

Reboot the ExtraHop System and Test Hardware with the Rescue USB Flash Drive

This guide explains how to create and use a Rescue USB flash drive to reinstall and recover the ExtraHop® system. When booting from the Rescue USB flash drive, you can also perform memory and hardware tests to ensure that the ExtraHop appliance functions properly.

Create the Rescue USB Flash Drive

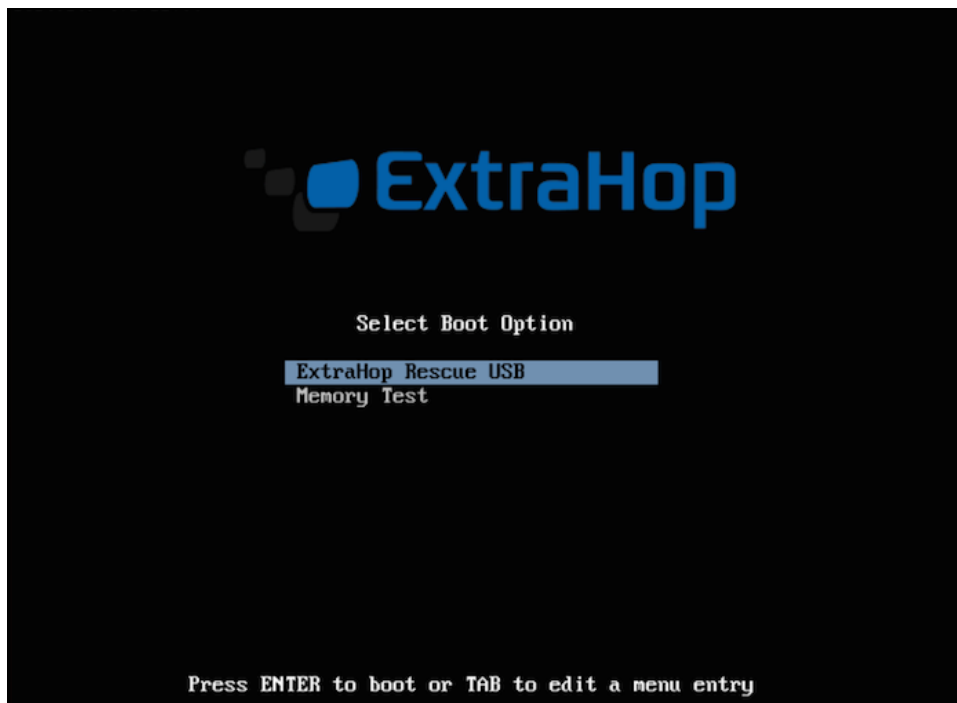
To create the USB flash drive:

1. Download the Rescue USB flash drive image:
 - a. Log in to the ExtraHop Customer Portal at <https://customer.extrahop.com>.
 - b. In the Downloads section, click **Utilities**
 - c. Click the **ExtraHop Discover Appliance rescue USB** download link.
2. Copy the .img file to a USB flash drive:
 - (Linux or Mac OS) Run the `dd` command in the terminal:

```
dd if=<file location> of=<location of root block device>
```
 - (Windows) Copy the .img file with a utility such as Win32 Disk Imager.

Displaying the Select Boot Option Screen

The Select Boot Option screen has options to boot from the Rescue USB flash drive and to perform memory tests.



To display the Select Boot Option screen:

1. If your appliance has a CD drive, make sure that no CD is present.
2. Insert the Rescue USB flash drive into a USB port on the ExtraHop appliance.
Ports are located on the front of the appliance.
3. If restarting within the firmware, do the following:
 - a. Log in to the ExtraHop system Command Line Interface (CLI) with the `shell` user account using either a monitor and USB keyboard plugged into the ExtraHop appliance or the iDRAC interface.
The default password is the service tag number of the appliance.
 - b. Enable the privilege commands. The default password is the setup user password.

```
extrahop>enable  
Password:  
extrahop#
```
 - c. At the prompt, restart the system using the `restart` command, and specify the `system` parameter as the component that you want to restart:

```
restart system
```
4. At the prompt, access the Boot Manager by pressing the F11 key.
5. Click **One-shot BIOS Boot Menu** under Boot Manager Main Menu.
6. Under **Select Legacy Boot Option**, click the selection for your Rescue USB flash drive.

Performing Memory Tests

If an error occurs during the boot process, you may need to reboot the system and perform the memory tests. For example, the system may have already detected and displayed an error message with bad DIMMs and their location during boot, as shown below.

```
Memory Initialization Warning: Memory size may be reduced.
```

```
MEMTEST lane failure detected on DIMM A2
```

```
MEMTEST failure - The following DIMM has been disabled by BIOS: DIMM  
A2
```

```
MEMTEST failure - The following DIMM has been disabled by BIOS: DIMM  
A5
```

Warning: The memory tests run indefinitely. Ensure that the installed amount of memory matches the amount shown in each test. Allow several of the tests to run before stopping the process.

