

# Hitachi NAS Platform F1000 Series Single Node Getting Started Guide

## FASTFIND LINKS

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# Preface

This manual explains how to set up a Hitachi NAS Platform F (HNAS F) system in a single-node configuration.

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## Intended audience

This manual is intended for system administrators who operate and manage HNAS F systems in a single-node configuration.

Also, the user must have:

- A basic knowledge of networks
- A basic knowledge of file sharing services
- A basic knowledge of CIFS
- A basic knowledge of NFS
- A basic knowledge of Windows
- A basic knowledge of Web browsers

## Product version

This document revision applies to Hitachi NAS Platform F version 4.2.2-01 or later.

## Release notes

Release notes can be found on the documentation CD. Release notes contain requirements and more recent product information that may not be fully described in this manual. Be sure to review the release notes before installation.

## Organization of HNAS F manuals

HNAS F manuals are organized as shown below.

Note that whether HNAS F nodes can be set up in a redundant configuration depends on the HNAS F model. A configuration where nodes are made redundant is called a cluster configuration, and a configuration where a node is not made redundant with another node is called a single-node configuration. Which manuals you need to read depends on which configuration you are going to use.

Manual name	Description
<i>Hitachi NAS Platform F1000 Series Installation and Configuration Guide, MK-92NAS061</i>	You must read this manual first to use an HNAS F system. This manual contains the information that you must be aware of before starting HNAS F system operation, as well as the environment settings for an external server.
<i>Hitachi NAS Platform F1000 Series Cluster Getting Started Guide, MK-92NAS076</i>	This manual explains how to set up an HNAS F system in a cluster configuration. To operate HNAS F on a virtual server, see the <i>Cluster Getting Started Guide for Virtual NAS</i> .
<i>Hitachi NAS Platform F1000 Series Cluster Getting Started Guide for Virtual NAS, MK-92NAS073</i>	This manual explains how to set up virtual servers for HNAS F systems in a cluster configuration.

Manual name	Description
<i>Hitachi NAS Platform F1000 Series Cluster Administrator's Guide, MK-92NAS084</i>	This manual provides procedures for using HNAS F systems in a cluster configuration, as well as provides GUI references.
<i>Hitachi NAS Platform F1000 Series Cluster Troubleshooting Guide, MK-92NAS066</i>	This manual provides troubleshooting information for HNAS F systems in a cluster configuration.
<i>Hitachi NAS Platform F1000 Series Single Node Getting Started Guide (This manual)</i>	This manual explains how to set up an HNAS F system in a single-node configuration.
<i>Hitachi NAS Platform F1000 Series Single Node Administrator's Guide, MK-92NAS089</i>	This manual explains the procedures for using HNAS F systems in a single-node configuration, as well as provides GUI references.
<i>Hitachi NAS Platform F1000 Series Single Node Troubleshooting Guide, MK-92NAS078</i>	This manual provides troubleshooting information for HNAS F systems in a single-node configuration.
<i>Hitachi NAS Platform F1000 Series CLI Administrator's Guide, MK-92NAS085</i>	This manual describes the syntax of the commands that can be used for HNAS F systems in a cluster configuration or a single-node configuration.
<i>Hitachi NAS Platform F1000 Series API References, MK-92NAS064</i>	This manual explains how to use the API for HNAS F systems in a cluster configuration or a single-node configuration.
<i>Hitachi NAS Platform F1000 Series Error Codes, MK-92NAS065</i>	This manual contains messages for HNAS F systems in a cluster configuration or a single-node configuration.
<i>Hitachi NAS Platform F1000 Series File System Protocols (CIFS/NFS) Administrator's Guide, MK-92NAS086</i>	This manual contains the things to keep in mind before using the CIFS or NFS service of an HNAS F system in a cluster configuration or a single-node configuration from a CIFS or NFS client.

