Status	Possible Conditions
Healthy	All systems are in a healthy state.
Critical	Both site systems are down or no longer accessible. Replication between the sites is down
Severe	Either of the sites has issues, such as array communication lost in one direction, quorum device path blocked issue, etc.
Warning	A warning condition exists in the solution. It is still functional but it requires attention:
Not Defined	The health status has not yet been collected. This could happen if storage has not been provisioned yet, or if Hstatus has not run.

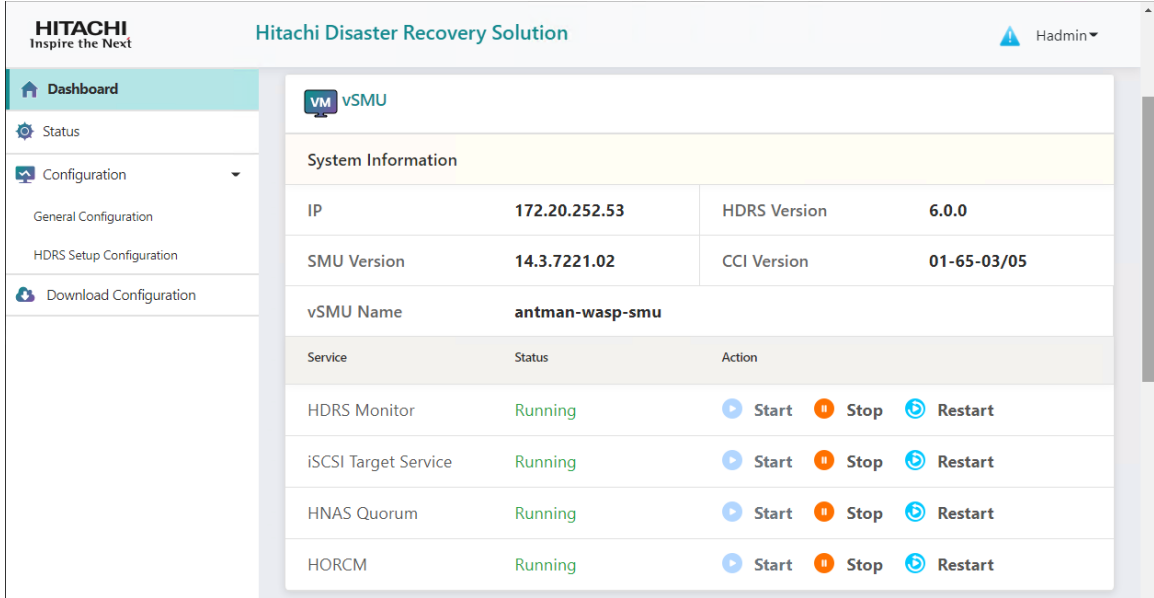
After an installation, if storage has been provisioned and state still shows as Not Defined, please execute Hstatus on the vSMU CLI or go to Status -> Refresh in the UI in order to collect the information and update the state.

Last Registry Backup

This area indicates the time when the NAS registry was backed up by the HDRS system. The registry backup is located in the `/home/manager/conf` directory with the convention `registry-<cluster-name>.tgz`.

vSMU Section

The Dashboard vSMU (Virtual Storage Management Unit) section displays its System and HDRS software related information.



The vSMU section of the Dashboard displays the following sub-sections: System Information and HDRS Related Services.

System Information

- IP address of vSMU.
- SMU Software Version.
- vSMU Name.
- HDRS software version.
- Command Control Interface (CCI) Version used by HDRS.

Services

This section of the dashboard shows the status of important services that both HDRS and vSMU supports, and allows to start, stop, and restart the following services:

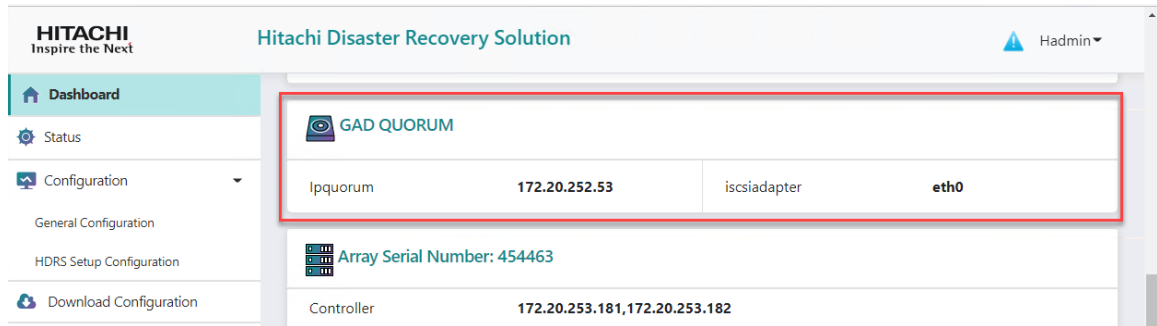
- **HDRS Monitor.** Periodically monitors the arrays and HNAS systems, collects information, and corrects conditions if appropriate and necessary.
- **iSCSI Target Service.** Service that provides iSCSI target used by the primary and peer arrays for quorum. If the solution uses a physical array for quorum instead, it will appear as Stopped as in this example.
- **HNAS Quorum.** Used by GEfN clusters to make decisions about which nodes should remain up in case of a partial failure and preserve integrity. Note this

does not apply to dual cluster deployments, since each cluster uses its own internal quorum.

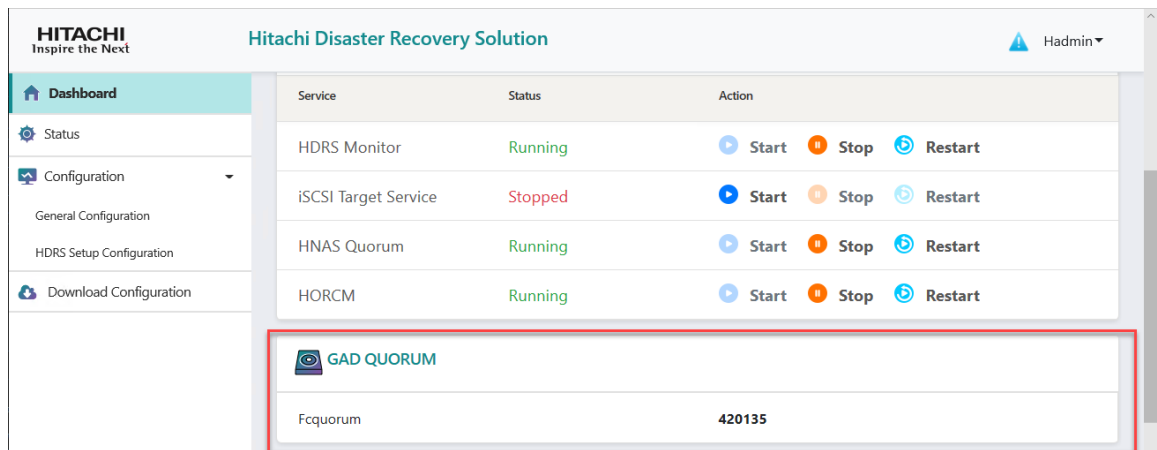
- **HORCM Service.** Facilitates interfacing with the storage components for HDRS functionality.

GAD Quorum Section

The Dashboard GAD quorum section displays the current GAD storage quorum information. The leftmost column displays the quorum type. If the Quorum is hosted by the vSMU itself then this field displays as **Ipquorum** with the IP address of the vSMU. If it's hosted by a supported Hitachi storage device then it will display as **Fcquorum** with the storage serial number on which the Quorum is hosted along with the necessary storage information.



Example of iSCSI quorum hosted by vSMU



Example of Fiber-channel quorum

The Following are the relevant fields that will be displayed in the Dashboard's GAD Quorum Section:

Field	Description
Ipquorum	Applies to iSCSI quorums. This value can be <serial> or <ip_address>:

	Serial number if it's an external iSCSI quorum storage system IP address of the vSMU if using the HDRS provided iSCSI quorums
Fcquorum	Serial number of the external storage system providing quorum devices. This value is displayed only if HDRS is configured with a quorum device on FC.
iscsiadapter1	If iSCSI quorum is provided by the vSMU, describes the vSMU interface where the storage arrays reach the iSCSI targets for GAD quorum.

Array Section

The Dashboard Array section displays information about each of the array on storage instances, both primary and secondary as defined in the *hdrs.cfg* file, as well as the HNAS Nodes that are local to each site. It also provides useful information about the NAS EVS's that are currently present in each node. If any EVS' are migrated from one site to other, the information will be updated accordingly.

The first screenshot is for a 4-node GEfN. Note that there are two HNAS nodes for each array/site.

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Hitachi Disaster Recovery Solution

Admin

Dashboard

- Status
- Configuration
 - General Configuration
 - HDRS Setup Configuration
 - Download Configuration

Array Serial Number: 453921		
SVP	172.20.252.205	
Controller	172.20.250.11,172.20.250.12	
Microcode Version	88-08-04/00	
Array Status	Active	
Node	(1) hnas5k-1	(2) hnas5k-2
Node IP	172.20.250.31	172.20.250.32
Model	HNAS 5200	HNAS 5200
NAS Firmware version	14.3.7218.00	14.3.7218.00
Node status	Online	Online
EVS Id	1	2

Array Serial Number: 453946		
SVP	172.20.252.206	
Controller	172.20.250.13,172.20.250.14	
Microcode Version	88-08-04/00	
Array Status	Active	
Node	(3) hnas5k-3	(4) hnas5k-4
Node IP	172.20.250.33	172.20.250.34

Dashboard array section sample for 4-node GEfN

The 2nd screenshot is a sample for a 2-node stretch cluster. Note that there is only one HNAS node per site.

