TECHNICAL BULLETIN

HIKVISION®

Title:	Configuring RAID Array		Version:	V2.0	Date:	070716
Product:	RAID Enabled NVRs and Hybrids				Page:	1 of 6
Action Required:	None, Information Only					

Summary

RAID (Redundant Array of Independent Disks) is a data storage virtualization technology that combines multiple disk drive components into a logical unit for the purpose of data redundancy or performance improvement. Most commonly used RAID levels are:

RAID Levels Table

RAID LEVEL	DESCRIPTION	EXAMPLE
RAID 0	**STRIPING**. Combines the capacity of individual HDDs into one. Requires 2 or more HDDs of any capacity. Disks can be different sizes, but the storage space added to the array by each disk is limited to the size of the smallest disk.	120 GB disk + 320 GB disk **Total: 240 TB** (120 GB × 2)
RAID 1	**MIRRORING**. Writes the same data identically on all HDDs. Requires an even number of HDDs of the same capacity.	Four 4 TB HDDs **Total: 8 TB**
RAID 5	**BLOCK-LEVEL STRIPING**. Striping with distributed parity. All drives must be the same capacity and like performance. It is preferred to use the same drive model when creating a RAID set. You can suffer a single drive failure, but you will be operating in a degraded state. You can designate an additional drive to be a hot spare, which can reconstruct the bits of the failed drive by using the parity bits along with the bits in the remaining drives. Requires at least three HDDs (preferably of the same capacity). Disks can be different sizes, but the storage space added to the array by each disk is limited to the size of the smallest disk.	120 GB disk + 320 GB disk **Total: 240 TB** (120 GB × 2)
RAID 10	**RAID 1 + RAID 0.** Requires a minimum of four disks, and stripes data across mirrored pairs. As long as one disk in each mirrored pair is functional, data can be retrieved.	Four 4 TB HDDs **Total: 8 TB**

The following Hikvision NVRs and hybrids have RAID support:

- DS-9616NI-ST
- DS-9632NI-ST
- DS-9664NI-ST
- DS-9632NI-I8
- DS-9664NI-I8
- DS-96128NI-F24/H
- DS-96256NI-F24/H
- DS-9008HQHI-SH
- DS-9016HQHI-SH

After the HDDs are installed in the NVR/hybrid, the HDDs will NOT show up in the HDD list and they will not be available for recording (Figure 1).

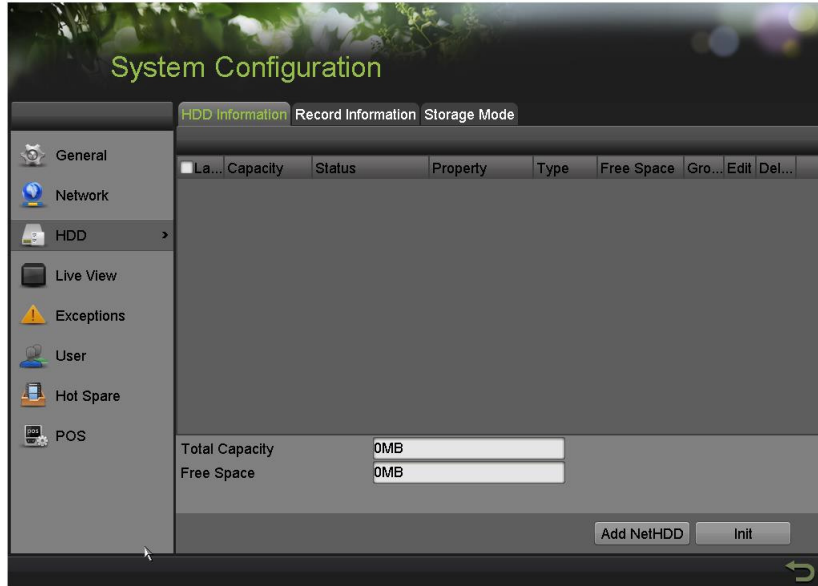| Title:	Configuring RAID Array	Version:	V2.0	Date:	070716
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Figure 1, HDD Information Tab

In order for the NVR/hybrid to recognize the HDDs, the RAID array needs to be configured.