## Abbreviation conventions

This manual uses the following abbreviations for product names:


Abbreviation	Full name or meaning
Active Directory	Active Directory(R)
HCP	Hitachi Content Platform
HNAS F	Hitachi NAS Platform F
Windows	Microsoft(R) Windows(R) Operating System
Windows NT	Microsoft(R) Windows NT(R) Server Network Operating System

## Document conventions

This document uses the following typographic conventions:

Convention	Description
<b>Bold</b>	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click <b>OK</b> .
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: <i>copy source-file target-file</i> Note: Angled brackets (< >) are also used to indicate variables.
screen/code	Indicates text that is displayed on screen or entered by the user. Example: # <code>pairedisplay -g oradb</code>

This document uses the following icons to draw attention to information:

Icon	Label	Description
	Note	Calls attention to important and/or additional information.

## Convention for storage capacity values

Storage capacity values (e.g., drive capacity) are calculated based on the following values:

Capacity Unit	Physical Value	Logical Value
1 KB	1,000 bytes	1,024 ( $2^{10}$ ) bytes
1 MB	1,000 KB or $1,000^2$ bytes	1,024 KB or $1,024^2$ bytes
1 GB	1,000 MB or $1,000^3$ bytes	1,024 MB or $1,024^3$ bytes
1 TB	1,000 GB or $1,000^4$ bytes	1,024 GB or $1,024^4$ bytes
1 PB	1,000 TB or $1,000^5$ bytes	1,024 TB or $1,024^5$ bytes
1 EB	1,000 PB or $1,000^6$ bytes	1,024 PB or $1,024^6$ bytes
1 block	-	512 bytes

## Getting help

The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week. If you need technical support, log on to the Hitachi Data Systems Portal for contact information: <https://portal.hds.com>

## Comments

Please send us your comments on this document: [doc.comments@hds.com](mailto:doc.comments@hds.com). Include the document title, number, and revision, and refer to specific sections and paragraphs when possible.

**Thank you!** (All comments become the property of Hitachi Data Systems Corporation.)



## Before you begin

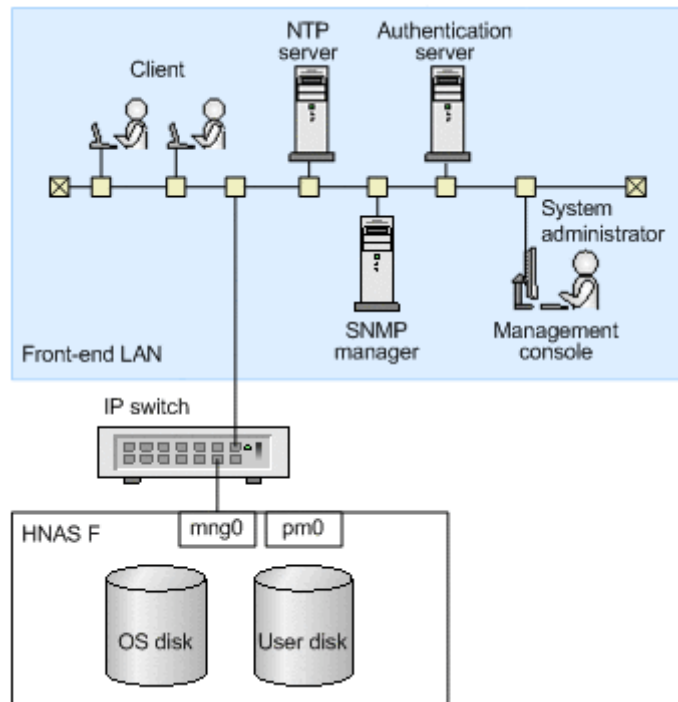
Hitachi NAS Platform F (HNAS F) is a system that provides file system services to clients on a network. This manual explains HNAS F systems in single-node configurations. This chapter describes what the system administrator needs to understand before setting up an HNAS F system in a single-node configuration.

- [Network configuration](#)

## Network configuration

Single-node HNAS F systems have a basic system configuration consisting of two system ports: one used for system management and data access (`mng0`), and one used by maintenance personnel for maintenance operations (`pm0`). It is also possible to trunk multiple ports used for system management and data access.

