



## How to setup Failover in Linux NVR

Application Note

Version 1.0

## Preface

This application note instructs you on how to set up the failover function and identify the failover function's status.

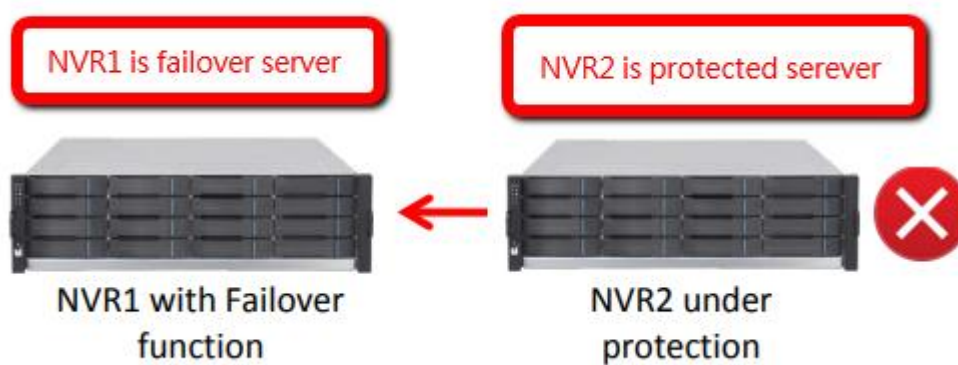
We strongly recommend you to create at least one dual RAID, one RAID for NVR's record, and another RAID for protected server failover's record.

In this case, we created two RAIDs:

1. One NVR normal record to drive E.
2. Two protected server failover record to drive F

This case uses two NVR 3308: NVR 1 for failover server and NVR2 for protected server.

Product model	Firmware version
Surveon Linux base NVR	4.0 or above version



This document has seven sections:

1. Creating the first RAID for NVR normal record
2. Creating the second RAID for protected server failovers record
3. Adding a protected server
4. Setting up the failover function
5. Identifying the protected server offline and failover server's failover status
6. Setting up Alarm rule
7. Setting up EonOne Lite Email notification (only for NVR5400 / NVR 7300 series.)

# 1. Creating the first RAID for NVR normal record

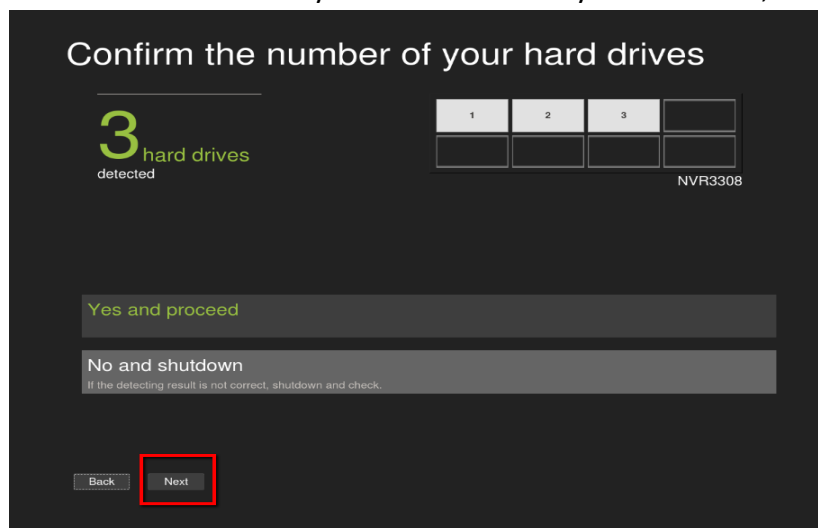
For this procedure, we use NVR3308. Take note that before turning on the NVR, ensure that you inserted the correct number of disks to create the first RAID. In this case, we use 3 disk drives.

To create the first RAID:

1. Turn on the NVR then run the installation wizard.

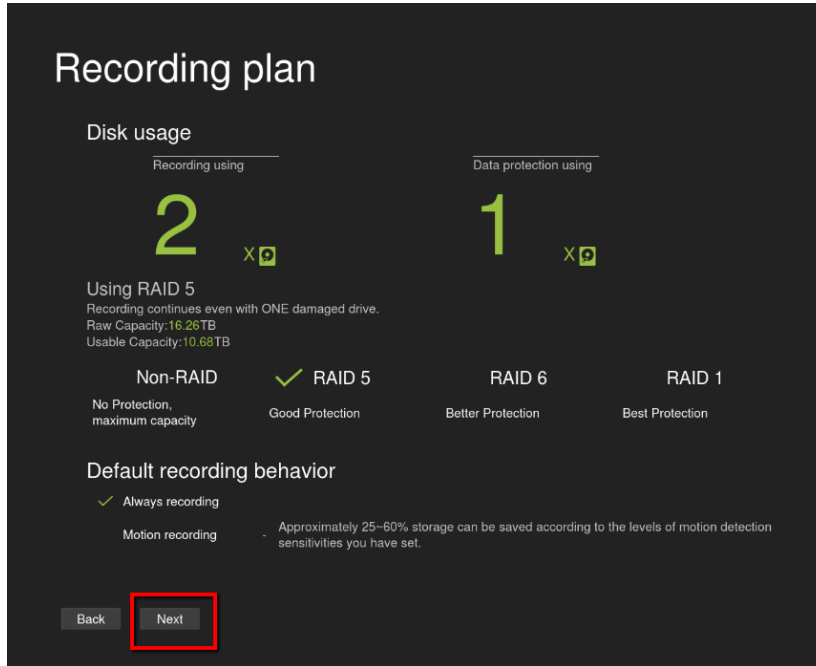


2. Confirm the number of your hard drives for your first RAID, then click **Next**.



Note: We use 3 disks in this case.

3. Select the RAID level, then press **Next**.



The 'Recording plan' screen displays disk usage and RAID configuration options. It shows 'Recording using' 2 drives and 'Data protection using' 1 drive. The RAID configuration section includes options for Non-RAID, RAID 5 (selected), RAID 6, and RAID 1. The 'Default recording behavior' section shows 'Always recording' selected. The 'Next' button is highlighted with a red box.

## Recording plan

Disk usage

Recording using: 2

Data protection using: 1

Using RAID 5  
Recording continues even with ONE damaged drive.  
Raw Capacity: 16.26TB  
Usable Capacity: 10.68TB

Non-RAID: No Protection, maximum capacity

RAID 5: Good Protection

RAID 6: Better Protection

RAID 1: Best Protection

Default recording behavior

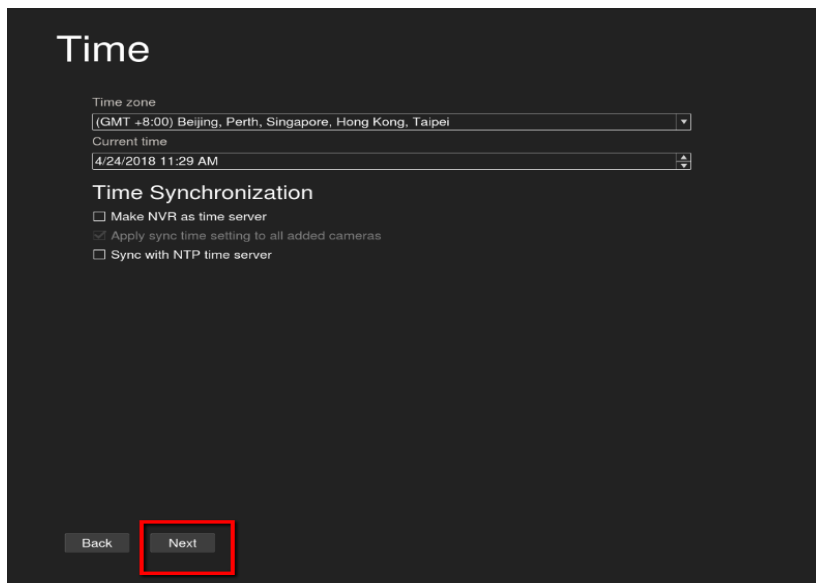
Always recording

Motion recording: Approximately 25~60% storage can be saved according to the levels of motion detection sensitivities you have set.

Back Next

Note: We strongly recommend you to set up RAID 6 for better RAID protection.

4. Set up the time, then click **Next**.



The 'Time' screen allows configuration of time zone, current time, and time synchronization. The time zone is set to '(GMT +8:00) Beijing, Perth, Singapore, Hong Kong, Taipei'. The current time is '4/24/2018 11:29 AM'. The 'Time Synchronization' section includes options for 'Make NVR as time server', 'Apply sync time setting to all added cameras', and 'Sync with NTP time server'. The 'Next' button is highlighted with a red box.

## Time

Time zone: (GMT +8:00) Beijing, Perth, Singapore, Hong Kong, Taipei

Current time: 4/24/2018 11:29 AM

Time Synchronization

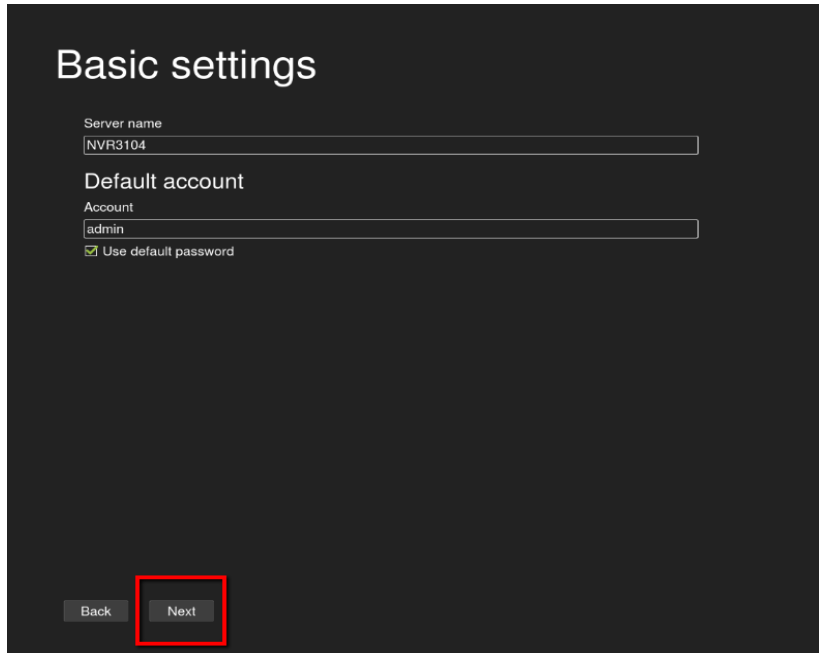
☐ Make NVR as time server

☒ Apply sync time setting to all added cameras

☐ Sync with NTP time server

Back Next

5. Configure the basic settings, then click **Next**.



The 'Basic settings' screen has a dark background. At the top, the title 'Basic settings' is in white. Below it, the 'Server name' field contains 'NVR3104'. The 'Default account' section shows the 'Account' field with 'admin' and a checked checkbox for 'Use default password'. At the bottom, there are 'Back' and 'Next' buttons; the 'Next' button is highlighted with a red rectangle.

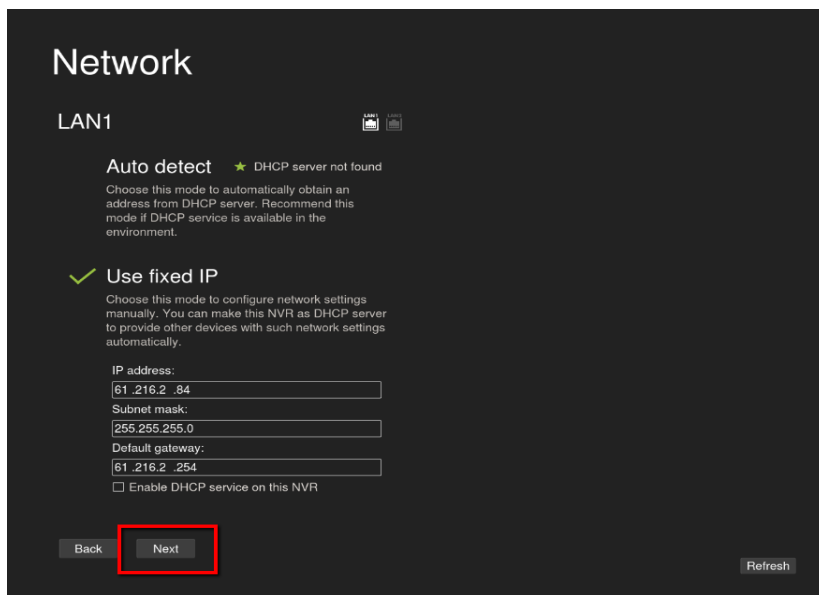
Basic settings

Server name  
NVR3104

Default account  
Account  
admin  
☒ Use default password

Back Next

6. Set up your network settings, then click **Next**.



The 'Network' screen has a dark background. The title 'Network' is in white. Below it, 'LAN1' is shown with a status icon. Two options are presented: 'Auto detect' (marked with a yellow star and 'DHCP server not found') and 'Use fixed IP' (marked with a green checkmark). The 'Use fixed IP' section includes fields for 'IP address' (61.216.2.84), 'Subnet mask' (255.255.255.0), and 'Default gateway' (61.216.2.254), along with an unchecked checkbox for 'Enable DHCP service on this NVR'. At the bottom, there are 'Back', 'Next', and 'Refresh' buttons; the 'Next' button is highlighted with a red rectangle.

