



# Replacing Hard Disks on the FortiAnalyzer Unit

Version 4.0 MR2

Technical Note

## ***Replacing Hard Disks on the FortiAnalyzer Unit***

Version 4.0 MR2

29 September 2010

Revision 1

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# Contents

|   |           |
|---|-----------|
| <b>Introduction .....</b>   | <b>5</b>  |
| <b>Before you begin.....</b>  | <b>5</b>  |
| How this guide is organized.....  | 5         |
| <b>Document conventions .....</b>                                       | <b>6</b>  |
| IP addresses.....   | 6         |
| Cautions, Notes and Tips .....  | 6         |
| Typographical conventions.....  | 6         |
| CLI command syntax.....   | 8         |
| <b>Registering your Fortinet product.....</b>                           | <b>9</b>  |
| <b>Fortinet products End User License Agreement .....</b>               | <b>9</b>  |
| <b>Customer service and technical support.....</b>                      | <b>9</b>  |
| <b>Training .....</b>   | <b>9</b>  |
| <b>Fortinet documentation .....</b>                                     | <b>10</b> |
| Tools and Documentation CD.....   | 10        |
| Fortinet Knowledge Base .....   | 10        |
| Comments on Fortinet technical documentation .....                      | 10        |
| <b>RAID overview .....</b>  | <b>11</b> |
| <b>What is RAID? .....</b>  | <b>11</b> |
| <b>Understanding RAID levels .....</b>                                  | <b>11</b> |
| <b>Linear .....</b>   | <b>12</b> |
| <b>RAID 0.....</b>  | <b>12</b> |
| <b>RAID 1.....</b>  | <b>12</b> |
| <b>RAID 5.....</b>  | <b>13</b> |
| <b>RAID 10.....</b>   | <b>13</b> |
| <b>RAID 50.....</b>   | <b>13</b> |
| <b>RAID 5 with hot spare.....</b>                                       | <b>13</b> |
| <b>Changing the RAID levels .....</b>                                   | <b>13</b> |
| <b>Alert Message Console widget .....</b>                               | <b>14</b> |
| <b>RAID Monitor widget.....</b>   | <b>15</b> |
| <b>FortiAnalyzer-400B and FortiAnalyzer-1000B disk replacement.....</b> | <b>17</b> |
| Identifying a failed hard disk.....                                     | 17        |
| Replacing a hard disk .....   | 18        |
| <b>FortiAnalyzer-800 disk replacement.....</b>                          | <b>21</b> |
| Identifying a failed hard disk.....                                     | 21        |
| Replacing a hard disk .....   | 22        |
| Replacing multiple hard disks .....                                     | 23        |

---

|   |           |
|---|-----------|
| <b>FortiAnalyzer-800B disk replacement</b> .....  | <b>25</b> |
| Identifying a failed hard disk.....               | 25        |
| Replacing a hard disk .....                       | 26        |
| Replacing multiple hard disks .....               | 27        |
| <b>FortiAnalyzer-2000 disk replacement</b> .....  | <b>29</b> |
| Identifying and locating a failed hard disk ..... | 29        |
| Replacing a hard disk .....                       | 30        |
| Replacing RAID 5 + hot spare .....                | 31        |
| Replacing multiple hard disks .....               | 32        |
| <b>FortiAnalyzer-2000A disk replacement</b> ..... | <b>33</b> |
| Identifying a failed hard disk.....               | 33        |
| Replacing a hard disk .....                       | 34        |
| Replacing multiple hard disks .....               | 35        |
| <b>FortiAnalyzer-4000 disk replacement</b> .....  | <b>37</b> |
| Identifying a failed hard disk.....               | 37        |
| Replacing a hard disk .....                       | 38        |
| Replacing multiple hard disks .....               | 39        |
| <b>FortiAnalyzer-4000A disk replacement</b> ..... | <b>41</b> |
| Identifying a failed hard disk.....               | 41        |
| Replacing a hard disk .....                       | 42        |
| Replacing multiple hard disks .....               | 43        |
| <b>Index</b> .....                                | <b>47</b> |

# Introduction

This guide provides detailed information about how to properly replace a hard disk on your specific FortiAnalyzer unit.

FortiAnalyzer units are network appliances that provide integrated tools for analysis, archive search, log collection, and data storage. The FortiAnalyzer-400B and higher models have multiple hard disk drives that can store data using a RAID array. The RAID array enables the FortiAnalyzer units to provide redundant storage, data protection, faster hard disk access or a larger storage capacity.

If a hard disk fails, it must be replaced. The hard disk can be replaced while the FortiAnalyzer unit is running.

This chapter includes the following topics:

- [Before you begin](#)
- [Document conventions](#)
- [Registering your Fortinet product](#)
- [Fortinet products End User License Agreement](#)
- [Customer service and technical support](#)
- [Training](#)
- [Fortinet documentation](#)

## Before you begin

Before you begin using this guide, take a moment to note the following assumptions:

- You have administrative access to the web-based manager and/or CLI.
- You are familiar with RAID and configuring RAID on the FortiAnalyzer unit. If you are not, review [“RAID overview” on page 11](#).
- You have a new hard disk ready to replace the failed hard disk.
- You have a Phillips screwdriver.
- If you are using a FortiAnalyzer-800, you have a key for the unit.

### How this guide is organized

This document describes how to configure RAID on your FortiAnalyzer unit and includes an explanation about RAID levels and the role of the Alert Message Console and RAID Monitor widgets.

[RAID overview](#) provides an overview of RAID, explanation of RAID levels, and describes the widgets Alert Message Console and RAID Monitor.

The rest of the guide consists of chapters, organized by FortiAnalyzer model, that explain how to identify and replace failed disks. The following models are covered:

- [FortiAnalyzer-400B and 1000B](#)
- [FortiAnalyzer-800](#)
- [FortiAnalyzer-800B](#)
- [FortiAnalyzer-2000](#)

- [FortiAnalyzer-2000A](#)
- [FortiAnalyzer-40000](#)
- [FortiAnalyzer-4000A](#)

## Document conventions

Fortinet technical documentation uses the conventions described below:

### IP addresses

To avoid publication of public IP addresses that belong to Fortinet or any other organization, the IP addresses used in Fortinet technical documentation are fictional and follow the documentation guidelines specific to Fortinet. The addresses used are from the private IP address ranges defined in RFC 1918: Address Allocation for Private Internets, available at <http://ietf.org/rfc/rfc1918.txt?number-1918>.

### Cautions, Notes and Tips

Fortinet technical documentation uses the following guidance and styles for cautions, notes and tips.



**Caution:** Warns you about commands or procedures that could have unexpected or undesirable results including loss of data or damage to equipment.



**Note:** Presents useful information, usually focused on an alternative, optional method, such as a shortcut, to perform a step.



**Tip:** Highlights useful additional information, often tailored to your workplace activity.

### Typographical conventions

Fortinet documentation uses the following typographical conventions:

**Table 1: Typographical conventions in Fortinet technical documentation**

| Convention  | Example  |
|---|--|
| Button, menu, text box, field, or check box label | From <i>Minimum log level</i> , select <i>Notification</i> .   |
| CLI input*  | <pre>config system dns   set primary &lt;address_ipv4&gt; end</pre>  |
| CLI output  | <pre>FGT-602803030703 # get system settings comments          : (null) opmode            : nat</pre>   |
| Emphasis  | HTTP connections are <b>not</b> secure and can be intercepted by a third party.  |
| File content                                      | <pre>&lt;HTML&gt;&lt;HEAD&gt;&lt;TITLE&gt;Firewall Authentication&lt;/TITLE&gt;&lt;/HEAD&gt; &lt;BODY&gt;&lt;H4&gt;You must authenticate to use this service.&lt;/H4&gt;</pre> |

**Table 1: Typographical conventions in Fortinet technical documentation (Continued)**

|                       |   |
|-----------------------|---|
| <b>Hyperlink</b>      | Visit the Fortinet Technical Support web site, <a href="https://support.fortinet.com">https://support.fortinet.com</a> .  |
| <b>Keyboard entry</b> | Type a name for the remote VPN peer or client, such as <code>Central_Office_1</code> .  |
| <b>Navigation</b>     | Go to <code>VPN &gt; IPSEC &gt; Auto Key (IKE)</code> .   |
| <b>Publication</b>    | For details, see the <a href="#">FortiGate Administration Guide</a> .<br><b>Note:</b> Links typically go to the most recent version. To access earlier releases, go to <a href="http://docs.fortinet.com/">http://docs.fortinet.com/</a> . <a href="#">This link appears at the bottom of each page of this document.</a> |

\* For conventions used to represent command syntax, see “CLI command syntax” on page 8.

