Chapter 12 RAID

This chapter is applicable for 2U series NVR only.

12.1 Configuring Array

Purpose:

RAID (redundant array of independent disks) is a storage technology that combines multiple disk drive components into a logical unit. A RAID setup stores data over multiple hard disk drives to provide enough redundancy so that data can be recovered if one disk fails. Data is distributed across the drives in one of several ways called "RAID levels", depending on what level of redundancy and performance is required.

The NVR support the disk array which is realized by the software, and RAID0, RAID1, RAID5 and RAID 10 are supported. You can enable the RAID function on your demand.

Before you start:

Please install the HDD(s) properly and it is recommended to use the same enterprise-level HDDs (including model and capacity) for array creation and configuration so as to maintain reliable and stable running of the disks.

Introduction:

The NVR can store the data (such as record, picture, log information) in the HDD only after you have created the array or you have configured network HDD (refer to *Chapter13.2 Managing Network HDD*). Our device provides two ways for creating array, including one-touch configuration and manual configuration. The following flow chart shows the process of creating array.

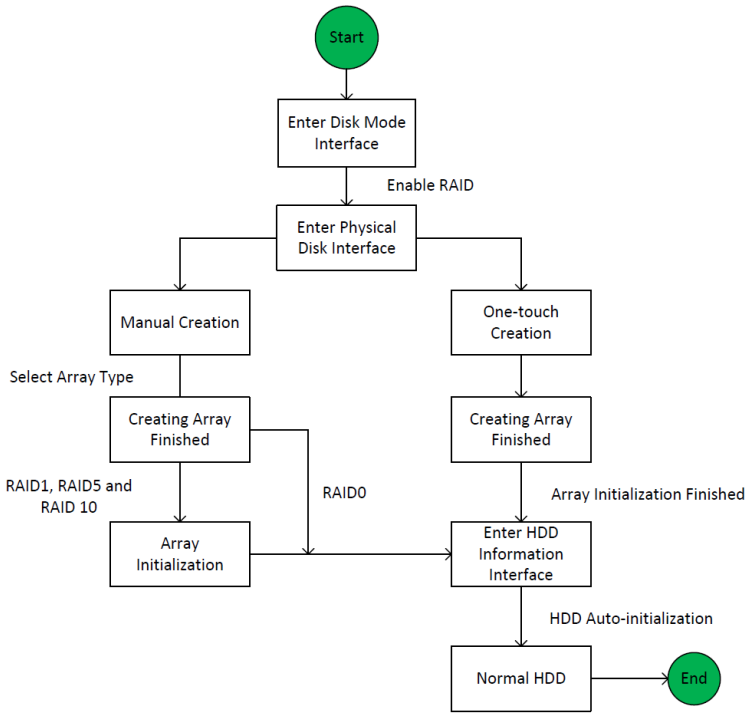

Figure 12. 1 RAID Working Flow

12.1.1 Enable RAID

Purpose:

Perform the following steps to enable the RAID function, or the disk array cannot be created.

- **OPTION 1:**

Enable the RAID function in the Wizard when the device startup, please refer to step 7 of Chapter 2.2.

- **OPTION 2:**

Enable the RAID function in the HDD Management Interface.

Steps:

1. Enter the disk mode configuration interface.

Menu > HDD > Advanced

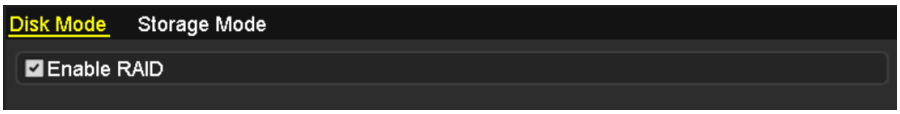

Figure 12. 2 Enable RAID Interface

2. Check the checkbox of **Enable RAID**.

3. Click the **Apply** button to save the settings.

12.1.2 One-touch Configuration

Purpose:

Through one-touch configuration, you can quickly create the disk array. By default, the array type to be created is RAID 5.

Before you start:

1. The RAID function should be enabled, please refer to the Chapter 13.1.1 for details.
2. As the default array type is RAID 5, please install at least 3 HDDs in you device.
3. If more than 10 HDDs are installed, 2 arrays can be configured.