The following explains the network configuration for an HNAS F system.



**Figure 1-1 HNAS F system network configuration example**

In addition to HNAS F, external servers are also needed to provide services to clients. For details about the environment settings for each external server, see the corresponding sections in the *Installation and Configuration Guide*.

When file systems are created on an HNAS F system in a single-node configuration, the internal hard disk in the node and the disk space in the storage system are logically partitioned and assigned. The following table describes the meaning of the terms used when creating a file system on an HNAS F system in a single-node configuration.

**Table 1-1 Terms used when creating a file system**

Terms	Meaning
LU	<p>An abbreviation of <i>logical unit</i>. This refers to a logical disk partition.</p> <p>For an HNAS F system, LUs must be used that were created on the internal hard disk of the node or in a storage system.</p> <p>To use a storage system, ask the storage system administrator to create LUs for you.</p> <p>When the internal hard disk in the node is used, LUs are automatically allocated from the internal hard disk when the OS on the node starts. The system administrator does not need to create LUs.</p>
Volume group	<p>A unit that is used to manage LUs on the internal hard disk and in storage systems in order to store user data, such as file systems.</p> <p>You can allocate multiple LUs to a volume group. If you create LUs, the LUs will be automatically allocated to volume groups when you log in to the GUI. When LUs are automatically allocated to volume groups, volume groups are created for like LUs, which are divided up based on the drive type (or pool for virtual LUs) of the LUs and the chassis (internal hard drive or storage system) the LUs are stored in.</p> <p>A certain amount of capacity in a volume group is allocated to a file system. A volume group can be used by multiple file systems.</p>



## Getting started

This chapter explains how to use the **System Configuration Wizard** and **Service Configuration Wizard** to perform setup.

Prepare the required information before starting setup. You can use [Setup worksheet on page B-1](#) as a worksheet for collecting information.

- [Configuring an environment](#)

## Configuring an environment

The following describes how to use the GUI to configure an HNAS F environment. For details about the displayed GUI items, see the *Single Node Administrator's Guide*.

1. Install Adobe(R) Flash(R) Player on a management console that uses a Web browser.

Install Adobe Flash Player 9.0.28 or later. For details about management-console machine requirements and Web browser settings (such as pop-up blocks and security settings), see the *Installation and Configuration Guide*.

2. Launch the Web browser, and enter the following URL:

```
https://HNAS F-IP-address-or-host-name/admin/
```

3. In the Login window, enter the following user ID and password, and click the **Log In**.

- o **User ID:** admin
- o **Password:** chang3me!

4. If you are accessing the GUI for the first time, in the **Change User Password** dialog box, change the password, and then click the **OK**.

When you set the password the first time, the System Configuration Wizard starts. To manually start the System Configuration Wizard, from the **Action** menu in the upper-left corner of the GUI, choose **Configuration Wizards**, and then **System Configuration Wizard**.

5. On the **1. Introduction** page, click **Next**.
6. On the **2. License Settings** page, set the license and then click **Next**.

To set the license, you can specify a license key file or directly enter a license key string into the dialog box.

7. On the **3. Basic Settings** page, enter the following information, and then click **Next**.

Registering node network information:

- o Host name
- o System management IP address
- o Netmask or prefix length
- o IP address of the default gateway (optional)

Registering the DNS server:

- o IP address of the primary server
- o IP address of the secondary server (optional)
- o Default domain name (optional)

Setting the time on the node:

- o Time zone
- o Specify the NTP server name, or specify the time manually.

Encryption settings: Whether to encrypt internal hard disks and storage system LUs that contain user data. You can specify this if an encryption license is set.

8. On the **4. Confirmation** page, check the displayed information, select the check box, and then click **Apply**.

The **5. Execution** page appears, and setup of the system starts.

When setup finishes, the **6. Completion** page appears.

