Data Recovery and Volume Restore after Disk Failures

Version 1.1

Introduction

This document describes how to recover data using the **“volume restore”** function in **JetStor SAS 516iS / 616iS RAID Array**. **“Volume restore”** is an embedded function of RAID Controller firmware. This function will keep track of all modifications of the online virtual disks and record all changes. Therefore the raid group can be restored and the data can be recovered in most cases.

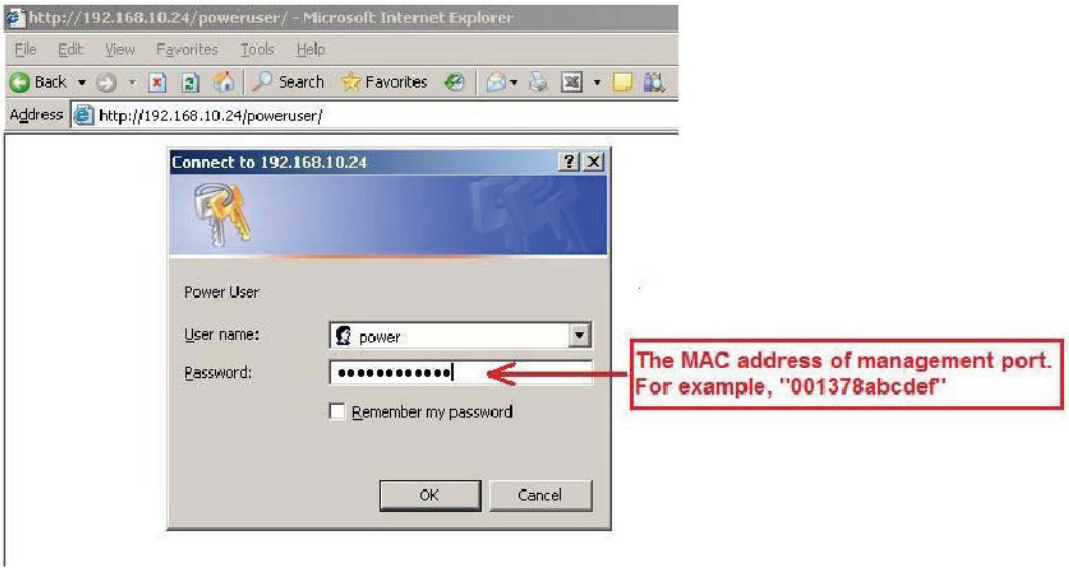
Attention:

1. The data recovery process does not guarantee that the lost data can be restored 100%. It depends on the real operation and the degree of physical damages on disks. Users will take their own risk to perform these procedures.
2. When trying to do data recovery, the same volume configurations as the original must be set and all member disks must be installed in the same sequence as they originally were. Otherwise data recovery will fail.