The screenshot displays the Hitachi Disaster Recovery Solution dashboard. On the left is a navigation menu with 'Dashboard' selected. The main content area shows two array configuration cards. The first card is for Array Serial Number 454463, showing controller IP addresses (172.20.253.181, 172.20.253.182), microcode version (88-08-04/00), active status, and one node (ANTMAN-WASP-1) with IP 172.20.253.191. The second card is for Array Serial Number 454268, showing controller IP addresses (172.20.253.183, 172.20.253.184), microcode version (88-08-04/00), active status, and two nodes (ANTMAN-WASP-2) with IP 172.20.253.192. Both arrays are HNAS 5300 models with NAS Firmware version 14.3.7221.02.

Dashboard array section example for a 2-node stretch cluster

Following are the relevant fields that will be displayed in the Dashboard Array section:

Field	Description
Array specific:	
SVP	IP address of the array Service Processor (SVP), if applicable. Note that this will not appear in a VSP e590 or VSP-e790 deployment.
Controller	IP addresses of the controller on the array, if applicable. Note that this will not appear in a VSP-5000 deployment.
Microcode Version	Current microcode version of the storage array.
Array Status	Status of the array (<i>Active, Inactive, Down</i>). Active: array is functional and there are some EVS's in the local nodes Inactive: array is functional, however there are no active EVS's in the local nodes. Down: array is down or unreachable

Field	Description
HNAS Node specific:	
Node	HNAS nodes that is local to the array. All the properties along this column below are pertinent to this node. There will be two nodes per array in a GEfN, and only one node per array in a 2-node stretch.
Node IP	IP address of the HNAS node
Model	HNAS Model
NAS Firmware version	HNAS firmware version
Node status	Status of the HNAS node. Can be Online or Offline Offline usually means that the node is down or unreachable
EVS Id	ID's of all the EVS's that are currently in this node.

Pools Section

The Dashboard Pools section provides information about the all the storage pools are available on the storage instances and are protected by HDRS.

Pool Name	Status (Node 182)	Status (Node 384)	Array Serial Number	% Freespace	Capacity	Used
GAD-primary-1	Healthy	Healthy	453921	74%	8 TiB	2 TiB
GAD-secondary-1	Healthy	Healthy	453946	74%	8 TiB	2 TiB

Pools example for GEfN

Pool Name	Status (Node 1)	Status (Node 2)	Array Serial Number	% Freespace	Capacity	Used
GAD-primary-1	Healthy	Healthy	454463	100%	32 TiB	0 GiB
GAD-secondary-1	Healthy	Healthy	454268	100%	32 TiB	0 GiB

Each pool column provides the following information:

Field	Description
Pool Name	Name of the pool. Note that if the name does not fit in the column the full name will appear when hovering the cursor over.
Status (Node 1&2)	Status of the pool as viewed from the Primary site cluster nodes (1 and 2). Can be <i>Healthy</i> , <i>Un-healthy</i> , <i>Severe</i> . In a 2-node stretch this will display as Status (Node 1).
Status (Node 3&4)	Status of the pool as viewed from the Secondary site cluster nodes (3 and 4). In a 2-node stretch this will display as Status (Node 2)..
Array Serial Number	Serial Number of Array on which the pool is primary (P-Vol)
% Freespace	Available free space on storage pool, in percentage.
Capacity	Total capacity of the storage pool.
Used	Used space on the storage pool.

File Systems Section

The Dashboard File Systems section provides details about all the file system which are online and available on the storage environment.

The screenshot shows the 'FILE Systems' section of the dashboard. It contains a table with the following data:

File System Name	Pool Name	Status	Evs	Node	Capacity	Used Space	Size	Block Size
fs01	GAD-prima...	Mount	1	1	1 TiB	4.463 GB	1024 GB	32 KB
fs02	GAD-prima...	Mount	2	2	1 TiB	4.463 GB	1024 GB	32 KB
fs03	GAD-secon...	Mount	3	3	1 TiB	4.463 GB	1024 GB	32 KB
fs04	GAD-secon...	Mount	4	4	1 TiB	4.462 GB	1024 GB	32 KB

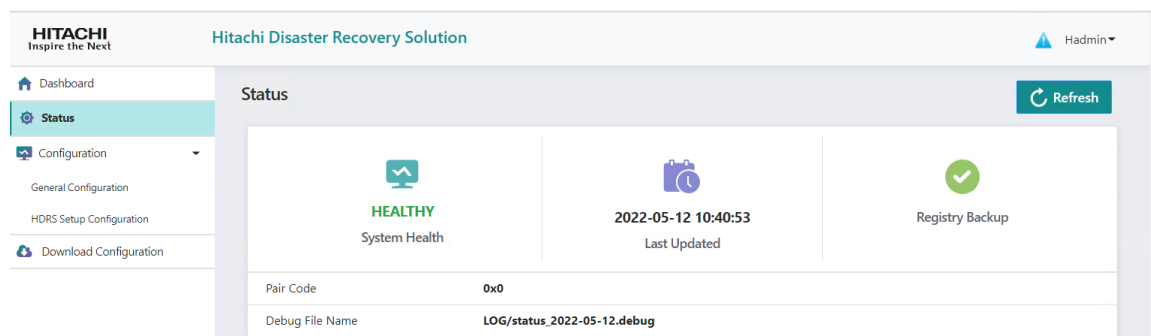
Each file system column will provide the following information:

Field	Description
File System Name	Name of the file system
Pool Name	Name of the storage pool where the file system is located
Status	Status of the file system. Some statuses are: <i>Mounted</i> and <i>Unmounted</i>
EVS	EVS associated with the file system
Node	Physical node where the EVS resides and hence the file system is mounted.
Capacity	Capacity of the file system
Used Space	Space currently utilized in the file system.
Size	Total file system size.
Block Size	File system block size – 4KB or 32KB

Chapter 4: Status Page

The Status page displays the equivalent of the CLI **Hstatus** command output of the replication environment for both sites and the HNAS configuration, reporting any issues it finds.

This section does not provide ways to perform any corrective actions but will display information on issues it identifies.



In order to get the latest information, click on the **Refresh** button. This could take several minutes to complete. Otherwise this reflects the last time the hdrs monitor process ran. The frequency of this update is controlled by the **Sleeptime** setting in the **General Configuration** (every 30 minutes by default).

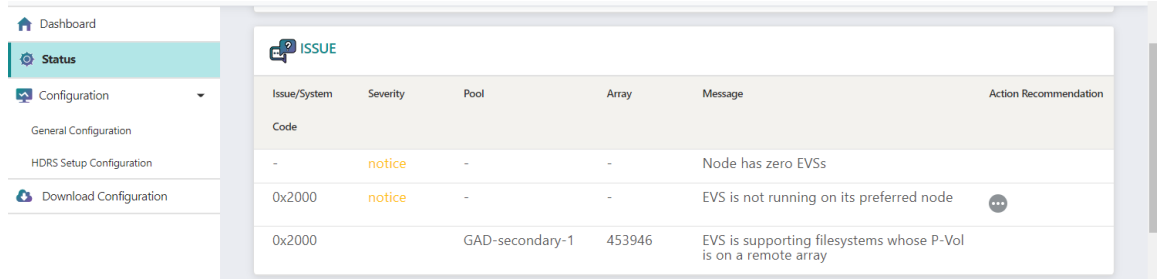
Status Header

The **Status Header** provides the following information:

Field	Description
System Health	Ranging from <i>healthy, normal, warning, severe, and critical</i> based on the severity associated with the most severe system-code
Last Updated	The last time that the status was collected
Registry Backup	If a registry backup was successfully made.
Pair Code	Issue codes related to all pools in the cluster. These are defined in the <i>Pair Status Codes</i> Appendix section of the <i>HDRS Reference Guide</i> . During normal operation value will be 0x0.
Debug File Name	The path location of latest Hstatus command debug file that is responsible for the data displayed in this screen. Path is relative to the /home/manager vSMU directory.

Issues Section

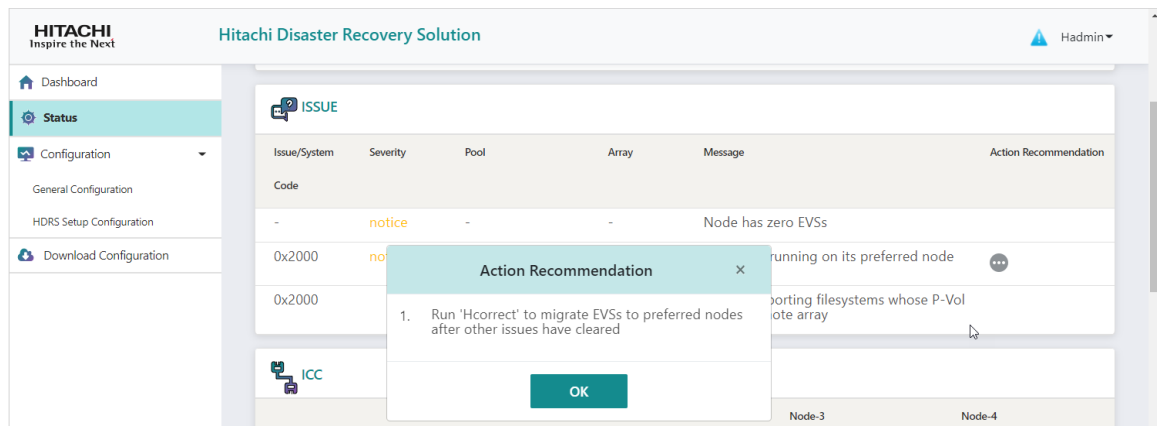
This section shows all system issues detected by the HDRS monitor. Here's an example of an HDRS deployment with multiple issues:



For each issue detected, the following information will be displayed:

Field	Description
Issue/System Code	The issue system code.
Severity	Severity of the issue, if it's HNAS related.
Pool	Name of the HNAS span/pool affected, if applicable
Array	Array serial number, if applicable
Message	Issue description
Action Recommendation	Message containing recommended course of action, if one is available.

You can click on the **Action Recommendation** icon  (if one appears) to display the suggested recommended action.