9. On the **6. Completion** page, check the processing results, and then click the displayed URL.
10. In the Login window, enter the user ID and password, and then click **Log In**.

If a dialog box prompts you about whether you want to automatically allocate LUs to the volume group, click **Yes**. Check the processing results, and then click **Close**.

The Service Configuration Wizard starts when you configure the environment the first time. To manually start the Service Configuration Wizard, from the **Action** menu in the upper-left corner of the GUI, choose **Configuration Wizards**, and then **Service Configuration Wizard**. When the wizard has started, go to step 19.

However, if you are creating a file system in the internal hard disk of the node and want to change the RAID level of the disk, go to the next step without logging on to the system.

11. Use the `internalraidlevelset` command to change the RAID level setting.
12. Use the `internalraidlevelget` command to make sure that the RAID level setting has been changed.
13. Use the `vgrdelete` command to delete the volume group.
14. Use the `internalludelete` command to delete the registration of the user disk.
15. After executing the `lumaplist` command, execute the `hwstatus` command and check the status of the internal hard disk.  
Make sure that the RAID level has been changed to the value you specified in step 11.
16. From the Web browser, log on again to the system.  
A dialog box that asks you whether you want to automatically allocate LUs to the volume group appears.
17. Click **Yes**.
18. Check the processing results, and then click **Close**.  
The **Service Configuration Wizard** starts.
19. On the **1. Introduction** page, click **Next**.
20. On the **2. HCP Settings** page, click **Next**.
21. In the **Create File Systems** area, click **Add**.
22. Of the following information, specify the necessary information required for each file system, and then click **Next**:

- File system name
  - Client access protocol (CIFS, NFS, or both)
  - Storage destination of the file system (when multiple volume groups exist): Chassis (internal hard disk or storage system), volume groups
  - Capacity
  - Whether to use the file snapshot functionality
  - Whether single instancing is enabled
  - Whether the WORM functionality is enabled
  - Whether to enable the CIFS bypass traverse checking
  - Name of the shared directory
  - CIFS share options: name of the CIFS share, and whether to automatically create the home directory in the CIFS share
  - Client host or network whose access to a file share is restricted
  - Access permission settings when creating a new CIFS file or directory
  - ACL settings for the shared directory
23. On the **4. CIFS User Authentication Settings** page, select the CIFS user authentication method.
- An authentication method that is neither Active Directory authentication nor local authentication by the node OS can be selected if a Windows NT server or domain controller within the domain authenticates users when IPv4 is used. In this case, after the wizard is finished, set the appropriate information in the **Access Protocol Configuration** dialog box.
24. If you select Active Directory authentication or local authentication by the node OS, specify the following information and then click **Next**. If you select any other authentication method, click **Next** without specifying anything.
- When Active Directory authentication is selected
- DNS name
  - User name and password for the domain controller
- When local authentication is selected
- Workgroup name
  - User name and user ID (optional)
  - Name and ID of the group to which the user belongs (optional)
  - User password (optional)
25. Check the information displayed on the **5. Confirmation** page, select the check box, and then click **Apply**.
- The **6. Execution** page appears, and setup of the service starts.
- When setup finishes, the **7. Completion** page appears.
26. On the **7. Completion** page, check the processing results, and then click **Finish**.
27. Choose **Resources** tab in the top-left corner of the GUI.



28. From the tree on the left side of the GUI, click *host-name*.  
The *host-name* window opens.
29. In the *host-name* window, click **Backup Configuration** in the **Settings** area.  
The **Backup Configuration** dialog box opens.
30. On the **Save System Settings Menu** page, click **Save All System Settings**.
31. On the **Save All System Settings** page, click **Download**, and download the system settings file to storage media outside the system.  
The system settings information is downloaded.



**Note:** If an error occurs in the HNAS F system, you can use the system settings file and backed up data to restore file systems. The system administrator must download the system settings file to storage media outside the system whenever the HNAS F system configuration is changed.