The following shows a memory test in progress.

```

Memtest86+ 5.01 | Intel(R) Core(TM) i5 CPU           680 @ 3.60GHz
CLK: 3597 MHz (X64 Mode) | Pass 15% #####
L1 Cache: 64K 50658 MB/s | Test 78% #####
L2 Cache: 6144K 37080 MB/s | Test #6 [Moving inversions, random pattern]
L3 Cache: None | Testing: 1024K - 1024M 1023M of 1024M
Memory : 1024M 9014 MB/s | Pattern: 44371604 | Time: 0:00:21
-----
Core#: 0 (SMP: Disabled) | RAM: 0 MHz (DDR3- 0) - BCLK: 899
State: | Running... | Timings: CAS -0-0-0 @ 64-bit Mode
Cores: 1 Active / 1 Total (Run: All) | Pass: 0 Errors: 0
-----
S S
(ESC)exit (c)configuration (SP)scroll_lock (CR)scroll_unlock

```

To perform memory tests:

1. Display the **Select Boot Option** screen.
2. Press the down arrow to select **Memory Test**, and then press Enter.

Boot from the Rescue USB Flash Drive

1. Display the **Select Boot Option** screen.
2. Select **ExtraHop USB**, and press Enter.

OR

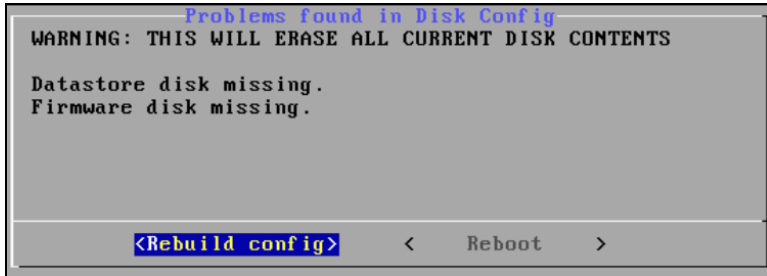
Wait for the system to automatically boot.

The ExtraHop system boots using the Rescue USB flash drive. If the system fails to boot, the ExtraHop appliance may have a faulty hard drive. Ensure that the drive is seated correctly in the slot, and restart the ExtraHop appliance. If the error persists, contact ExtraHop Support to replace the drive.

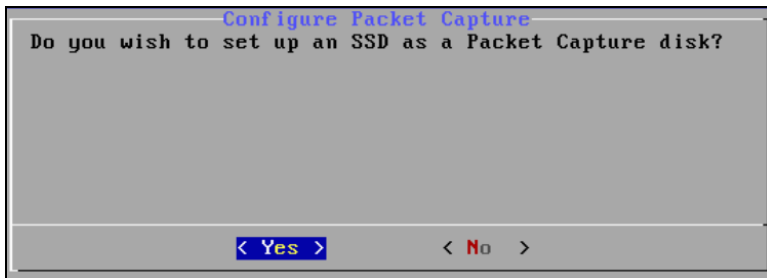
3. If the **Problems found in Disk Config** screen appears, complete the following steps.

These steps show default selections. For additional help, contact ExtraHop Support.

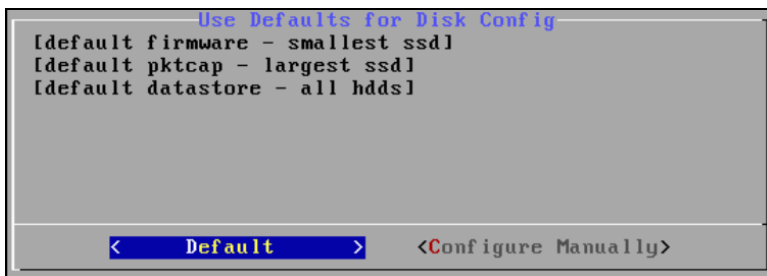
- a. On the **Problems found in Disk Config** screen , select **Rebuild config** by using the arrow keys, and then press Enter.



- b. On the **Configure Packet Capture** screen, select **Yes** and press Enter.

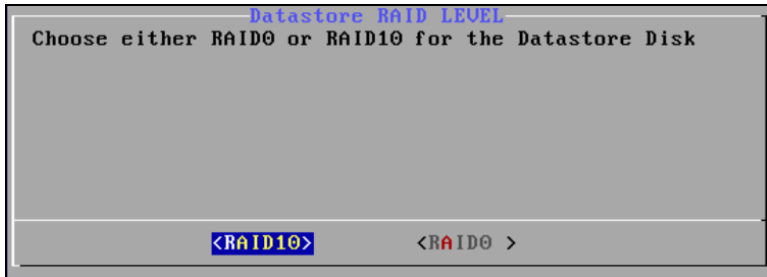


- c. On the **Use Defaults for Disk Config** screen, select **Default** and press Enter.