ICC Section

	Node-1	Node-2	Node-3	Node-4
Node-1	-NA-	✓ OK	✓ OK	✓ OK
Node-2	✓ OK	-NA-	✓ OK	✓ OK
Node-3	✓ OK	✓ OK	-NA-	✓ OK
Node-4	✓ OK	✓ OK	✓ OK	-NA-

Sample ICC Status for GEfN

	Node-1	Node-2
Node-1	-NA-	✓ OK
Node-2	✓ OK	-NA-

Sample ICC Status for 2-node stretch

This section will display the status of the inter-cluster connect links (ICC) and identify any issues that could impact important HNAS cluster functions such as NVRAM mirroring and heartbeat between the nodes.

Here's an example with some ICC issues, more than likely originating in Node 1.

	Node-1	Node-2	Node-3	Node-4
Node-1	-NA-	✗ FAIL	✗ FAIL	✗ FAIL
Node-2	✗ FAIL	-NA-	✓ OK	✓ OK
Node-3	✗ FAIL	✓ OK	-NA-	✓ OK
Node-4	✗ FAIL	✓ OK	✓ OK	-NA-

Pools Section

Pool: GAD-primary-1			
Available	Yes	Health Code	0x0
Home Nodes	hnas5k-1,hnas5k-2	Storage Nodes	hnas5k-1,hnas5k-2
Pair State	healthy	Pool	GAD-primary-1
Array		Array	
Name	453921		453946
Pair Role	Primary		Secondary
Pool Available	True		True
NAS System Drive Access	Allowed		Allowed
NAS System Drive Status	OK		OK
EVS	1 2		4 3
iomode	L/M		L/M
State	PAIR		PAIR

Pool section sample for GEfN

Pool: GAD-PRIMARY-1			
Available	Yes	Health Code	0x0
Home Nodes	ANTMAN-WASP-1	Storage Nodes	ANTMAN-WASP-1
Pair State	healthy	Pool	GAD-PRIMARY-1
Array		Array	
Name	454463		454268
Pair Role	Primary		Secondary
Pool Available	True		True
NAS System Drive Access	Allowed		Allowed
NAS System Drive Status	OK		OK
EVS	1 2		4 3
iomode	L/M		L/M
State	PAIR		PAIR

Pool section sample for 2-Node Stretch

The pool section will display detailed information about each of the pools associated with the system.

For each *pool*, the following global information will be displayed in the header:

Field	Description
Available	Indicates if pool is available on the cluster
Health Code	Indicate the issue flags in the pool (healthy = 0x0)
Home Nodes	The HNAS Nodes local to the array that maintains the Primary (or writeable) replication copy under normal operation

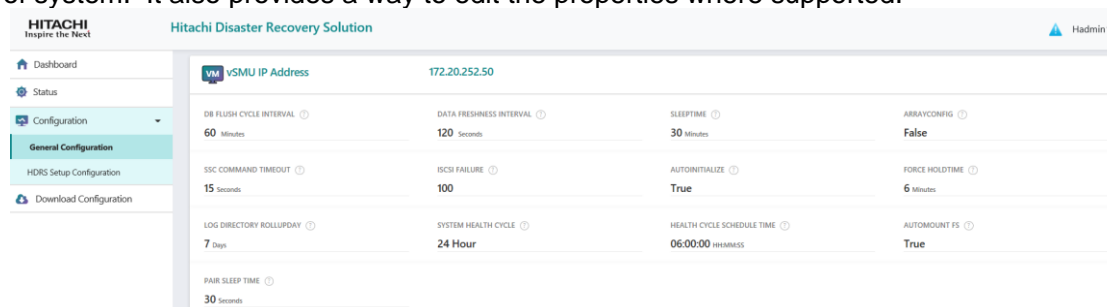
Field	Description
Storage Nodes	The HNAS Nodes local to the array that is currently used as the primary storage array for the pool. If the environment is working optimally, these will be the same as the Home Nodes.
Pair State	Health level ranging from healthy, normal, warning, severe, critical based on the severity associated with the most severe Health-code
Pool	The name of the replication group and HNAS span/pool

Below the header section of the pool will display the following information about each of the arrays separated by columns.

Field	Description
Name	Serial number of the array
Pair Role	The replication role, either <i>Primary</i> or <i>Secondary</i>
Pool Available	Whether the pool is available and healthy within that array. <i>True</i> or <i>False</i> .
NAS System Drive Access	Whether the HNAS system drive is licensed and can be used by the cluster in the nodes local to this array. <i>Allowed</i> or <i>Denied</i> .
NAS System Drive Status	The status reported of the HNAS system drives within the pool. Possible values can be <i>OK</i> , <i>Unknown</i> , etc.
EVS	List of the HNAS EVS ID's currently hosted on the nodes local to the array. Tip: if you highlight the EVS ID you can see the full name
IOmode	The pool's GAD iomode as reported by the RAIDCOM <i>pairedisplay</i> command in this array, indicating the mirroring state of the GAD pairs. Possible values are: <i>L/M (local/mirroring)</i> , <i>L/L (local/local)</i> , <i>B/B (block/block)</i> , Should be <i>L/M</i> during normal operation.
State	This is the replication state of the pool/group. Possible values are: <i>PAIR, COPY, PSUS, SSUS, PSUE, SSUE, SSWS, SMPL</i> . Should be <i>PAIR</i> during normal operation.

Chapter 5: General Configuration

The General Configuration page provides a way to view the general configuration properties of system. It also provides a way to edit the properties where supported.



A tooltip with a brief description of each value is available when hovering the pointer above the ? icon to the right of each parameter. For more information about each of these parameters, check the **HDRS Reference Guide, general.cfg** section.

The following properties are available for edit:

Field	Description	Value ranges
DB FLUSH CYCLE INTERVAL	Time interval in minutes when database is flushed in minutes	60 [default]
DATA FRESHNESS INTERVAL	Time interval in seconds when data is assumed fresh, in seconds	120 [default]
SLEEPTIME	Time between HDRS Monitor scans, in minutes	10-60 [default = 30]
ARRAYCONFIG	Whether to archive array configuration	True, False[default].
ISCSI FAILURE	How many iSCSI ping test failures can HDRS tolerate during discovery.	100 [default]
AUTOINITIALIZE	Control the automatic initialization of parity groups	True[default], false

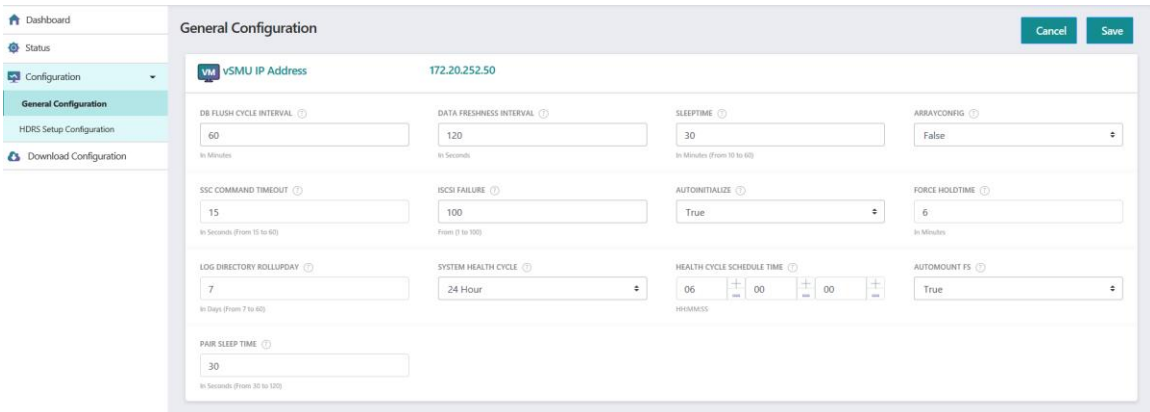
Field	Description	Value ranges
FORCE HOLDDTIME	Number of minutes to wait for SSWS state transition when replication is blocked, but quorum is available	6 [default]
LOG DIRECTORY ROLLUPDAY	Number of days after which HDRS monitor will rollup logs from LOG directory	7 [default]
SYSTEM HEALTH CYCLE	Frequency at which HDRS will check for HNAS health and generate an HNAS event	24 hrs [Default]. <i>From 30 minutes to 24 hours, at an interval of 30 minutes each</i>
HEALTH CYCLE SCHEDULE TIME	Set the daily start time for HDRS to initiate HNAS health cycles, in HH:MM:SS format	[00-23]:[00-59]:[00-59]
AUTOMOUNT FS	Whether HDRS should automatically mount a filesystem if it's unmounted.	True, False. [default = true]
PAIR SLEEP TIME	Number of cycles and time to wait until the pool is in paired state, in seconds	30-120 [default = 30]

Edit General Configuration

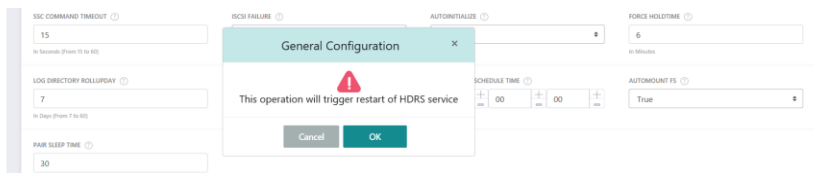
The most common parameter to adjust in the General configuration is the SLEEPTIME parameter, which controls the frequency that HDRS checks status and performs corrective access if needed. Supported ranges are 10 to 60 minutes, default is 30 minutes.

Making changes to General Configuration will require a restart of the HDRS monitoring system. This restart will not disrupt the service of the GEfN solution, only the administrative functionality.

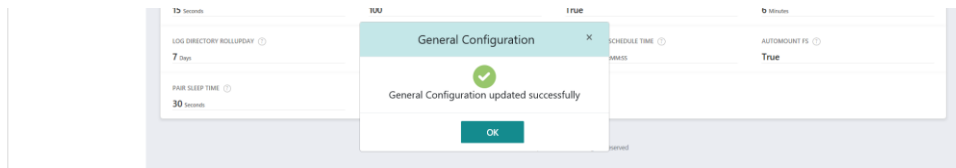
To edit the parameters in the **General Configuration** page, click on the Edit button. The page will change to edit mode, with option to Cancel or Save buttons.