Steps:

1. Enter the RAID configuration interface.

Menu > HDD > RAID

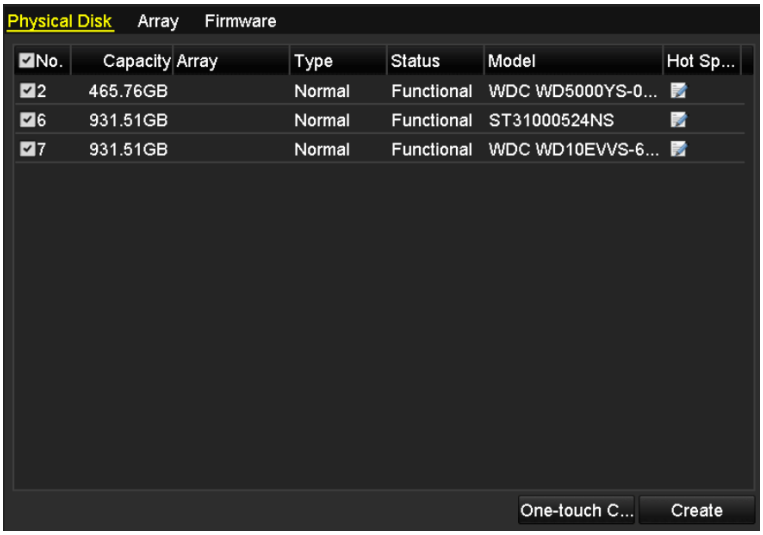

Figure 12. 3 Physical Disk Interface

2. Check the checkbox of corresponding HDD No. to select it.
3. Click the **One-touch Create** button to enter the One-touch Array Configuration interface.

Figure 12. 4 One-touch Array Configuration

4. Edit the array name in the **Array Name** text filed and click **OK** button to start configuring array.

NOTE

If you install 4 HDDs or above for one-touch configuration, a hot spare disk will be set by default. It is recommended to set hot spare disk for automatically rebuilding the array when the array is abnormal.

5. When the array configuration is completed, click **OK** button in the pop-up message box to finish the settings.
6. You can click **Array** tab to view the information of the successfully created array.

NOTE

By default, one-touch configuration creates an array and a virtual disk.

Figure 12. 5 Array Settings Interface

7. A created array displays as an HDD in the HDD information interface.

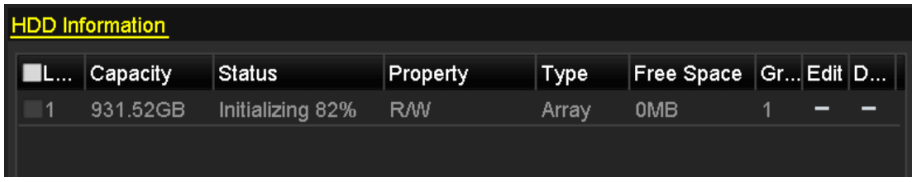

Figure 12. 6 HDD Information Interface

12.1.3 Manually Creating Array

Purpose:

You can manually create the array of RAID 0, RAID 1, RAID 5 and RAID 10.

NOTE

In this section, we take RAID 5 as an example to describe the manual configuration of array and virtual disk.

Steps:

1. Enter the Physical Disk Settings interface.

Menu > HDD > RAID > Physical Disk

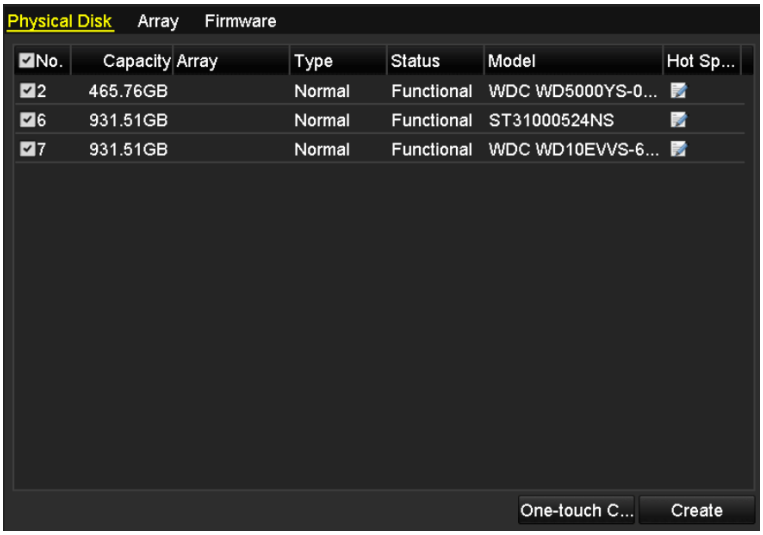

Figure 12. 7 Physical Disk Settings Interface

2. Click **Creat** button to enter the Create Array interface.

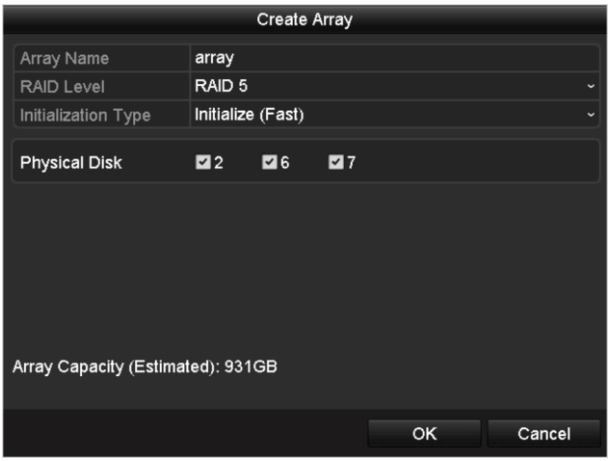

Figure 12. 8 Create Array Interface

3. Edit the **Array Name**; set the **RAID Level** to RAID 0, RAID 1, RAID 5 or RAID 10; select the **Physical Disk** that you want to configure array.

NOTE

- If you choose RAID 0, at least 2 HDDs must be installed.
- If you choose RAID 1, 2 HDDs need to be configured for RAID 1.
- If you choose RAID 5, at least 3 HDDs must be installed.
- If you choose RAID 10, the number of HDDs installed should be even in the range of 4~16.

4. Click **OK** button to create array.

NOTE

If the number of HDDs you select is not compatible with the requirement of the RAID level, the error message box will pop up.

Figure 12. 9 Error Message Box

5. You can click **Array** tab to view the successfully created array.

Figure 12. 10 Array Settings Interface

12.2 Rebuilding Array

Purpose:

The working status of array includes Functional, Degraded and Offline. By viewing the array status, you can take immediate and proper maintenance for the disks so as to ensure the high security and reliability of the data stored in the disk array.

When there is no disk loss in the array, the working status of array will change to Functional; when the number of lost disks has exceeded the limit, the working status of array will change to Offline; in other conditions, the working status is Degraded.

When the virtual disk is in Degraded status, you can restore it to Functional by array rebuilding.

Before you start:

Please make sure the hot spare disk is configured.

1. Enter the Physical Disk Settings interface to configure the hot spare disk.

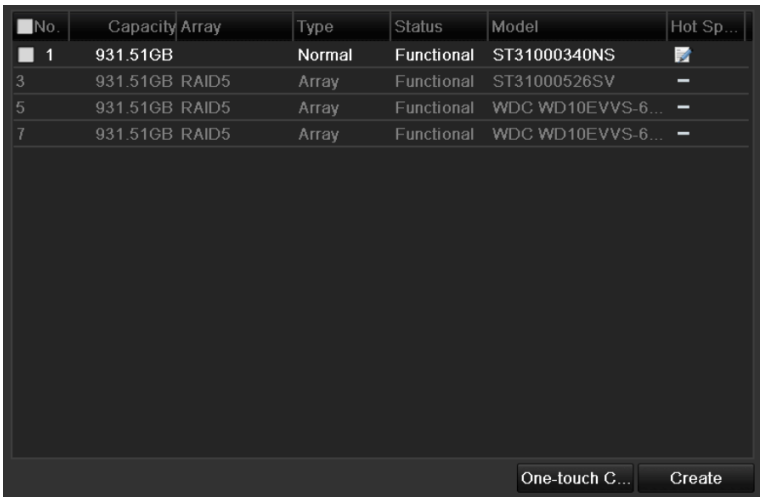

Figure 12. 11 Physical Disk Settings Interface

2. Select a disk and click  to set it as the hot spare disk.

Only global hot spare mode is supported.

12.2.1 Automatically Rebuilding Array

Purpose:

When the virtual disk is in Degraded status, the device can start rebuilding the array automatically with the hot spare disk to ensure the high security and reliability of the data.

Steps:

1. Enter the Array Settings interface. The status of the array is Degraded. Since the hot spare disk is configured, the system will automatically start rebuilding using it.

Menu > HDD > RAID > Array

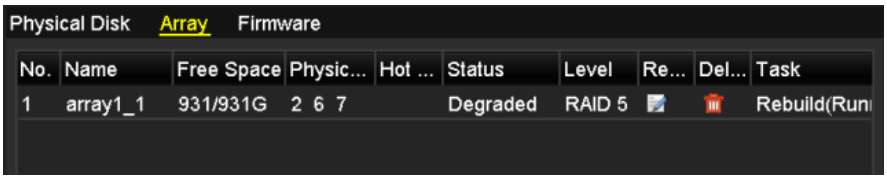

Figure 12. 12 Array Settings Interface

If there is no hot spare disk after rebuilding, it is recommended to install a HDD into the device and set is as a hot spare disk to ensure the high security and reliability of the array.