If the HNAS F system is not linked to the HCP system, then after you start using the HNAS F system, the system settings file is periodically saved in the home directory of the SSH account (`/home/nasroot`).

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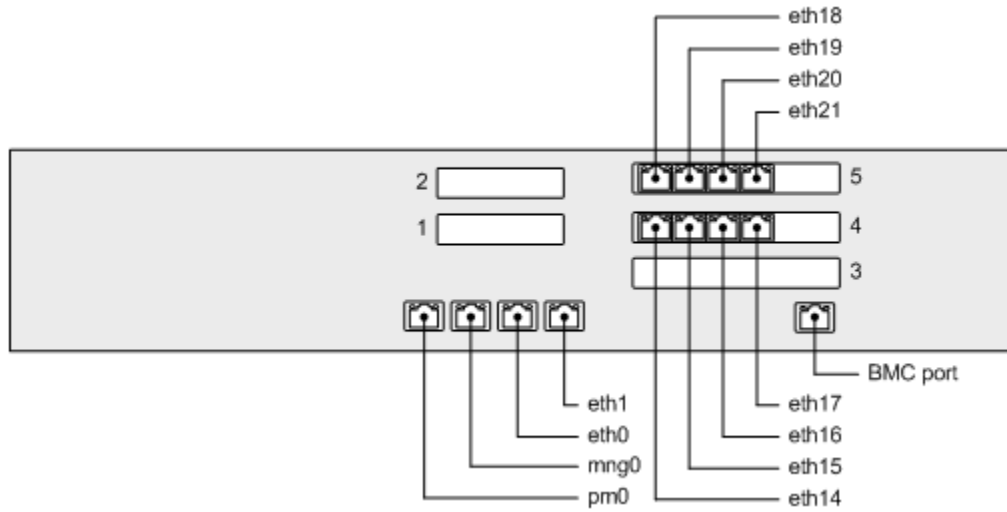
# Layout of ports on the node

This appendix describes the port layout.

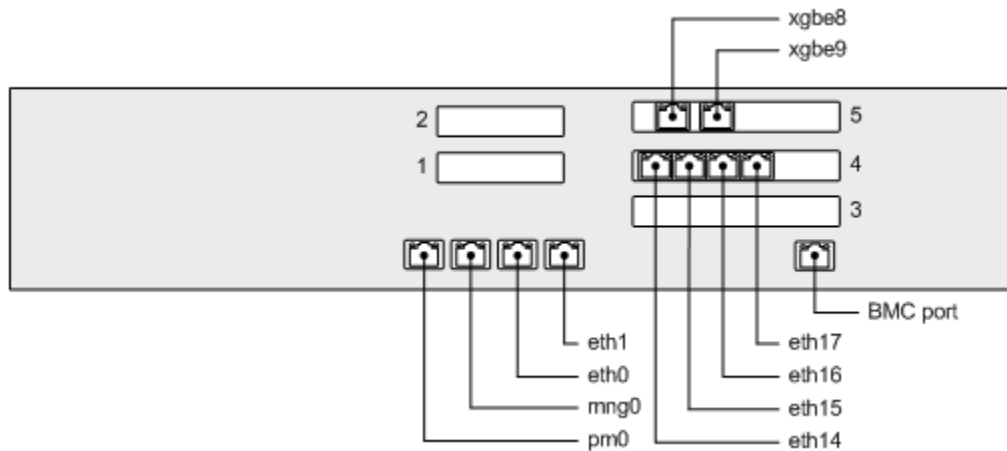
- [Layout of ports](#)