After clicking the **Save** button, you will get the following warning:



If you select OK, it will take a few seconds, then it will confirm if it has saved successfully:

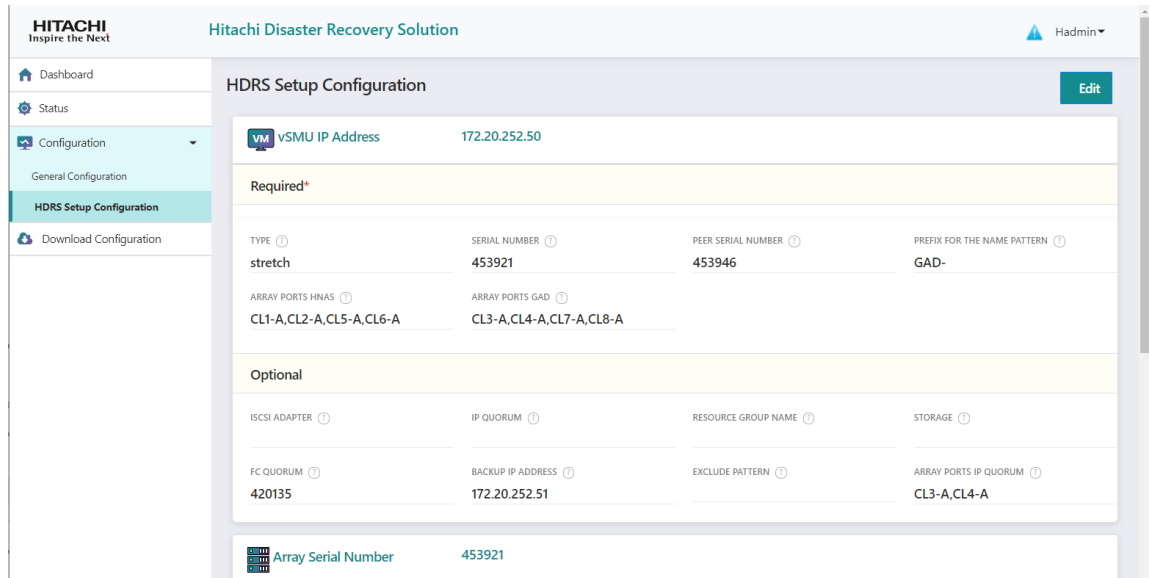


Once the configuration is saved or cancelled, it will go back to *View* mode.

For further reference on the individual parameters in this section, check the *General Configuration* File section of the **HDRS Reference Guide**.

Chapter 6: HDRS Setup Configuration

The **HDRS Setup Configuration** page provides way to view and edit the HDRS configuration properties if supported. The properties here reflect the contents of the *hdrs.cfg* file.



This page is divided into several sections, which are equivalent to the stanzas in the *hdrs.cfg* file:

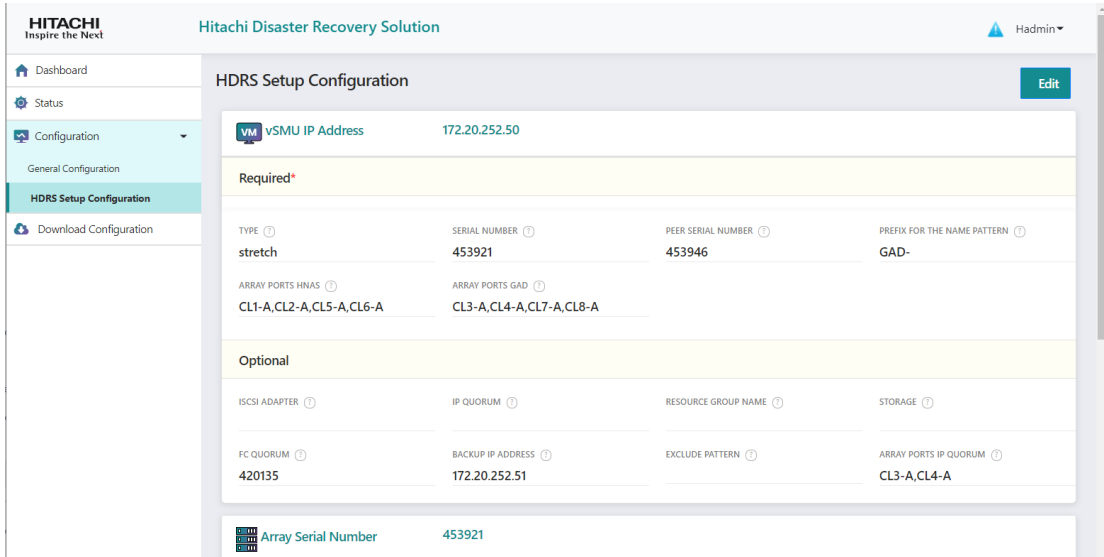
- **vSMU.** This is the same SMU where the HDRS software is running.
- **Primary Array.**
- **Peer Array.**
- **Quorum Array** (if applicable). This is the array used for GAD quorum, not to be confused with HNAS quorum. Not present if HDRS/iSCSI is used for quorum.
- **Contact (optional)**

A tooltip with a brief description of each value is available when hovering the pointer above the question mark [?] icon to the right of each parameter. These sections are described in more detail below. For further reference on the individual configuration parameters, refer to the *Hdrsc.cfg Reference* section of the **HDRS Implementation Guide (FE-97HDRS002-00)**.

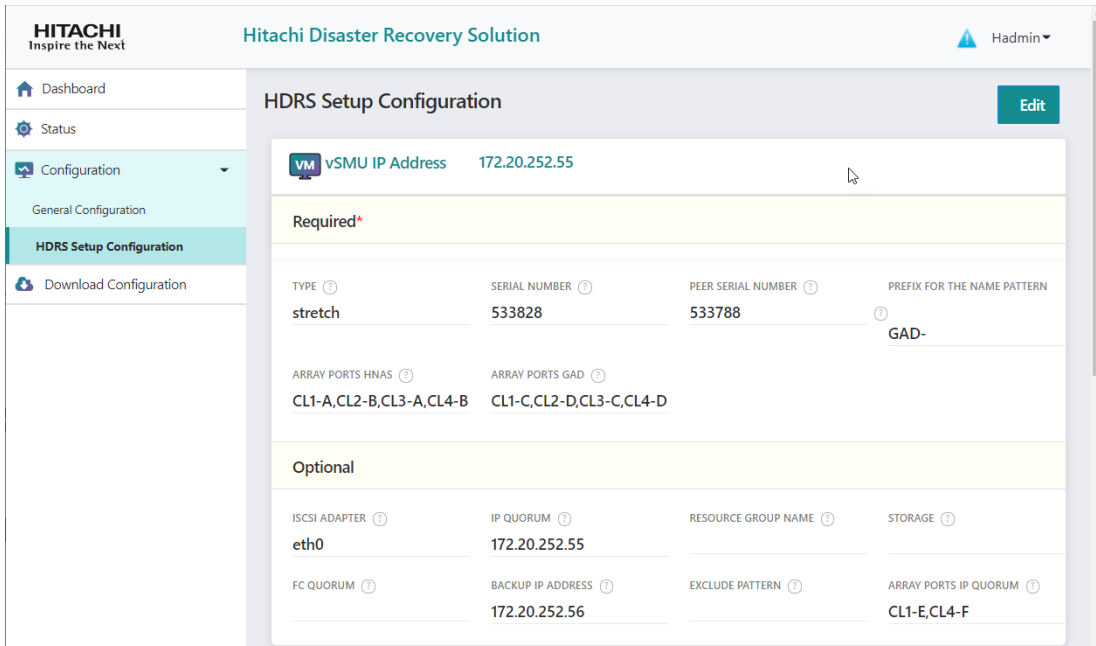
Most of the parameters in this page are part of the initial install and cannot be edited in the UI. One major exception is the credentials that HDRS uses to log in to the storage arrays and NAS cluster (**raiduser** parameter) which get periodically changed. These are described in the *Array Specific Setup and Edit Configuration* sections in this chapter.

Global Setup

This part of the setup contains parameters that are global to the HDRS configuration.



Note that the contents may vary depending on the configuration. In this next example the type is **stretch-iscsi** and it uses the iSCSI quorum hosted by HDRS software instead of a physical (FC quorum) array.