12.2.1 Manually Rebuilding Array

Purpose:

If you do not enable the Auto-rebuild in Firmware Settings interface (Menu>HDD>RAID>Firmware) or the hot spare disk has not been configured, then you can rebuild the array manually to restore the array when the virtual disk is in Degraded status.

Steps:

1. Enter the Array Settings interface. The disk 3 is lost.

Menu > HDD > RAID > Array

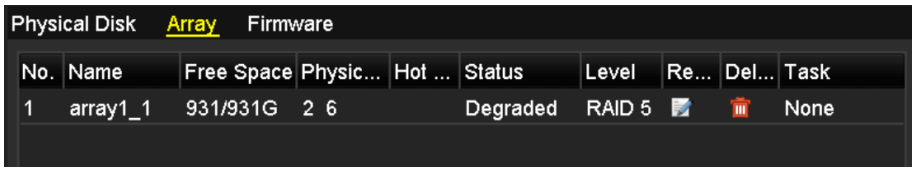

Figure 12. 13 Array Settings Interface

2. Click Array tab to back to the Array Settings interface and click  to configure the array rebuild.

At least one available physical disk should exist for rebuilding the array.

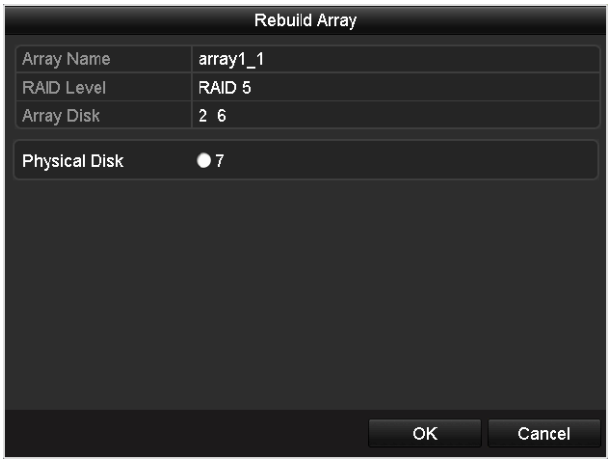

Figure 12. 14 Rebuild Array Interface

3. Select the available physical disk and click **OK** button to confirm to rebuild the array.

4. The “Do not unplug the physical disk when it is under rebuilding” message box pops up. Click **OK** button to

start rebuilding.

5. You can enter the Array Settings interface to view the rebuilding status.

6. After rebuilding successfully, the array and virtual disk will restore to Functional.

12.3 Deleting Array

Deleting array will cause to delete all the data saved in the disk.

Steps:

1. Enter the Array Settings interface.

Menu>HDD>RAID>Array

Figure 12. 15 Array Settings Interface

2. Select an array and click to delete the array.

Figure 12. 16 Confirm Array Deletion

3. In the pop-up message box, click **Yes** button to confirm the array deletion.

Deleting array will cause to delete all the data in the array.

12.4 Checking and Editing Firmware

Purpose:

You can view the information of the firmware and upgrade the firmware by local backup device or remote FTP server.

Steps:

1. Enter the Firmware interface to check the information of the firmware, including the version, maximum physical disk quantity, maximum array quantity, auto-rebuild status, etc.

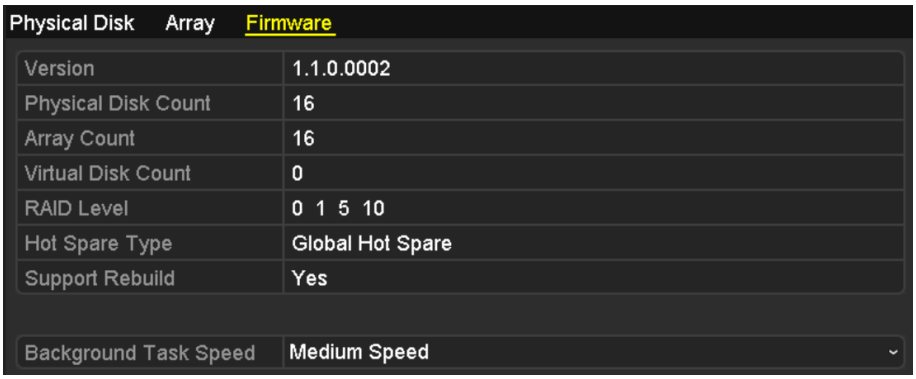

Figure 12. 17 Firmware Interface

2. You can set the Background Task Speed in the drop-down list.