## Layout of ports

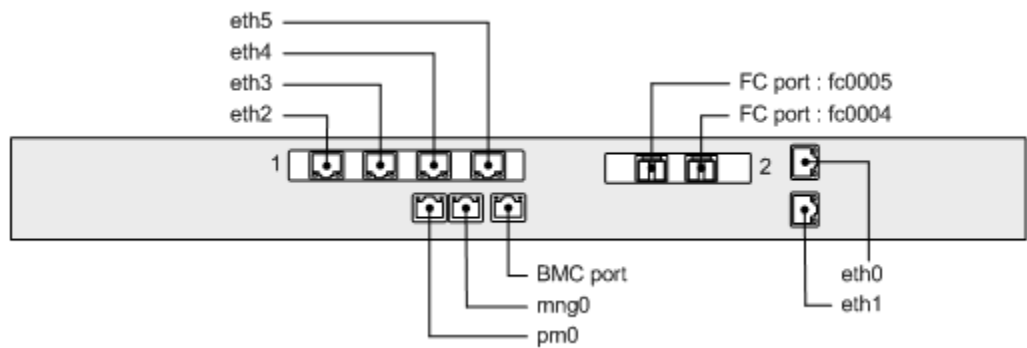
The layout of the ports differs depending on the model. The following figures show the layout of the ports on nodes.



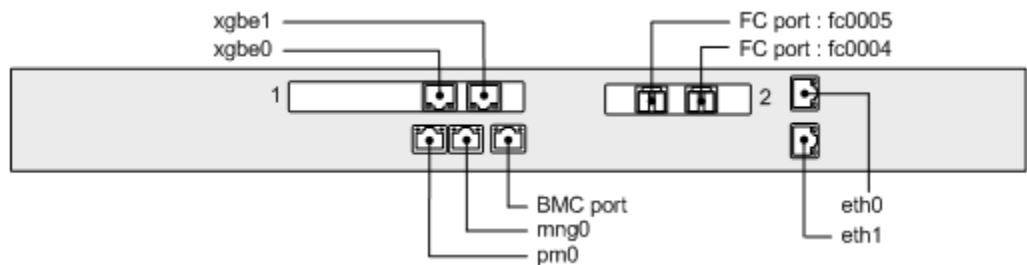
**Figure A-1 Nodes with no attached storage. Expansion Slots 4 and 5 can have 1GbE cards installed. A single card may be in slot 5 with no card in slot 4.**



**Figure A-2 Nodes with no attached storage. Expansion slot 5 may have a 10GbE card installed. A 1GbE card may also be installed in slot 4.**



**Figure A-3 With a storage system attached. Shows optional 1GbE card installed in expansion slot 1.**



**Figure A-4 With a storage system attached. Shows optional 10GbE card installed in expansion slot 1.**

You can install either of the following optional cards into an expansion slot:

GbE card

There are four GbE data ports (*ethnumber*).

10GbE card

There are two 10GbE data ports (*xgbenumber*).

The following tables list the port layout for the various types of nodes.

**Table A-1 Port layout (when a storage system is not connected to the node)**

Node and optional card combination	Port name		
	On board	Expansion slot 4	Expansion slot 5
Figure A-1 GbE cards installed in expansion slots 4 and 5	pm0 mng0 eth0 eth1 BMC port	eth14 eth15 eth16 eth17	eth18 eth19 eth20 eth21

Node and optional card combination	Port name		
	On board	Expansion slot 4	Expansion slot 5
Figure A-1 GbE card installed in expansion slot 5 only	pm0 mng0 eth0 eth1 BMC port	Not used, upgrade with 1GbE only.	eth18 eth19 eth20 eth21
Figure A-2 10GbE card and 1GbE card installed in expansion slots 5 and 4 respectively	pm0 mng0 eth0 eth1 BMC port	eth14 eth15 eth16 eth17	xgbe8 xgbe9
Figure A-2 10GbE card installed in expansion slot 5 only	pm0 mng0 eth0 eth1 BMC port	Not used, upgrade with 1GbE only.	xgbe8 xgbe9

**Table A-2 Port layout (when a storage system is connected to the node)**

Node and optional card combination	Port name			
	On board	Mezzanine slot	Expansion slot 1	Expansion slot 2
Figure A-3 1GbE card installed in expansion slot 1	pm0 mng0 BMC port	eth0 eth1	eth2 eth3 eth4 eth5	fc0004 fc0005
Figure A-4 10GbE card installed in expansion slot 1	pm0 mng0 BMC port	eth0 eth1	xgbe0 xgbe1	fc0004 fc0005



## Setup worksheet

This appendix provides a worksheet for collecting setup information.