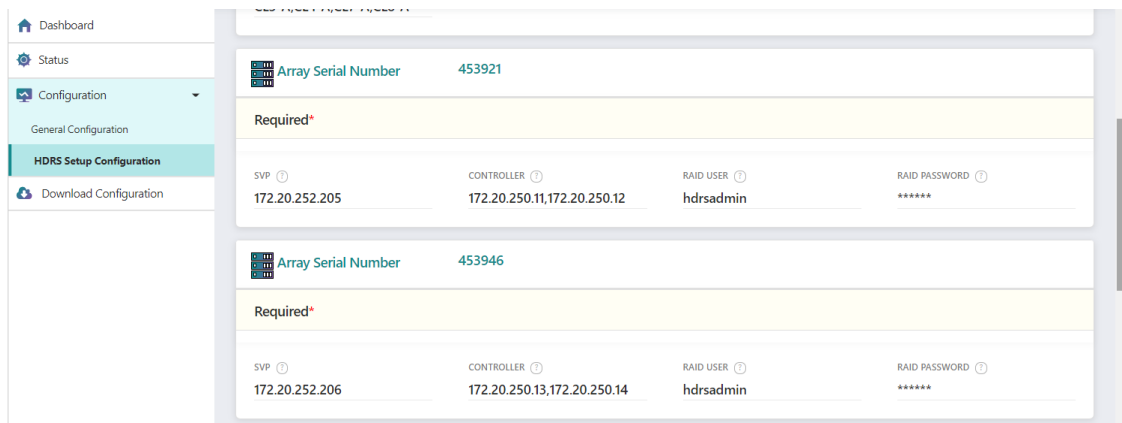


Field	Description
Type	<p>Defines the deployment type. Possible values are:</p> <ul style="list-style-type: none"> • <i>stretch</i> for GEfN and 2-node stretch clusters using fiber-channel replication • <i>stretch-iscsi</i>: GEfN using iscsi replication
Serial Number	<p>Defines the serial number of the primary storage system.</p> <p>In a GEfN deployment, HNAS Nodes 1 and 2 are local to this array. In a stretch-cluster deployment, only HNAS Node 1 is local to this array.</p>
Peer Serial Number	<p>Defines the serial number of the second storage system.</p> <p>In a GEfN deployment, HNAS Nodes 3 and 4 are local to this array. In a stretch-cluster deployment, only HNAS Node 2 is local to this array.</p>
Prefix for The Name Pattern	<p>Defines the name pattern that HDRS uses for storage allocation and replication when creating the LDEVs.</p>
Array Ports HNAS	<p>Fiber-channel ports used by the arrays to connect to the HNAS</p>
Array Ports GAD	<p>Ports used by the arrays to connect to each other using GAD for replication. Can be fiber-channel or iSCSI.</p>
iSCSI Adapter	<p>Only applicable if an iSCSI quorum is used.</p> <p>Describes the interface used by the vSMU to present the iSCSI quorum targets. This key is required when using the built-in iSCSI target of vSMU/HDRS as GAD quorum.</p>
Ip Quorum	<p>Only applicable if an iSCSI quorum is used</p> <p>This value can be either:</p> <ul style="list-style-type: none"> • <i>serial number</i> if a supported Hitachi array is used • <i>IP address</i> if it uses the built-in iSCSI target of the vSMU/HDRS
Backup IP Address	<p>This is the IP address the backup HDRS instance (if used) and should be the same address as Backup SMU.</p>
Resource Group Name	<p>The name of a resource-group whose resources, including LDEVs, pools, ports, that HDRS manages</p>
Storage	<p>Defines storage to be provisioned during installation. Refer to the HDRS User Guide on usage of the Express Provisioning syntax.</p>

Field	Description
FC Quorum	Only applicable if using a supported Hitachi array for quorum over fiber channel. Serial number of the external storage system providing quorum devices.
Exclude Pattern	A regular expression pattern that can be used to exclude pools included by “pattern” key
Array Ports IP Quorum	Only applicable if iSCSI quorum is used. The iscsi ports in the array used for quorum.

Array Specific Setup Section

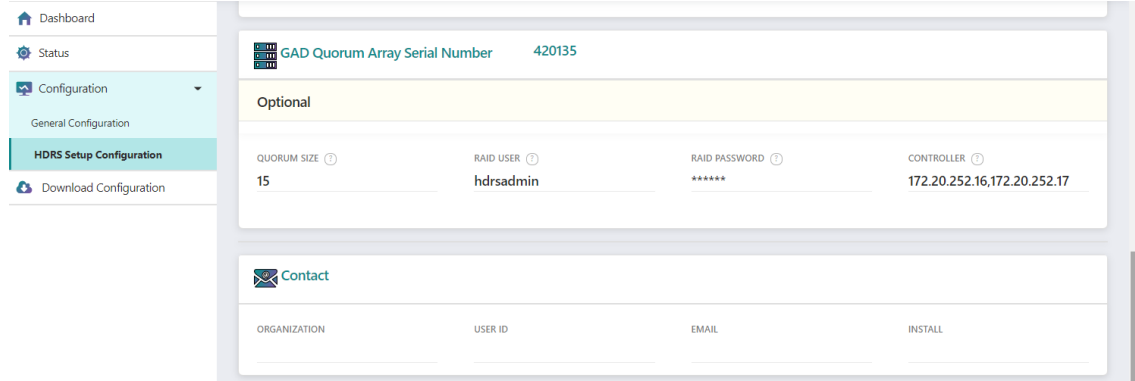
This section has configuration parameters that are specific for each of the replicating arrays in the solution.



Field	Description
SVP	The IP address of the SVP managing the storage system
Controller	The IP addresses of the storage system’s controllers.
Raid User	The name of the HDRS service account created on both the storage array and HNAS. This is the account that HDRS uses to manage both storage and NAS components of the solution.
Raid Password	The password of the Raid User account. It must be changed whenever the Raid User password gets changed in the storage management and NAS management utilities.

Quorum Array Setup Section

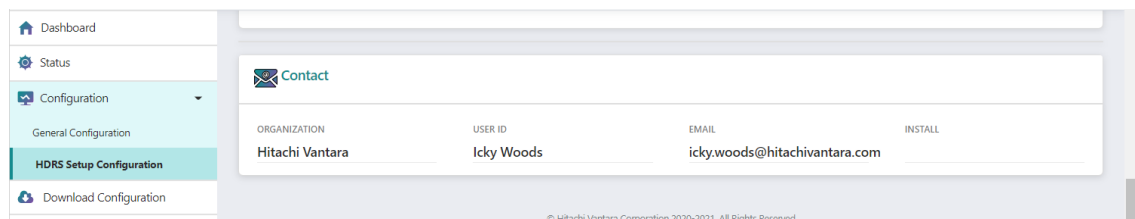
This section will only appear if the solution uses a supported Hitachi storage array (such as a VSP G or F series array) as a GAD quorum instead of the iSCSI target hosted by HDRS software.



Field	Description
Quorum Size	Specifies the capacity (in GB) of the quorum devices
Raid User	The name of the HDRS service account created on the storage system.
Raid Password	The password of the <i>raiduser</i> account
Controller	Defines the IP addresses of the system’s controllers.

Contact Section

This section is optional and appears at the end of the HERS Setup Configuration page.



Field	Description
organization	Organization where the solution is installed
User	Solution contact name
email	Contact email

install	Used as a comment field during install
---------	----------------------------------------

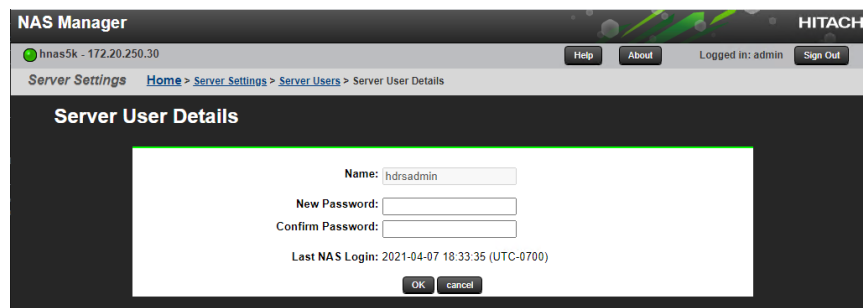
Edit Configuration Section

The most common reason to edit the HDRS configuration will be when the HDRS credentials as configured in both the array (username or password) and HNAS have changed. HDRS will stop working until these credentials are updated in the HDRS configuration.

Make sure that any special characters used in passwords are supported by both VSP and HDRS, as described in the HDRS Implementation and User Guides. While tools like Maintenance Utility and Storage Navigator may allow you to configure passwords using these characters, they may not work correctly when using CCI or shell commands that HDRS relies upon. Characters that are safe to use are: dot (.), hyphen (-), underscore (_), and at (@). Any other characters should be avoided. Please refer to the CCI Command Reference documents for more details.

When changing the passwords keep the following in mind. These are required for HDRS to function properly:

1. Make sure that the credentials are the same in both arrays.
2. Make sure that the credentials are also the same in the HNAS cluster. In order to change the password in HNAS, from the SMU **NAS Manager** go to **Server Settings > Server Users**.



⚠ If the password is changed only in the arrays but not in HDRS there might be a delayed effect. HDRS may continue to work in the short term because of the caching effect of HORCM, until an event such as an SMU reboot requires another authentication.

When clicking the **Edit** button, the *HDRS Setup Configuration* page changes to an edit form where the user can edit the configuration fields. Fields that are not editable will be displayed in grey background.

HITACHI
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Hitachi Disaster Recovery Solution

Admin

Dashboard

Status

Configuration

General Configuration

HDRS Setup Configuration

Download Configuration

HDRS Setup Configuration [Cancel] [Save]

VM VSMU IP Address 172.20.252.50

Required*

TYPE SERIAL NUMBER PEER SERIAL NUMBER PREFIX FOR THE NAME PATTERN

stretch 453921 453946 GAD-

ARRAY PORTS HNAS ARRAY PORTS GAD

CL1-A,CL2-A,CL5-A,CL6-A CL3-A,CL4-A,CL7-A,CL8-A

Optional

ISCSI ADAPTER IP QUORUM RESOURCE GROUP NAME STORAGE

FC QUORUM BACKUP IP ADDRESS EXCLUDE PATTERN ARRAY PORTS IP QUORUM

420135 172.20.252.51 CL3-A,CL4-A

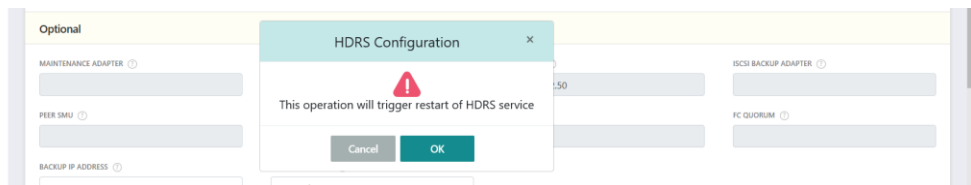
Array Serial Number 453921

Required*

SVP CONTROLLER RAID USER RAID PASSWORD

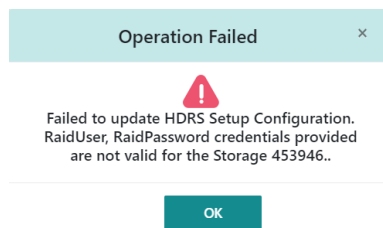
172.20.252.205 172.20.250.11,172.20.250.12 hdrsadmin

After clicking the **Save** button there will be a prompt to restart the HDRS services. Clicking OK will save the changes and restart the HDRS services. If on the other hand the operation is canceled, then changes in configuration will be not saved and the interface will go back to edit mode.