## CLI command syntax

This guide uses the following conventions to describe syntax to use when entering commands in the Command Line Interface (CLI).

Brackets, braces, and pipes are used to denote valid permutations of the syntax. Constraint notations, such as `<address_ipv4>`, indicate which data types or string patterns are acceptable value input.

For more information, see the [FortiGate CLI Reference](#).

**Table 2: Command syntax**

| Convention                 | Description   |
|----------------------------|---|
| <b>Square brackets</b> [ ] | A non-required word or series of words. For example:<br>[verbose {1   2   3}]<br>indicates that you may either omit or type both the <code>verbose</code> word and its accompanying option, such as:<br>verbose 3   |
| <b>Angle brackets</b> < >  | A word constrained by data type.<br>To define acceptable input, the angled brackets contain a descriptive name followed by an underscore ( <code>_</code> ) and suffix that indicates the valid data type. For example:<br><retries_int><br>indicates that you should enter a number of retries, such as 5.<br>Data types include: <ul style="list-style-type: none"> <li>• &lt;xxx_name&gt;: A name referring to another part of the configuration, such as <code>policy_A</code>.</li> <li>• &lt;xxx_index&gt;: An index number referring to another part of the configuration, such as 0 for the first static route.</li> <li>• &lt;xxx_pattern&gt;: A regular expression or word with wild cards that matches possible variations, such as <code>*@example.com</code> to match all email addresses ending in <code>@example.com</code>.</li> <li>• &lt;xxx_fqdn&gt;: A fully qualified domain name (FQDN), such as <code>mail.example.com</code>.</li> <li>• &lt;xxx_email&gt;: An email address, such as <code>admin@mail.example.com</code>.</li> <li>• &lt;xxx_url&gt;: A uniform resource locator (URL) and its associated protocol and host name prefix, which together form a uniform resource identifier (URI), such as <code>http://www.fortinet./com/</code>.</li> <li>• &lt;xxx_ipv4&gt;: An IPv4 address, such as <code>192.168.1.99</code>.</li> <li>• &lt;xxx_v4mask&gt;: A dotted decimal IPv4 netmask, such as <code>255.255.255.0</code>.</li> <li>• &lt;xxx_ipv4mask&gt;: A dotted decimal IPv4 address and netmask separated by a space, such as <code>192.168.1.99 255.255.255.0</code>.</li> <li>• &lt;xxx_ipv4/mask&gt;: A dotted decimal IPv4 address and CIDR-notation netmask separated by a slash, such as <code>192.168.1.99/24</code>.</li> <li>• &lt;xxx_str&gt;: A string of characters that is <b>not</b> another data type, such as <code>P@ssw0rd</code>. Strings containing spaces or special characters must be surrounded in quotes or use escape sequences</li> <li>• &lt;xxx_int&gt;: An integer number that is <b>not</b> another data type, such as 15 for the number of minutes.</li> </ul> |
| <b>Curly braces</b> { }    | A word or series of words that is constrained to a set of options delimited by either vertical bars or spaces.<br>You must enter at least one of the options, unless the set of options is surrounded by square brackets [ ].   |

Table 2: Command syntax

|  |   |  |
|--|---|--|
|  | <b>Options delimited by vertical bars  </b> | Mutually exclusive options. For example:<br>{enable   disable}<br>indicates that you must enter either <code>enable</code> or <code>disable</code> , but must not enter both.  |
|  | <b>Options delimited by spaces</b>          | Non-mutually exclusive options. For example:<br>{http https ping snmp ssh telnet}<br>indicates that you may enter all or a subset of those options, in any order, in a space-delimited list, such as:<br>ping https ssh<br><b>Note:</b> To change the options, you must re-type the entire list. For example, to add <code>snmp</code> to the previous example, you would type:<br>ping https snmp ssh<br>If the option adds to or subtracts from the existing list of options, instead of replacing it, or if the list is comma-delimited, the exception will be noted. |

## Registering your Fortinet product

Before you begin configuring and customizing features, take a moment to register your Fortinet product at the Fortinet Technical Support web site, <https://support.fortinet.com>.

Many Fortinet customer services, such as firmware updates, technical support, and FortiGuard Antivirus and other FortiGuard services, require product registration.

For more information, see the Fortinet Knowledge Base article [Registration Frequently Asked Questions](#).

## Fortinet products End User License Agreement

See the [Fortinet products End User License Agreement](#).

## Customer service and technical support

Fortinet Technical Support provides services designed to make sure that you can install your Fortinet products quickly, configure them easily, and operate them reliably in your network.

To learn about the technical support services that Fortinet provides, visit the Fortinet Technical Support web site at <https://support.fortinet.com>.

You can dramatically improve the time that it takes to resolve your technical support ticket by providing your configuration file, a network diagram, and other specific information. For a list of required information, see the Fortinet Knowledge Base article [Fortinet Technical Support Requirements](#).

## Training

Fortinet Training Services provides a variety of training programs to serve the needs of our customers and partners world-wide. Visit the Fortinet Training Services web site at <http://campus.training.fortinet.com>, or email [training@fortinet.com](mailto:training@fortinet.com).

## Fortinet documentation

The Fortinet Technical Documentation web site, <http://docs.fortinet.com>, provides the most up-to-date versions of Fortinet publications, as well as additional technical documentation such as technical notes.

In addition to the Fortinet Technical Documentation web site, you can find Fortinet technical documentation on the Fortinet Tools and Documentation CD, and on the Fortinet Knowledge Base.

### Tools and Documentation CD

The documentation for your product is available on the Fortinet Tools and Documentation CD shipped with your product. The documents on this CD are current at shipping time. For the most current versions of Fortinet documentation, visit the Fortinet Technical Documentation web site, <http://docs.fortinet.com>.

### Fortinet Knowledge Base

The Fortinet Knowledge Base provides additional Fortinet technical documentation, such as troubleshooting and how-to articles, examples, FAQs, technical notes, and more. Visit the Fortinet Knowledge Base at <http://kb.fortinet.com>.

### Comments on Fortinet technical documentation

Please send information about any errors or omissions in this or any Fortinet technical document to [techdoc@fortinet.com](mailto:techdoc@fortinet.com).

# RAID overview

This chapter introduces you to RAID. RAID is an important feature on the FortiAnalyzer unit because it allows data reliability. This chapter explains RAID levels, how to change these levels, and what role the Alert Message Console and RAID Monitor widgets have when managing RAID status.

This chapter contains the following sections:

- [What is RAID?](#)
- [Understanding RAID levels](#)
- [Changing the RAID levels](#)
- [Alert Message Console widget](#)
- [RAID Monitor widget](#)



**Note:** Fortinet recommends having an Uninterruptible Power Supply (UPS) because it reduces the possibility of data inconsistencies when power failures occur.

## What is RAID?

RAID (Redundant Array of Independent Disks) helps to divide data storage over multiple disks. By dividing data this way, data reliability is increased.

FortiAnalyzer units can have either software RAID or hardware RAID. Hardware RAID is performed by the RAID controller while software RAID is performed by the software itself. Hardware RAID is found on the FortiAnalyzer-2000/2000A and FortiAnalyzer-4000/4000A units. Software RAID is found on FortiAnalyzer-400B and 1000B, as well as FortiAnalyzer-800/800B units.

On most FortiAnalyzer units, you can hot swap hard disks. Hot swapping means you can remove a failed hard disk and replace it with a new one even while the FortiAnalyzer unit is still in operation. Hot swapping is a quick and efficient way to replace hard disks.

## Understanding RAID levels

RAID levels vary between FortiAnalyzer units. The following table explains the recommended RAID levels for each unit, the supported RAID levels, and any additional information.

**Table 3: RAID levels explained**

| FortiAnalyzer Platform | Supported Levels    | Recommended Level | NOTE   |
|------------------------|---------------------|-------------------|--|
| FortiAnalyzer-100B     |                     |                   | RAID is not supported.   |
| FortiAnalyzer-400B     | 0, 1                | 1                 | RAID 0 is supported for only two-disk configuration.                                 |
| FortiAnalyzer-800/800B | Linear, 0, 1, 5, 10 | 10                | RAID 5 can be configured in the CLI; however, using RAID 5 may decrease performance. |

**Table 3: RAID levels explained**

|                          |                            |    |   |
|--------------------------|----------------------------|----|---|
| FortiAnalyzer-1000B      | 0, 1                       | 1  | RAID 0 is supported for only two-disk configuration |
| FortiAnalyzer-2000/2000A | 0, 5, 5 plus spare, 10, 50 | 50 |   |
| FortiAnalyzer-4000/4000A | 0, 5, 5 plus spare, 10     | 50 |   |

When changing the RAID level, the available levels depend on the number of working disks that are actually present in the unit. For example, RAID 5 is not available on FortiAnalyzer units with fewer than three disks. With a full complement of working disks, the default level is the recommended level in the above table. The following sections assume a full complement except where noted.