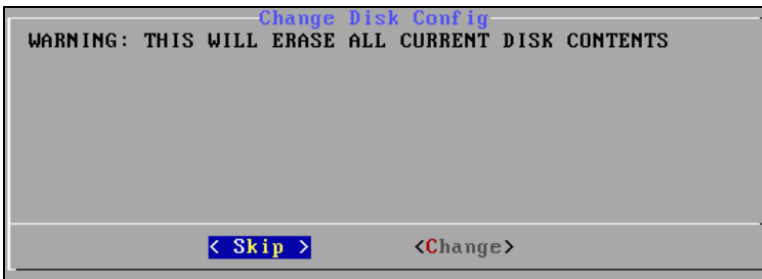
- d. On the **Datastore RAID LEVEL** screen, select the RAID level for your configuration and press

Enter.

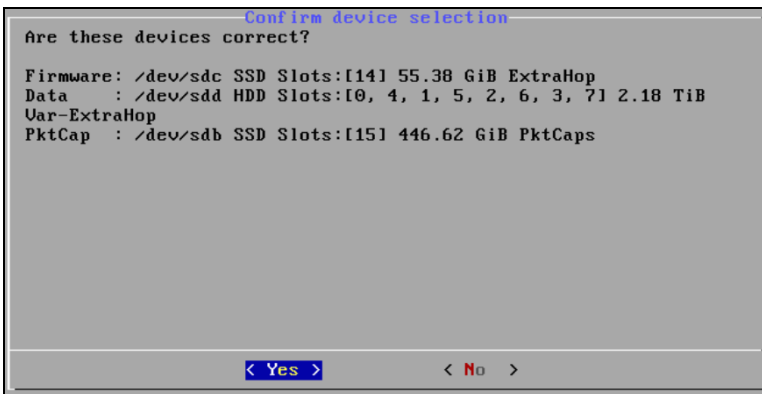


4. On the **Change Disk Config** screen, select **Skip** and press Enter.

If you want to change your disk configuration, select **Change** and follow the prompts. Contact ExtraHop Support if you need help.

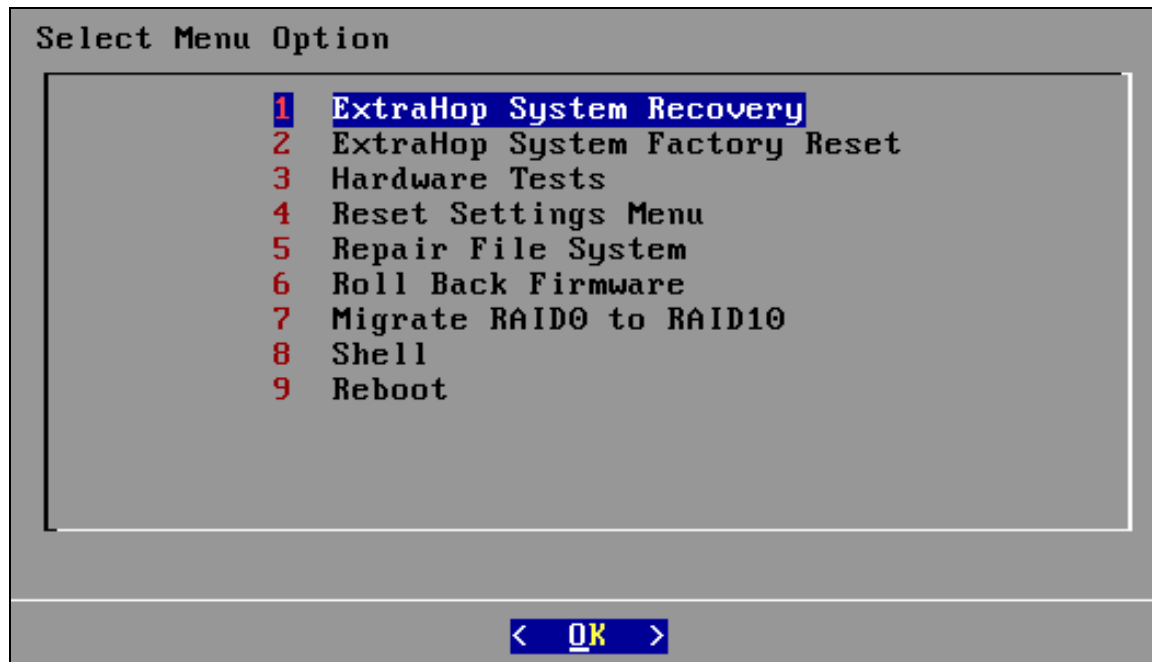


5. On the **Confirm device selection** screen, make sure that the firmware device is the USB drive. Select **Yes**, and press Enter.



Recovery Tasks

After rebooting from the Rescue USB flash drive, the ExtraHop system displays the **Select Menu Option** screen with multiple recovery tasks:



1 ExtraHop System Recovery: Enables ExtraHop system recovery without a system reset, maintaining the configuration, customizations, and metrics.