Network

LAN1

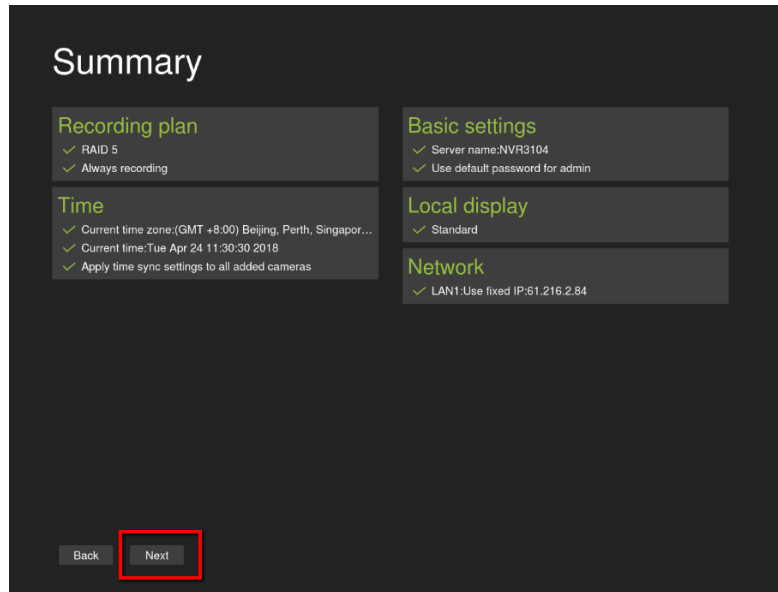
Auto detect ★ DHCP server not found  
Choose this mode to automatically obtain an address from DHCP server. Recommend this mode if DHCP service is available in the environment.

✓ Use fixed IP  
Choose this mode to configure network settings manually. You can make this NVR as DHCP server to provide other devices with such network settings automatically.

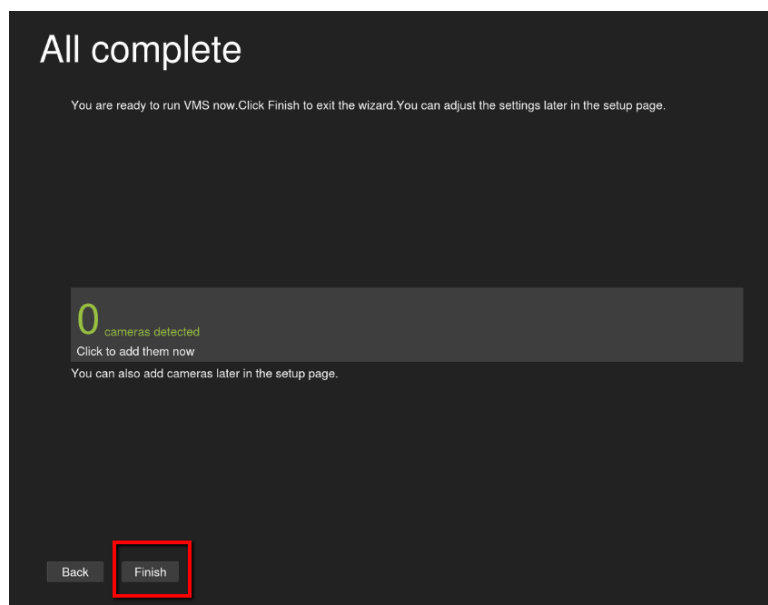
IP address:  
61.216.2.84  
Subnet mask:  
255.255.255.0  
Default gateway:  
61.216.2.254  
☐ Enable DHCP service on this NVR

Back Next Refresh

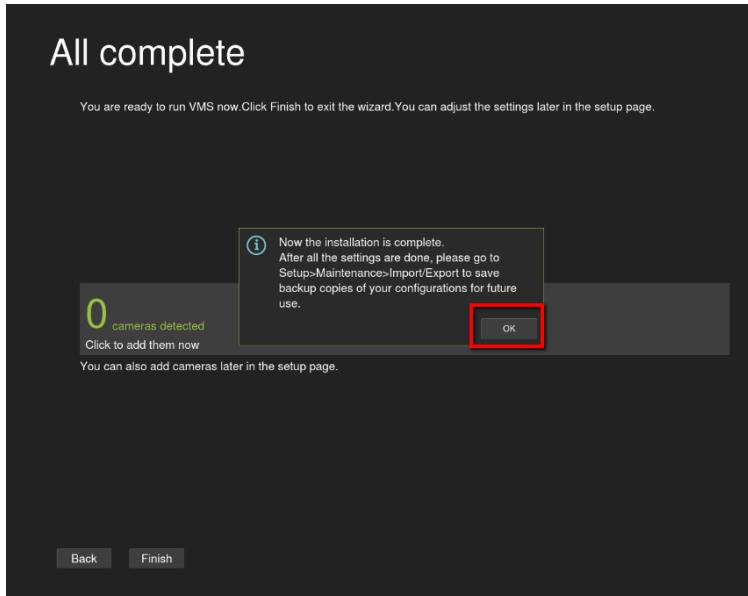
7. Confirm the summarized information of your configured settings, then click **Next**.



8. After the NVR has completed the creating of the first RAID, press **Finish**.



9. Click **OK**.

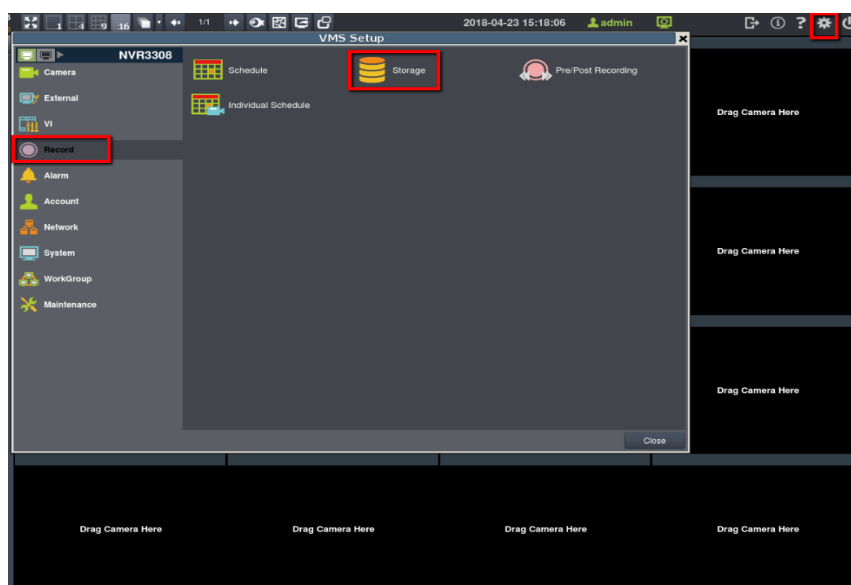


## 2. Creating the second RAID for protected server failovers record

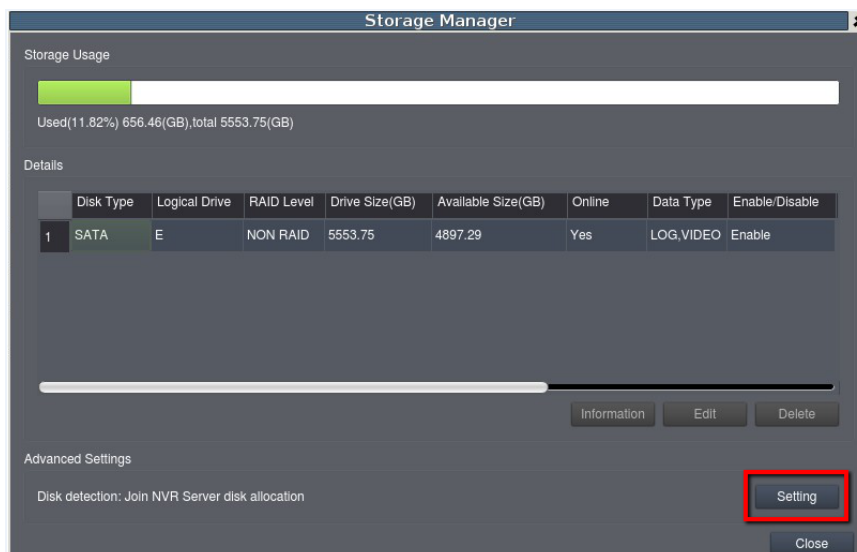
After creating the first RAID, shut down the NVR3308 and insert the disks for the second RAID creation.

To set up the second RAID:

1. Turn on the NVR 3308.
2. From the NVR3308 interface, enter in local client, then click **Setup** > **Record** > **Storage**.

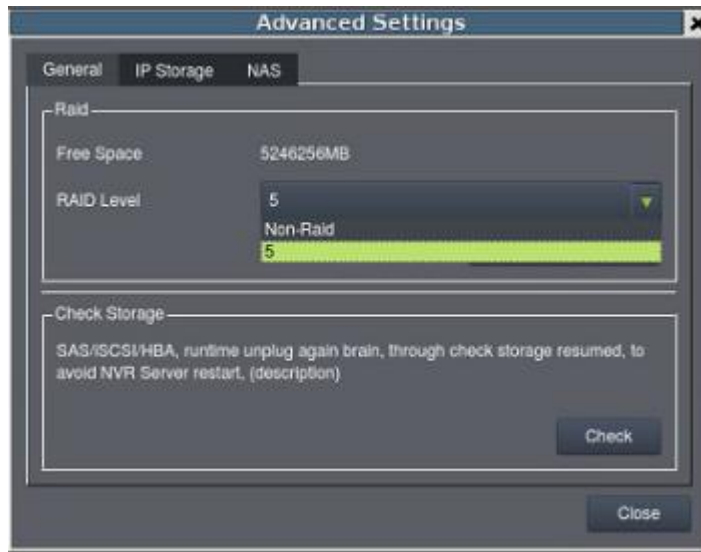


3. In Storage Manager, you can see the first RAID that was created. Click **Setting**.



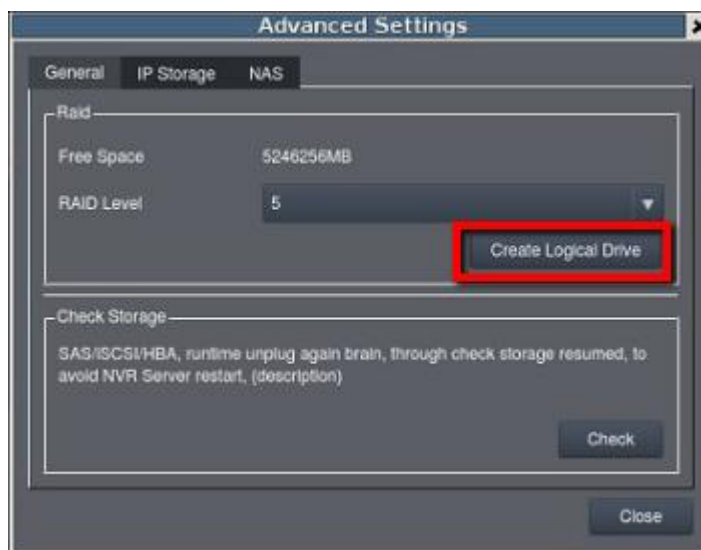


4. Select a **RAID level** for the second RAID.

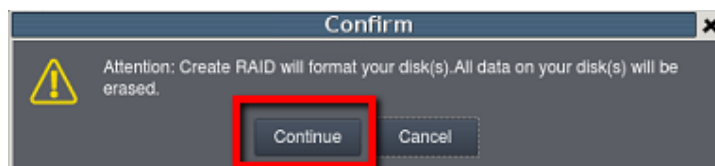


Note: We recommend you to select **RAID6** or **RAID5** for better RAID protection.

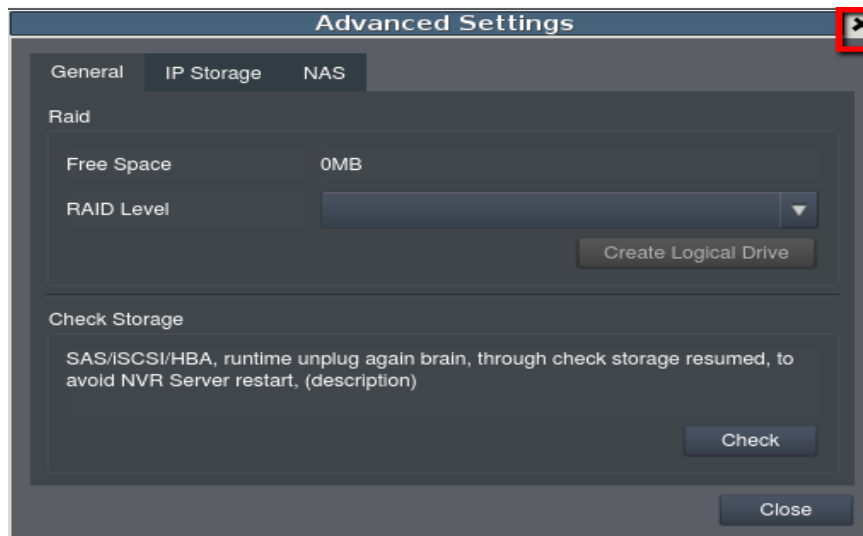
5. Click **Create Logical Drive**.