1. Go to **MENU > SYSTEM CONFIGURATION > RAID**. The HDDs will be shown on the list of available drives under the **PHYSICAL DISK** tab (Figure 2).
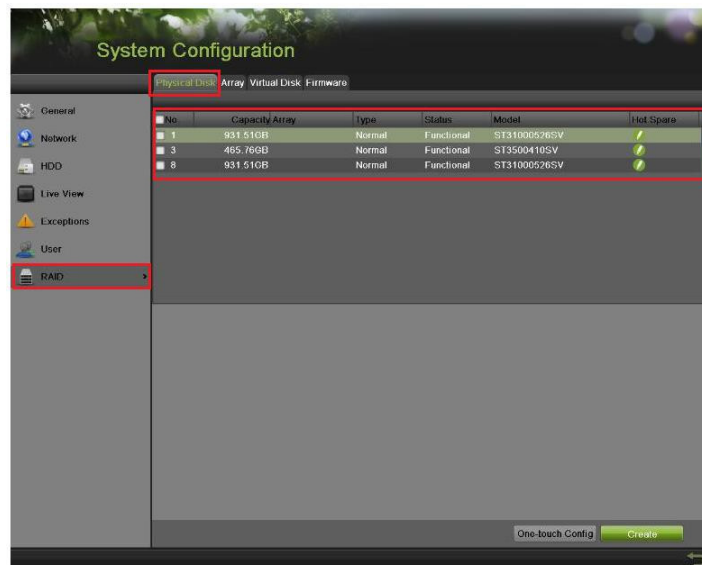

Figure 2, Physical Disk Tab

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2. Select the HDDs that will be included in the RAID array.

3. Press **CREATE**. A window will appear prompting for an **Array Name** and **RAID Level** and the disks that will be included in the array (Figure 3).

4. Enter a name for the array in the **Array Name** field.

5. Use the pull-down menu to select the array level (see RAID Levels Table, above):
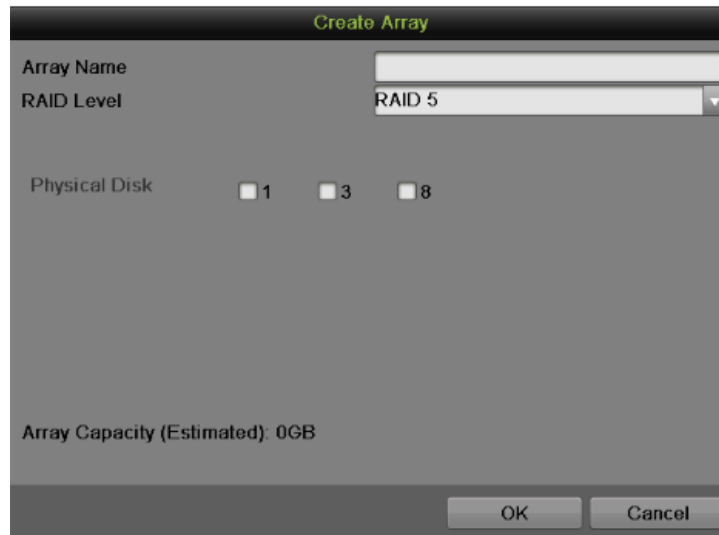
   • RAID 0
   • RAID 1
   • RAID 5
   • RAID 10