2 ExtraHop System Factory Reset: Resets the ExtraHop system to factory defaults.

3 Hardware Tests: Verifies that the system hardware is functioning correctly.

4 Reset Settings Menu: Erases the IP and datastore settings of the appliance.

5 Repair File System: Runs a system repair on the firmware drive.

6 Roll Back Firmware: Restores corrupt files for a full or partial rollback.

7 Migrate RAID0 to RAID10: Enables migration from RAID0 to RAID10.

8 Shell: Enables the display of diagnostics in the command-line shell.

9 Reboot: Reboots the system.

ExtraHop System Recovery

The system recovery option is used to recover your ExtraHop system in the unlikely event of an upgrade or restart failure. This recovery option replaces the firmware with a known good version while maintaining the system configuration, customizations, and metrics.

If there is no backed-up firmware, then the Rescue USB flash drive must have the same version or earlier than the current version you are running, and the data drive must be partitioned and ready for writing.

To recover the ExtraHop system without a full reset:

1. Select **ExtraHop System Recovery** on the **Select Menu Option** screen.
2. At the prompt that confirms you want to recover the previous firmware installation, select **Yes**.
3. If there is no backup directory, the recovery option uses the USB flash drive version to recover the

system. At the prompt to continue, select **Yes**.

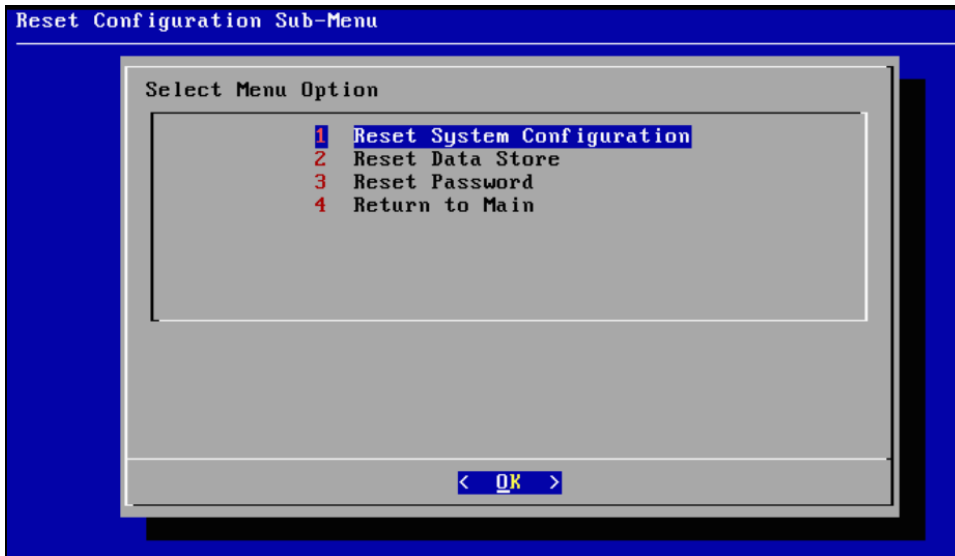
The recovery may take up to 45 minutes to complete.

4. When the recovery is complete, press Enter and select **Yes** to restart.

ExtraHop System Factory Reset

To reinstall the ExtraHop firmware and remove all previous data, including the ExtraHop license:

1. Select **ExtraHop System Factory Reset** on the **Select Menu Option** screen.
2. On the **Reset Configuration Sub-Menu** screen, select **Reset System Configuration** and select **OK**.



3. At the prompt that warns about clearing all previous data, select **Yes**.
4. After ExtraHop system installation is complete, at the reboot prompt, choose reboot.

Configuration after Reset

The ExtraHop system defaults to a DHCP IP address. If you need a static IP address, log in to the system after the reboot. The default username is *shell* and the password is the system serial number (case-sensitive). To enter privileged mode, enter the `enable` command. If prompted, enter the same default password.

To configure the recovered ExtraHop system:

1. In privileged mode, use the `configure` sub-command to enter configuration mode to configure the IP address for the ExtraHop appliance:

```
extrahop>enable
Password:
extrahop#configure
extrahop(config)#interface
```

```
extrahop(config-if)#ip ipaddr <addr> <netmask> <gateway> <dns>
Changing IP address. Please wait...
.Done
extrahop(config-if)#exit
extrahop(config) * #running_config save
Would you like to write configuration changes to default config
[Y/n]?: y
extrahop(config)#exit
extrahop#
```






3. After the IP address is configured, log in to the Admin UI at <https://<extrahop-ip>/admin>. On the EULA screen, select **I Agree** and click **Submit**.

Please review the **End User Software License and Terms of License and Sale**. If you agree to these terms, indicate your agreement by clicking the "I agree" button. By doing so, you represent that you are duly authorized to legally bind your company to these terms. If you do not agree to these terms, click the "I decline" button. The underlined text is a hypertext link which, if selected, displays these documents.

I Agree
 I Decline

4. On the Admin UI Login page, log in as follows:
 - For **Username**, type *setup*.
 - For **Password**, type the system serial number (case-sensitive).

- On the Admin page, under **System Settings**, click **License**.

System Settings	
Services	 Change
Firmware	 Change
System Time	 Change
Shutdown/Restart	 Change
License	 Change

- On the License Administration page, go to **Manage License** and click **Register**.