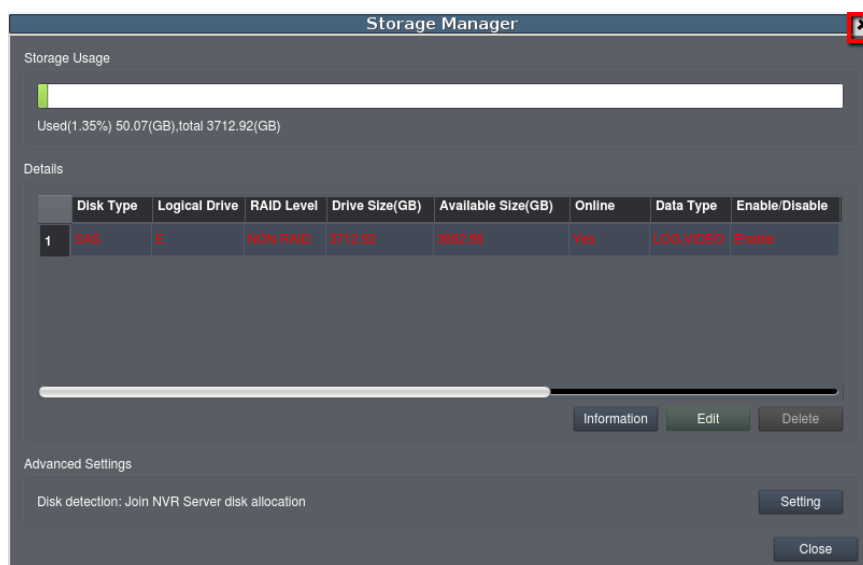
6. Click **Continue**.



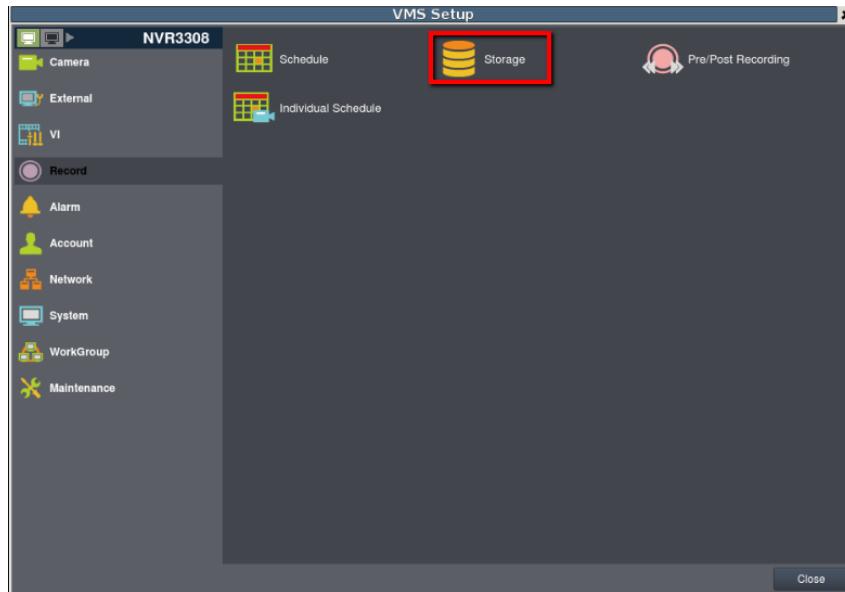
- Click **X** to close the Advanced Settings window. This re-flashes the storage information.



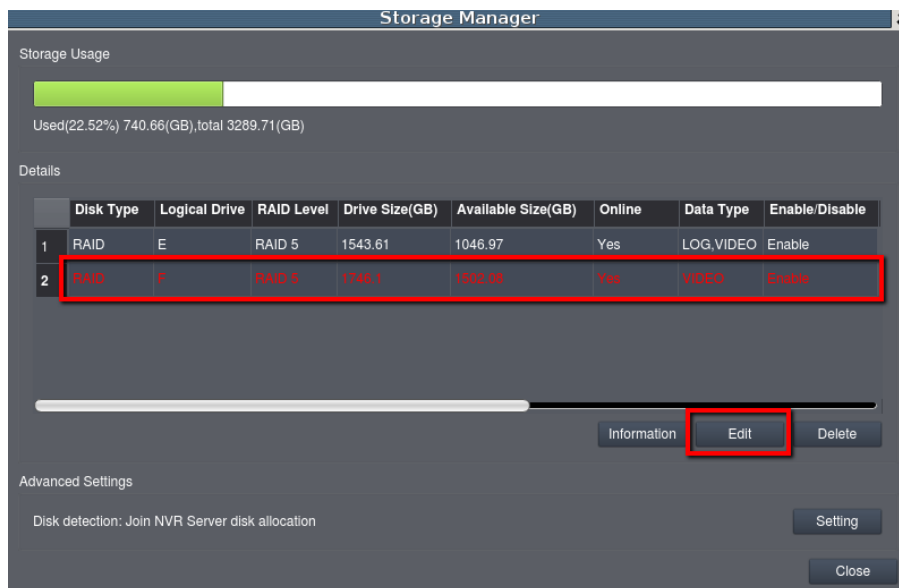
- Click **X** to close the Storage Manager window. This re-flashes the storage information.



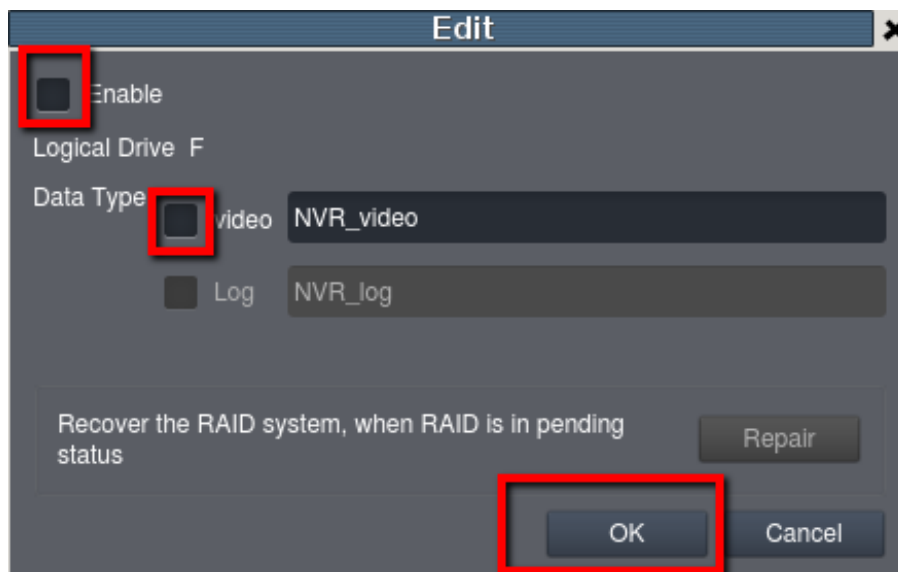
9. Click **Storage**.



10. The **Storage** window displays the newly-created second RAID. Click the second RAID, then click **Edit**.



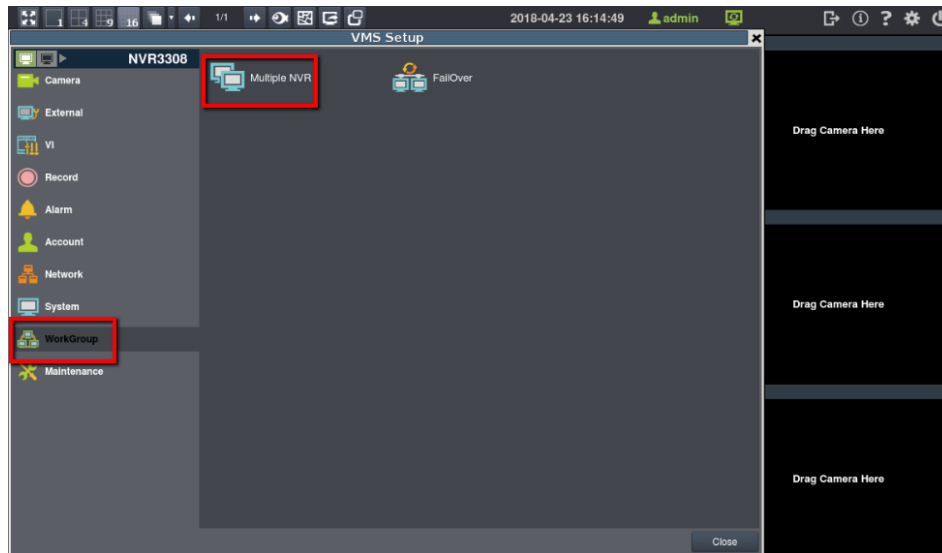
11. Uncheck **Enable** and **NVR\_video**. The **Logical Drive F** is only for failover recording, so this folder is only for normal recording.



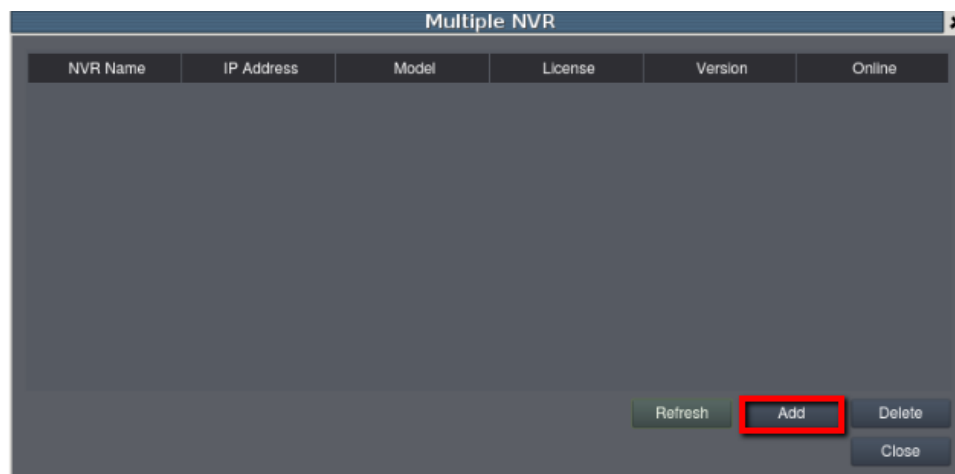
### 3. Adding a protected server

To add a protected server:

1. From the NVR3308 interface, enter in local client, then click **Setup** > **WorkGroup** > **Multiple NVR**.

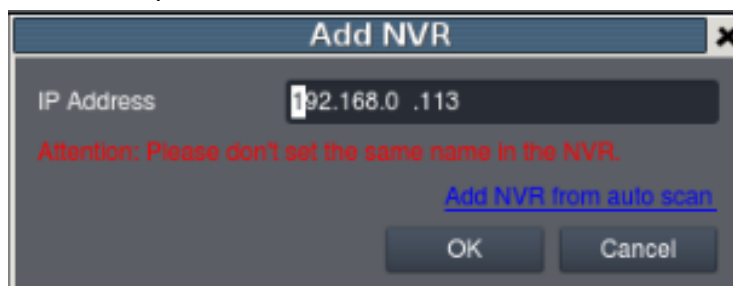


2. Click **Add**.

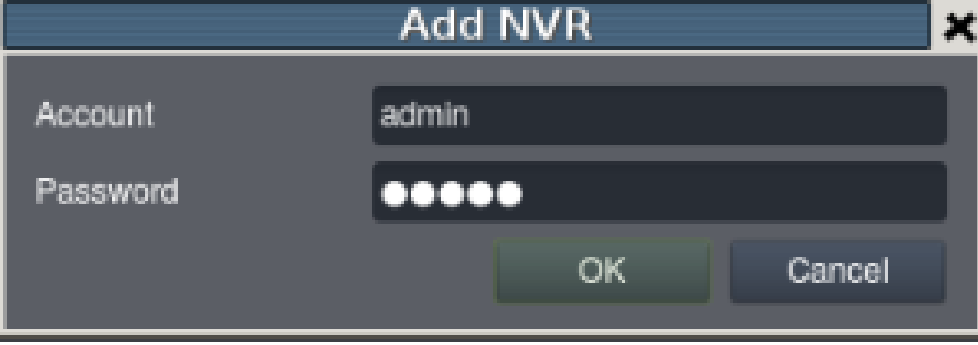


3. Enter the protected server's IP address (NVR2), then click **OK**.

**Note:** Both protected server and Failover server must in same IP domain.



4. Enter the NVR2's account name and password, then click **OK**.



The 'Add NVR' dialog box is shown. It has a title bar with the text 'Add NVR' and a close button (X). The dialog contains two input fields: 'Account' with the text 'admin' and 'Password' with six dots. Below the input fields are two buttons: 'OK' and 'Cancel'.

5. When logged in, the Multiple NVR displays the added protected NVR system. Click **Close** to exit.



The 'Multiple NVR' window is shown. It has a title bar with the text 'Multiple NVR' and a close button (X). The window contains a table with the following data:

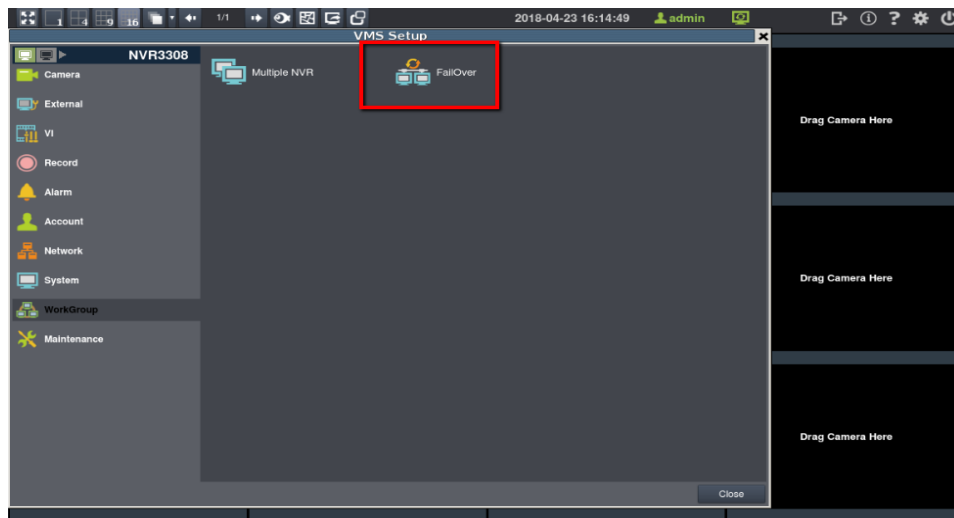
NVR Name	IP Address	Model	License	Version	Online
NVR0000A	192.168.0.113	3000	32	4.0.0 A01	Yes

Below the table are four buttons: 'Refresh', 'Add', 'Delete', and 'Close'.

