



NAStorage
Administrator Guide
Hot Expand

Version 1.00
10/01/2002

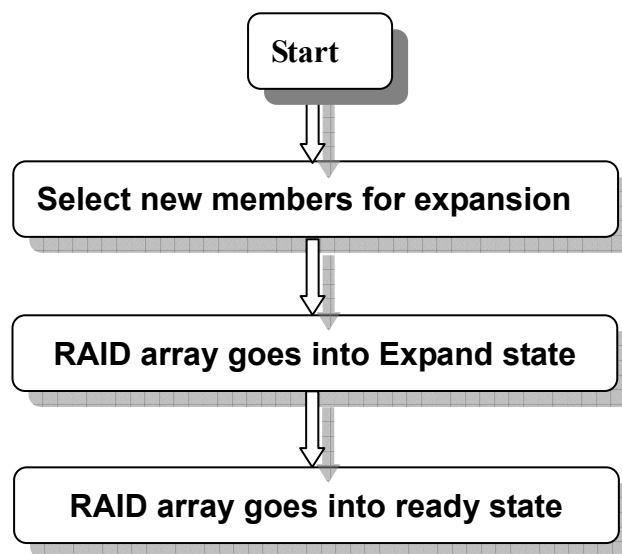
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Expand

NASStorage server supports expand function (On-line Capacity Expansion). The Online RAID Expansion allow user to adapt the capacity of the array to growing demand while operating, you can add disk drive to a RAID level 5 logical drive without system reconfiguration. The additional storage space created by the new drive expands the capacity and creates an additional logical drive.

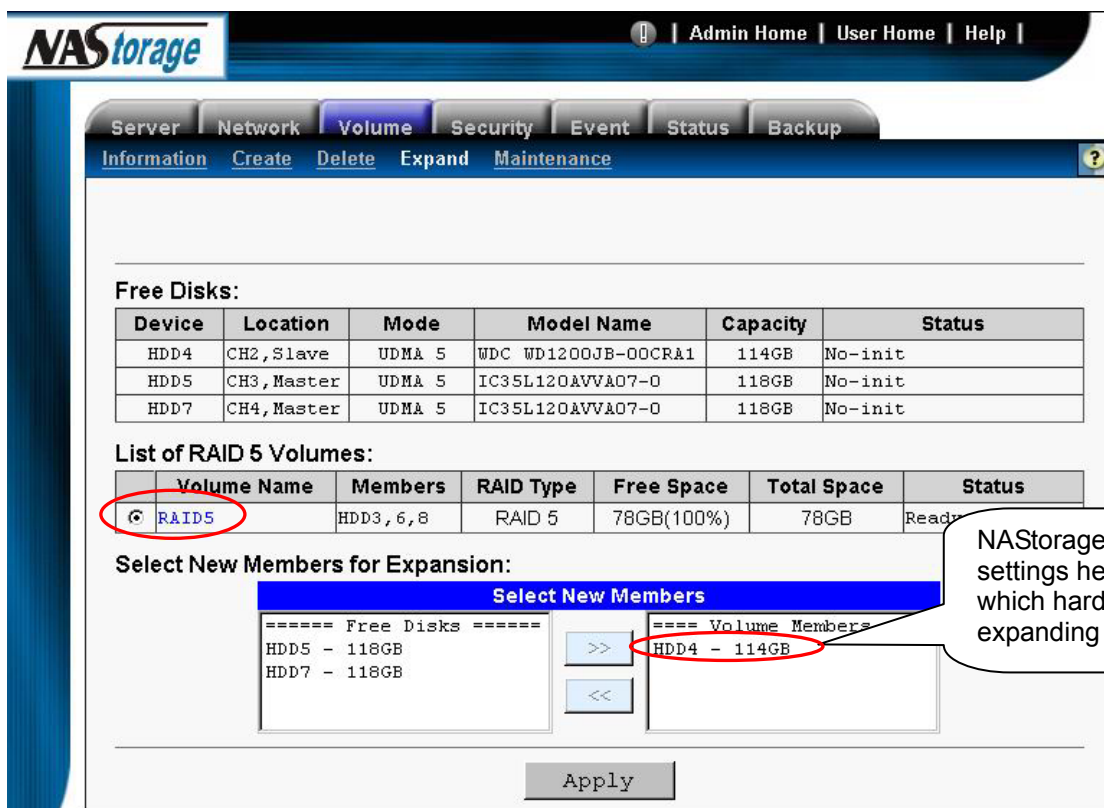
RAID-5 volume expansion makes it possible to enlarge volume capacity without rebooting the NAS Server. Volume capacity grows on the fly. Moreover, you do not have to change any share permissions, security controls and quota settings after volume expansion. Storage management becomes much easier.