Manage License	
Register	 Change
Update	 Change

- Enter the product key provided to you by ExtraHop Networks and click **Register**.

Register Appliance

Product Key:

The **License Update Successful** message confirms the installation. (If an error message appears, the license was not installed.)

License Update Successful

- Click **Done**.

9. Go back to the Admin page, and under **Access Settings**, click **Support Account**.
10. Select **Enable** and click **Save**.

Enable / Disable Support Account

Support Account: **Disabled**

Enable

Disable

11. An encrypted key appears. Copy the entire key, and send it to support@extrahop.com.

Please send the encrypted key shown below to ExtraHop support

```

-----BEGIN PGP MESSAGE-----
Version: GnuPG v2.0.11 (GNU/Linux)

hQIOA3SsdhNXNYEFAf/eBI7ajyQ1zcDPDLMbc/PRVkvpb6zSwb+9/lxRQnrPIU8
iG9AREhHk3BCtiMbpas5DwzqTqZrGBmhYXLU6hdkw6Z0Y7qGa1ZwOoYbG+Cat7dW
7sZrUd6WvBtOQJeQhIXFX/sdd14+QHYYmqWbeXjAAEX//AdsqfxOpd3YMyIk4pZm
dd6c1ZlnGiqql/vORght4dNsWGV016e3saF2CIUNE0cDBNW+Fko2pCcyC2CefDWu
5W6kj0YR5z33pY0lasDBu7ZYmdmoyA8FJHb45+OKF1XQl7m+xE3Jkpr0ZV/XwpOa
apt23v2Yrpx/oBlldWo5Qm/C8ibfW779T7gBNiWcGaf/VJLTui+zcjKcDGpT7g2a
zeoKHblkz6EY1vK1YtBykwG7MKH1ngNpqBHogS41lmCR5t1vqdsMnJJxH1c4Qdte
mldG08TTF1B58IEJG7+IKCftZgjl7vr3oZQxllDSpaDL6Uex/2B3G22WmsKdCBjl
hptK3Vh6sl1wwFLlu5zQ903kcOyEMmWUUKz8cHlnON+ENiCRQ3rz7LbGzTuoG2YJ
UVKAQPguLuor6Q9HrCvyTPkXj/xtqlrRCHEUIC6Fg9R7bZNdclHB68gsO7fXYJl4
nJiC6nEicZhFZLFIVY2qx5V//Ue3FUXL9tEttDYiWylBrSIEkU7fBaoMF9QxCEAH
u9LpAbQM0F3T1M4nYyoctFengGA5NglvwuOIP+45VKjhCCt1Zhs0pSf07+/ncWn4
rZ/maHVsBtjVoqgf4E8V76DR3f1dxS8d/KU4rlwYmfiGD9bsCwljqoNuL0tR5IS
oulrsDSv7JcPZY06iUvfAk6jADJjsjiRsJNLRJCT9sO52iU9WmD6UpcEHGCnKc2
71shfSVFy2aQ3tiwGYMdG4QpgihtocD99OAJ1oVaZDCzVc6J3vq7f2j0j51nKBf5
GghKr5vUFBcTsI4c5KfH9Sw33ZA/G865IN0cbOFTRmxdNI712HIMzFyzoxwOll4/
5ocN8KnbW2e4IJEKFI/OrRYVxWHISriyJqQpY72zYOvJ6Qauqpx09KuLWTiLDDZc
K0Bvy6f346PXaPOWKn6u3r5HzWBlhi2pP2IfSHI8GFb6tMh4q2XmixhukQHob0q/
mnfe21/TXfjxQsNC/D/Cg1C1MeFeGQP6QVx59oMgIDxSj98J6L6BjWjCTPD3XR+r
ljk+0MMR3JCWjOkMXPrmSe4QKc/55WVwOR/QRVvHV8laNKM1WPPNU88EUzv9UO4U
nsLFrsHK80/B/1Cste0OfUc6lga77BvmekWb7GebXrOvqyWLPAdDqHyk+F1p/bR4
n5Wm+vxhO4tPnyhR8HICZfp4/fikTnCc+3hXTupge3JPDi1aVf8gF7dsfPYlaKXi
/S7OcmCtKVYFExDYy3LVHle/5HSQ6SohJG4pQu46D2tQ0nhQdLWkVAUSxE2KZ3xL
HKVPvTVZivxOipam2n/DrMhspGqBfz8Q1U0MCgok
=6MVy
-----END PGP MESSAGE-----

```

Done

12. Click **Done**.
13. Set the system time. The default time server setting is `pool.ntp.org`. To configure the time servers manually, refer to the *System Settings* section of the *ExtraHop Admin UI Users Guide*.
14. After configuring the time settings, save the running config:
 - a. In the upper right corner, click **View & Save Changes**.
 - b. On the Running Config page, click **Update**.
15. To configure the connectivity settings, do the following:
 - a. On the Admin page, under **Network Settings**, click **Connectivity**.
 - b. In the **Interface Status** section, refer to the diagram of the appliance to determine whether a

network feed is going into the data port. Ensure that all licensed interfaces are black (live, but not connected) or green (licensed, connected).