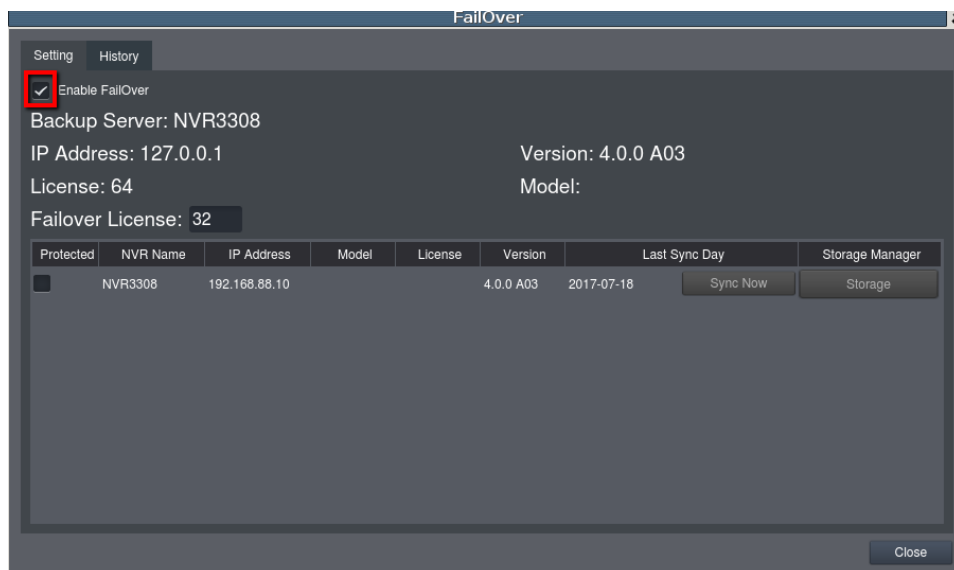
## 4. Setting up the failover function

To set up the failover function:

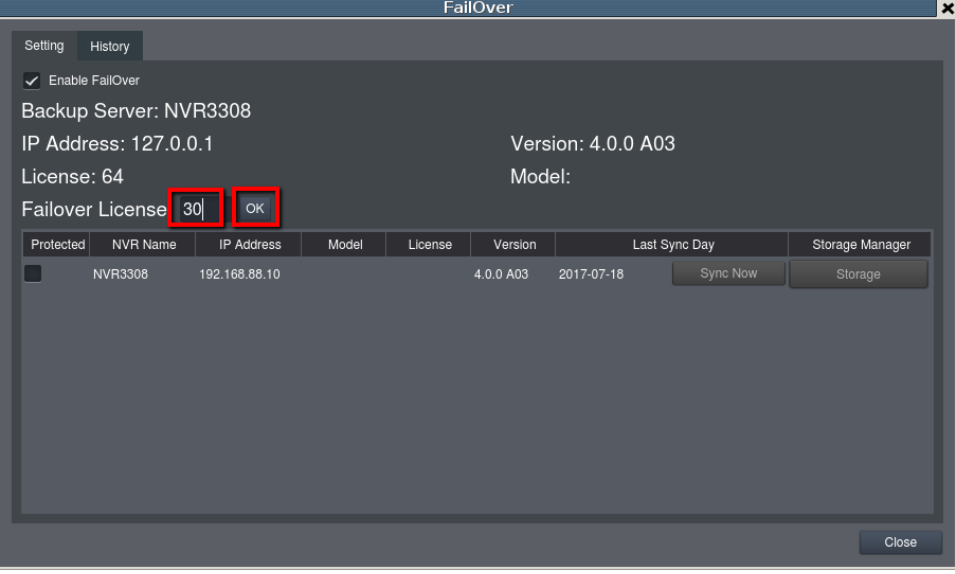
1. From the VMS Setup window, click **FailOver**.



2. From **Setting** tab, check **Enable FailOver**.



3. Enter the FailOver license number, then click **OK**.



The FailOver configuration window shows the following settings:

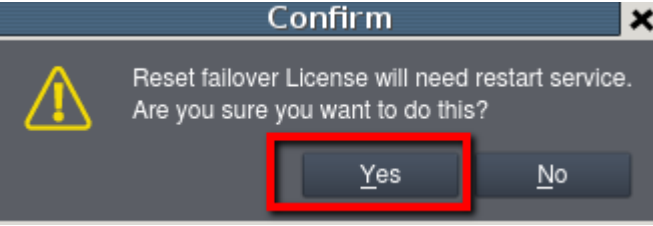
- Setting: ☒ Enable FailOver
- Backup Server: NVR3308
- IP Address: 127.0.0.1
- Version: 4.0.0 A03
- License: 64
- Model:
- Failover License: 30 (highlighted with a red box)
- OK (highlighted with a red box)

Protected	NVR Name	IP Address	Model	License	Version	Last Sync Day	Storage Manager
<input type="checkbox"/>	NVR3308	192.168.88.10			4.0.0 A03	2017-07-18	<button>Sync Now</button> <button>Storage</button>

Close

**Note:** In this case, NVR3308 has 64 CH licenses. We assigned 32 CH licenses for failover, so there are only 32 CH licenses that you can use for normal record in failover server (NVR1). Also, failover server (NVR1) only assigns 32 CH licenses for failover record. If the protected server (NVR2) has more than 32 CH licenses, the failover server can only record the first 32 CH licenses. For example, if the protected server has 48 cameras and when failover happens; only the first 32 CH licenses will be protected by the failover server.

4. Click **Yes** to confirm restart.

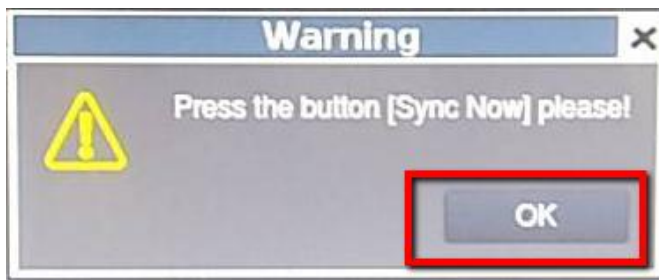
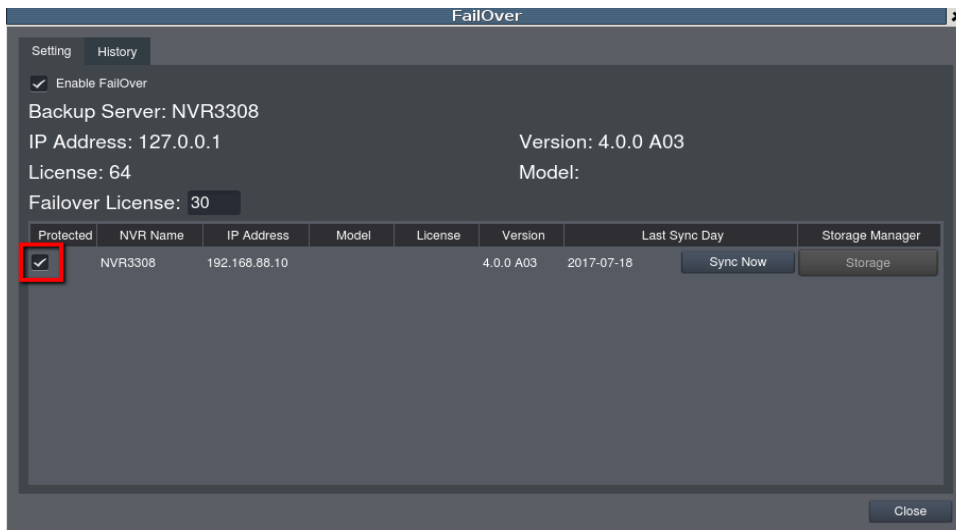


**Confirm**

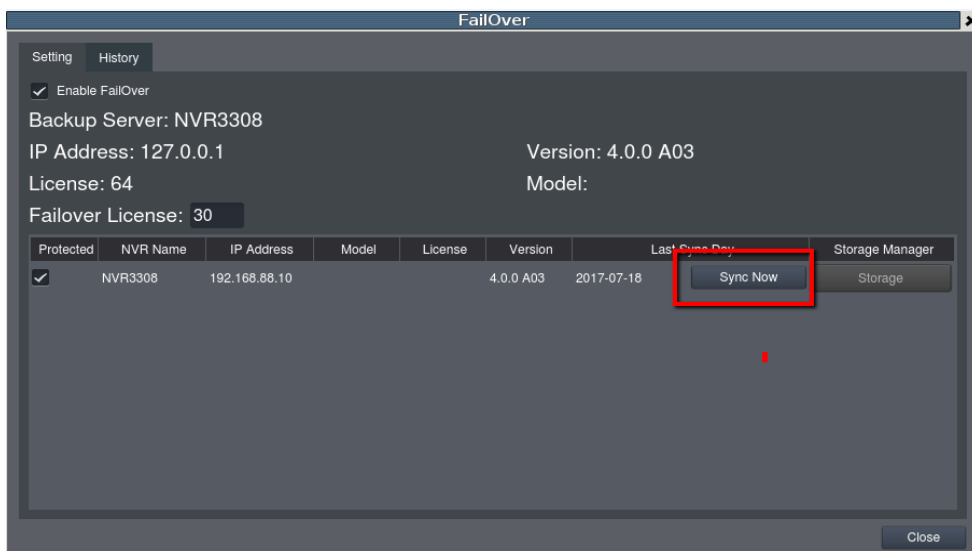
Reset failover License will need restart service.  
Are you sure you want to do this?



5. When the service has restarted, check to select a protected server, then press **OK** to enable syncing.

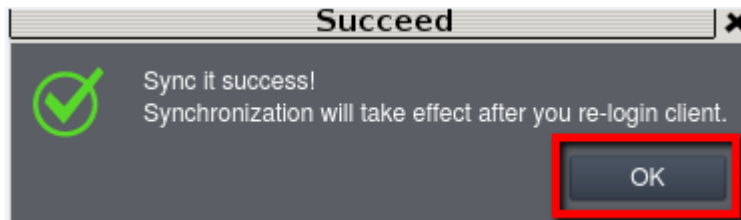



6. Press **Sync now**.

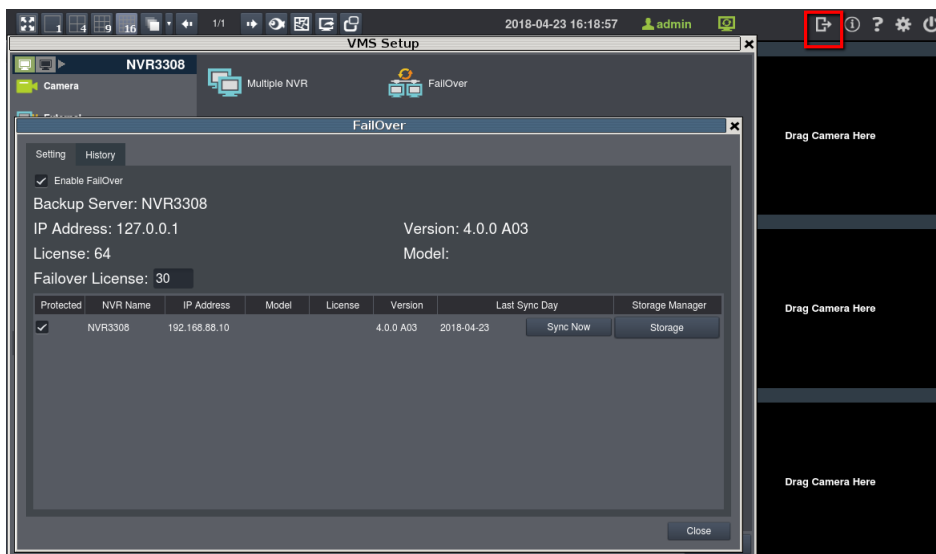


**Note:** If the sync is successful, the failover server displays the camera list of the protected server and syncs all configurations inside the protected server. If the protected has some changed configurations, enter this GUI again and click **Sync now** to re-sync the configuration.