1. Select new members for expansion:

To expand a RAID-5 volume, please go to the Volume--Expand page. Select a RAID-5 volume to be expanded. Then choose the Free Disks as new members. Click Apply to submit changes. The progress of RAID expansion is shown on the Volume Information page.

Configuration flow: “**Volume Manager–Expand** “→ “**Select** ” a RAID device from RAID list which you want to expand → Add a Free Disk from left to right window then click “**Apply**” button.



The screenshot shows the NASStorage web interface. The top navigation bar includes 'Server', 'Network', 'Volume', 'Security', 'Event', 'Status', and 'Backup'. The 'Volume' section is active, with sub-tabs for 'Information', 'Create', 'Delete', 'Expand', and 'Maintenance'. The 'Expand' tab is selected.

Free Disks:

Device	Location	Mode	Model Name	Capacity	Status
HDD4	CH2, Slave	UDMA 5	WDC WD1200JB-00CRA1	114GB	No-init
HDD5	CH3, Master	UDMA 5	IC35L120AVVA07-0	118GB	No-init
HDD7	CH4, Master	UDMA 5	IC35L120AVVA07-0	118GB	No-init

List of RAID 5 Volumes:

Volume Name	Members	RAID Type	Free Space	Total Space	Status
RAID5	HDD3, 6, 8	RAID 5	78GB(100%)	78GB	Ready

Select New Members for Expansion:

Select New Members

==== Free Disks =====

HDD5 - 118GB

HDD7 - 118GB

>>

<<

==== Volume Members =====

HDD4 - 114GB

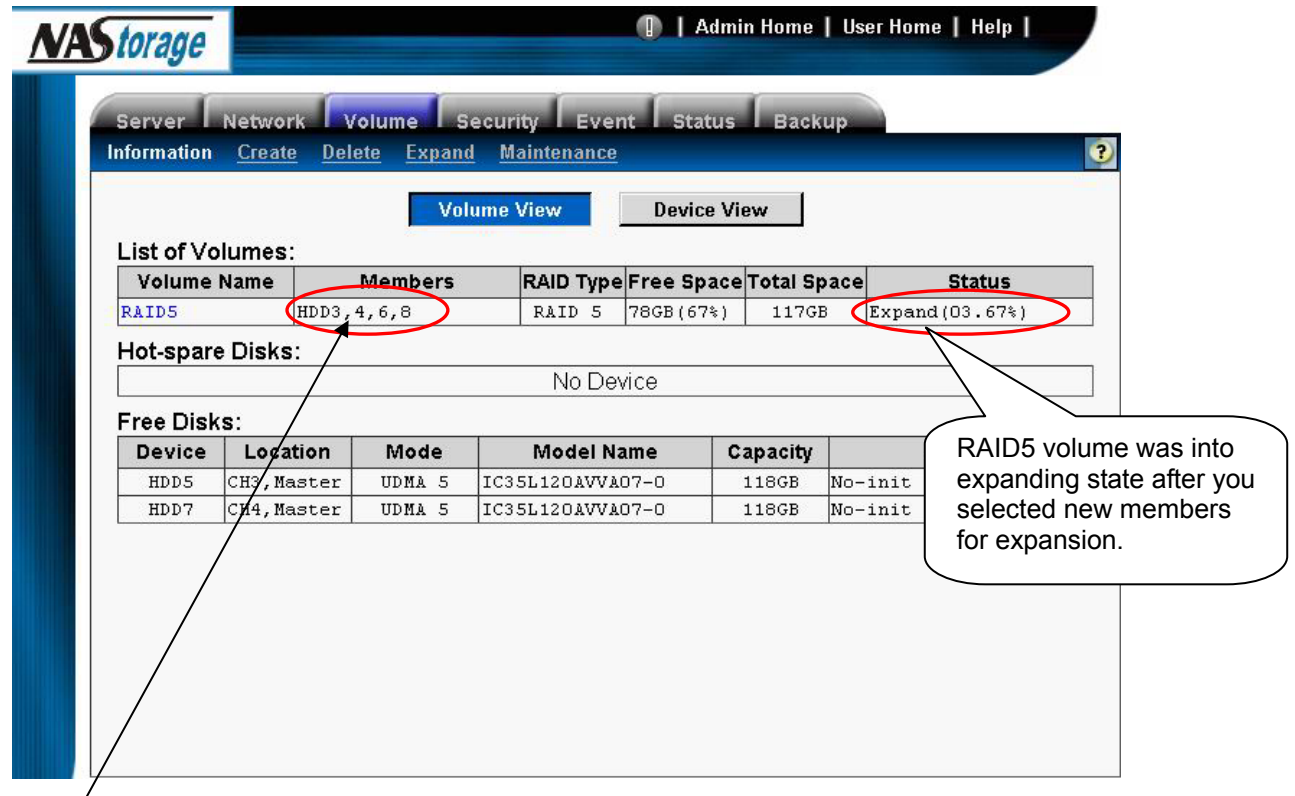
NASStorage will count on the settings here to determine which hard drive can be expanding disk.