You can find more information about RAID from the `get system status` or `diag raid info` commands in the CLI.

## Linear

A linear RAID level combines all hard disks into one large virtual disk. It is also known as concatenation or JBOD (Just a Bunch of Disks). The total space available in this option is the capacity of all disks used. This RAID format has very little effect on performance. If any single drive fails, the entire set of drives cannot be used until the faulty drive is replaced. All data on all of the failed disks will be lost.

## RAID 0

A RAID 0 array is also referred to as striping. The FortiAnalyzer unit writes information evenly across all hard disks. The total space available is that of all the disks in the RAID array. There is no redundancy available. If any single drive fails, the data on that drive cannot be recovered. This RAID level is beneficial because it provides better performance, since the FortiAnalyzer unit can distribute disk writing across multiple disks.

## RAID 1

A RAID 1 array is also referred to as mirroring. The FortiAnalyzer unit writes information to one hard disk, and writes a copy (a mirror image) of all information to all other hard disks. The total disk space available is that of only one hard disk, as the others are solely used for mirroring. This provides redundant data storage with no single point of failure. Should any of the hard disks fail, there are several backup hard disks available. For example, with a FortiAnalyzer-800, if one disk fails, the FortiAnalyzer unit can still access three other hard disks and continue functioning.

## RAID 5

A RAID 5 array employs striping with a parity check. Similar to RAID 0, the FortiAnalyzer unit writes information evenly across all drives but additional parity blocks are written on the same stripes. The parity block is staggered for each stripe. The total disk space is the total number of disks in the array, minus one disk for parity storage. For example, on a FortiAnalyzer-800 with four hard disks, the total capacity available is actually the total for three hard disks. RAID 5 performance is typically better with reading than with writing, although performance is degraded when one disk has failed or is missing. With RAID 5, one disk can fail without the loss of data. If a drive fails, it can be replaced and the FortiAnalyzer unit will restore the data on the new disk by using reference information from the parity volume.



**Note:** RAID 5 appears in the web-based manager only for FortiAnalyzer units with hardware RAID.

## RAID 10

RAID 10 (or 1+0), includes nested RAID levels 1 and 0, or a stripe (RAID 0) of mirrors (RAID 1). The total disk space available is the total number of disks in the array (a minimum of 4) divided by 2. One drive from a RAID 1 array can fail without the loss of data; however, should the other drive in the RAID 1 array fail, all data will be lost. In this situation, it is important to replace a failed drive as quickly as possible.



**Note:** Fortinet recommends using RAID 10 for redundancy instead of RAID 5 on FortiAnalyzer units with software RAID. RAID 5 causes system performance issues.

## RAID 50

RAID 50 (or 5+0) includes nested RAID levels 5 and 0, or a stripe (RAID 0) and stripe with parity (RAID 5). The total disk space available is the total number of disks minus the number of RAID 5 sub-arrays. RAID 50 provides increased performance and also ensures no data loss for the same reasons as RAID 5. One drive in each RAID 5 array can fail without the loss of data.

## RAID 5 with hot spare

FortiAnalyzer-2000/2000A and FortiAnalyzer-4000/4000A units can use one of their hard disks as a hot spare (a stand-by disk for the RAID), should any of the other RAID hard disks fail. When a hard disk fails, the FortiAnalyzer unit begins to automatically substitute the hot spare for the failed drive, integrating it into the RAID array, and rebuilding the RAID's data.

When you replace the failed hard disk, the FortiAnalyzer unit uses the new hard disk as the new hot spare. The total disk space available is the total number of disks minus two.

## Changing the RAID levels

You can change the RAID level of the RAID array in either the web-based manager or CLI. Changing the RAID level will remove all log data from the disks, and the device disk quota may be reduced to accommodate the available disk space in the new RAID array.

Figure 1: RAID Settings page on a FortiAnalyzer-1000B unit

| Disk # | Size     | Status      |
|--------|----------|-------------|
| 1      | 465.76GB | OK          |
| 2      | 0.00GB   | Not Present |

### To change the RAID levels - web-based manager

- 1 Log in to the web-based manager.
- 2 Go to *System > Config > RAID*.



**Tip:** You can instead go to *System > Dashboard* and, on the *RAID Monitor* widget, select the *RAID Settings* icon in the title bar area.

- 3 Select a RAID level in the *RAID Level* list.
- 4 Select *Apply* to begin the process of changing the RAID level.

The following message appears:

Warning: If the RAID setting is changed, ALL data will be DELETED! The procedure could take up to 20 minutes. Continue?

- 5 Select *OK* to continue with the process.

### To change the RAID levels- CLI

- 1 Log in to the CLI.
- 2 Enter the following to change the RAID level:

```
config system raid
  set level <raid_level>
end
```

- 3 Enter *y* when a message similar to the following appears:

```
Changing the RAID levels will erase the hard disks, causing
you to lose all logged data. The new device quota may be
reduced to accommodate the available disk space in the new
RAID array. Do you want to continue? (y/n)
```

The RAID level changes and the FortiAnalyzer unit reboots. This may take several minutes.

## Alert Message Console widget

The Alert Message Console widget, located in *System > Dashboard*, displays any messages about events or activities that need urgent attention, such as a failed hard disk. This widget provides detailed messages that contain the date and time of the event or activity, as well as an explanation about what happened.

These alert messages provide a quick way to find out what happened to a failed disk. In the message, you can see the time and date of the failure, as well as what may have happened.

**Figure 2: Alert Console widget**



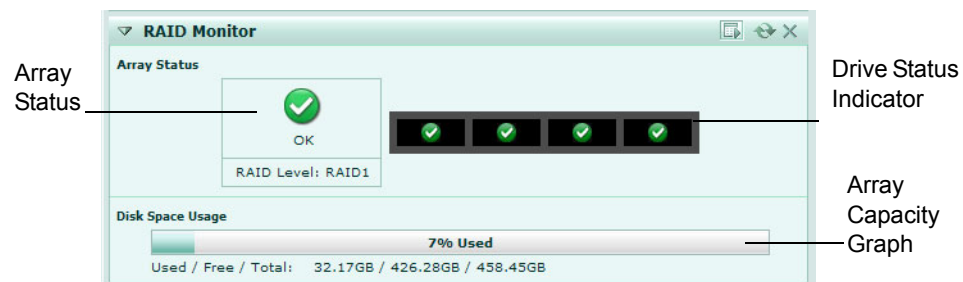
## RAID Monitor widget

The RAID Monitor widget, located in *System > Dashboard*, displays information about the status of RAID disks as well as what RAID level has been selected. The RAID Monitor also displays how much disk space is being used.

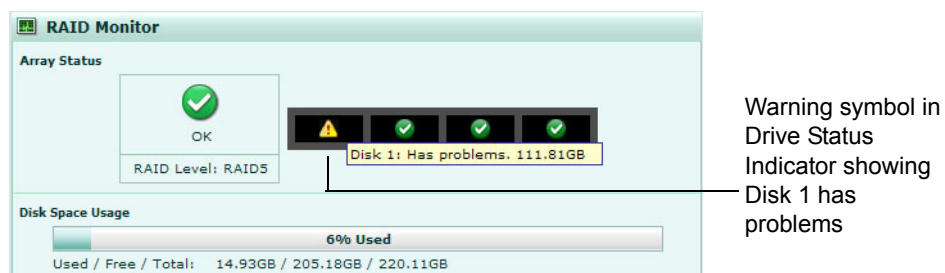
The RAID Monitor layout is similar to the look of the front panel. The Drive Status Indicator allows you to view each disk's name and the amount of space in GB each has. For example, Disk 2: Ready 465.76GB.

You can configure RAID settings from the RAID Monitor area as well by selecting *RAID Settings*. This option is available only when you move your mouse over the title bar.