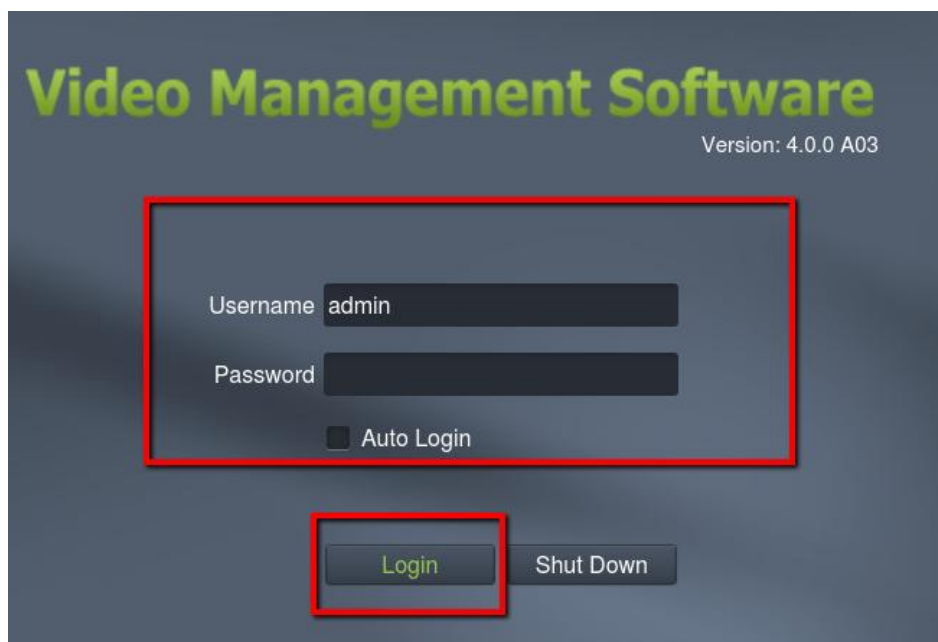
7. Once the sync is successfully done, a pop-up window appears to confirm synchronization after re-logging in. Click **OK**.



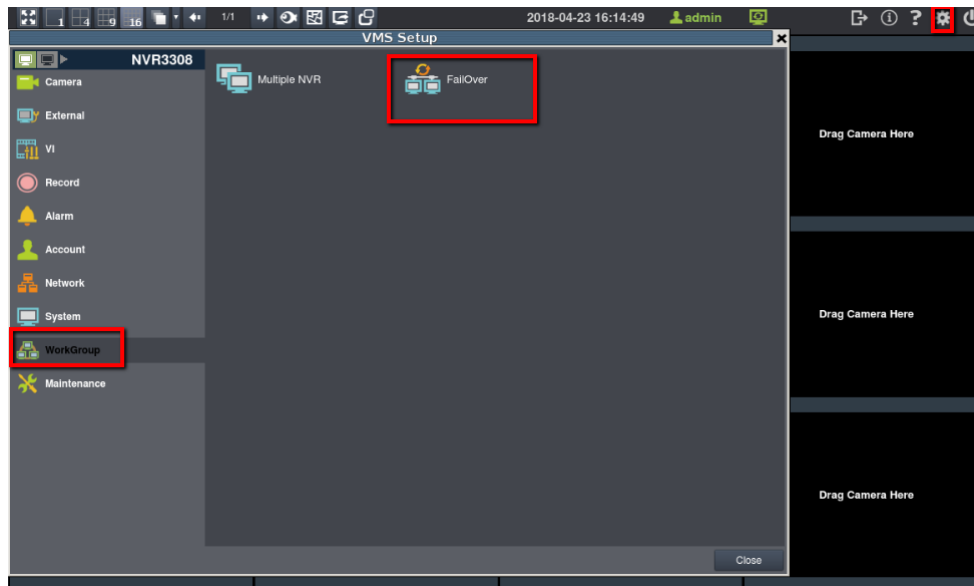
8. Click  to log out of the NVR.



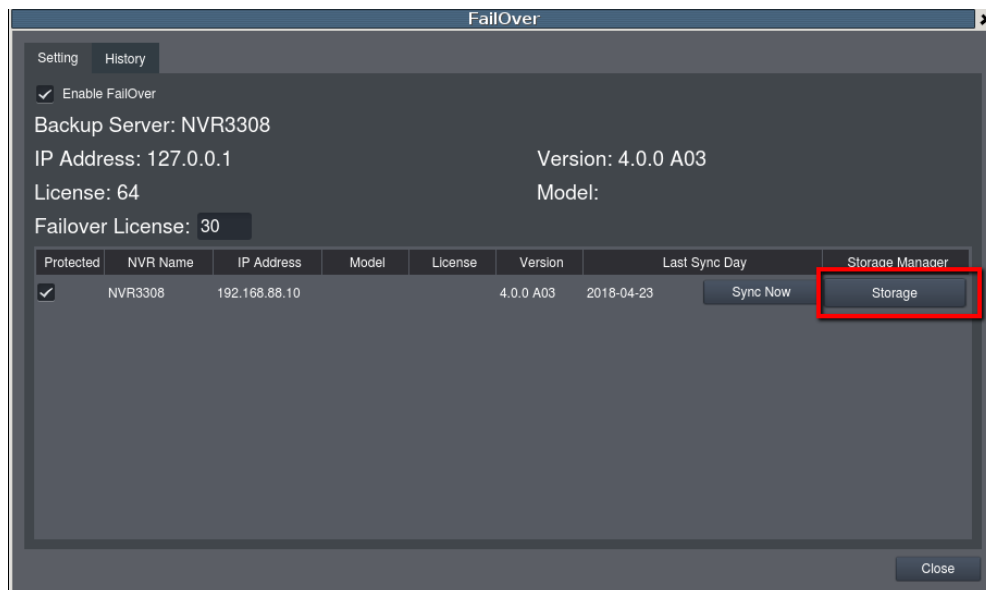
9. Use your user account to log in again to VMS Setup.



10. When logged in, go to **Setup > WorkGroup > FailOver**.



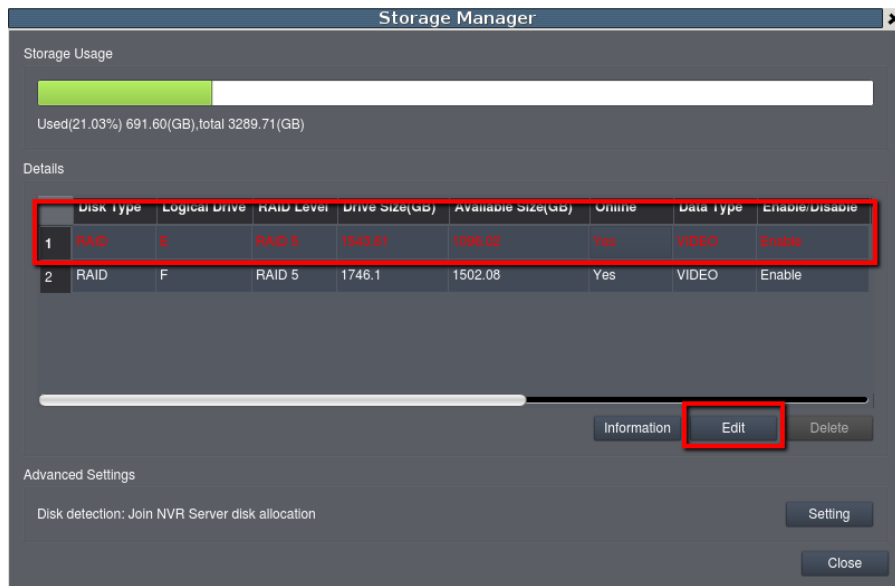
11. Click **Storage**, then assign the drive for your video to be recorded when a failover occurs.



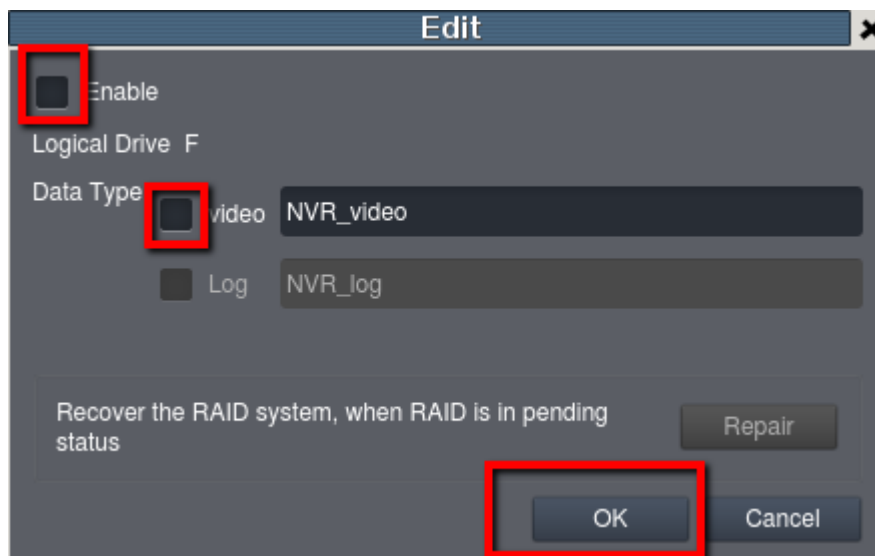
**Notes:**

- The path **Setting > Record > Storage** is for normal record.
- The path **Setting > WorkGroup > FailOver > Storage** is for assigning the failover record to a drive.

12. From **Logical Drive** column, select **E**, then click **Edit**.

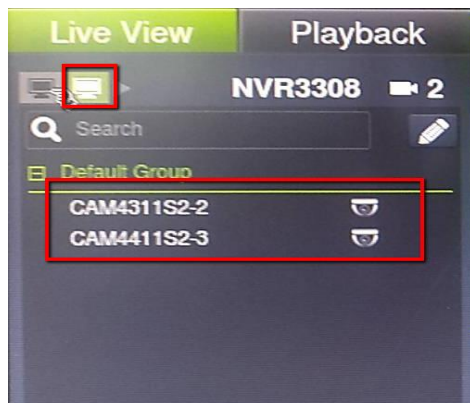


13. Uncheck **Enable** and **NVR\_video**, then click **OK**.



Note: In this case, logical drive E is for normal record, so we disable it.

After this procedure is done, you can see the new icon for protected NVR (NVR2) and the camera now belongs to the said NVR.

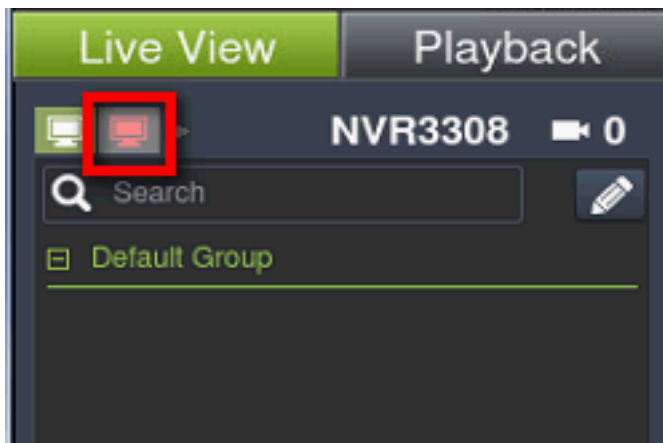


## 5. Identifying the protected server offline and failover server's failover status

When a failover happens, it takes 1 to 3 minutes for the failover server to take over the record.

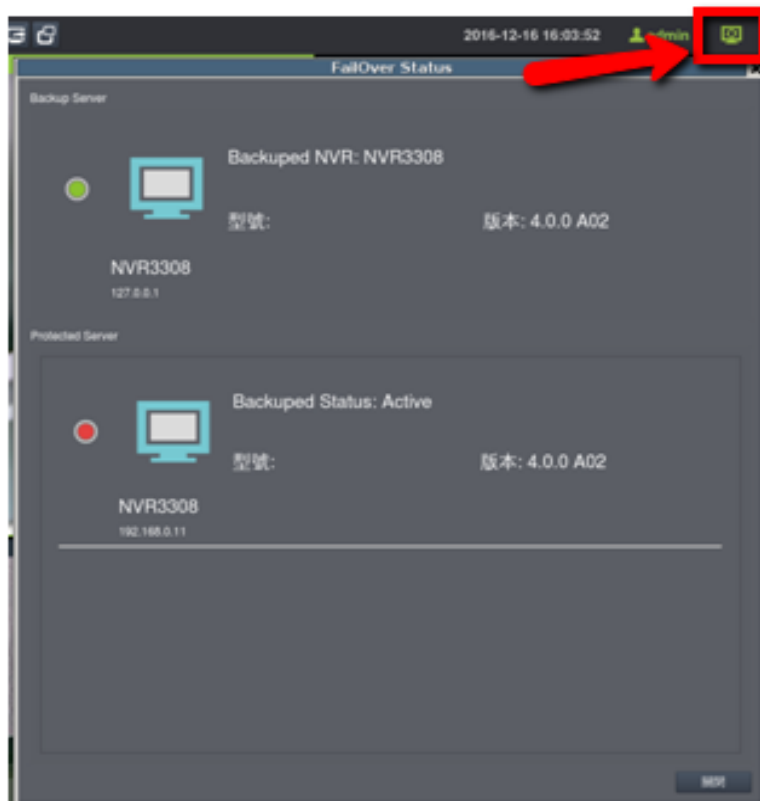
### Identifying the offline status of the protected server

If a protected server is offline, the protected server icon turns red.