(For example, select HDD4 as new member of “RAID5” then this RAID array will into Expand state.)

There’s one thing need to concern, if you selected the hard disk capacity is smaller than the smallest hard disk of the RAID group, the Expand function won’t have effect. That mean your hot spare disk capacity must greater or equal to the smallest hard disk of the RAID group.

2. RAID array goes into Expand state

RAID array will go into Expand state after you select new members for expansion.



The screenshot shows the NAS storage management interface. The 'Volume' tab is selected, and the 'Expand' sub-tab is active. The 'List of Volumes' table shows a RAID5 volume with the following details:

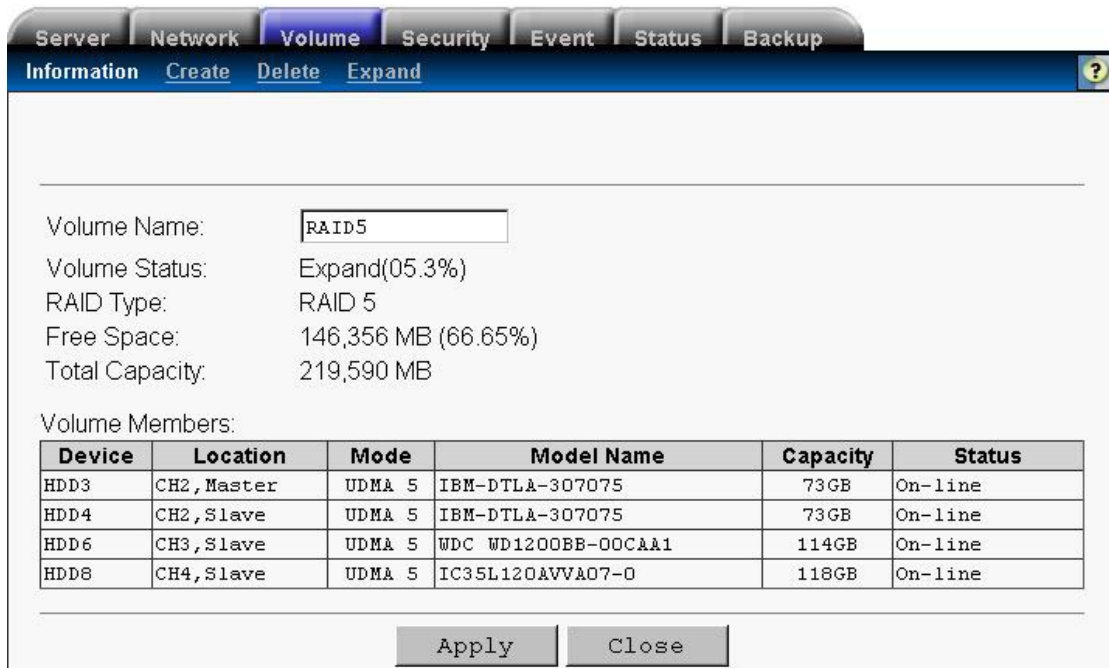
Volume Name	Members	RAID Type	Free Space	Total Space	Status
RAID5	HDD3, 4, 6, 8	RAID 5	78GB (67%)	117GB	Expand (03.67%)