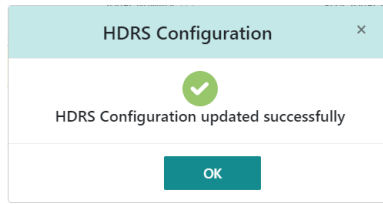


Otherwise, if clicking the **Cancel** button in the *Edit Configuration* window, the changes will not be saved and HDRS Setup Configuration page will return to read mode.

When saving, HDRS will do some basic parameter verification. For example, if the raid user or password credentials are not valid, it will display an error, and it will cancel the save operation. The configuration will then be reverted to the last known good configuration.



Once the configuration is validated, a confirmation will be displayed.

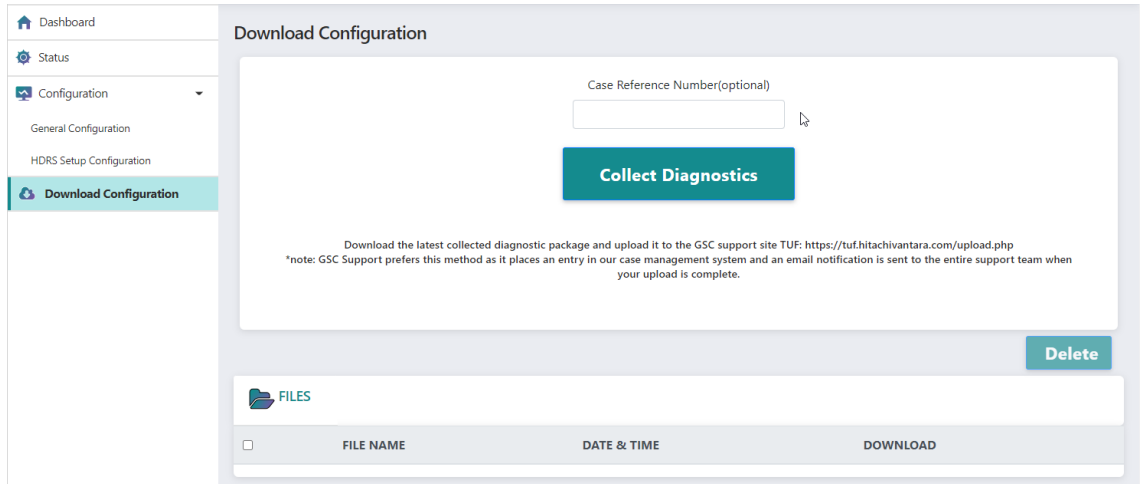


Chapter 7: Download Diagnostics

On this page the user can collect and download diagnostic packages that can be useful for Technical Support when working on a case.

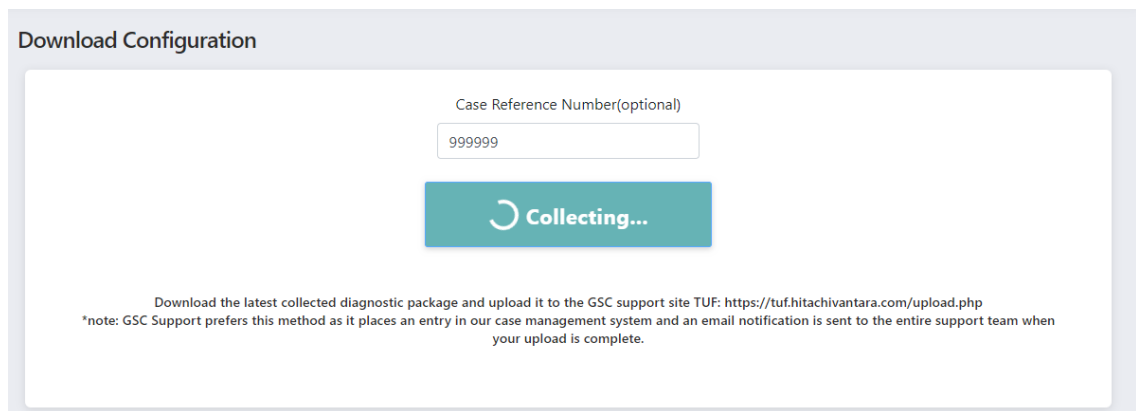
Collect diagnostics tool collects the following logs and information:

- vSMU Environmental data
- HNAS Diagnostics
- HDRS directories – Configuration, DB and Logs.



There is an optional field Case Reference Number where the case ID can be entered so that it's used when generating the files.

To begin the diagnostics collection process, click on the **Collect Diagnostics** button. This process can take several minutes.



Once the diagnostic collection process is complete, a package file will be added to the list in the Files section.

Dashboard

Status

Configuration

General Configuration

HDRS Setup Configuration

Download Configuration

Case Reference Number(optional)

Collect Diagnostics

Download the latest collected diagnostic package and upload it to the GSC support site TUF: <https://tuf.hitachivantara.com/upload.php>
 *note: GSC Support prefers this method as it places an entry in our case management system and an email notification is sent to the entire support team when your upload is complete.

Delete

FILES

<input type="checkbox"/>	FILE NAME	DATE & TIME	DOWNLOAD
<input type="checkbox"/>	getconfig-HDRS-999999-2021_09_16-14_08.tgz	Thu Sep 16 14:11:49 2021	

The user can download any of the diagnostic package in the list by clicking on the button in the download column to the right. Diagnostics can then be uploaded to the GSC support site <https://tuf.hitachivantara.com/upload.php>. GSC Support prefers this method as it places an entry in case management system and an email notification is sent to the entire support team when your upload is complete.

Diagnostics can also be deleted if necessary to save storage in the vSMU system. You can select any diagnostic in the list and click on the Delete button.

Chapter 8: Common CLI Operations

HDRS was originally written as a CLI tool. While the UI provides a useful dashboard to monitor status of the HNAS stretch cluster solution, there are some operations that require using the CLI. The most common are described below.

All these commands must be run from the vSMU console or SSH in bash shell as user manager.

Hstatus

You can run Hstatus – any time. It will display the health of the system. This is equivalent to what is displayed in the UI Dashboard and Hstatus.

The following is a sample output in a healthy system.

```
[manager@antman-wasp-smu ~]$ Hstatus -
Initiating collection
(fs, cifs, smu, cluster, repl, nfs, pool, vivol, evs, cloud, cns) ...done
<?xml version="1.0" ?>
<request elapsed="0:00:13.253946" finish="2022-05-12 17:32:38"
start="2022-05-12 17:32:25" version="6.0.0.22_04_22">
  <debug filename="LOG/status_2022-05-12.debug"/>
  <arguments operation="status" result="stdout"/>
  <operation command="status" function="status_hur" start="2022-05-12
17:32:25">
    <pair available="Yes" cluster="ANTMAN-WASP" home-nodes="ANTMAN-
WASP-1" pool="GAD-primary-1" storage-nodes="ANTMAN-WASP-1">
      <node drive-access="Allowed" drive-status="OK"
evs="EVS01,EVS03" iomode="L/M" name="454463" pair-role="Primary" pool-
available="True" state="PAIR" type="stretch"/>
      <node drive-access="Allowed" drive-status="OK"
evs="EVS04,EVS02" iomode="L/M" name="454268" pair-role="Secondary"
pool-available="True" state="PAIR" type="stretch"/>
      <health code="0x0" pair-state="healthy"/>
    </pair>
    <pair available="Yes" cluster="ANTMAN-WASP" home-nodes="ANTMAN-
WASP-2" pool="GAD-secondary-1" storage-nodes="ANTMAN-WASP-2">
      <node drive-access="Allowed" drive-status="OK"
evs="EVS04,EVS02" iomode="L/M" name="454268" pair-role="Primary" pool-
available="True" state="PAIR" type="stretch"/>
      <node drive-access="Allowed" drive-status="OK"
evs="EVS01,EVS03" iomode="L/M" name="454463" pair-role="Secondary"
pool-available="True" state="PAIR" type="stretch"/>
      <health code="0x0" pair-state="healthy"/>
    </pair>
    <icc message="All ICC links are UP" status="UP">
      <Node-2 Node-1="OK"/>
      <Node-1 Node-2="OK"/>
    </icc>
    <health config-state="healthy" pair-code="0x0" system-
code="0x0" system-state="healthy"/>
  </operation>
</request>
```

```

        <configuration elapsed="0:01:14.836110" start="2022-05-12
17:17:18">
            <config start="17:18:32" status="complete" topic="hnas-
config"/>
            <config backup-ip="172.20.252.54" status="complete"
topic="archive-config"/>
        </configuration>
        <smu cmd=" e2bcea38-aa6e-11d7-9000-ba8679f87452 nolog
backupregistry -f conf/registry-ANTMAN-WASP-2.tgz" returncode="0"/>
        <status code="0"/>
    </operation>
</request>
Saved output in LOG/status---2022-05-12_17-32-25.xml