Figure 3, Create Array Window

6. Use the checkboxes to select the HDDs to include in the RAID array.

7. Press the **OK** button.

8. Go to the **ARRAY** tab on the top of the page. This tab will display all available arrays (Figure 4).

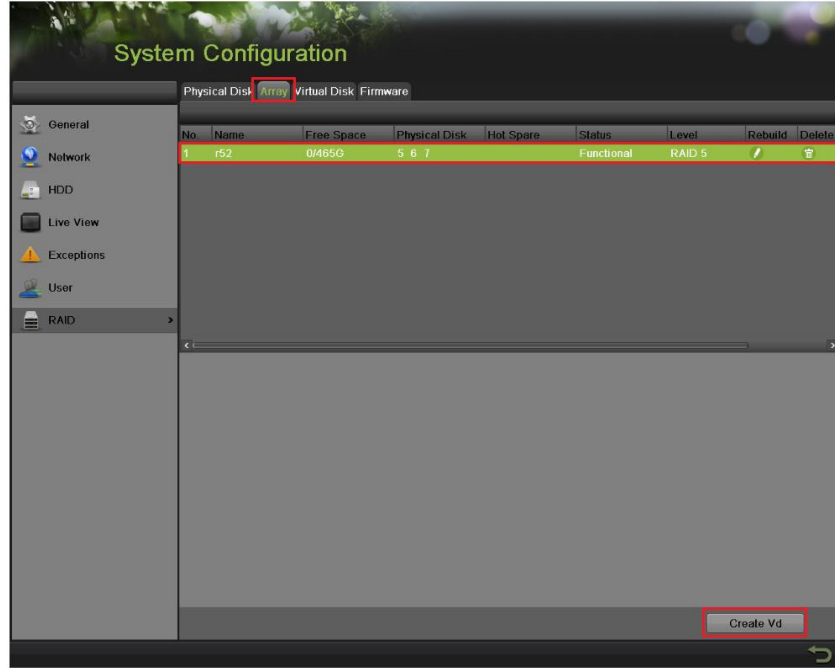| Title:	Configuring RAID Array			Version:	V2.0	Date:	070716
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Figure 4, Array Tab

To the array for recording, a **VIRTUAL DRIVE** needs to be created, because at this stage the total disk size is unallocated.

9. Highlight the array.

10. Press **Create Vd** button. A window will appear prompting for a name, capacity, and initialization type (Figure 5).
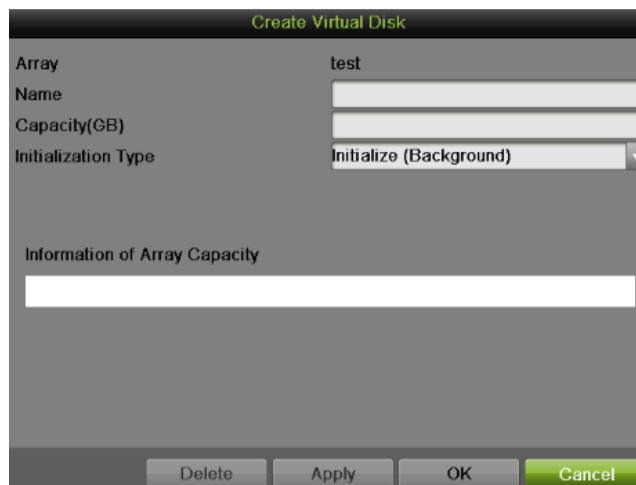

Figure 5, Create Virtual Disk Window

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12. Type a label for the virtual disk in the Name field.

13. Type how large a size (in GB) you want to allocate in the **Capacity (GB)** field.

14. Use the pull-down **Initialization Type** menu to select how you want the virtual disk initialized:

- **Initialization (Fast)** — The array will be initialized without checking the HDD sectors against each other. The HDD will be available for recording immediately.

- **Initialization (Background)** — The HDD sectors will be checked against each other in the background. The HDD will be available for recording almost **immediately**, but the NVR will continue checking the sectors in the background (depending on the HDD size, this can take up to 96 hours).

- **Initialization (Foreground)** — The HDD sectors will be checked against each other in the foreground. The HDD **WILL NOT** be available for recording until this process is finished (depending on the HDD size, this can take up to 96 hours).

  NOTE: HikVision recommends choosing the **Initialization (Background)** option for both performance and reliability.

15. Click the **OK** button to initialize the array. After this step is complete, the HDDs will be initialized and the unit will be ready for recording.