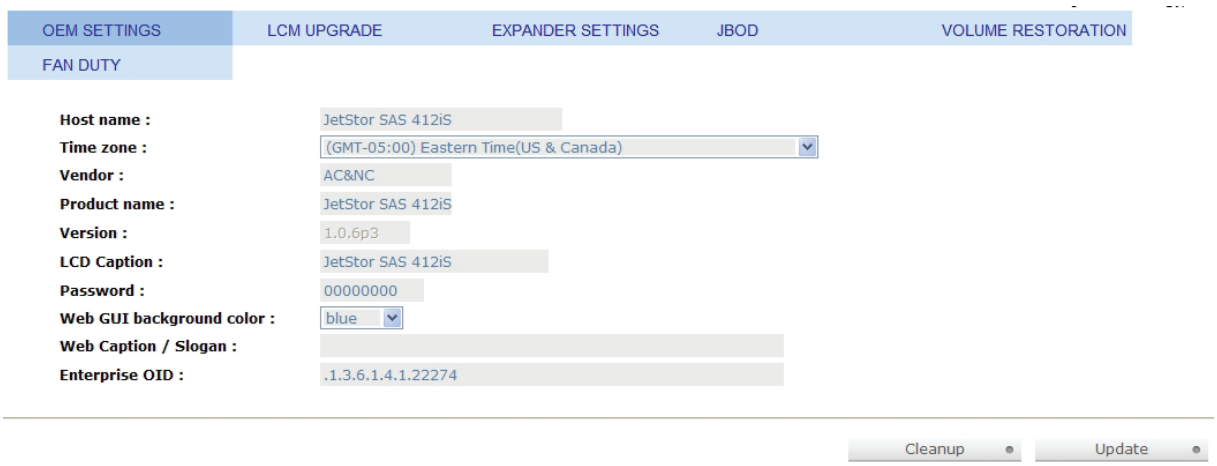
The status on volume restore

1. Login to **JetStor** as a power user using the following URL. For example: http://192.168.10.24/poweruser/

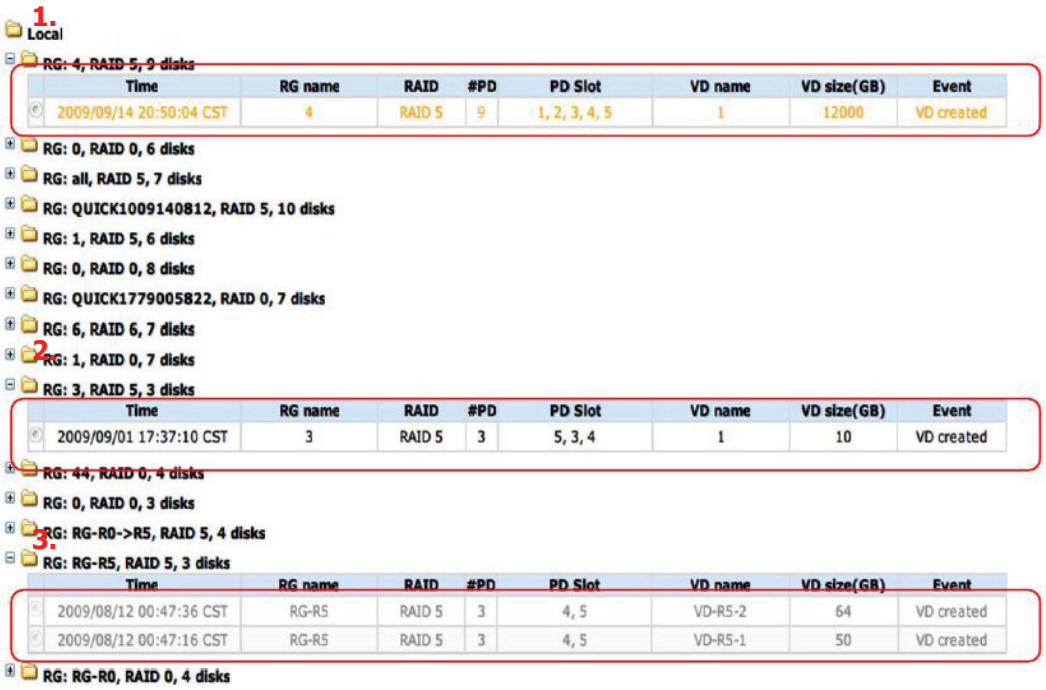
2. Enter username **power** and password: “The MAC address of management port”. Notice that the input is all in lower case. The password is case sensitive.



3. After login, there are various functions available on each tab.



4. Click on the **VOLUME RESTORATION** tab. Please wait for a while; it will query every RAID configuration of physical disks which might have been created. The status of volumes found is displayed as in the following figure.



The following describes the meaning of each status:

1. **Defective status:** This status is displayed in orange font. It means that the number of disks is greater than the minimum needed for the given RAID level. But some disks in the original RAID group have been lost. **The configuration can't be restored.**

2. **Enabled status:** This status is displayed in black font. It means that all disk signatures correspond with the RAID group created. **The configuration can be restored successfully.**

3. **Disabled status:** This status will be greyed out. It means that the number of missing disks is greater than the minimum needed for the given RAID level. **The configuration can't be restored.**

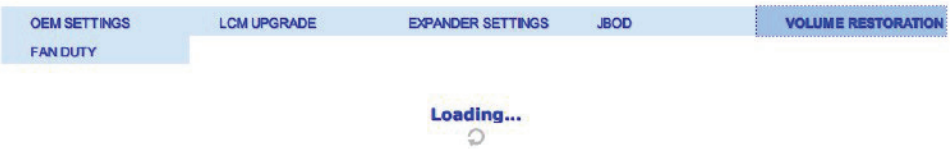
In the following cases, only the Enabled status will be discussed. The other two statuses can not be restored at all.