**Figure 3: RAID Monitor displaying a RAID array without any failures**

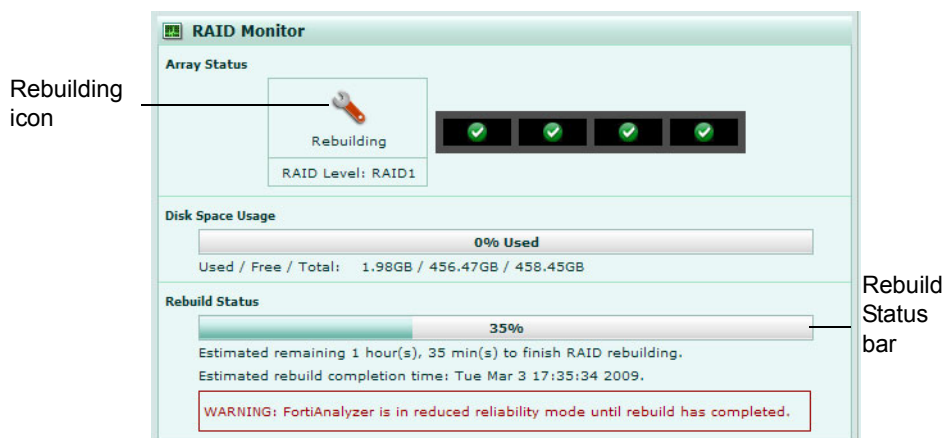


**Figure 4: RAID Monitor displaying a failed disk**



In Figure 2, the Drive Status Indicator is indicating that Disk 1 has problems. This is displayed by both a warning symbol and text. The text appears when you hover your mouse over the warning symbol; the text also indicates the amount of space in GB. When a disk has failed, a circle with an X appears in the Drive Status Indicator.

Figure 5: RAID Monitor displaying a disk that is being rebuilt on a FortiAnalyzer-800B

**Array Status**

The following icons and text display the RAID disk status:

- **green checkmark (OK)** – indicates that the RAID disk has no problems
- **warning symbol (Warning)** – indicates that there is a problem with the RAID disk, such as a failure, and needs replacing. The RAID disk is also in reduced reliability mode when this status is indicated in the widget.
- **wrench symbol (Rebuilding)** – indicates that a drive has been replaced and the RAID array is being rebuilt; it is also in reduced reliability mode
- **exclamation point (Failure)** – indicates that multiple drives have failed, the RAID array is corrupted, and the drive must be reinitialized

**Disk space usage**

The amount of disk space used, displayed as a percentage and a percentage bar.

**Used/Free/Total**

The amount of used, free, and total disk space. These numbers are displayed in GB.

**Rebuild Status progress bar**

A percentage bar indicating the progress of the rebuilding of a RAID array. This bar displays only when a RAID array is being rebuilt.

**Estimated rebuild time [start and end time] (For software RAID only)**

The time remaining to rebuild the RAID array, and the date and time the rebuild is expected to end. This time period displays only when an array is being rebuilt.

This time period will not display in hardware RAID, such as FortiAnalyzer-2000/2000A and FortiAnalyzer-4000/4000A.

**Rebuild Warning**

Text reminding you the system has no redundancy protection until the rebuilding process is complete. This text displays only when an array is being rebuilt.

# FortiAnalyzer-400B and FortiAnalyzer-1000B disk replacement

This chapter describes how to replace hard disks in a FortiAnalyzer-400B and 1000B and contains the following sections:

- [Identifying a failed hard disk](#)
- [Replacing a hard disk](#)



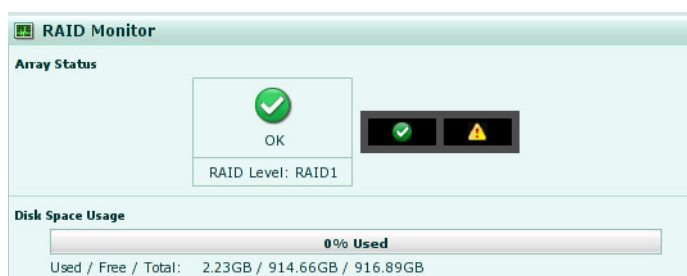
**Note:** On the FortiAnalyzer-400B and 1000B, only RAID 0 and RAID 1 are supported.

## Identifying a failed hard disk

When a hard disk fails, an alert message appears in the Alert Message Console widget, which is located in *System > Dashboard*. The Alert Message Console widget provides specific information about the failed disk, including when it failed. For more information about the Alert Message Console widget, see the [FortiAnalyzer Administration Guide](#).

The RAID Monitor widget provides a quick way to identify a failed disk, including its RAID level, but does not give specific information about when the disk failed. Use the Alert Message Console widget for identifying a failed hard disk. For more information about the RAID Monitor widget, see the [FortiAnalyzer Administration Guide](#).

**Figure 6: The status of a failed hard disk on a FortiAnalyzer-1000B unit as shown in the RAID Monitor widget**



To identify a failed disk, go to *System > Dashboard*, and on the Alert Message Console widget, select the *More Alerts* icon in the title bar area, and then locate the message that indicates the disk has failed.

## Replacing a hard disk



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

After identifying the failed hard disk, you can hot swap the failed disk for a new one. Hot swapping refers to removing a failed hard disk and replacing it with a new one while the FortiAnalyzer unit is still in operation.

You need a Phillips screwdriver when replacing a hard disk on either the FortiAnalyzer-400B or 1000B.

Using new, blank disks when hot swapping provides the best performance.

### To replace a hard disk on a FortiAnalyzer-400B

- 1 Identify the failed hard disk. See [“Identifying a failed hard disk” on page 17](#).
- 2 Remove the screws on both sides of the failed disk.
- 3 Pull out the hard disk.
- 4 Turn the tray over.
- 5 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 6 Hold both the tray and the hard disk, and turn the tray over.
- 7 Lift the failed disk from the tray and disconnect the data and power cables.
- 8 Connect the data cable and the power cable to the new disk.
- 9 Place the new disk in the tray.
- 10 Secure the new disk to the tray with the screws.
- 11 Insert a new hard disk into the empty disk bay and push the disk firmly into the slot until you hear a click.
- 12 Secure the new hard disk in the disk bay with the two screws on each side of the disk, ensuring the screws are in tight.
- 13 In the web-based manager, go to *System > Config > RAID*.
- 14 Select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.

The FortiAnalyzer unit rebuilds the RAID array with the new disk.

You can view the status of the RAID array’s rebuilding process from the RAID Monitor widget on the Dashboard page. When the RAID array rebuilding process is finished, the RAID Monitor widget displays a green check mark to indicate that the RAID array was successfully rebuilt. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.

**To replace a hard disk on a FortiAnalyzer-1000B**

- 1 Identify the failed hard disk. See [“Identifying a failed hard disk” on page 17](#).
- 2 Remove the faceplate of the FortiAnalyzer unit.
- 3 Pull out the hard disk.
- 4 Turn the tray over.
- 5 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 6 Hold both the tray and the hard disk, and turn the tray over.
- 7 Lift the failed disk from the tray and disconnect the data and power cables.
- 8 Connect the data cable and the power cable to the new disk.
- 9 Place the new disk in the tray.
- 10 Secure the new disk to the tray with the screws.
- 11 Insert a new hard disk into the empty disk bay and push the disk firmly into the slot until you hear a click.
- 12 Replace the faceplate of the FortiAnalyzer unit.
- 13 In the web-based manager, go to *System > Config > RAID*.
- 14 Select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.

The FortiAnalyzer unit rebuilds the RAID array with the new disk.

You can view the status of the RAID array's rebuilding process from the RAID Monitor widget on the Dashboard page. When the RAID array rebuilding process is finished, the RAID Monitor widget displays a green check mark to indicate that the RAID array was successfully rebuilt. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.



# FortiAnalyzer-800 disk replacement

This chapter describes how to swap hard drives in a FortiAnalyzer-800 and contains the following sections:

- [Identifying a failed hard disk](#)
- [Replacing a hard disk](#)
- [Replacing multiple hard disks](#)



**Note:** Only perform a hot swap with a RAID setting of either 1 or 5. Hot swapping on any other RAID settings will result in data loss.

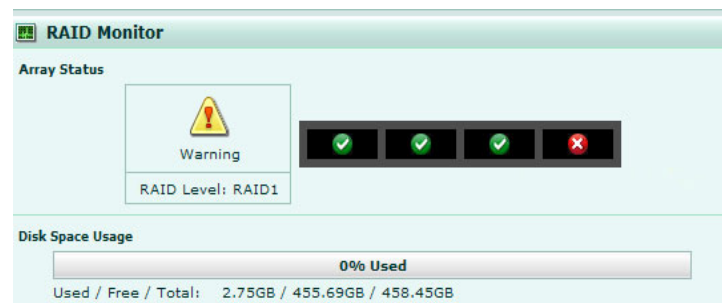
Fortinet recommends using RAID 10 for redundancy instead of RAID 5 on FortiAnalyzer units with software RAID. RAID 5 causes system performance issues.