```

Here is an example of Hstatus where a few issues are identified:

```

[manager@antman-wasp-smu ~]$ Hstatus -
Initiating collection
(fs,cifs,smu,cluster,repl,nfs,pool,vivol,evs,cloud,cns)...done
[gadhur][INFO    ][2022-05-12 17:35:14,246][EVS01 (1) is supporting
filesystems fs01 running on a remote node ANTMAN-WASP-2]
[gadhur][INFO    ][2022-05-12 17:35:14,347][Issue: 0x2000 Not migrating
EVSs: EVS01]
<?xml version="1.0" ?>
<request elapsed="0:00:12.699687" finish="2022-05-12 17:35:14"
start="2022-05-12 17:35:02" version="6.0.0.22_04_22">
    <debug filename="LOG/status_2022-05-12.debug"/>
    <arguments operation="status" result="stdout"/>
    <operation command="status" function="status_hur" start="2022-05-12
17:35:02">
        <pair available="Yes" cluster="ANTMAN-WASP" home-nodes="ANTMAN-
WASP-1" pool="GAD-primary-1" storage-nodes="ANTMAN-WASP-1">
            <node drive-access="Allowed" drive-status="OK" evs="EVS03"
iomode="L/M" name="454463" pair-role="Primary" pool-available="True"
state="PAIR" type="stretch">
                <issue array="454463" code="0x2000" evs="EVS01"
filesystem="fs01" msg="EVS is supporting filesystems whose P-Vol is on
a remote array" node="ANTMAN-WASP-2"/>
            </node>
            <node drive-access="Allowed" drive-status="OK"
evs="EVS04,EVS01,EVS02" iomode="L/M" name="454268" pair-
role="Secondary" pool-available="True" state="PAIR" type="stretch"/>
            <health code="0x0" pair-state="healthy"/>
        </pair>
        <pair available="Yes" cluster="ANTMAN-WASP" home-nodes="ANTMAN-
WASP-2" pool="GAD-secondary-1" storage-nodes="ANTMAN-WASP-2">
            <node drive-access="Allowed" drive-status="OK"
evs="EVS04,EVS01,EVS02" iomode="L/M" name="454268" pair-role="Primary"
pool-available="True" state="PAIR" type="stretch"/>
            <node drive-access="Allowed" drive-status="OK" evs="EVS03"
iomode="L/M" name="454463" pair-role="Secondary" pool-available="True"
state="PAIR" type="stretch"/>
            <health code="0x0" pair-state="healthy"/>
        </pair>
        <icc message="All ICC links are UP" status="UP">

```

```

        <Node-2 Node-1="OK"/>
        <Node-1 Node-2="OK"/>
    </icc>
    <issue code="0x2000" current-node="2" evs="EVS01" msg="EVS is
not running on its preferred node" preferred-node="ANTMAN-WASP-1"
severity="notice">
        <action recommendation="Run 'Hcorrect' to migrate EVSs to
preferred nodes after other issues have cleared"/>
    </issue>
        <action recommendation="Run 'Hcorrect' to migrate EVSs to
preferred nodes after other issues have cleared"/>
        <health config-state="healthy" pair-code="0x0" system-
code="0x0" system-state="healthy"/>
        <configuration elapsed="0:01:14.836110" start="2022-05-12
17:17:18">
            <config start="17:18:32" status="complete" topic="hnas-
config"/>
            <config backup-ip="172.20.252.54" status="complete"
topic="archive-config"/>
        </configuration>
        <smu cmd=" e2bcea38-aa6e-11d7-9000-ba8679f87452 nolog
backupregistry -f conf/registry-ANTMAN-WASP-2.tgz" returncode="0"/>
        <status code="0"/>
    </operation>
</request>
Saved output in LOG/status---2022-05-12_17-35-02.xml

```

Hcorrect

The **Hcorrect** command can be used to correct an issue in the solution such as blocked storage once the underlying issue (such as a power or link failure) has been addressed. HDRS will attempt to autocorrect the issue after the predefined *sleeptime* parameter. By default the interval is 30 minutes but this can be adjusted in the *General Configuration* section. You can also correct the issue manually by running this command if you wish to do it sooner.

We recommend you run *Hstatus* - first to make sure that HDRS recognizes that there is an underlying condition before running an Hcorrect and see if this is the recommended action. Also, there could be times where HDRS will already be taking corrective action. If this is the case, then a warning will be displayed and will stop from executing.

Syntax:

```
Hcorrect [pool=<poolname>]
```

You can run Hcorrect without any parameters and it will repair what is needed. You can also run **Hcorrect** with the <pool name> if you only wish to target a pool. For example:

```
Hcorrect pool=GAD-PRIMARY-01
```

Hdrstool Pswap/Swap

Sometimes it is necessary to change the array that is primary for a pool. For example, you might want to make the pool GAD-PRIMARY primary in the second array. An example where this could be required would be if the primary array will be undergoing maintenance for an extended period of time.

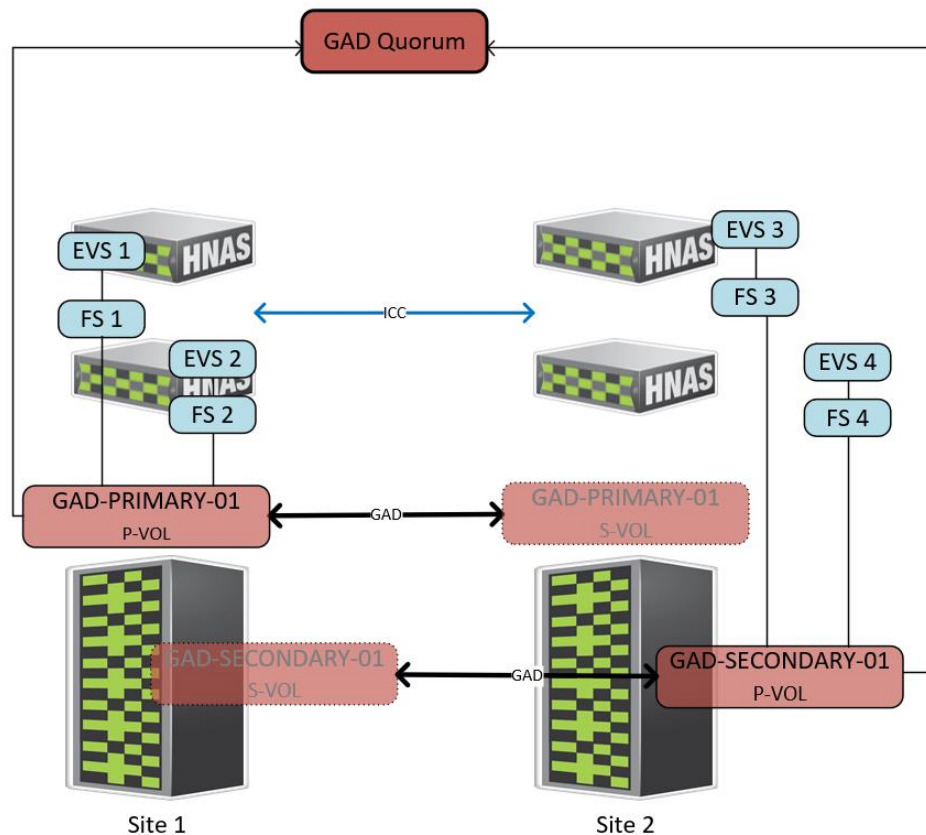
For this purpose, we use the **Hdrstool** command with the **Pswap** or **Sswap** parameters, depending on which direction we want to do the swap.

The Pswap (primary swap) or Sswap (secondary) command is always seen from the perspective of the 'primary' array.

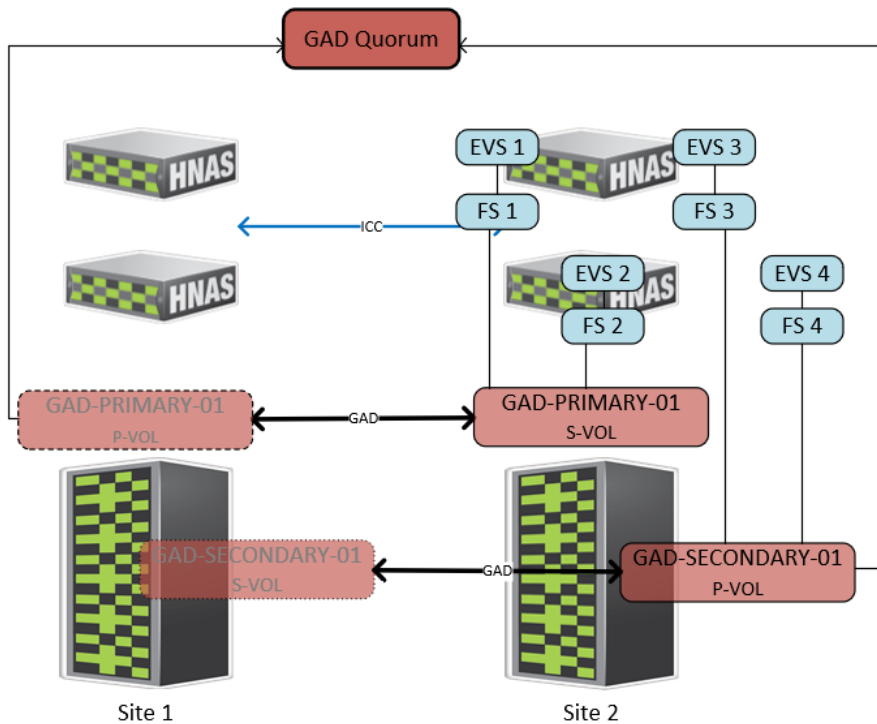
If we want to make the pool 'primary' in the 'primary' array we use the *Pswap* keyword. If we want to make the pool 'primary' in the 'second' array we use the *Sswap* keyword (make this pool 'secondary' in the first array). If the array is already primary in the intended array, then no swap will take effect.

The *Pswap* or *Swap* operations will require the filesystems to unmount so should only be done during a maintenance window.