The 'Hot-spare Disks' section shows 'No Device'. The 'Free Disks' section shows two available disks:

Device	Location	Mode	Model Name	Capacity	
HDD5	CH3, Master	UDMA 5	IC35L120AVVA07-0	118GB	No-init
HDD7	CH4, Master	UDMA 5	IC35L120AVVA07-0	118GB	No-init

A callout box points to the 'Expand (03.67%)' status, stating: "RAID5 volume was into expanding state after you selected new members for expansion."

(HDD4 already become a member of the RAID array "RAID5".)



Server Network **Volume** Security Event Status Backup

Information Create Delete Expand

Volume Name:

Volume Status: Expand(05.3%)

RAID Type: RAID 5

Free Space: 146,356 MB (66.65%)

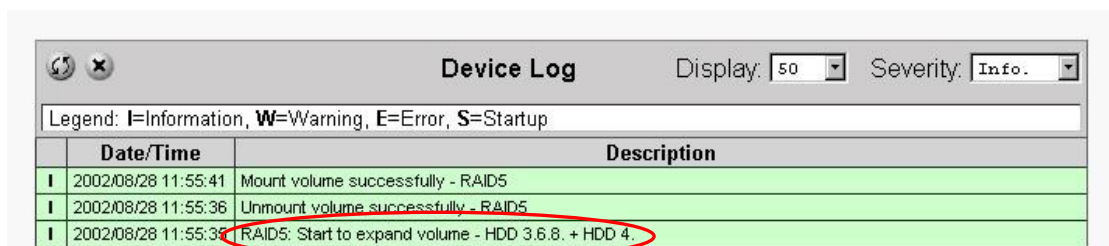
Total Capacity: 219,590 MB

Volume Members:

Device	Location	Mode	Model Name	Capacity	Status
HDD3	CH2, Master	UDMA 5	IBM-DTLA-307075	73GB	On-line
HDD4	CH2, Slave	UDMA 5	IBM-DTLA-307075	73GB	On-line
HDD6	CH3, Slave	UDMA 5	WDC WD1200BB-00CAA1	114GB	On-line
HDD8	CH4, Slave	UDMA 5	IC35L120AVV&07-0	118GB	On-line

Apply Close

You can check the device log from “Event and Log” page, the log will appear the HDD4 is a new number of the RAID array “RAID5”.



Device Log Display: 50 Severity: Info.

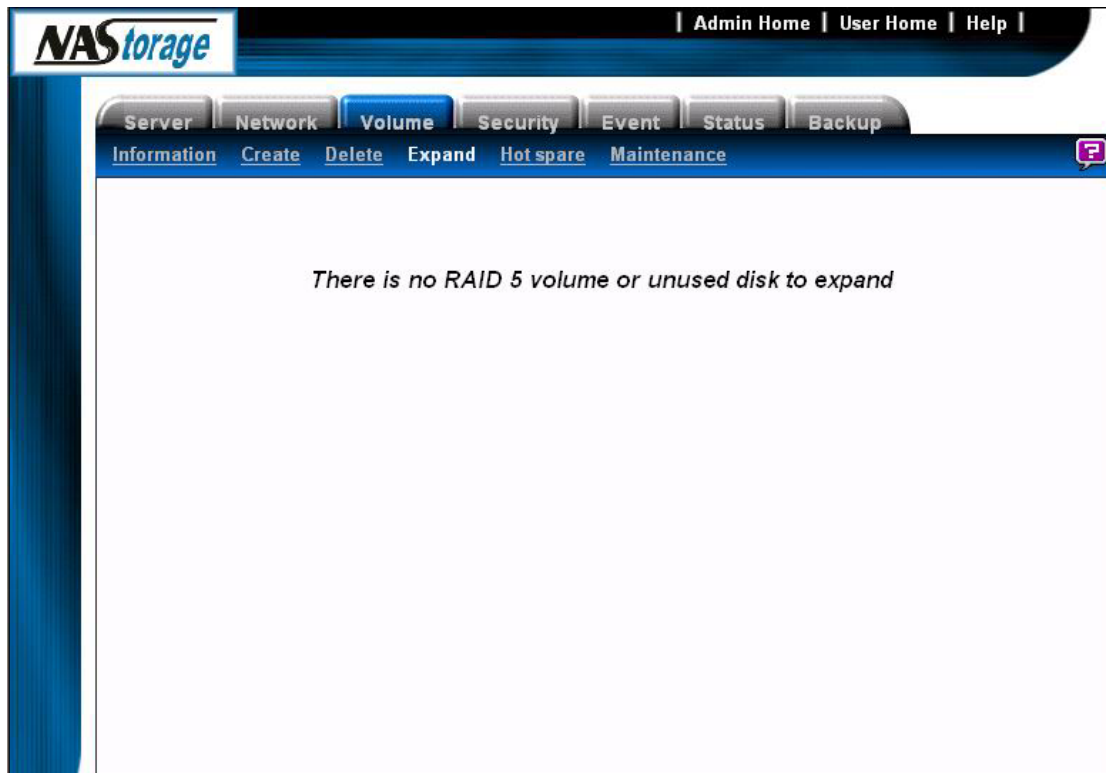
Legend: I=Information, W=Warning, E=Error, S=Startup