- [Worksheet](#)

## Worksheet

We recommend that you prepare the following information before starting setup. For details about the HCP information, contact your HCP administrator.

**Table B-1 Setup worksheet**

Type of information	Item	Input value	
License	License key file or license key		
Node network information	Host name <sup>#1</sup>		
	Use DHCP to set the node network information	No	
	IPv4 settings	IP address used for system management	
		Netmask	
		IP address of the default gateway <sup>#2</sup>	
	IPv6 settings	IP address used for system management	
		Prefix length	
		IP address of the default gateway <sup>#2</sup>	
	DNS server	IP address of the primary server	
IP address of the secondary server			
Default domain name			
NTP server	NTP server name		
Encryption setting	Whether to encrypt internal hard disks and storage system LUs that contain user data <sup>#3</sup>	Yes / No	



Type of information	Item	Input value
File system	File system name <sup>#4</sup>	
	Client access protocol	CIFS / NFS / both
	Storage destination of the data in the file system (when multiple volume groups exist)	Internal hard disk / storage system storage system name:
	Volume group name used by the file systems (when multiple volume groups exist)	
	Capacity	
	Configure file snapshots <sup>#5</sup>	Acquire a differential-data snapshot of the file system: Yes / No Space to be allocated to the differential-data storage device: Enable automatic snapshot creation: Yes / No Interval of automatic snapshot creation: Snapshots are not created automatically / Every 12 hours / Every day / Every week / Every month / Unspecified (Date:            Number of reserved generations:            Method for showing snapshots: Maximum number of snapshots that can be automatically mounted:            ) Identifier to be used as the mount point name when a snapshot is automatically mounted or shared: Limit use of the file system if the capacity of the differential-data storage device is insufficient: Yes / No
	Enable single instancing <sup>#5#6</sup>	Yes / No
	Enable WORM functionality <sup>#5#7</sup>	Yes / No
	Enable CIFS bypass traverse checking <sup>#5</sup>	Yes / No
	Shared directory name <sup>#8</sup>	
	CIFS share options	CIFS share name <sup>#9</sup> : Whether to automatically create the home directory in the CIFS share: Yes / No
	Host or network whose access to a CIFS share is restricted <sup>#10</sup>	
Access permission settings when creating a new CIFS file or directory	Owner: RW / RO / None Owner group: RW / RO / None Others: RW / RO / None	

Type of information	Item	Input value
CIFS user authentication (When Active Directory is used)#11	Domain DNS name#12	
	User name and password for the domain controller	User name: Password:
CIFS user authentication (when local authentication is used)	Workgroup name#13	
	Newly created user#14	User name: User ID (200 to 2147483147): Name of group to which user belongs: ID of group to which user belongs (200 to 2147483147): User password:

#1: The host name can have a maximum of 15 characters. You can use alphanumeric characters including hyphens (-). The host name must begin with an alphabetic letter, and must not end with a hyphen (-). You cannot also specify system-reserved words in upper case or lower case. For details about reserved words, see the *Single Node Administrator's Guide*. Note that in the initial settings, a unique name is assigned to each node.

#2: Required when connected through a router to an external network segment.

#3: You can specify this when an encryption license is set. For notes on using encryption, see the *Installation and Configuration Guide*.

#4: Specify this item using 16 or fewer alphanumeric characters or underscores (\_).

For details about how to make HCP data migrated from other HNAS F systems public as read-only and how to use the home-directory-roaming functionality, see the *Installation and Configuration Guide*.

#5: This function cannot be enabled if the home-directory-roaming functionality is used.

#6: If single instancing is enabled, it cannot be disabled after the file system is created.

#7: Once a file system is created, whether the WORM functionality is enabled cannot be changed for the file system.