16. (Optional) If an extra HDD is installed and is not included in an array, it can be used as a HOT SPARE. By clicking the HOT SPARE button next to the HDD, the HDD becomes a hot spare for the RAID (Figure 6).
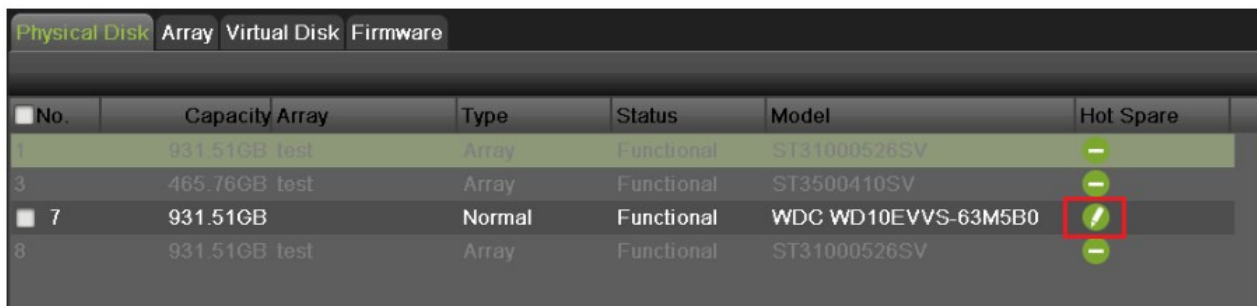

Figure 6, Physical Disk Tab, Hot Spare Button

17. Go to the **FIRMWARE** tab and check (enable) the **AUTO-REBUILD** checkbox (Figure 7).

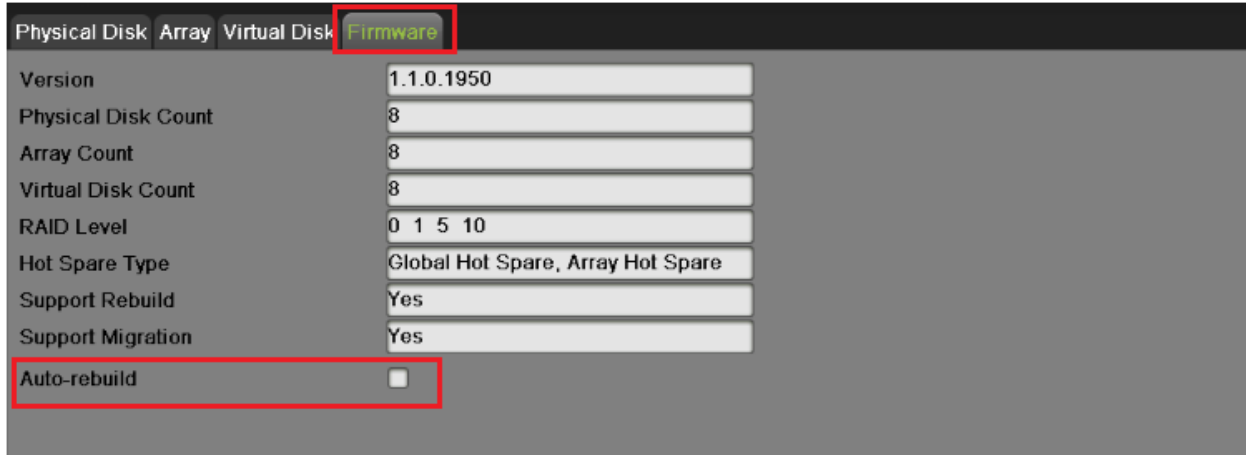| Title:	Configuring RAID Array	Version:	V2.0	Date:	070716
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Figure 7, Firmware Tab, Auto-Rebuild Checkbox

NOTE: Having a **Hot Spare** HDD will increase the reliability of the system. If one of the HDDs in the array fails, the **Hot Spare** HDD will automatically take over and rebuild the array. During this process the recording will not be interrupted.