Upgrade the Firmware

At this point in the recovery process, you should check for any updates more recent than the Rescue USB flash drive firmware version.

To check for updated firmware versions:

1. Log in to the ExtraHop Customer Portal.
2. In the Downloads section, click **Firmware**.
3. Download the incremental firmware update for your appliance.

To install the firmware update:

1. In the Admin UI, go to **System Settings** and click **Firmware**.
2. On the **Firmware** page, click **Update**.
3. Select the incremental firmware version you downloaded and follow the screen prompts. After uploading new firmware, you must restart the system.

After you have the license installed, the support account activated, the time zone set correctly, and the latest firmware installed, your ExtraHop system is configured.

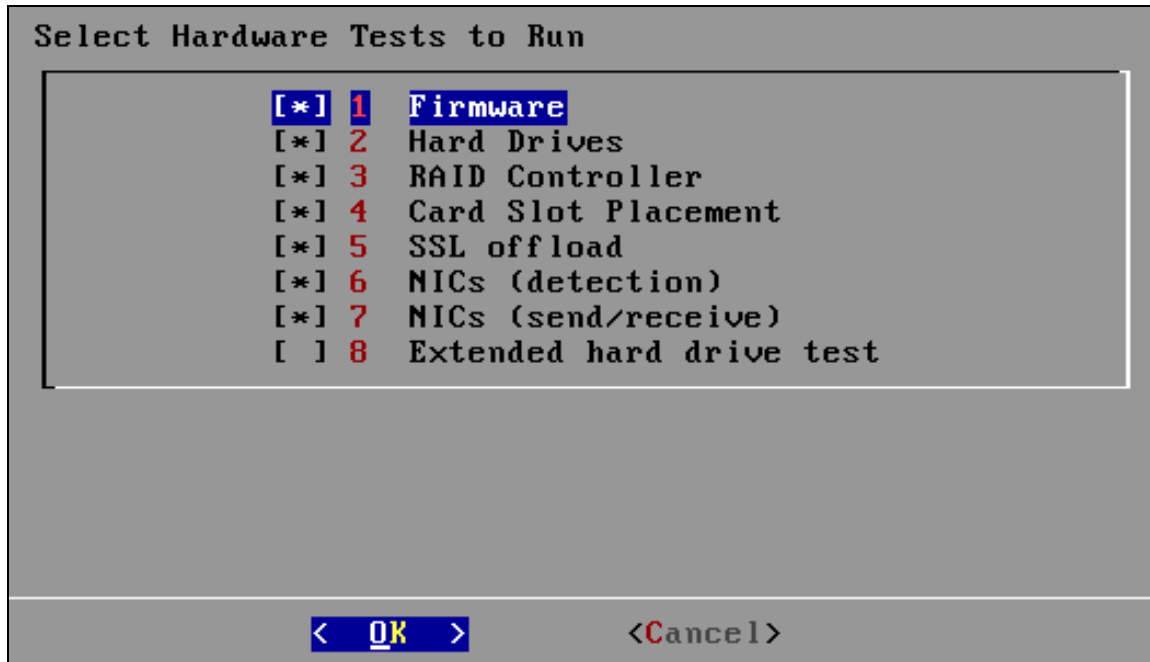
To properly shut down the system:

- On the command-line interface, enter the `shutdown system` command.
- OR
- In the Admin UI, go to the **Shutdown/Restart** page and select **Halt** under **System**.

If you shut down the ExtraHop system by powering it off, the system will restart in Database Recovery mode.

Hardware Tests

Hardware tests are for use before the ExtraHop appliance ships, during deployment, and after an appliance replacement or upgrade. The **Select Hardware Tests to Run** menu contains the following tests.



The following is a brief description:

- 1 Firmware:** Verifies that the firmware version is correct. Checks the MD5 sums on both the base firmware and the ExtraHop firmware.
- 2 Hard Drives:** Performs a test of all hard drives in the appliance.
- 3 RAID Controller:** Checks the RAID statistics and gives a summary of errors, if any.
- 4 Card Slot Placement:** Verifies that additional SSL and 10G cards are installed in the correct slots.
- 5 SSL offload:** Turns on the card and performs two decryption tests.
- 6 NICs (detection):** Verifies the two fiber interfaces and four Ethernet interfaces are present on the appliance. The result is N/A. Check the appliance to ensure the number of detected interfaces matches the number of interfaces on the appliance.
- 7 NICs (send/receive):** Sends and receives data to and from the interfaces.
- 8 Extended Hard Drive Test:** Performs a thorough test of the hard drive. This test can take up to 24 hours and checks every sector of every hard drive for errors. Run this test separately and only if there were errors in previous tests.

The following table shows the approximate length of each test.