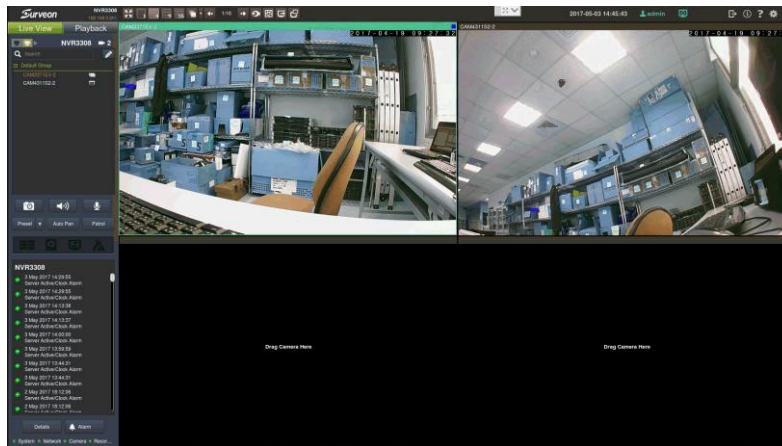


### Identifying the failover status of the failover server

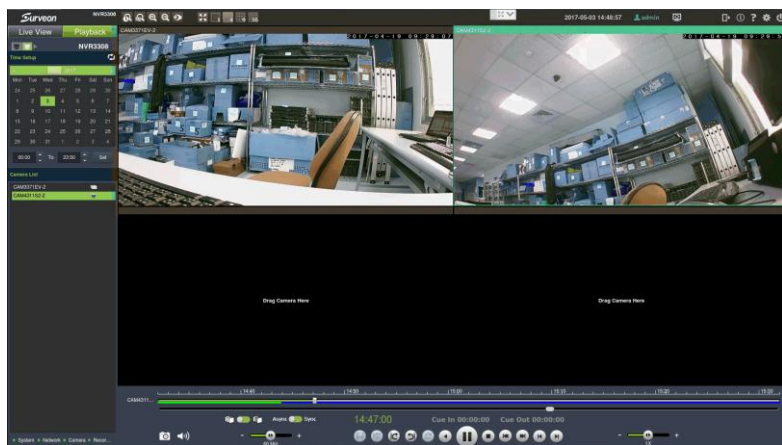
The failover icon starts flashing and the protected server icon turns red.



It takes about 5 minutes for the failover server to take over the camera's live view from the protected server.



Also, the failover server takes over the playback from the protected server. When a failover happens, the time bar turns blue.

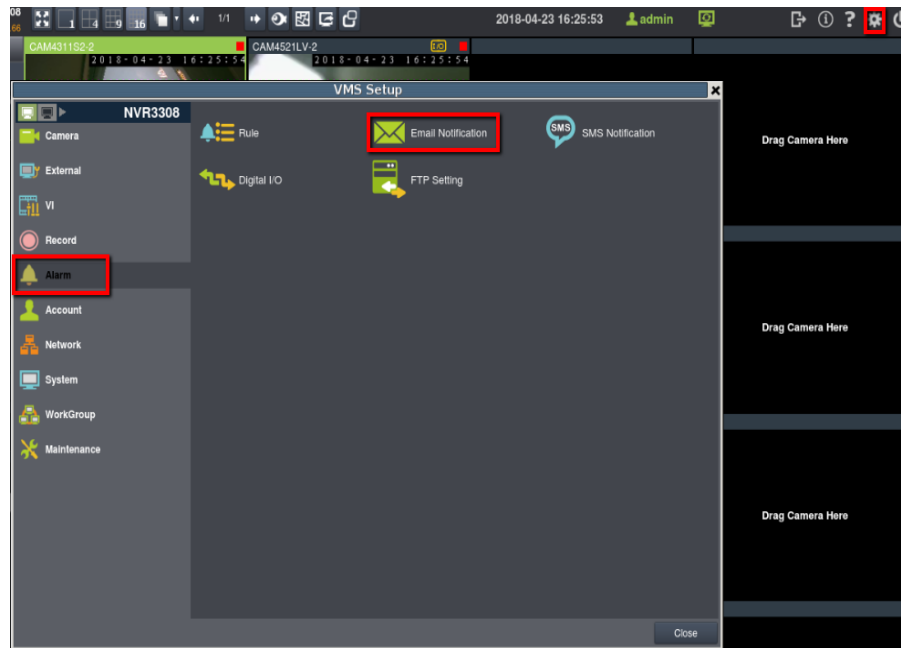


## 6. Setting up an Alarm rule

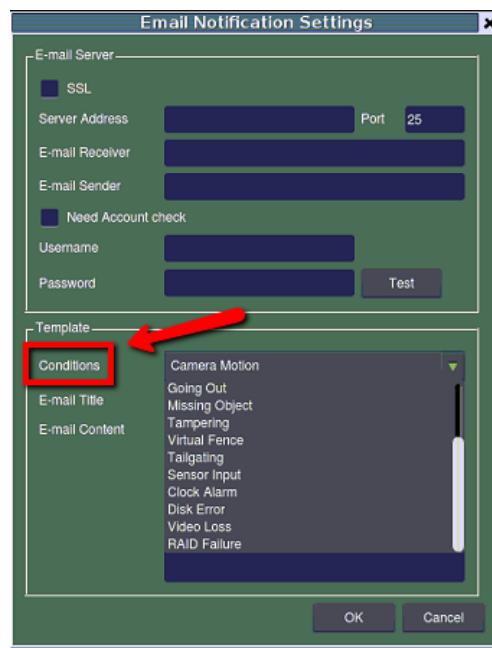
We strongly recommend you to set up the alarm rule. This rule triggers the NVR to send an email to alarm you when error conditions happen.

To set up the alarm rule:

1. From VMS, click **Setup > Alarm > Email Notification**.



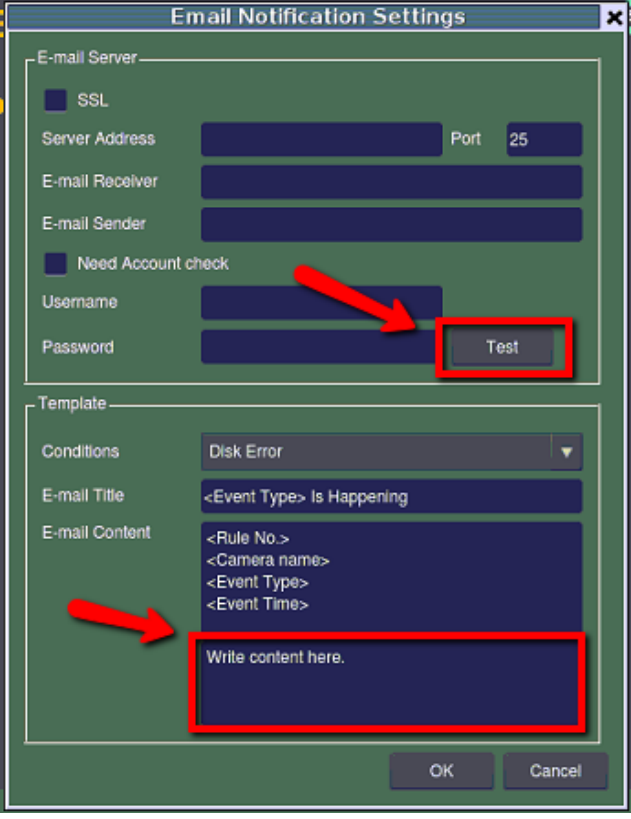
2. Select conditions such as **RAID Failure**, **Disk error**, **Clock alarm** (for Failover), and **Video loss** (optional), then click **OK**.





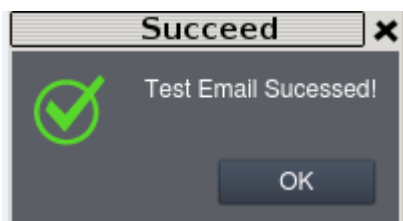
**Note:** You must set up a specific e-mail notification per condition to avoid confusion of the alarm notification.

3. Test to verify if the email setting is functional. You can also write down some notification content. An example is **Received disk error in NVR1**.

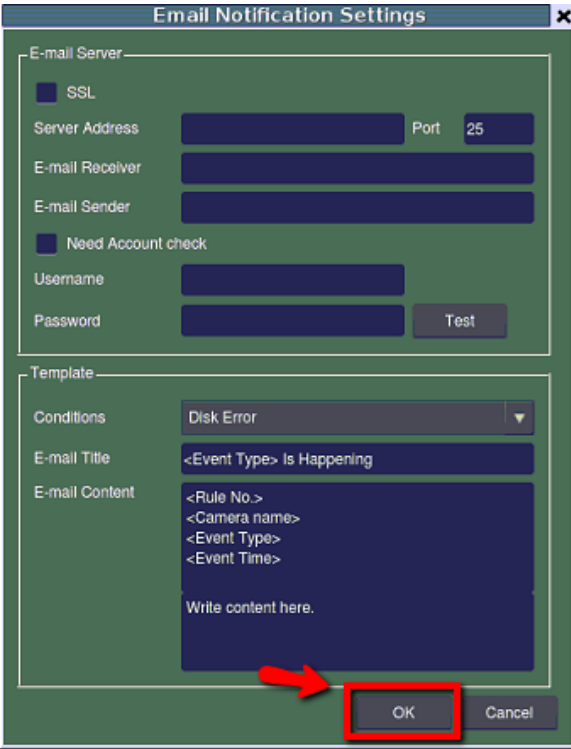


The image shows the 'Email Notification Settings' dialog box. It is divided into two main sections: 'E-mail Server' and 'Template'. In the 'E-mail Server' section, there are fields for 'Server Address', 'Port' (set to 25), 'E-mail Receiver', 'E-mail Sender', 'Need Account check' (checkbox), 'Username', and 'Password'. A red arrow points to the 'Test' button, which is highlighted with a red rectangle. In the 'Template' section, there is a 'Conditions' dropdown menu set to 'Disk Error'. Below it are fields for 'E-mail Title' (containing '<Event Type> Is Happening') and 'E-mail Content' (containing placeholders: '<Rule No.>', '<Camera name>', '<Event Type>', and '<Event Time>'). A red arrow points to a text area below the 'E-mail Content' field with the placeholder text 'Write content here.', which is also highlighted with a red rectangle. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

4. If the email is successfully sent, a pop up window appears. Click **OK**.

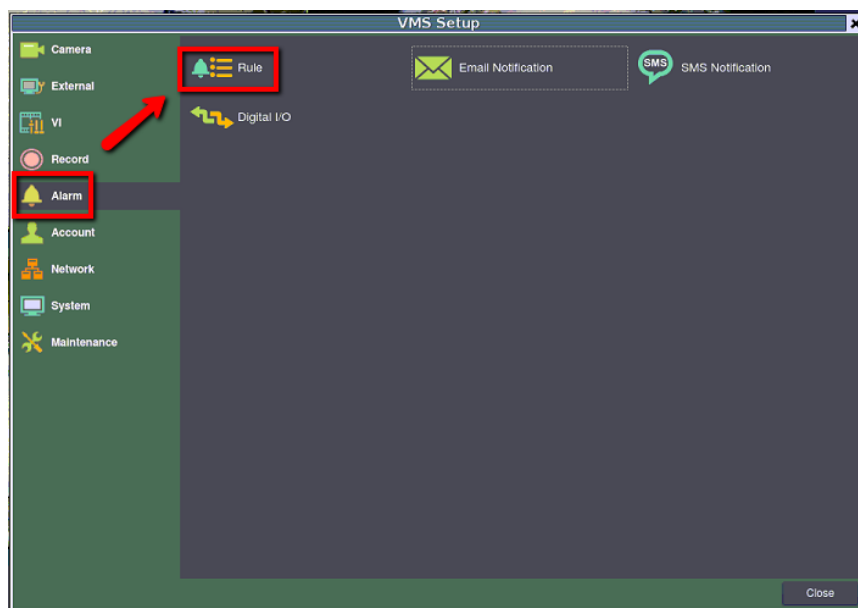


5. Click **OK** to save the settings and exit.

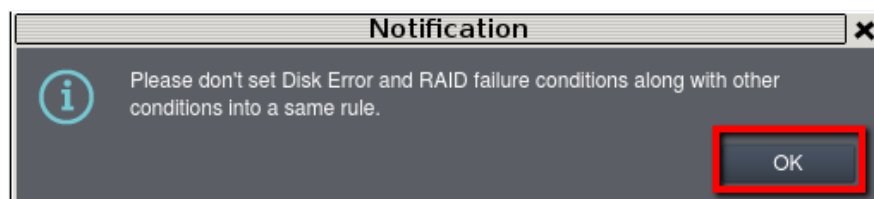


The 'Email Notification Settings' dialog box is shown. It has two main sections: 'E-mail Server' and 'Template'. In the 'E-mail Server' section, there are checkboxes for 'SSL' and 'Need Account check'. Below these are text fields for 'Server Address', 'Port' (set to 25), 'E-mail Receiver', 'E-mail Sender', 'Username', and 'Password'. A 'Test' button is next to the password field. The 'Template' section has a 'Conditions' dropdown menu set to 'Disk Error'. Below it are text fields for 'E-mail Title' (containing '<Event Type> Is Happening') and 'E-mail Content' (containing placeholders for rule number, camera name, event type, and event time, followed by 'Write content here.'). At the bottom, there are 'OK' and 'Cancel' buttons. A red arrow points to the 'OK' button, which is also highlighted with a red rectangle.

6. From VMS, click **Alarm > Rule**.



7. Click **OK**.



Note: By default, the disk error and RAID failure are already enabled, but cannot set up the disk error and RAID failure with other conditions in the same alarm rule. You must create a new rule for other conditions such as Clock alarm (failover) or video loss (optional).

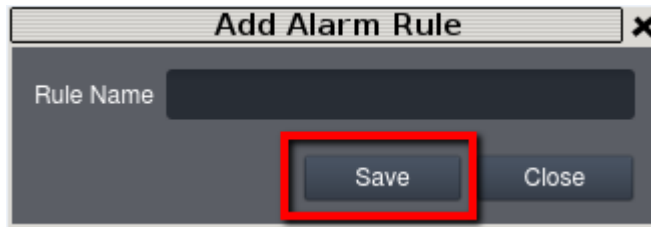
8. Since the disk error and RAID failure are already enabled by default, only select **Event Log** and **Email** for this case.