Date/Time	Description
2002/08/28 11:55:41	Mount volume successfully - RAID5
2002/08/28 11:55:36	Unmount volume successfully - RAID5
2002/08/28 11:55:35	RAID5: Start to expand volume - HDD 3.6.8. + HDD 4.

Note1. When the RAID array went into expand state, the volume on this RAID array will become read-only.

Note2. If there is serious failure occurred during expand process, such as power lost \ power shutdown, the expand process will continue previously task until the RAID array expansion finish.

If NASTorage server doesn't have any unused hard disk or RAID array (RAID5), when you click the Expand page, NASTorage won't find device to configure.



The screenshot shows a web-based management interface for NAS storage. At the top left, the logo "NAS storage" is displayed. To the right of the logo, there are navigation links: "Admin Home", "User Home", and "Help". Below this, a horizontal menu contains several tabs: "Server", "Network", "Volume", "Security", "Event", "Status", and "Backup". The "Volume" tab is currently selected. Underneath the "Volume" tab, there is a sub-menu with options: "Information", "Create", "Delete", "Expand", "Hot spare", and "Maintenance". The "Expand" option is highlighted. The main content area of the interface displays the message: "There is no RAID 5 volume or unused disk to expand".

3. RAID array into ready state

The RAID array will into ready state after expand finished.



The screenshot shows the NAS storage management interface. At the top, there is a navigation bar with 'NAS storage' on the left and 'Admin Home | User Home | Help |' on the right. Below this is a menu bar with 'Server', 'Network', 'Volume', 'Security', 'Event', 'Status', and 'Backup'. Under 'Volume', there are sub-menus: 'Information', 'Create', 'Delete', 'Expand', and 'Maintenance'. The 'Volume View' button is selected, and the 'Device View' button is also visible. The main content area displays the 'List of Volumes:' section with a table showing one RAID volume named 'RAID5' with 4 members (HDD3, 4, 6, 8), RAID Type 'RAID 5', 117GB free space (100%), and 117GB total space, with a status of 'Ready'. Below this is the 'Hot-spare Disks:' section, which shows 'No Device'. The 'Free Disks:' section contains a table with two entries: HDD5 and HDD7, both located on CH3 and CH4 respectively, with a mode of 'UDMA 5', model name 'IC35L120AVV&A07-0', and capacity of 118GB, with a status of 'No-init'.

Volume Name	Members	RAID Type	Free Space	Total Space	Status
RAID5	HDD3, 4, 6, 8	RAID 5	117GB (100%)	117GB	Ready

Hot-spare Disks:

No Device

Device	Location	Mode	Model Name	Capacity	Status
HDD5	CH3, Master	UDMA 5	IC35L120AVV&A07-0	118GB	No-init
HDD7	CH4, Master	UDMA 5	IC35L120AVV&A07-0	118GB	No-init