## Identifying a failed hard disk

When a hard disk fails, an alert message appears in the Alert Message Console widget, which is located in *System > Dashboard*. The Alert Message Console widget provides specific information about the failed disk, including when it failed. For more information about the Alert Message Console widget, see the [FortiAnalyzer Administration Guide](#).

The RAID Monitor widget provides a quick way to identify a failed disk, including its RAID level, but does not give specific information about when the disk failed. Use the Alert Message Console widget for identifying a failed hard disk. For more information about the RAID Monitor widget, see the [FortiAnalyzer Administration Guide](#).

**Figure 7: The status of a failed hard disk as shown in the RAID Monitor widget**



To identify a failed disk, go to *System > Dashboard*, and on the Alert Message Console widget, select the *More Alerts* icon in the title bar area, and then locate the message that indicates the disk has failed.

To locate the failed disk on the FortiAnalyzer unit, use the following diagram:

**Table 4: FortiAnalyzer-800 hard disk configuration**

|         |         |         |         |
|---------|---------|---------|---------|
| Drive 1 | Drive 2 | Drive 3 | Drive 4 |
|---------|---------|---------|---------|

## Replacing a hard disk



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

After identifying the failed hard disk, you can hot swap the failed disk for a new one. Hot swapping refers to removing a failed hard disk and replacing it with a new one while the FortiAnalyzer unit is still in operation.

The following tools are required when replacing a hard disk on a FortiAnalyzer-800 unit:

- a key that accompanied the FortiAnalyzer unit to unlock the disk tray
- a Phillips screwdriver.

Using new, blank disks when hot swapping provides the best performance.

### To replace a hard disk

- 1 Identify the failed hard disk. See [“Identifying a failed hard disk” on page 21](#).
- 2 Press the tabs on both sides of the front panel and pull the faceplate away from the unit, towards you.  
The front panel will slide out about two inches and will rotate down, giving you access to the hard disks.
- 3 Unlock the tray for the failed hard disk, turning the key a quarter turn clockwise.
- 4 Pull out the tray.
- 5 Turn the tray over.
- 6 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 7 Hold both the tray and the hard disk, and turn the tray over.
- 8 Lift the failed disk from the tray and disconnect the data and power cables.
- 9 Connect the data cable and the power cable to the new disk.
- 10 Place the new disk in the tray.
- 11 Secure the new disk to the tray with the screws.
- 12 Put the tray into the FortiAnalyzer unit.
- 13 Lock the tray, turning the key a quarter turn counter-clockwise, and replace the front panel.
- 14 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed hard disk.

The FortiAnalyzer disk controller scans the available hard disks and updates its information with the new hard disk.

**15** In *System > Config > RAID*, select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.

The FortiAnalyzer rebuilds the RAID array with the new hard disk.

You can view the status of the RAID array's rebuilding process from the RAID Monitor widget on the Dashboard page. When the RAID array rebuilding process is finished, the RAID Monitor widget displays a green check mark to indicate that the RAID array was successfully rebuilt. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.

## Replacing multiple hard disks



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

When replacing multiple hard disks on your FortiAnalyzer unit, you must replace each one separately. If you do not follow the steps in the order that they appear in the next procedure, data will be lost.

You will need the following tools when replacing multiple disks:

- a key that accompanied the FortiAnalyzer unit to unlock the disk tray
- a Phillips screwdriver.

Using new, blank disks when hot swapping provides the best performance.

### To replace multiple hard disks

- 1** Identify each of the failed hard disks. See [“Identifying a failed hard disk” on page 21](#).
- 2** For the first failed hard disk, press the tabs on both sides of the front panel and pull the faceplate away from the unit, towards you.  
The front panel will slide out about two inches and will rotate down, giving you access to the hard disks.
- 3** Unlock the tray for the failed hard disk, turning the key a quarter turn clockwise.
- 4** Pull out the tray.
- 5** Turn the tray over.
- 6** Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 7** Hold both the tray and the hard disk, and turn the tray over.
- 8** Lift the failed disk from the tray and disconnect the data and power cables.
- 9** Connect the data cable and the power cable to the new disk.
- 10** Place the new disk in the tray.
- 11** Secure the new disk to the tray with the screws.

- 12** Insert the tray into the empty drive bay on the FortiAnalyzer unit.
- 13** Lock the tray, turning the key a quarter turn counter-clockwise, and replace the front panel.
- 14** In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed hard disk.  
The FortiAnalyzer disk controller scans the available hard disks and updates its information with the new hard disk.
- 15** In *System > Config > RAID*, select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.  
The FortiAnalyzer rebuilds the RAID array with the new hard disk.
- 16** Verify that the new disk is functioning properly by going to *System > Dashboard* and viewing its status from the RAID Monitor widget.  
If the disk is working properly, green check marks display in Drive Status Indicator on the RAID Monitor widget. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.
- 17** Before proceeding to the next failed disk, make sure that the new disk has been integrated into the array.
- 18** For the next failed disk, unlock the tray for the failed hard disk, turning the key a quarter turn clockwise.  
The front panel will slide out about two inches and will rotate down, giving you access to the hard disks.
- 19** Repeat steps 3 to 18, until all failed disks are replaced.

# FortiAnalyzer-800B disk replacement

This chapter describes how to swap hard drives in a FortiAnalyzer-800B and contains the following sections:

- [Identifying a failed hard disk](#)
- [Replacing a hard disk](#)
- [Replacing multiple hard disks](#)



**Note:** Only perform a hot swap with a RAID setting of either 1 or 5. Hot swapping on any other RAID settings will result in data loss.

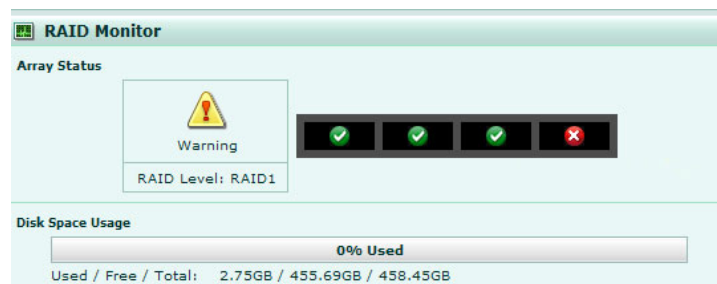
Fortinet recommends using RAID 10 for redundancy instead of RAID 5 on FortiAnalyzer units with software RAID. RAID 5 causes system performance issues.

## Identifying a failed hard disk

When a hard disk fails, an alert message appears in the Alert Message Console widget, which is located in *System > Dashboard*. The Alert Message Console widget provides specific information about the failed disk, including when it failed. For more information about the Alert Message Console widget, see the [FortiAnalyzer Administration Guide](#).

The RAID Monitor widget provides a quick way to identify a failed disk, including its RAID level, but does not give specific information about when the disk failed. Use the Alert Message Console widget for identifying a failed hard disk. For more information about the RAID Monitor widget, see the [FortiAnalyzer Administration Guide](#).

**Figure 8: The status of a failed hard disk as shown in the RAID Monitor widget**



To identify a failed disk, go to *System > Dashboard*, and on the Alert Message Console widget, select the *More Alerts* icon in the title bar area, and then locate the message that indicates the disk has failed.

To locate the failed disk on the FortiAnalyzer unit, use the following diagram:

**Table 5: FortiAnalyzer-800B hard disk configuration**

|         |         |         |         |
|---------|---------|---------|---------|
| Drive 1 | Drive 2 | Drive 3 | Drive 4 |
|---------|---------|---------|---------|

## Replacing a hard disk



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

After identifying the failed hard disk, you can hot swap the failed disk for a new one. Hot swapping refers to removing a failed hard disk and replacing it with a new one while the FortiAnalyzer unit is still in operation.

Using new, blank disks when hot swapping provides the best performance.

### To replace a hard disk

- 1 Identify the failed hard disk. See [“Identifying a failed hard disk” on page 25](#).
- 2 Push the tab on the handle of the failed disk to the right.
- 3 Pull the handle out. The handle will swing away from the unit.
- 4 Pull out the disk from the FortiAnalyzer unit.
- 5 Turn the tray over.
- 6 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 7 Hold both the tray and the hard disk, and turn the tray over.
- 8 Lift the failed disk from the tray.
- 9 Insert the new hard disk in the tray and replace the screws.
- 10 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed hard disk.

The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.

- 11 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 12 Close the drive handle so the tab on the handle clicks into its locked position.
- 13 In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.

The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.

You can view the status of the RAID array’s rebuilding process from the RAID Monitor widget on the Dashboard page. When the RAID array rebuilding process is finished, the RAID Monitor widget displays a green check mark to indicate that the RAID array was successfully rebuilt. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.