Test	Time
Firmware	5 seconds
Hard Drives	5 to 10 seconds
Raid Controller	5 seconds
Card Slot Placement	5 seconds
SSL Offload	5 seconds

NICs (Detection)	5 to 10 seconds
NICs (Send/Receive)	1 minute
Extended Hard Drive Test	Up to 24 hours

To run the hardware tests:

1. Connect the 10GB interfaces with a single-mode fiber optic cable, and connect interface 1 to interface 2, and interface 3 to interface 4 using Ethernet cables. On the EH9100, also connect interface 5 to interface 6, and interface 7 to interface 8.
2. Select **Hardware Tests** on the **Select Menu Option** screen.
3. On the **Select Hardware Tests to Run** screen, select which tests to run and then press Enter.
By default, the first seven tests are selected as shown by the asterisk before each item. To deselect a test, highlight it and press the spacebar. Each test you choose to run stops at the end of the page to allow you to review the results.
4. Press **Page Up** and **Page Down** on your keyboard to view the test results.
5. When you finish reading the logs, press any key and then press Q at the prompt.

```
Use Page Up/Page Down to view the rest of the results

>>> Verifying Firmware ...
Base MD5 sum is valid
ExtraHop firmware MD5 sum is valid
>>> Result: PASS

Press Q to return to the menu
(END)_
```

Troubleshooting the Hardware Tests

Before troubleshooting the ExtraHop appliance, check the LEDs on the appliance to ensure that the drives are functioning properly. A blinking amber LED indicates that the drive is not present or may not be secure inside the slot.

Check the LCD on the front of the appliance (EH8100/9100). On the **Net** screen, select **Errors** to view system events such as CPU errors, undetected hard drives, or missing power supplies. When an error occurs, the LCD turns amber and displays the error immediately.



Failed Firmware Test: If the firmware test fails, the firmware or base image file may be corrupted. To repair this, go to the **Select Menu Option** menu and select option 1, **ExtraHop System Recovery**. If that fails, select option 2, **ExtraHop System Factory Reset**. Selecting this option deletes the datastore. If the problem persists, contact ExtraHop Support.

```

>>> Verifying Firmware ...
Base filename: base-4.0.0.sqsh
Base MD5 sum is valid (aa34c5f9c7058a31f7712fc45eb5f3cd)
ExtraHop firmware filename: extrahop-3.10.18610.sqsh
ExtraHop firmware MD5 sum mismatch!
Stored MD5: 0ed82e873a5de8c17cf29bb24c59bcac
Computed MD5: fed82e873a5de8c17cf29bb24c59bcac
>>> Result: FAIL

```

Failed Hard Drive Test: If the hard drive test fails, the drive may not be present or secure inside the slot. Ensure that the drive is seated correctly in the slot, and run the test again. If the error persists, contact ExtraHop Support to replace the drive.

```

SMART Self-test log
Num Test Status segment LifeTime LBA_first_err [
SK ASC ASQ]
Description number (hours)
# 1 Background long Failed in segment --> 36 6019 - [
- - -]
# 2 Background long Failed in segment --> 36 5996 - [
- - -]
# 3 Background long Completed 32 2 - [
- - -]
# 4 Background short Completed 32 0 - [
- - -]

Long (extended) Self Test duration: 2520 seconds [42.0 minutes]
Slot #14: Good
Slot #15: Good
>>> Result: FAIL

```

Failed RAID Controller Test: If the RAID controller test fails, the drives may not be present or secure inside the slots. Ensure that the drives are seated correctly in the slots, and run the test again. If the error persists, contact ExtraHop Support to replace the drives.

```

>>> Verifying RAID Controller ...
RAID Controller Alerts
[
  {
    "device": "0",
    "status": "Offline",
    "role": "Datastore",
    "details": "virtual disk not in optimal state",
    "sev": 2
  }
]
>>> Result: FAIL

```

Failed Card Slot Placement Test: If the card slot placement test fails, the output shows a slot mismatch for the 10G or SSL cards. Designated slots vary by appliance model. To verify the designated slots, refer to your appliance documentation. If you have trouble replacing the cards in the correct slots, contact ExtraHop Support.

```
Use Page Up/Page Down to view the rest of the results

>>> Verifying Card Slot Placement ...
Detecting card placement for platform EH6000
No device found!
Slot mismatch for 10G card. Expected ['41:00.0']; got 42:00.0
>>> Result: FAIL

Press Q to return to the menu
(END)_
```

Failed SSL Offload Test: If the SSL offload test fails, the SSL card was not initialized properly or may be in the incorrect slot. Ensure that the SSL card is in the correct slot. If you have trouble replacing the cards in the correct slots, contact ExtraHop Support.