Recovery procedure

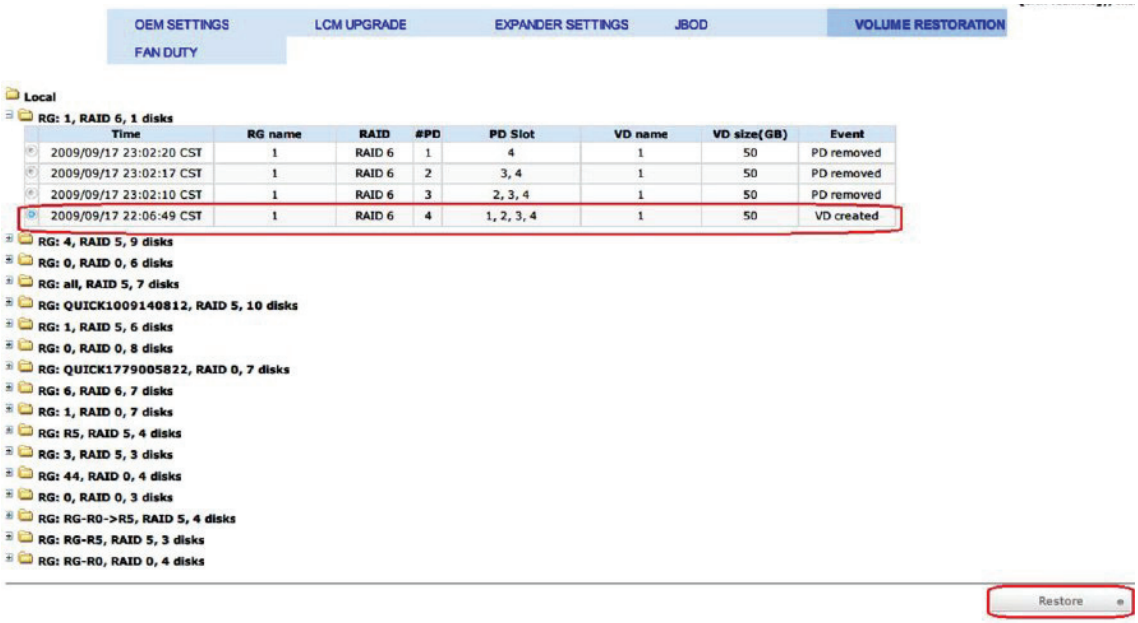
Case 1: RAID group has failed and some member physical disks in RAID group are recognized as "Free" by the controller after booting.

1. Delete the original RAID group.

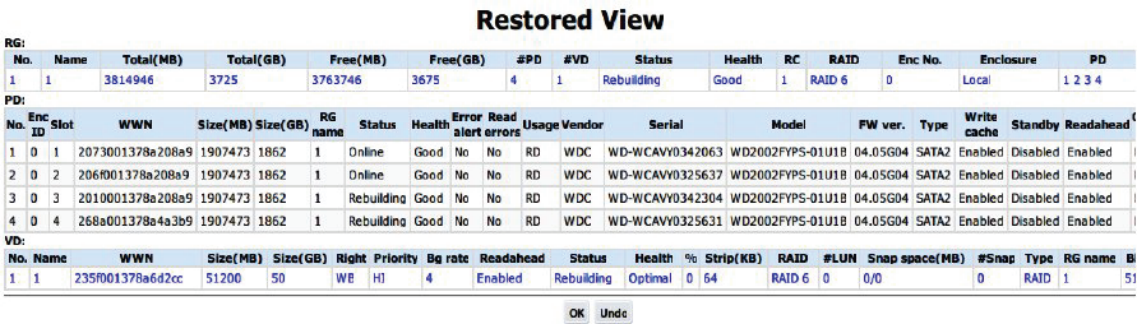
2. Login as poweruser. And click the **VOLUME RESTORATION** tab. Please wait for a while.



3. Select the RG configuration which is going to be restored. And click the **RESTORE** button.



4. The original RAID group configuration is now in the **Restored View.** Make sure that it is the configuration which you want restored, and then click **OK** button.