## Replacing multiple hard disks



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

When replacing multiple hard disks on your FortiAnalyzer unit, you must replace each one separately. If you do not follow the steps in the order that they appear in the next procedure, data will be lost.

Using new, blank disks when hot swapping provides the best performance.

### To replace multiple hard disks

- 1 Identify each of the failed hard disks. See [“Identifying a failed hard disk” on page 25](#).
- 2 For the first failed disk, push the tab on the handle of the failed disk to the right.
- 3 Pull the handle out.  
The handle will swing away from the unit.
- 4 Pull out the disk from the FortiAnalyzer unit.
- 5 Turn the tray over.
- 6 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 7 Hold both the tray and the hard disk, and turn the tray over.
- 8 Lift the failed disk from the tray.
- 9 Insert the new hard disk in the tray and replace the screws.
- 10 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed hard disk.  
The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.
- 11 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 12 Close the drive handle so the tab on the handle clicks into its locked position.
- 13 In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.  
The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.
- 14 Verify the new disk is functioning properly by going to *System > Dashboard* and viewing its status from the RAID Monitor widget.  
If the disk is working properly, green check marks display in the Drive Status Indicator on the RAID Monitor widget. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.
- 15 Before proceeding to the next failed disk, make sure that the new disk has been integrated into the array.

**16** For the next failed disk, push the tab on the handle of the failed disk to the right.

**17** Repeat steps 3 to 16, until all failed disks are replaced.

# FortiAnalyzer-2000 disk replacement

This chapter describes how to replace hard disks in a FortiAnalyzer-2000 and contains the following sections:

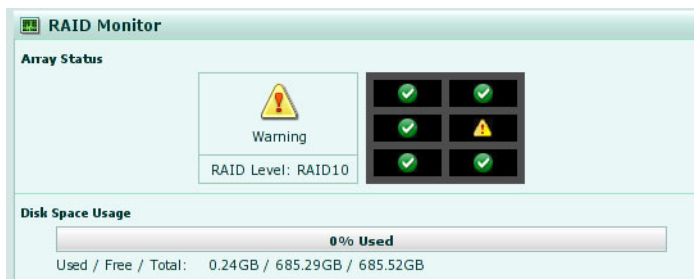
- [Identifying and locating a failed hard disk](#)
- [Replacing a hard disk](#)
- [Replacing RAID 5 + hot spare](#)
- [Replacing multiple hard disks](#)

## Identifying and locating a failed hard disk

When a hard disk fails, an alert message appears in the Alert Message Console widget, which is located in *System > Dashboard*. The Alert Message Console widget provides specific information about the failed disk, including when it failed. For more information about the Alert Message Console widget, see the [FortiAnalyzer Administration Guide](#).

The RAID Monitor widget provides a quick way to identify a failed disk, including its RAID level, but does not give specific information about when the disk failed. Use the Alert Message Console widget for identifying a failed hard disk. For more information about the RAID Monitor widget, see the [FortiAnalyzer Administration Guide](#).

**Figure 9: The status of a failed hard disk as shown in the RAID Monitor widget**



To identify a failed disk, go to *System > Dashboard*, and on the Alert Message Console widget, select the *More Alerts* icon in the title bar area, and then locate the message that indicates the disk has failed.

To locate the failed disk on the FortiAnalyzer unit, use the following diagram:

**Table 6: FortiAnalyzer-2000 hard disk configuration**

|              |              |
|--------------|--------------|
| Drive 1 (p1) | Drive 4 (p4) |
| Drive 2 (p2) | Drive 5 (p5) |
| Drive 3 (p3) | Drive 6 (p6) |

## Replacing a hard disk



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

After identifying the failed hard disk, you can hot swap the failed disk for a new one. Hot swapping refers to removing a failed hard disk and replacing it with a new one while the FortiAnalyzer unit is still in operation.

Using new, blank disks when hot swapping provides the best performance.

### To replace a hard disk

- 1 Identify the failed hard disk. See [“Identifying and locating a failed hard disk” on page 29](#).
- 2 Press the tab on the handle of the failed disk.  
The handle will swing away from the unit.
- 3 Pull out the disk from the FortiAnalyzer unit.
- 4 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed disk.  
The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.
- 5 Remove the screws on the side of the disk tray to remove the faulty hard disk.
- 6 Remove the faulty hard disk and replace with a new hard disk and secure with the screws.
- 7 Insert the new hard disk in to the empty drive bay on the FortiAnalyzer unit.
- 8 Close the drive handle so the tab on the handle clicks into its locked position.
- 9 In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.

The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.

You can view the status of the RAID array’s rebuilding process from the RAID Monitor widget on the Dashboard page. When the RAID array rebuilding process is finished, the RAID Monitor widget displays a green check mark to indicate that the RAID array was successfully rebuilt. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.

## Replacing RAID 5 + hot spare



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

The FortiAnalyzer-2000 unit can use one of its hard disks as a hot spare, which is a stand-by disk for RAID, in the event any of the hard disks should fail. When a hard disk fails, the FortiAnalyzer unit begins to automatically substitute the hot spare for the failed drive, integrating it into the RAID array, and rebuilding the RAID's data.

The following procedure explains how to replace a hard disk that has RAID 5 plus hot spare enabled on the FortiAnalyzer-2000 unit.

Using new, blank disks when hot swapping provides the best performance.

### To replace RAID 5 + hot spare

- 1 Verify that the hot spare has been integrated into the RAID array.
- 2 Identify the failed disk. See [“Identifying and locating a failed hard disk” on page 29](#).
- 3 Press the tab on the handle of the failed disk.  
The handle will swing away from the unit.
- 4 Pull out the disk from the FortiAnalyzer unit.
- 5 In the web-based manager, go to *System > Config > RAID*.
- 6 Select the *Trash can* icon in the row of the failed disk.  
The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.
- 7 Remove the screws on the side of the disk tray to remove the faulty hard disk.
- 8 Remove the faulty hard disk and replace with a new hard disk and secure with the screws.
- 9 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 10 Close the drive handle so the tab on the handle clicks into its locked position.
- 11 In *System > Config > RAID*, select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.

The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.

You can view the status of the RAID array's rebuilding process from the RAID Monitor widget on the Dashboard page. When the RAID array rebuilding process is finished, the RAID Monitor widget displays a green check mark to indicate that the RAID array was successfully rebuilt. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.

## Replacing multiple hard disks



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that it has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss.

When replacing multiple hard disks on your FortiAnalyzer unit, you must replace each one separately. If you do not follow the steps in the order that they appear in the next procedure, data will be lost.

Using new, blank disks when hot swapping provides the best performance.

### To replace multiple hard disks

- 1 Identify each of the failed disks. See [“Identifying and locating a failed hard disk” on page 29](#).
- 2 For the first failed disk, press the tab on the handle of the failed disk.  
The handle will swing away from the unit.
- 3 Pull out the disk from the FortiAnalyzer unit.
- 4 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon to start controller rescan in the RAID settings.  
The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.
- 5 Remove the screws on the side of the disk tray to remove the faulty hard disk.
- 6 Remove the faulty hard disk and replace with a new hard disk and secure with the screws.
- 7 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 8 Close the drive handle so the tab on the handle clicks into its locked position.
- 9 In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon to add the hard disk to the RAID array.  
The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.
- 10 Verify the new disk is functioning properly by going to *System > Dashboard* and viewing its status from the RAID Monitor widget.  
If the disk is working properly, green check marks display in the Drive Status Indicator on the RAID Monitor widget. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.
- 11 Before proceeding to the next failed disk, make sure that the new disk has been integrated into the array.
- 12 For the next failed disk, press the tab on the handle of the failed disk.  
The handle will swing away from the unit.
- 13 Repeat steps 3 to 12, until all failed disks are replaced.

# FortiAnalyzer-2000A disk replacement

This chapter describes how to replace hard disks in a FortiAnalyzer-2000A and contains the following sections:

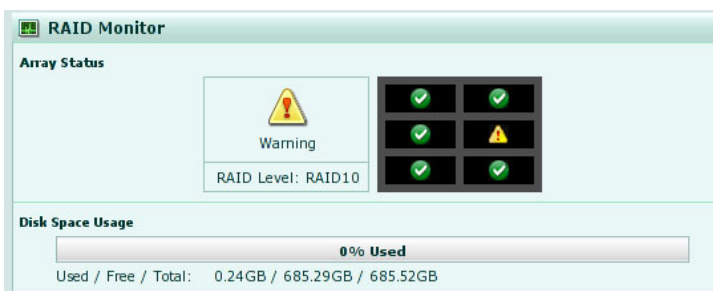
- [Identifying a failed hard disk](#)
- [Replacing a hard disk](#)
- [Replacing multiple hard disks](#)

## Identifying a failed hard disk

When a hard disk fails, an alert message appears in the Alert Message Console widget, which is located in *System > Dashboard*. The Alert Message Console widget provides specific information about the failed disk, including when it failed. For more information about the Alert Message Console widget, see the [FortiAnalyzer Administration Guide](#).