In our example, we start with the pool GAD-PRIMARY-01 being 'primary' (P-VOL) in the first array



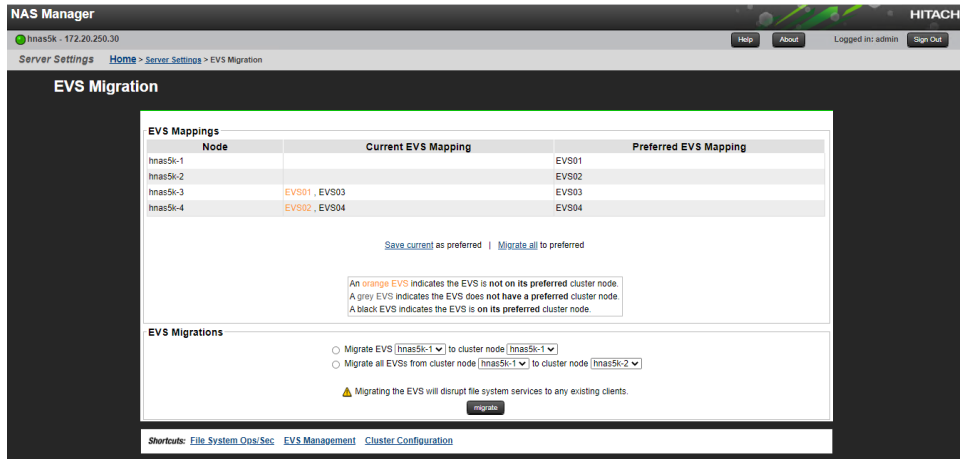
If EVS 1 and 2 get migrated to nodes 3 and/or 4 in the second site, the filesystems will continue to function. However, this is not an optimal condition as the underlying storage pool GAD-PRIMARY-01 is secondary (S-VOL) in this array, and a warning condition will be reported.



Issue/System Code	Severity	Pool	Array	Message	Action Recommendation
0x2000		GAD-PRIMARY-01	453921	EVS is supporting filesystems whose P-Vol is on a remote array	
0x2000		GAD-PRIMARY-01	453921	EVS is supporting filesystems whose P-Vol is on a remote array	

If these EVS's will be relocated permanently to the new nodes in the second site, or for an extended period of time then an Sswap should be performed (i.e. make this pool 'Secondary' in the first site).

```
[manager@thor-silk-smu ~]$ Hdrstool Sswap "GAD-PRIMARY-01"
Initiating collection
(node,fs,cifs,smu,cluster,rep1,nfs,pool,evs,cloud,cns)...done
[ misc ][INFO    ][2021-04-08 14:00:09,471][Reverse syncing the Pool GAD-PRIMARY-01 ]
[ misc ][INFO    ][2021-04-08 14:00:14,028][Pool GAD-PRIMARY-01 new Qid 1]
[corect][INFO    ][2021-04-08 14:00:14,029][  waiting for all LUNS to reach pair state in GAD-PRIMARY-01]
[ misc ][INFO    ][2021-04-08 14:00:33,104][Unmounting filesystems from pool GAD-PRIMARY-01 on cluster hnas5k...]
[corect][INFO    ][2021-04-08 14:00:41,090][  waiting for all LUNS to reach smp1 state in GAD-PRIMARY-01]
[ misc ][INFO    ][2021-04-08 14:00:44,417][Re-pairing pool GAD-PRIMARY-01]
[corect][INFO    ][2021-04-08 14:00:46,331][  waiting for all LUNS to reach pair state in GAD-PRIMARY-01]
```

To reverse the operation and make the pool 'primary' in the first array we would issue this command:

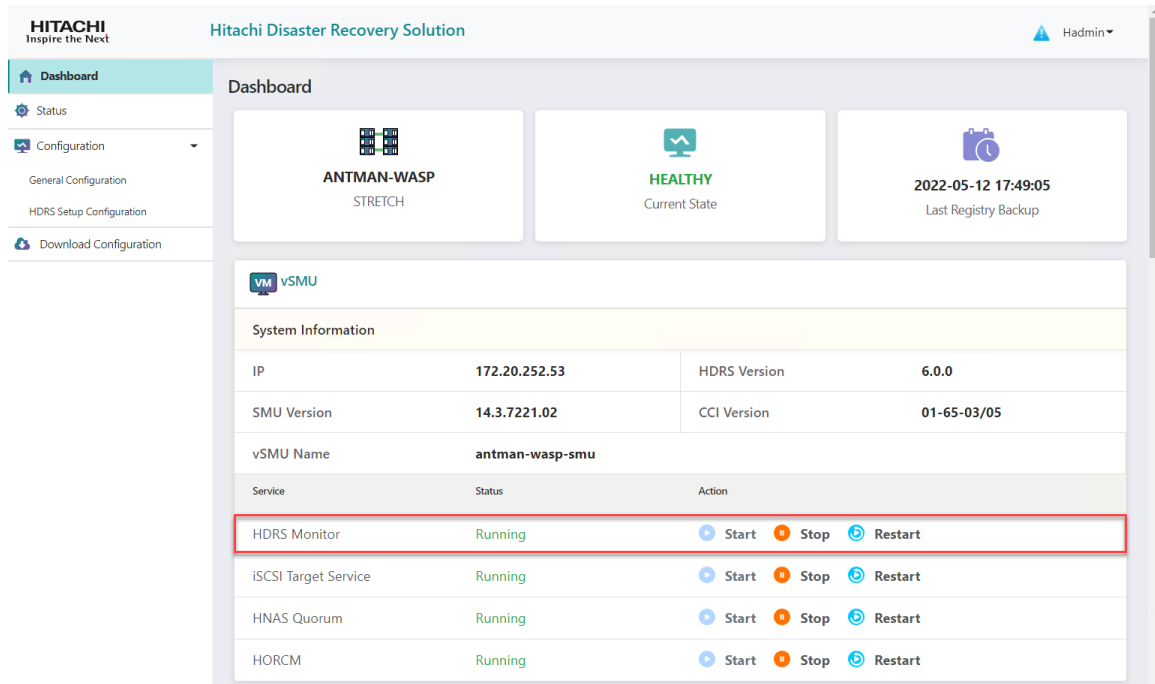
```
[manager@thor-silk-smu ~]$ Hdrstool Pswap "GAD-PRIMARY-01"
Initiating collection
(node,fs,cifs,smu,cluster,rep1,nfs,pool,evs,cloud,cns)...done
[ misc ][INFO    ][2021-04-08 15:07:28,236][Reverse syncing the Pool GAD-PRIMARY-01 ]
[ misc ][INFO    ][2021-04-08 15:07:32,330][Pool GAD-PRIMARY-01 new Qid 0]
[corect][INFO    ][2021-04-08 15:07:32,330][   waiting for all LUNS to reach pair state in GAD-PRIMARY-01]
[ misc ][INFO    ][2021-04-08 15:07:47,841][Unmounting filesystems from pool GAD-PRIMARY-01 on cluster hnas5k...]
[corect][INFO    ][2021-04-08 15:07:56,072][   waiting for all LUNS to reach smp1 state in GAD-PRIMARY-01]
[ misc ][INFO    ][2021-04-08 15:07:59,398][Re-pairing pool GAD-PRIMARY-01]
[corect][INFO    ][2021-04-08 15:08:01,567][   waiting for all LUNS to reach pair state in GAD-PRIMARY-01]
[ misc ][INFO    ][2021-04-08 15:08:05,050][Disabling DRU write protection on pool GAD-PRIMARY-01 for instance 10]
[ misc ][INFO    ][2021-04-08 15:08:05,658][Disabling DRU write protection on pool GAD-PRIMARY-01 for instance 11]
[ misc ][INFO    ][2021-04-08 15:08:06,744][Mounting filesystems of pool GAD-PRIMARY-01 on cluster hnas5k...]
Saved output in LOG/drstool-Pswap-2021-04-08_15:07:06.xml
```

Chapter 9: Other Less Common Operations

Stopping AutoCorrect

HDRS will autocorrect any issues it finds that don't need operator input as determined by the **sleeptime** parameter in the *General Configuration* page. If you wish to temporarily stop this behavior you can do it one of the following ways:

By stopping the HDRS Monitor service. This is in the Dashboard SMU section



You can also do it from the CLI by issuing the command **sudo service hdrsmon stop**

If stopped, the HDRS Monitor service will restart if the SMU is rebooted again. It is not recommended that the HDRS Monitor service be disabled permanently unless directed by technical support.

If there are any particular issues that you would not like to be repaired by HDRS Monitor, you can edit the `pairrepair` parameter in the `use-cases.cfg` file. See the *HDRS Reference Guide* for more details.

Restarting the HDRS Web Server

Sometimes it's necessary to stop certain services, verify that they are functional, or restart them. Most of them are visible from the Dashboard SMU section. Most notably absent is the `hdrswebserver` service which controls the HDRS UI. Sometimes it's needed if it's suspected to be malfunctioning

To check the HDRS webserver status:

```
hdrswebserver status
```

To restart:

```
hdrswebserver restart
```

Or to stop and restart

```
hdrswebserver stop  
hdrswebserver start
```

Resetting UI Password

If the UI **hadmin** password is lost or forgotten, you can run the command:

```
bin/re-configure-web-ui.sh
```

This new script in your `/home/manager/bin` directory allows to reset the *hadmin* password for the HDRS web UI in case the password is forgotten.

Example:

```
[manager@marvel-wonder-smu ~]$ sh bin/re-configure-web-ui.sh  
Creating conf directory links for webUI  
Configure HDRS web server...  
No changes detected  
Operations to perform:  
  Apply all migrations: admin, auth, contenttypes, sessions  
Running migrations:  
  Applying contenttypes.0001_initial... OK  
  Applying auth.0001_initial... OK  
  Applying admin.0001_initial... OK  
  Applying admin.0002_logentry_remove_auto_add... OK  
  Applying contenttypes.0002_remove_content_type_name... OK  
  Applying auth.0002_alter_permission_name_max_length... OK  
  Applying auth.0003_alter_user_email_max_length... OK  
  Applying auth.0004_alter_user_username_opts... OK  
  Applying auth.0005_alter_user_last_login_null... OK  
  Applying auth.0006_require_contenttypes_0002... OK  
  Applying auth.0007_alter_validators_add_error_messages... OK  
  Applying auth.0008_alter_user_username_max_length... OK  
  Applying sessions.0001_initial... OK  
Creating user 'hadmin' to access HDRS through webUI  
Password:  
Password (again):  
Superuser created successfully.  
[manager@marvel-wonder-smu ~]$
```

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