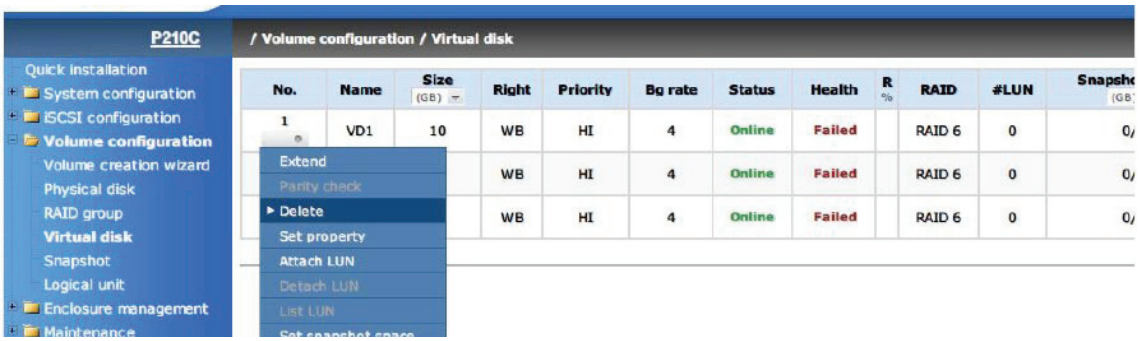
5. After successful restore, there will be events logged as follows:
INFO Configuration of VDXX has been restored.
INFO Configuration of RGXX has been restored.

6. Attach the VD to LUN0 and connect to it form the host.

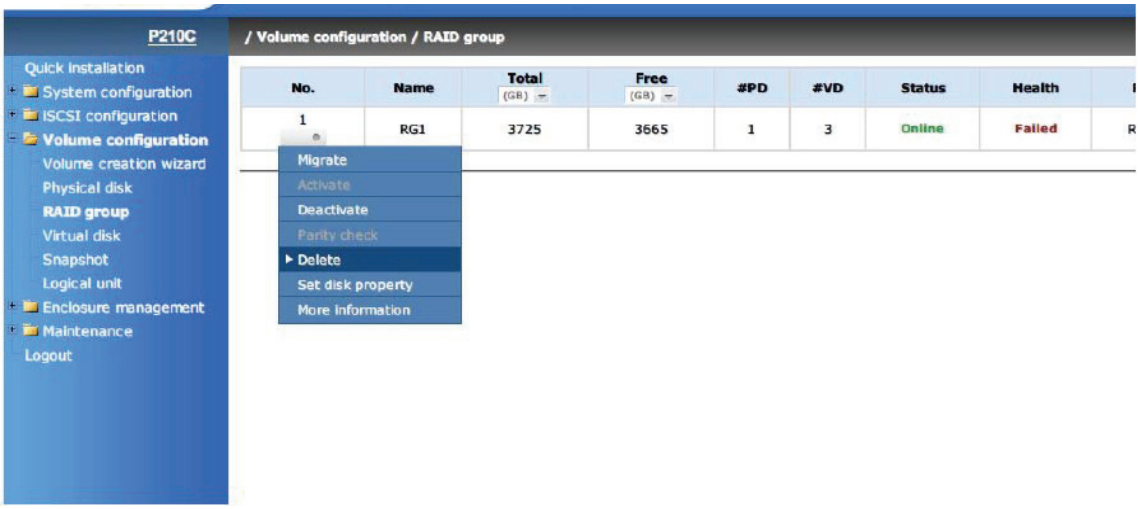
7. The data should now be visible. Backup all files, and then reconfigure the whole volume to ensure that everything is in a consistent state.

Case 2: RAID group has failed and some member physical disks in RAID group are recognized as "Free" by the controller after booting, and one of them has serious physical damage. (In this case, the RAID group contains three virtual disks.)

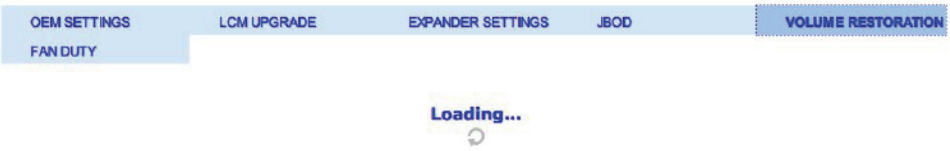
1. Delete all original virtual disks in the RAID group.