If the WORM functionality is enabled, the following default settings are used for the WORM settings:

- Minimum retention period: 0 days, 0 hours, and 0 minutes
- Maximum retention period: Infinite

#8: If the NFS protocol is used, make sure that the total length of the file system name and directory path is no more than 58 characters. When you use the automatic creation schedule function of differential-data snapshots,

the total number of characters must be no more than 43. The characters that can be used to specify this item are alphanumeric characters and the following symbols:

- . / \_

If only the CIFS protocol is used, make sure that the total length of the file system name and directory path is no more than 251 characters. When you use the automatic creation schedule function of differential-data snapshots, the total number of characters must be no more than 236. The characters that can be used are alphanumeric characters, spaces, and the following symbols. You can also specify multibyte characters.

! # \$ % & ' ( ) + , - . / ; = @ [ ] ^ \_ ` { } ~

#9: This item must be specified with no more than 80 characters. The characters that can be used are alphanumeric characters, spaces, and the following symbols:

! # \$ % & ' ( ) + , - . ; = @ [ ] ^ \_ ` { } ~

You can also specify multibyte characters. However, you cannot specify only a dollar sign or periods (e.g., \$, ., or ..) in the string, and you cannot specify a period at the end (e.g., Abc.). If the string ends with a dollar sign, you cannot specify a period just before the dollar sign (e.g., Abc.\$). Spaces specified at the end are deleted.

In addition, the CIFS share name cannot be `global`, `homes`, `printers`, `admin$`, `c$`, `global$`, `homes$`, `ipc$`, or `printers$`.

In Windows, the entered value is not case sensitive. Specify a name that is unique regardless of whether upper-case or lower-case alphabetic characters are used.

#10: For details about the specification format, see the explanation of the **Edit CIFS Share Host or Network** dialog box or **Edit NFS Share Host or Network** dialog box in the *Single Node Administrator's Guide*.

#11: If Active Directory is used for user authentication, only users authenticated by Active Directory can access CIFS shares. Users locally authenticated by the HNAS F system cannot access CIFS shares.

If **Custom settings** is selected, the domain name (NetBIOS), the server name or the IP address of the domain controller, and user mapping form can also be specified. If **Custom settings** is not selected, a domain name (NetBIOS) and up to five DC servers based on the specified domain name (DNS) are automatically searched for and set. When only the CIFS protocol is used, RID user mapping is selected and an ID range from 70000 through 4069999 (4,000,000 IDs) is set for the domain name (NetBIOS) that was automatically searched for. When both the CIFS and the NFS protocol are used, Active Directory schema-form user mapping is selected, and the RFC2307 schema is set to be used for acquiring user IDs and group IDs from the domain controller.

#12: All entered lowercase characters are recognized as uppercase characters. For use as both an Active Directory domain controller and KDC server, the name specified here is used as the name of the domain to which the KDC server belongs.

#13: Specify a name other than the host name.

#14: User names already registered in the HNAS F system, the NIS server, or LDAP server used for user authentication cannot be specified for the user name and group name. Specify a name no longer than 16 characters. The first character must be an alphanumeric character. The second and subsequent characters can be alphanumeric characters, hyphens (-), or underscores (\_). Entered uppercase characters and lowercase characters are treated the same by Windows. Specify a name that is unique regardless of case. Names in the list of reserved terms in the *Single Node Administrator's Guide* are reserved by the OS and cannot be specified.

Also, the names used for existing groups set to use ACL functionality cannot be specified as user names.

IDs already registered in the HNAS F system, the NIS server, or LDAP server for user authentication, and also the ID 65534 cannot be specified. When user mapping is used, IDs in the range set for user mapping cannot be specified.

Passwords must be specified between 6 and 20 characters. You can specify the alphanumeric characters and the following symbols:

! " # \$ % & ' ( ) \* + , - . / : ; < = > ? @ [ \ ] ^ \_ ` { | } ~



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**MK-92NAS079-02**