The RAID Monitor widget provides a quick way to identify a failed disk, including its RAID level but does not give specific information about when the disk failed. Use the Alert Message Console widget for identifying a failed hard disk. For more information about the RAID Monitor widget, see the [FortiAnalyzer Administration Guide](#).

**Figure 10: The status of a failed hard disk as shown in the RAID Monitor widget**



To identify a failed disk, go to *System > Dashboard*, and on the Alert Message Console widget, select the *More Alerts* icon in the title bar area, and then locate the message that indicates the disk has failed.

To locate the failed disk on the FortiAnalyzer unit, use the following diagram:

**Table 7: FortiAnalyzer-2000A hard disk configuration**

|              |              |
|--------------|--------------|
| Drive 1 (p1) | Drive 4 (p4) |
| Drive 2 (p2) | Drive 5 (p5) |
| Drive 3 (p3) | Drive 6 (p6) |

## Replacing a hard disk



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

After identifying the failed hard disk, you can hot swap the failed disk for a new one. Hot swapping refers to removing a failed hard disk and replacing it with a new one while the FortiAnalyzer unit is still in operation.

Using new, blank disks when hot swapping provides the best performance.

### To replace a hard disk

- 1 Identify the failed hard disk. See [“Identifying a failed hard disk” on page 33](#).
- 2 Press the tab on the handle of the failed disk.
- 3 Pull the handle out. The handle will swing away from the unit.
- 4 Pull out the disk from the FortiAnalyzer unit.
- 5 Turn the tray over.
- 6 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 7 Hold both the tray and the hard disk, and turn the tray over.
- 8 Lift the failed disk from the tray.
- 9 Insert the new hard disk in the tray and replace the screws.
- 10 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed disk.

The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.

- 11 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 12 Close the drive handle so the tab on the handle clicks into its locked position.
- 13 In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.

The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.

You can view the status of the RAID array’s rebuilding process from the RAID Monitor widget on the Dashboard page. When the RAID array rebuilding process is finished, the RAID Monitor widget displays a green check mark to indicate that the RAID array was successfully rebuilt. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.

## Replacing multiple hard disks



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

When replacing multiple hard disks on your FortiAnalyzer unit, you must replace each one separately. If you do not follow the steps in the order that they appear in the next procedure, data will be lost.

Using new, blank disks when hot swapping provides the best performance.

### To replace multiple hard disks

- 1 Identify each of the failed disks. See [“Identifying a failed hard disk” on page 33](#).
- 2 For the first failed disk, press the tab on the handle of the failed disk.  
The handle will swing away from the unit.
- 3 Pull out the disk from the FortiAnalyzer unit.
- 4 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed disk.  
The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.
- 5 Remove the screws on the side of the disk tray to remove the faulty hard disk.
- 6 Remove the faulty hard disk and replace with a new hard disk and secure with the screws.
- 7 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 8 Close the drive handle so the tab on the handle clicks into its locked position.
- 9 In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.  
The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.
- 10 Verify the new disk is functioning properly by going to *System > Dashboard* and viewing its status from the RAID Monitor widget.  
If the disk is working properly, green check marks display in Drive Status Indicator on the RAID Monitor widget. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.
- 11 Before proceeding to the next failed disk, make sure that the new disk has been integrated into the array.
- 12 For the next failed disk, press the tab on the handle of the failed disk.  
The handle will swing away from the unit.
- 13 Repeat steps 3 to 12, until all failed hard disks are replaced.



# FortiAnalyzer-4000 disk replacement

This chapter describes how to replace hard disks in a FortiAnalyzer-4000 and contains the following sections:

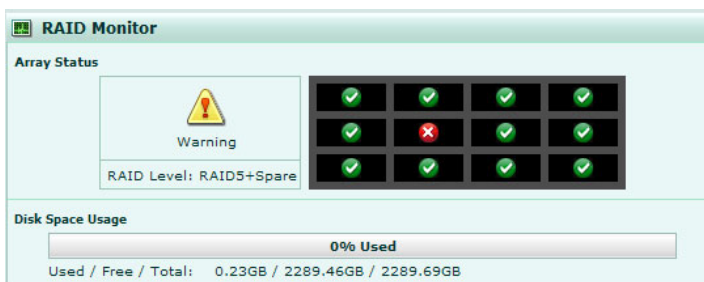
- [Identifying a failed hard disk](#)
- [Replacing a hard disk](#)
- [Replacing multiple hard disks](#)

## Identifying a failed hard disk

When a hard disk fails, an alert message appears in the Alert Message Console widget, which is located in *System > Dashboard*. The Alert Message Console widget provides specific information about the failed disk, including when it failed. For more information about the Alert Message Console widget, see the [FortiAnalyzer Administration Guide](#).

The RAID Monitor widget provides a quick way to identify a failed disk, including its RAID level, but does not give specific information about when the disk failed. Use the Alert Message Console widget for identifying a failed hard disk. For more information about the RAID Monitor widget, see the [FortiAnalyzer Administration Guide](#).

**Figure 11: The status of a failed hard disk as shown in the RAID Monitor widget**



To identify a failed disk, go to *System > Dashboard*, and on the Alert Message Console widget, select the *More Alerts* icon in the title bar area, and then locate the message that indicates the disk has failed.

To locate the failed disk on the FortiAnalyzer unit, use the following diagram:

**Table 8: FortiAnalyzer-4000 hard disk configuration**

|              |              |              |                |
|--------------|--------------|--------------|----------------|
| Drive 1 (p1) | Drive 4 (p4) | Drive 7 (p7) | Drive 10 (p10) |
| Drive 2 (p2) | Drive 5 (p5) | Drive 8 (p8) | Drive 11 (p11) |
| Drive 3 (p3) | Drive 6 (p6) | Drive 9 (p9) | Drive 12 (p12) |

## Replacing a hard disk



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

After identifying the failed hard disk, you can hot swap the failed disk for a new one. Hot swapping refers to removing a failed hard disk and replacing it with a new one while the FortiAnalyzer unit is still in operation.

Using new, blank disks when hot swapping provides the best performance.

### To replace a hard disk

- 1 Identify the failed hard disk. See [“Identifying a failed hard disk” on page 37](#).
- 2 Unlock the faceplate and remove the faceplate from the front of the device.
- 3 Turn the screw on the front of the hard disk clockwise on the failed drive to unlock the drive handle.
- 4 Slide the blue latch to the right.  
The drive handle will swing away from the drive.
- 5 Pull out the disk from the FortiAnalyzer unit.
- 6 Turn the disk tray over.
- 7 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 8 Hold both the tray and the hard disk, and turn the tray over.
- 9 Lift the failed disk from the tray.
- 10 Insert the new hard disk in the tray and replace the screws.
- 11 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed disk.

The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.

- 12 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 13 Push the drive handle into the disk until the handle snaps into position.  
The blue latch will snap into position as well.
- 14 In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.  
The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.

You can view the status of the RAID array's rebuilding process from the RAID Monitor widget on the Dashboard page. When the RAID array rebuilding process is finished, the RAID Monitor widget displays a green check mark to indicate that the RAID array was successfully rebuilt. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.

## Replacing multiple hard disks



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

When replacing multiple hard disks on your FortiAnalyzer unit, you must replace each one separately. If you do not follow the steps in the order that they appear in the next procedure, data will be lost.

Using new, blank disks when hot swapping provides the best performance.

### To replace multiple hard disks

- 1 Identify each failed hard disks. See ["Identifying a failed hard disk" on page 37](#).
- 2 For the first failed disk, unlock the faceplate and remove the faceplate from the front of the device.
- 3 Turn the screw on the front of the hard disk clockwise on the failed drive to unlock the drive handle.
- 4 Slide the blue latch to the right.  
The drive handle will swing away from the drive.
- 5 Pull out the disk from the FortiAnalyzer unit.
- 6 Turn the disk tray over.
- 7 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 8 Hold both the tray and the hard disk, and turn the tray over.
- 9 Lift the failed disk from the tray.
- 10 Insert the new hard disk in the tray and replace the screws.
- 11 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed disk.  
The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be "Missing".
- 12 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 13 Push the drive handle into the disk until the handle snaps into position.  
The blue latch will snap into position as well.