2. Delete the RAID group.



3. Login as poweruser. And click the **VOLUME RESTORATION** tab. Please wait for a while.



4. Select the RG configuration which is going to be restored. And click **RESTORE** button. Because one of physical disks is damaged, the RAID group will be in a degraded mode when restored.

OEM SETTINGS | LCM UPGRADE | EXPANDER SETTINGS | JBOD | VOLUME RESTORATI
FAN DUTY

Local
RG: 5, RAID 5, 4 disks
RG: RG1, RAID 6, 1 disks

Time	RG name	RAID	#PD	PD Slot	VD name	VD size(GB)	Event
2009/09/22 18:53:40 CST	RG1	RAID 6	1	1	VD3	30	PD removed
2009/09/22 18:53:40 CST	RG1	RAID 6	1	1	VD2	20	PD removed
2009/09/22 18:53:40 CST	RG1	RAID 6	1	1	VD1	10	PD removed
2009/09/22 18:53:34 CST	RG1	RAID 6	2	1, 4	VD3	30	PD removed
2009/09/22 18:53:34 CST	RG1	RAID 6	2	1, 4	VD2	20	PD removed
2009/09/22 18:53:34 CST	RG1	RAID 6	2	1, 4	VD1	10	PD removed
2009/09/22 18:53:31 CST	RG1	RAID 6	3	1, 2, 4	VD3	30	PD removed
2009/09/22 18:53:31 CST	RG1	RAID 6	3	1, 2, 4	VD2	20	PD removed
2009/09/22 18:53:31 CST	RG1	RAID 6	3	1, 2, 4	VD1	10	PD removed
2009/09/22 18:35:29 CST	RG1	RAID 6	4	1, 2, 4	VD3	30	VD created
2009/09/22 18:35:21 CST	RG1	RAID 6	4	1, 2, 4	VD2	20	VD created
2009/09/22 18:35:00 CST	RG1	RAID 6	4	1, 2, 4	VD1	10	VD created

RG: R6, RAID 6, 1 disks
RG: 0, RAID 0, 9 disks
RG: 1, RAID 6, 8 disks
RG: 1, RAID 5, 3 disks

5. The original RAID group configuration is now in the Restored View. Make sure that it is the configuration which you want to restore, and then click **OK** button. Please look at **#PD** and **PD Slot** column, where there are three drives remain. The volume restore function saves single VD change on each record. In this case, there are three VDs that need to be restored, so it becomes necessary to select each VD one by one. This is the first VD.

Restored View

RG:

No.	Name	Total(MB)	Total(GB)	Free(MB)	Free(GB)	#PD	#VD	Status	Health	RC	RAID	Enc No.	Enclosure	PD
1	RG1	3814946	3725	3804706	3715	3	1	Online	Degraded	1	RAID 6	0	Local	1 2 4

PD:

No.	Enc ID	Slot	WWN	Size(MB)	Size(GB)	RG name	Status	Health	Error alert	Read errors	Usage	Vendor	Serial	Model	FW ver.	Type	Write cache	Standby	Readahead
1	0	1	2073001378a208a9	1907473	1862	RG1	Online	Good	No	No	RD	WDC	WD-WCAVY0342063	WD2002FYPS-01U1B	04.05G04	SATA2	Enabled	Disabled	Enabled
2	0	2	2627001378ac0016	1907473	1862	RG1	Online	Good	No	No	RD	WDC	WD-WCAVY0342068	WD2002FYPS-01U1B	04.05G04	SATA2	Enabled	Disabled	Enabled
3	0	4	2674001378a4a3b9	1907473	1862	RG1	Online	Good	No	No	RD	WDC	WD-WCAVY0340324	WD2002FYPS-01U1B	04.05G04	SATA2	Enabled	Disabled	Enabled

VD:

No.	Name	WWN	Size(MB)	Size(GB)	Right	Priority	Bg rate	Readahead	Status	Health	%	Strip(KB)	RAID	#LUN	Snap space(MB)	#Snap	Type	RG name
1	VD1	2374001378a6d2cc	10240	10	WB	HI	4	Enabled	Online	Degraded		64	RAID 6	0	0/0	0	RAID	RG1

OK Undo

6. Restore the second VD.

Restored View

RG:

No.	Name	Total(MB)	Total(GB)	Free(MB)	Free(GB)	#PD	#VD	Status	Health	RC	RAID	Enc No.	Enclosure	PD
1	RG1	3814946	3725	3784226	3695	3	2	Online	Degraded	1	RAID 6	0	Local	1 2 4

PD:

No.	Enc ID	Slot	WWN	Size(MB)	Size(GB)	RG name	Status	Health	Error alert	Read errors	Usage	Vendor	Serial	Model	FW ver.	Type	Write cache	Standby	Readahea
1	0	1	2073001378a208a9	1907473	1862	RG1	Online	Good	No	No	RD	WDC	WD-WCAVY0342063	WD2002FYPS-01U1B	04.05G04	SATA2	Enabled	Disabled	Enabled
2	0	2	2627001378ac0016	1907473	1862	RG1	Online	Good	No	No	RD	WDC	WD-WCAVY0342068	WD2002FYPS-01U1B	04.05G04	SATA2	Enabled	Disabled	Enabled
3	0	4	2674001378a4a3b9	1907473	1862	RG1	Online	Good	No	No	RD	WDC	WD-WCAVY0340324	WD2002FYPS-01U1B	04.05G04	SATA2	Enabled	Disabled	Enabled

VD:

No.	Name	WWN	Size(MB)	Size(GB)	Right	Priority	Bg rate	Readahead	Status	Health	%	Strip(KB)	RAID	#LUN	Snap space(MB)	#Snap	Type	RG name
1	VD1	2374001378a6d2cc	10240	10	WB	HI	4	Enabled	Online	Degraded		64	RAID 6	0	0/0	0	RAID	RG1
2	VD2	2375001378a6d2cc	20480	20	WB	HI	4	Enabled	Online	Degraded		64	RAID 6	0	0/0	0	RAID	RG1

OK Undo

7. Restore the third VD.

Restored View

RG:

No.	Name	Total(MB)	Total(GB)	Free(MB)	Free(GB)	#PD	#VD	Status	Health	RC	RAID	Enc No.	Enclosure	PD
1	RG1	3814946	3725	3753506	3665	3	3	Online	Degraded	1	RAID 6	0	Local	1 2 4

PD:

No.	Enc ID	Slot	WWN	Size(MB)	Size(GB)	RG name	Status	Health	Error alert	Read errors	Usage	Vendor	Serial	Model	FW ver.	Type	Write cache	Standby	Readahead
1	0	1	2073001378a208a9	1907473	1862	RG1	Online	Good	No	No	RD	WDC	WD-WCAVY0342063	WD2002FYPS-01U1B	04.05G04	SATA2	Enabled	Disabled	Enabled
2	0	2	2627001378ac0016	1907473	1862	RG1	Online	Good	No	No	RD	WDC	WD-WCAVY0342068	WD2002FYPS-01U1B	04.05G04	SATA2	Enabled	Disabled	Enabled
3	0	4	2674001378a4a3b9	1907473	1862	RG1	Online	Good	No	No	RD	WDC	WD-WCAVY0340324	WD2002FYPS-01U1B	04.05G04	SATA2	Enabled	Disabled	Enabled

VD:

No.	Name	WWN	Size(MB)	Size(GB)	Right	Priority	Bg rate	Readahead	Status	Health	%	Strip(KB)	RAID	#LUN	Snap space(MB)	#Snap	Type	RG name	E
1	VD1	2374001378a6d2cc	10240	10	WB	HI	4	Enabled	Online	Degraded		64	RAID 6	0	0/0	0	RAID	RG1	5
2	VD2	2375001378a6d2cc	20480	20	WB	HI	4	Enabled	Online	Degraded		64	RAID 6	0	0/0	0	RAID	RG1	5
3	VD3	2376001378a6d2cc	30720	30	WB	HI	4	Enabled	Online	Degraded		64	RAID 6	0	0/0	0	RAID	RG1	5

OK Undo

8. After all volumes have been restored successfully, the following events are logged:
   INFO Configuration of VDXX has been restored.
   INFO Configuration of RGXX has been restored.

9. Attach the VD to LUN0 and connect to it form the host.

10. The data should now be visible. Backup all files, and then reconfigure the whole volume to ensure that everything is in a consistent state.