The screenshot shows the 'Alarm Rule Setup' window. At the top, there is a table with columns: Rule, Conditions, Action, and Schedule. The first row is 'default' with conditions 'RAID Failure, Disk Error' and action 'Event Log, E-Mail'. Below the table, there are buttons for 'Rule Template', 'VI Template', 'Set', 'New', and 'Delete'. The 'Conditions' section contains a grid of checkboxes for various detection types: General Motion Detection, Foreign Object Detection, Forbidden Area Detection, Intrusion Detection, Going Out Detection, Missing Object Detection, Tampering Detection, Camera Motion Detection, Virtual Fence, Tailgate Detection, Sensor Input, Clock Alarm, Disk Error (checked), Video Loss, and RAID Failure (checked). The 'Action' section contains a grid of checkboxes: Event Log (checked), PTZ Control, Recording Controls, Default, Alarm Sound, Video Popup/E-Map, E-Mail (checked), SMS, Relay Output, and Speak Out. At the bottom right are 'Save' and 'Close' buttons.

9. Click **New** to create a new alarm rule for other conditions.

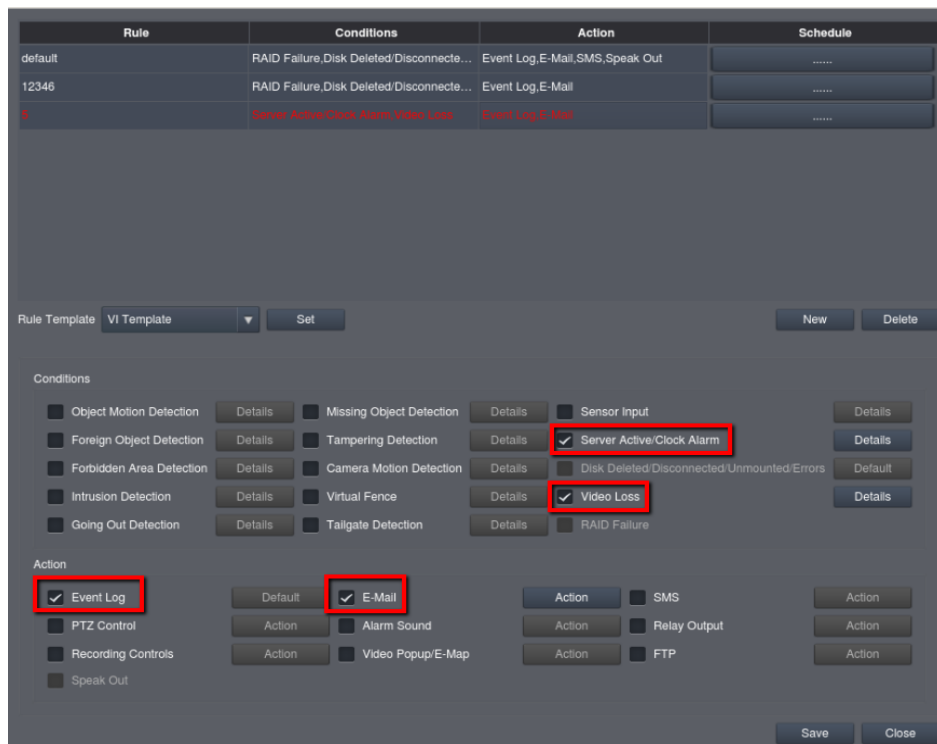
The screenshot shows the 'Alarm Rule Setup' window with a new rule being created. The table at the top now has two rows: 'default' and a new rule named 'RAID Failure, Disk Deleted/Disconnected...'. The new rule has conditions 'RAID Failure, Disk Deleted/Disconnected/Unmounted/Errors' and action 'Event Log, E-Mail, SMS, Speak Out'. Below the table, the 'Conditions' section shows 'Disk Deleted/Disconnected/Unmounted/Errors' (checked) and 'RAID Failure' (checked). The 'Action' section shows 'Event Log' (checked) and 'E-Mail' (checked). The 'New' button is highlighted with a red box. At the bottom right are 'Save' and 'Close' buttons.

10. Enter a new rule name, then click **Save**.



The 'Add Alarm Rule' dialog box has a title bar with a close button. It contains a 'Rule Name' text input field. Below the input field, there are two buttons: 'Save' and 'Close'. The 'Save' button is highlighted with a red rectangular box.

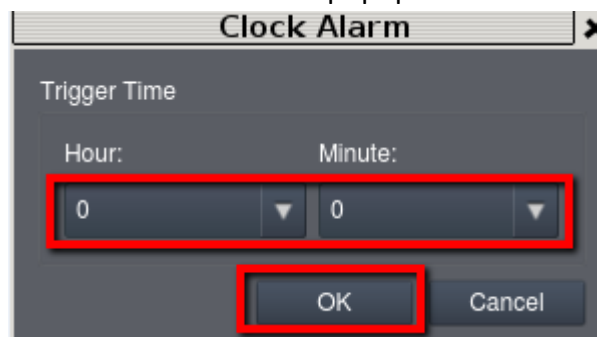
11. In *Conditions* list, check **Server Active/Clock Alarm** and **Video loss**. In *Actions* list, check **Event log** and **E-Mail**.



The main configuration screen displays a table of rules and a detailed configuration section below. The table has columns for Rule, Conditions, Action, and Schedule. Below the table, there is a 'Rule Template' dropdown set to 'VI Template' and 'Set' and 'New' buttons. The 'Conditions' section contains a grid of checkboxes for various detection types. 'Server Active/Clock Alarm' and 'Video Loss' are checked and highlighted with red boxes. The 'Action' section contains a grid of checkboxes for various actions. 'Event Log' and 'E-Mail' are checked and highlighted with red boxes. At the bottom right are 'Save' and 'Close' buttons.

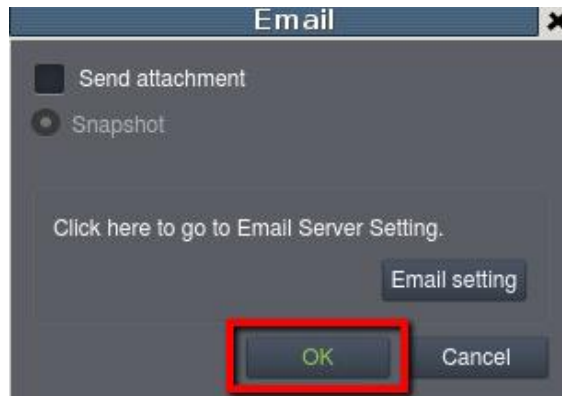
Rule	Conditions	Action	Schedule
default	RAID Failure, Disk Deleted/Disconnect...	Event Log, E-Mail, SMS, Speak Out	.....
12346	RAID Failure, Disk Deleted/Disconnect...	Event Log, E-Mail	.....
5	Server Active/Clock Alarm, Video Loss	Event Log, E-Mail	.....

- When you check **Clock Alarm**, a popup screen appears. Just press **OK** to confirm and close the popup screen.

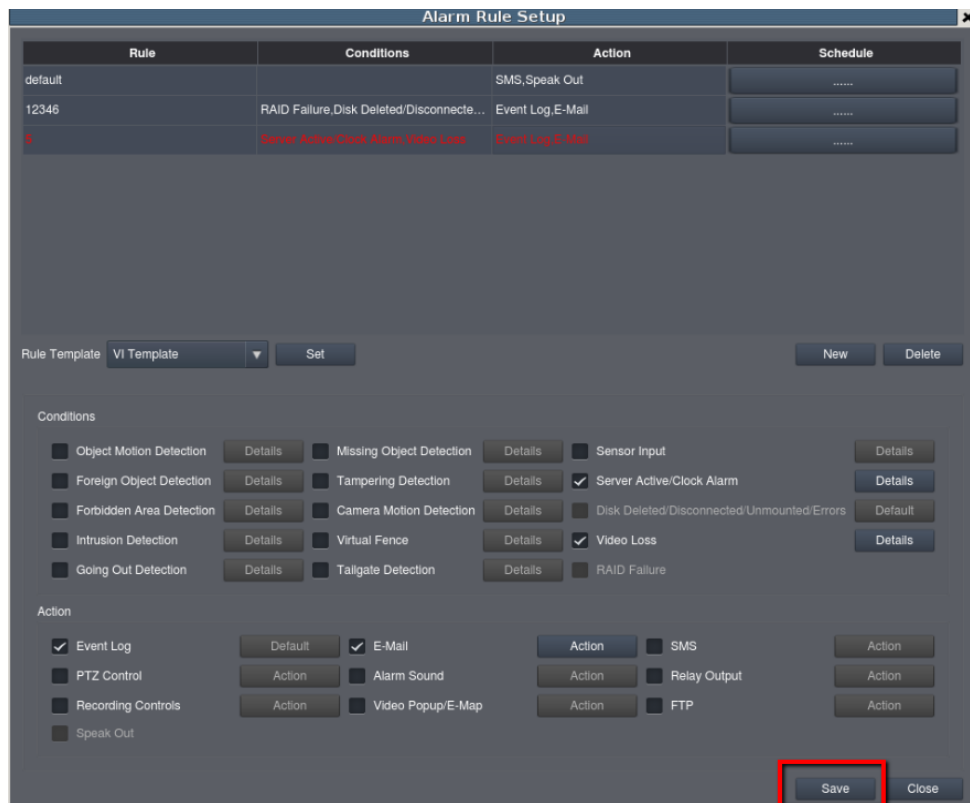


The 'Clock Alarm' popup screen has a title bar with a close button. It contains a 'Trigger Time' section with 'Hour' and 'Minute' labels. Below these labels are two dropdown menus, both showing '0'. The 'OK' button is highlighted with a red rectangular box.

- When you check **E-Mail**, a popup screen appears. Just press **OK** to confirm and close the popup screen.



- When you are done, click **Save**.



- When a popup success message appears, click **OK**.

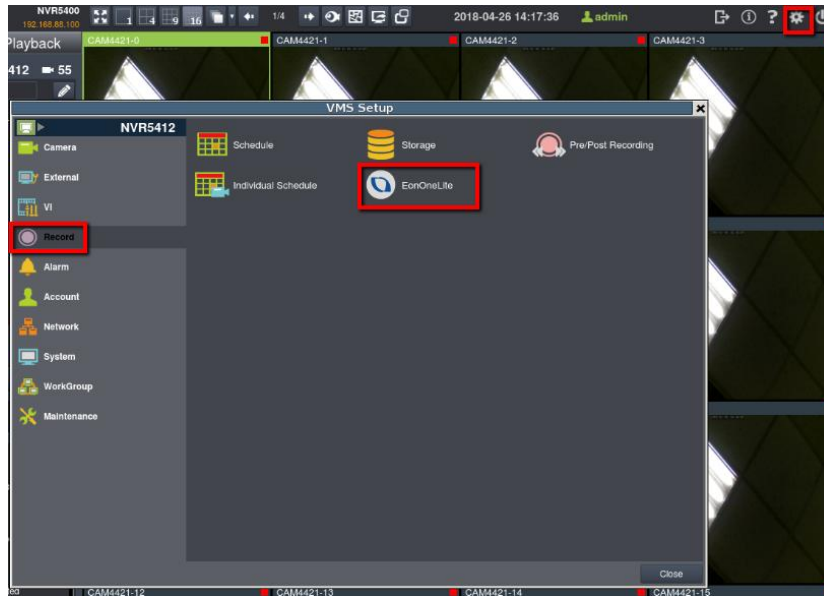


## 7. Setting up EonOne Lite Email notification

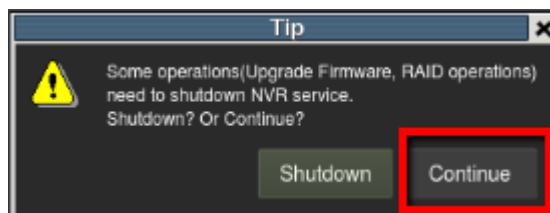
This procedure is only for NVR5400 and NVR 7300 series.

To set up EonOne Lite Email notification:

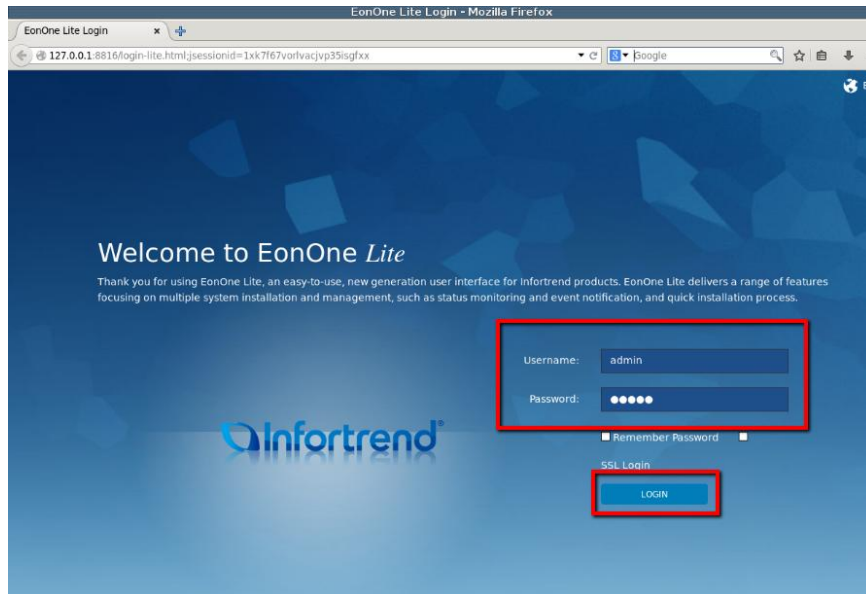
1. From VMS user interface, click **Setup** > **Record** > **EonOne Lite**.