- 14** In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.  
The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.
- 15** Verify the new disk is functioning properly by going to *System > Dashboard* and viewing its status from the RAID Monitor widget.  
If the disk is working properly, green check marks display in the Drive Status Indicator on the RAID Monitor widget. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.
- 16** Before proceeding to the next failed disk, make sure that the new disk has been integrated into the array.
- 17** For the next failed disk, turn the screw on the front of the hard disk clockwise on the failed drive to unlock the drive handle.
- 18** Repeat steps 4 to 17, until all failed disks are replaced.

# FortiAnalyzer-4000A disk replacement

This chapter describes how to replace hard disks in a FortiAnalyzer-4000A and contains the following sections:

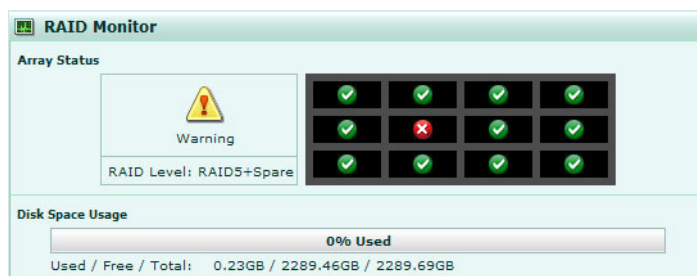
- [Identifying a failed hard disk](#)
- [Replacing a hard disk](#)
- [Replacing multiple hard disks](#)

## Identifying a failed hard disk

When a hard disk fails, an alert message appears in the Alert Message Console widget, which is located in *System > Dashboard*. The Alert Message Console widget provides specific information about the failed disk, including when it failed. For more information about the Alert Message Console widget, see the [FortiAnalyzer Administration Guide](#).

The RAID Monitor widget provides a quick way to identify a failed disk, including its RAID level, but does not give specific information about when the disk failed. Use the Alert Message Console widget for identifying a failed hard disk. For more information about the RAID Monitor widget, see the [FortiAnalyzer Administration Guide](#).

**Figure 12: The status of a failed hard disk as shown in the RAID Monitor widget**



To identify a failed disk, go to *System > Dashboard*, and on the Alert Message Console widget, select the *More Alerts* icon in the title bar area, and then locate the message that indicates the disk has failed.

To locate the failed hard disk on the FortiAnalyzer unit, use your RAID controller model for that FortiAnalyzer unit. The disk layout on a FortiAnalyzer-4000A depends on the RAID controller model so it is important that you identify the correct failed hard disk.

## Replacing a hard disk



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

After identifying the failed hard disk, you can hot swap the failed disk for a new one. Hot swapping refers to removing a failed hard disk and replacing it with a new one while the FortiAnalyzer unit is still in operation.

Using new, blank disks when hot swapping provides the best performance.

### To replace a hard disk

- 1 Identify the failed hard disk. See [“Identifying a failed hard disk” on page 41](#).
- 2 Unscrew the tabs on either side of the FortiAnalyzer faceplate.
- 3 Slide the blue catch to the right.  
The drive handle will swing away from the drive.
- 4 Pull out the disk from the FortiAnalyzer unit.
- 5 Turn the disk tray over.
- 6 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 7 Hold both the tray and the hard disk, and turn the tray over.
- 8 Lift the failed disk from the tray.
- 9 Insert the new hard disk in the tray and replace the screws.
- 10 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon in the row of the failed disk.

The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.

- 11 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 12 Push the drive handle into the disk until the handle snaps into position.  
The blue latch will snap into position as well.
- 13 In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon that appears in the row of the failed hard disk to add it to the RAID array.

The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.

You can view the status of the RAID array’s rebuilding process from the RAID Monitor widget on the Dashboard page. When the RAID array rebuilding process is finished, the RAID Monitor widget displays a green check mark to indicate that the RAID array was successfully rebuilt. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.

## Replacing multiple hard disks



**Caution:** Electrostatic discharge (ESD) can damage FortiAnalyzer equipment. Only perform the procedures described in this document from an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an anti-static wrist or ankle strap and attaching it to an ESD connector or to a metal part of a FortiAnalyzer chassis.

When replacing a hard disk, you need to first verify that the new disk has the same size as those supplied by Fortinet and has at least the same capacity as the old one in the FortiAnalyzer unit. Installing a smaller hard disk will affect the RAID setup and may cause data loss. Due to possible differences in sector layout between disks, the only way to guarantee that two disks have the same size is to use the same brand and model. The size provided by the hard drive manufacturer for a given disk model is only an approximation. The exact size is determined by the number of sectors present on the disk.

When replacing multiple hard disks on your FortiAnalyzer unit, you must replace each one separately. If you do not follow the steps in the order that they appear in the next procedure, data will be lost.

Using new, blank disks when hot swapping provides the best performance.

### To replace multiple hard disks

- 1 Identify each of the failed hard disks. See [“Identifying a failed hard disk” on page 41](#).
- 2 For the first failed disk, unscrew the tabs on either side of the FortiAnalyzer faceplate.
- 3 Slide the blue catch to the right.  
The drive handle will swing away from the drive.
- 4 Pull out the disk from the FortiAnalyzer unit.
- 5 Turn the disk tray over.
- 6 Remove the screws on the bottom of the tray using the Phillips screwdriver.
- 7 Hold both the tray and the hard disk, and turn the tray over.
- 8 Lift the failed disk from the tray.
- 9 Insert the new hard disk in the tray and replace the screws.
- 10 In the web-based manager, go to *System > Config > RAID* and select the *Trash can* icon to start the controller rescan in the RAID settings.  
The FortiAnalyzer disk controller scans the available hard disks and updates the RAID array for the remaining hard disks. The RAID array status will be “Missing”.
- 11 Insert the new hard disk into the empty drive bay on the FortiAnalyzer unit.
- 12 Push the drive handle into the disk until the handle snaps into position.  
The blue latch will snap into position as well.
- 13 In the web-based manager, go to *System > Config > RAID* and select the *Edit* icon to add the hard disk to the RAID array.  
The FortiAnalyzer unit rebuilds the RAID array with the new hard disk.
- 14 Verify that the new disk is functioning properly by going to *System > Dashboard* and viewing its status from the RAID Monitor widget.  
If the disk is working properly, green check marks display in the Drive Status Indicator on the RAID Monitor widget. You may need to refresh the Dashboard page to verify that the rebuilding process is finished.

- 15** Before proceeding to the next failed disk, make sure that the new disk has been integrated into the array.

- 16** For the next failed disk, slide the blue catch to the right.  
The drive handle will swing away from the drive.
- 17** Repeat steps 4 to 16, until all failed hard disks are replaced.



# Index

## A

alert message console widget, 11

## C

certification, 7  
customer service, 7

## D

documentation, 7  
Fortinet, 7

## F

FAQ, 8  
FortiGuard  
  Antivirus, 7  
  services, 7  
Fortinet  
  Knowledge Center, 8  
  Technical Documentation, 7  
  Technical Documentation, web site, 7  
  Technical Support, 7  
  Training Services, 7  
Fortinet documentation, 7  
Fortinet Knowledge Center, 8

## G

glossary, 8

## H

how-to, 8

## I

identifying failed disks, 15  
introduction  
  Fortinet documentation, 7  
IP address  
  private network, 6

## K

Knowledge Center, 8

## P

product registration, 7

## R

RAID, 9  
RAID levels  
  linear, 10  
  RAID 0, 10  
  RAID 10, 11  
  RAID 5, 10  
  RAID 5 with hot spare, 11  
  RAID 50, 11  
  RAID1, 10  
RAID monitor widget, 12  
replacing a disk  
  on a FortiAnalyzer-100B, 16  
  on a FortiAnalyzer-2000, 28  
  on a FortiAnalyzer-2000A, 32  
  on a FortiAnalyzer-4000, 36  
  on a FortiAnalyzer-4000A, 40  
  on a FortiAnalyzer-400B, 16  
  on a FortiAnalyzer-800, 20  
  on a FortiAnalyzer-800B, 24  
replacing disks  
  on a FortiAnalyzer-2000, 30  
  on a FortiAnalyzer-2000A, 33  
  on a FortiAnalyzer-4000, 37  
  on a FortiAnalyzer-4000A, 41  
  on a FortiAnalyzer-800, 21  
  on a FortiAnalyzer-800B, 25  
  RAID 5 with hot spare, 29  
RFC  
  1918, 6

## T

technical  
  documentation, 7  
  notes, 8  
  support, 7  
Training Services, 7

## W

widgets  
  alert message console, 11  
  RAID monitor, 12



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