N/A NIC Detection Test: The output of the NIC detection test is a list of fiber interfaces (EH6100/8100/9100) and Ethernet interfaces on the ExtraHop appliance. Ensure that the number of detected interfaces matches the number of interfaces on the ExtraHop appliance. If one or more interfaces are not listed, ensure that all network interfaces and cards are present. If they are present and the system does not detect them, contact ExtraHop Support.

```
>>> Verifying NIC detection ...
6 interfaces detected:
  eth0
  eth1
  eth2
  eth3
  eth4
  eth5
>>> Result: N/A
```

Failed NIC Send/Receive Test: If the NIC send/receive test fails, the single-mode fiber optic cables may be improperly connected. Ensure that the cables are properly connected, and restart the ExtraHop system. If the error persists, read the output to determine whether traffic was unsent or not received. If there is no traffic, the NIC may be defective. To replace a defective NIC, contact ExtraHop Support.


```
>>> Verifying NIC send/receive ...
NOTE: This test requires that pairs of interfaces be physically
connected to each other. See the documentation for more info.

Initializing all interfaces...
Waiting for initialization to complete...

ERROR: No link detected on eth1
ERROR: No link detected on eth2
ERROR: No link detected on eth3
TEST: Send on eth0, receive on eth1
Sending test packets on eth0...
Checking received packets...
ERROR: Received packets file differs!
```

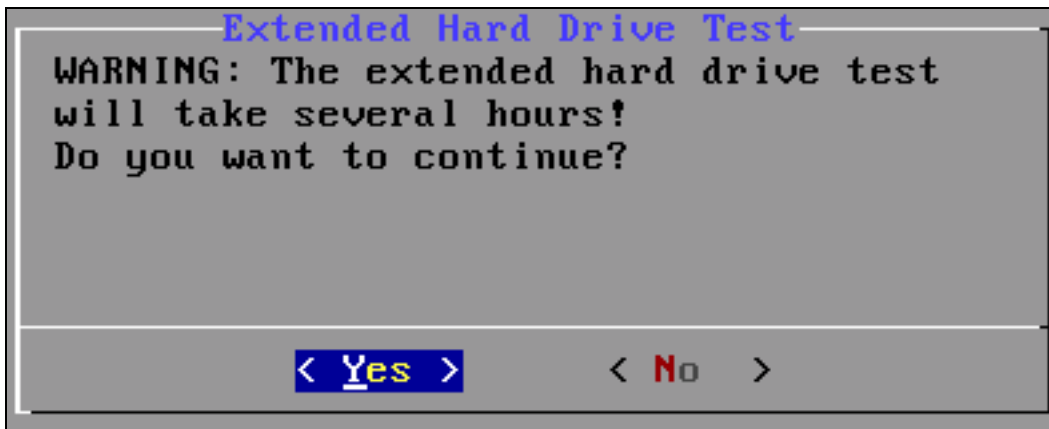
Extended Hard Drive Test

The extended hard drive test can take up to 24 hours and checks every sector of every hard drive for errors. For more information, refer to the smartmontools man page (<http://smartmontools.sourceforge.net/man/smartctl.8.html>).

Run this test separately and only if there were errors in previous tests.

To run the extended hard drive test:

1. Connect the 10GB interfaces with a single-mode fiber optic cable, and connect interface 1 to interface 2, and interface 3 to interface 4 using Ethernet cables. For EH9100, also connect interface 5 to interface 6, and interface 7 to interface 8.
2. Select **Hardware Tests** on the **Select Menu Option** screen.
3. On the **Select Hardware Tests to Run** screen, select option 8, **Extended Hard Drive Test**.
4. Select **Yes** to run the extended hard drive test.

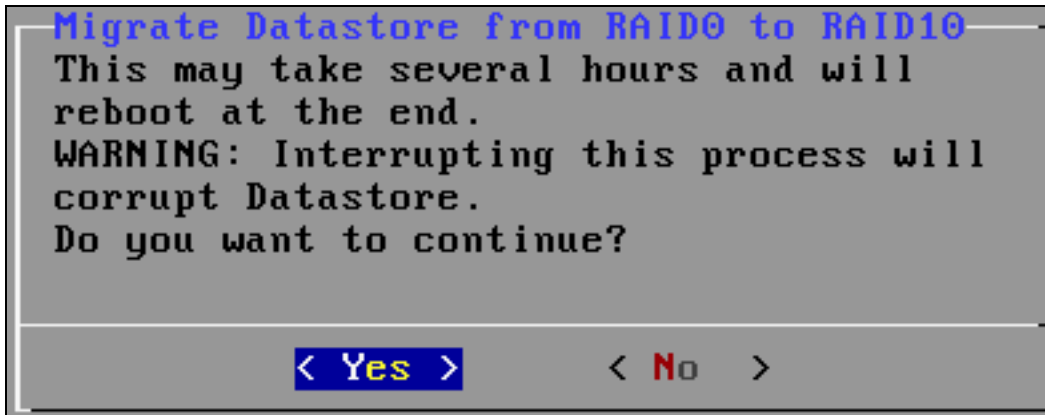


Migrate RAID0 to RAID10

You can configure the EH9100 appliance for RAID10 using four additional hard drives from ExtraHop.

To enable advanced RAID features:

1. Select **Migrate RAID0 to RAID10** on the **Select Menu Option** screen.
2. Select **Yes** to migrate to RAID10.



3. (Optional) Once you finish the migration process, restart the ExtraHop appliance, and then go to the Admin UI to check the hard drive states and to configure alerts and notifications.