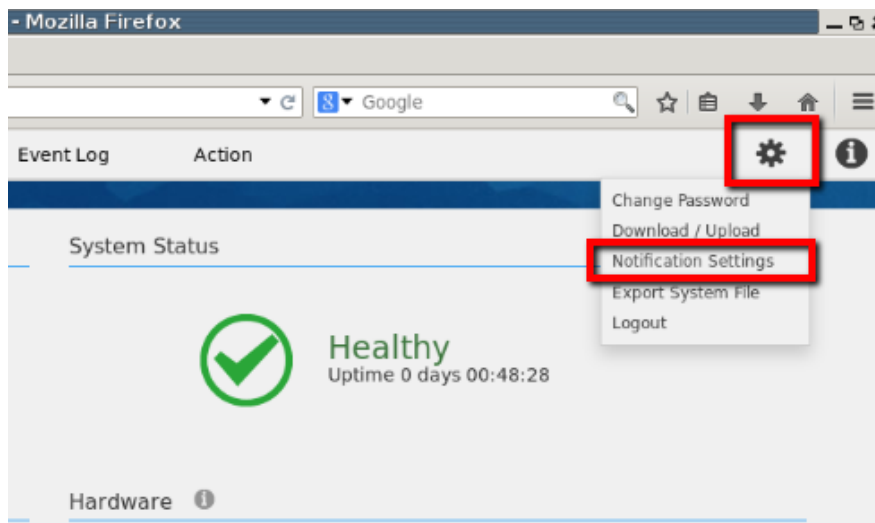
2. Click **Continue**.



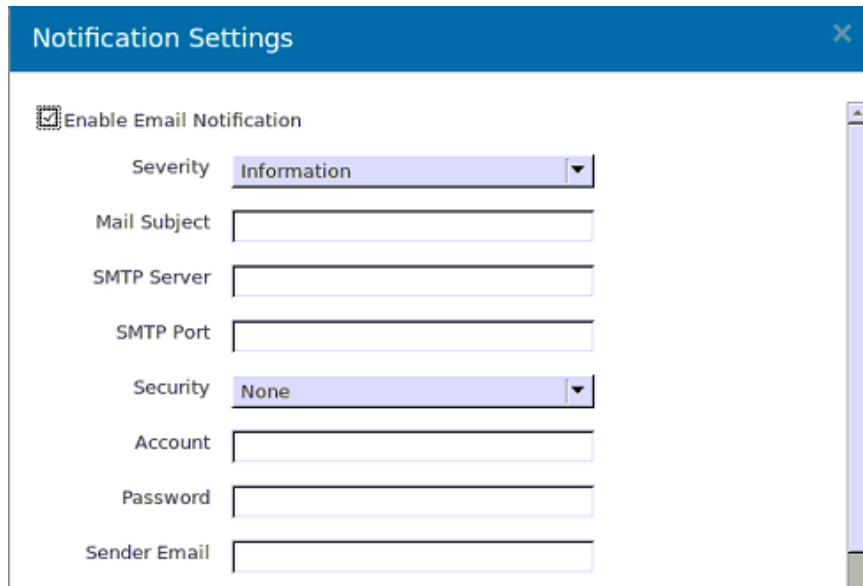
- When EonOne Lite window appears, type **admin** in username and password fields, then click **LOGIN**.



- From the upper-right side of the window, click  > **Notification Settings**.

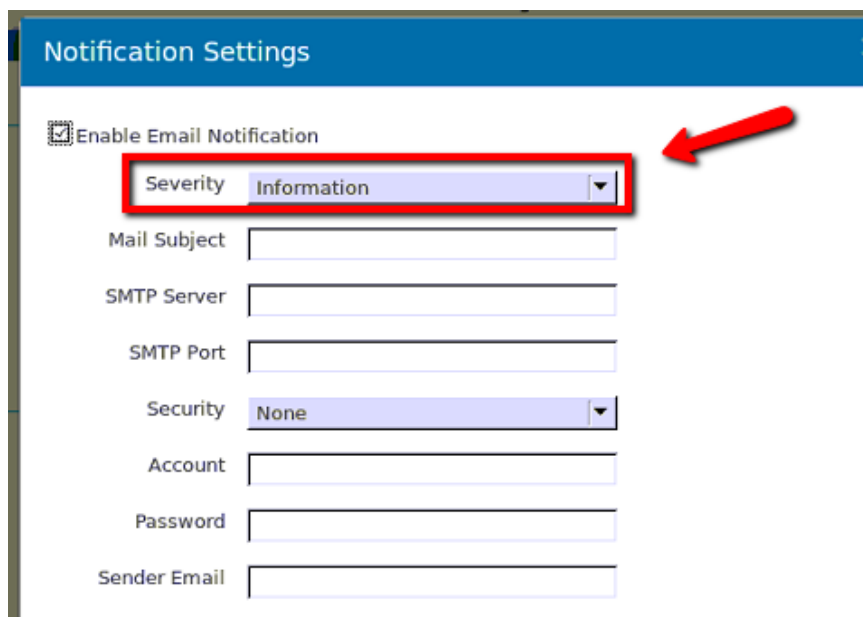


5. Check **Enable Email Notification** then configure the e-mails detail information.



The screenshot shows a 'Notification Settings' dialog box with a blue header bar containing a close button (X). Below the header, there is a checkbox labeled 'Enable Email Notification' which is checked. Underneath, there are several configuration fields: 'Severity' is a dropdown menu currently showing 'Information'; 'Mail Subject', 'SMTP Server', 'SMTP Port', 'Account', 'Password', and 'Sender Email' are all empty text input fields; and 'Security' is a dropdown menu currently showing 'None'. A vertical scrollbar is visible on the right side of the dialog.

6. In *Severity* dropdown list, select **Information**.

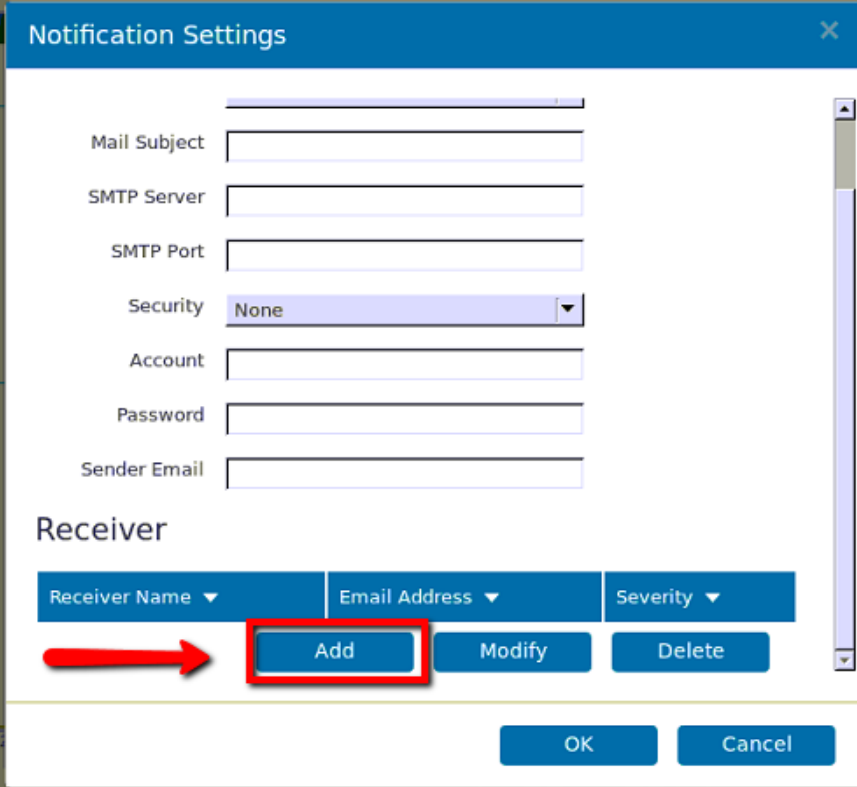


This screenshot is similar to the previous one, but it highlights the 'Severity' dropdown menu with a red rectangular box. A red arrow points from the right towards the box. The dropdown menu is open, and 'Information' is selected. The other fields remain the same: 'Mail Subject', 'SMTP Server', 'SMTP Port', 'Account', 'Password', 'Sender Email' are empty, and 'Security' is set to 'None'.

Note: This item includes all level's message information such as warnings, errors, and critical errors.

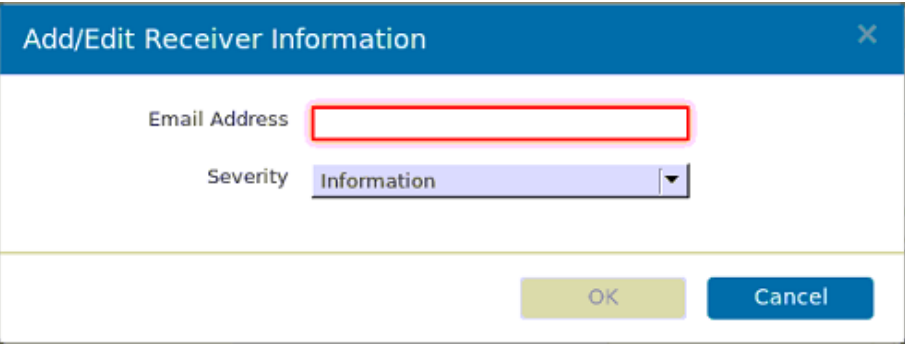


7. In *Receiver* section, click **Add**.



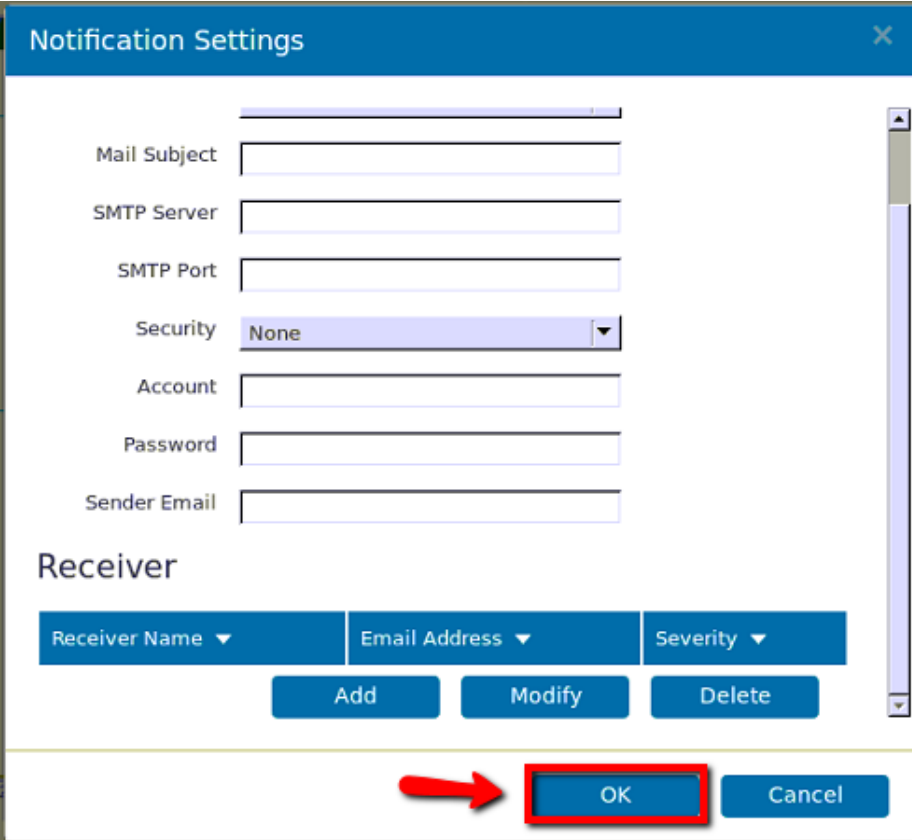
The **Notification Settings** dialog box contains several input fields: Mail Subject, SMTP Server, SMTP Port, Security (set to None), Account, Password, and Sender Email. Below these is the **Receiver** section, which includes a table with columns for Receiver Name, Email Address, and Severity. The **Add** button is highlighted with a red box and a red arrow points to it. Other buttons in the section include Modify and Delete. At the bottom of the dialog are OK and Cancel buttons.

8. Enter the receiver's email address, select **Information** in *Severity* dropdown list, then click **OK**.



The **Add/Edit Receiver Information** dialog box has two main fields: Email Address and Severity. The Email Address field is highlighted with a red box. The Severity dropdown menu is set to Information. At the bottom are OK and Cancel buttons.

9. When all is done, click **OK** to save and exit.



The image shows a 'Notification Settings' dialog box. It has a blue title bar with a close button (X) in the top right corner. The main area contains several input fields: 'Mail Subject', 'SMTP Server', 'SMTP Port', 'Security' (a dropdown menu currently showing 'None'), 'Account', 'Password', and 'Sender Email'. Below these fields is a section titled 'Receiver'. This section contains three columns: 'Receiver Name' with a dropdown arrow, 'Email Address' with a dropdown arrow, and 'Severity' with a dropdown arrow. Underneath these columns are three buttons: 'Add', 'Modify', and 'Delete'. At the bottom of the dialog, there are two buttons: 'OK' and 'Cancel'. A red arrow points to the 'OK' button, which is also highlighted with a red rectangular border.

Notification Settings

Mail Subject

SMTP Server

SMTP Port

Security None

Account

Password

Sender Email

Receiver

Receiver Name Email Address Severity

Add Modify Delete

OK Cancel