



Upgrade and Maintenance Guide

SteelHead™ GX10000

SteelHead CX xx70, xx55

SteelHead EX xx60

SteelHead Interceptor

SteelCentral™ NetProfiler (2270, 4270-xx)

SteelCentral NetShark (2170, 4170, 6170)

SteelCentral NetExpress (470)

SteelCentral AppResponse (2170, 4170, 6170, 8170)

SteelFusion™ Core

February 2019

© 2019 Riverbed Technology, Inc. All rights reserved.

Riverbed and any Riverbed product or service name or logo used herein are trademarks of Riverbed. All other trademarks used herein belong to their respective owners. The trademarks and logos displayed herein cannot be used without the prior written consent of Riverbed or their respective owners.

Akamai® and the Akamai wave logo are registered trademarks of Akamai Technologies, Inc. SureRoute is a service mark of Akamai. Apple and Mac are registered trademarks of Apple, Incorporated in the United States and in other countries. Cisco is a registered trademark of Cisco Systems, Inc. and its affiliates in the United States and in other countries. EMC, Symmetrix, and SRDF are registered trademarks of EMC Corporation and its affiliates in the United States and in other countries. IBM, iSeries, and AS/400 are registered trademarks of IBM Corporation and its affiliates in the United States and in other countries. Juniper Networks and Junos are registered trademarks of Juniper Networks, Incorporated in the United States and other countries. Linux is a trademark of Linus Torvalds in the United States and in other countries. Microsoft, Windows, Vista, Outlook, and Internet Explorer are trademarks or registered trademarks of Microsoft Corporation in the United States and in other countries. Oracle and JInitiator are trademarks or registered trademarks of Oracle Corporation in the United States and in other countries. UNIX is a registered trademark in the United States and in other countries, exclusively licensed through X/Open Company, Ltd. VMware, ESX, ESXi are trademarks or registered trademarks of VMware, Inc. in the United States and in other countries.

This product includes Windows Azure Linux Agent developed by the Microsoft Corporation (<http://www.microsoft.com/>). Copyright 2016 Microsoft Corporation.

This product includes software developed by the University of California, Berkeley (and its contributors), EMC, and Comtech AHA Corporation. This product is derived from the RSA Data Security, Inc. MD5 Message-Digest Algorithm.

The SteelHead Mobile Controller (virtual edition) includes VMware Tools. Portions Copyright © 1998-2016 VMware, Inc. All Rights Reserved.

NetApp Manageability Software Development Kit (NM SDK), including any third-party software available for review with such SDK which can be found at <http://communities.netapp.com/docs/DOC-1152>, and are included in a NOTICES file included within the downloaded files.

For a list of open source software (including libraries) used in the development of this software along with associated copyright and license agreements, see the Riverbed Support site at <https://support.riverbed.com>.

This documentation is furnished "AS IS" and is subject to change without notice and should not be construed as a commitment by Riverbed. This documentation may not be copied, modified or distributed without the express authorization of Riverbed and may be used only in connection with Riverbed products and services. Use, duplication, reproduction, release, modification, disclosure or transfer of this documentation is restricted in accordance with the Federal Acquisition Regulations as applied to civilian agencies and the Defense Federal Acquisition Regulation Supplement as applied to military agencies. This documentation qualifies as "commercial computer software documentation" and any use by the government shall be governed solely by these terms. All other use is prohibited. Riverbed assumes no responsibility or liability for any errors or inaccuracies that may appear in this documentation.



Riverbed Technology
680 Folsom Street
San Francisco, CA 94107
www.riverbed.com

Part Number
712-00016-24

Contents

Welcome	7
About this guide	7
Audience	7
Document conventions.....	8
Electrostatic discharge guidelines	8
Safety guidelines.....	8
Documentation and release notes	9
Contacting Riverbed	9
 1 - Replacing SteelHead GX, xx70, Interceptor 9600, SteelFusion Core 3500 Components	11
Appliances included in this chapter.....	11
Required tools	12
Removing and installing the bezel	12
Removing and installing the chassis cover	13
Removing the chassis cover on 1U and 2U appliances.....	13
Installing the chassis cover on 1U and 2U appliances.....	15
Removing and installing the air duct.....	16
Removing and installing the air duct for 1U appliances	17
Removing and installing the air duct for 2U appliances	18
Replacing disk drives	20
Replacing disk drives in 1U appliances with 3.5-inch drives	20
Replacing disk drives in 2U appliances with 2.5-inch drives	24
Replacing disk drives in 2U appliances with 3.5-inch drives	26
Replacing power supply units.....	30
Replacing an AC power supply with a DC power supply	31
Replacing memory modules	31
Replacing memory modules in 1U appliances.....	32
Replacing memory modules in 2U appliances.....	34
Replacing fans.....	35
Determining fan status.....	35
Replacing fans in 1U appliances.....	36
Replacing fans in 2U appliances.....	39

2 - Replacing CX xx55, EX xx60, and SteelFusion Core Components.....	41
Appliances included in this chapter.....	41
Required tools	41
Opening the bezel.....	42
Removing the chassis cover	43
Removing the chassis cover on the desktop appliances	43
Removing the chassis cover on 1U appliances.....	43
Removing the chassis cover on 2U appliances.....	44
Replacing disk drives	45
Removing disk drives in desktop appliances	45
Replacing disk drives in 1U appliances.....	48
Replacing disk drives in 2U appliances.....	49
Replacing disk drives in 2U appliances.....	51
Replacing power supply units.....	52
Replacing power supply units in 1U and 2U appliances	53
Replacing memory modules	53
Replacing memory modules in desktop appliances	54
Replacing memory modules in 1U appliances.....	55
Replacing memory modules in 2U appliances.....	58
Replacing fans	62
Determining fan status.....	62
Replacing fans in 1U appliances.....	63
Replacing fans in 2U appliances.....	65
3 - Replacing SteelHead xx50 Components	67
Required tools	67
Replacing disk drives	67
Replacing disk drives in SteelHead 150, 250, and 550 appliances	68
Replacing disk drives in the Interceptor 9350	69
Replacing power supply units.....	72
Replacing power supply units in Interceptor 9350 appliances	72
Replacing memory.....	73
DIMM slot locations	73
Replacing memory modules in SteelHead 150, 250, and 550 appliances	74
Replacing memory modules in 1U xx50 appliances	76
Replacing memory modules in 3U xx50 appliances	77
Replacing fans	80
Determining fan status.....	80
Replacing fans in the Interceptor 9350 appliances	81
4 - Upgrading SteelHead CX, EX, and SteelFusion Core Appliances	89
Overview.....	89
Model upgrades and platform requirements	89

Hardware upgrade kits	94
Basic steps	94
Installing licenses and activating specifications	96
Model upgrades using the CLI	96
Model upgrades using the Management Console	97
Installing hardware for model upgrades	99
Installing required memory and disk drives for CX755H upgrades	100
Replacing hard disk drives for CX1555H upgrades.....	102
Installing required memory and disk drives for EX1160VH upgrades	103
Adding Disk Drives for EX1260VH Upgrades	105
Upgrading memory for EX1260 appliances	105
Upgrading to 32 GB.....	106
Upgrading to 64 GB.....	106
5 - Upgrading SteelHead xx50 Appliances	107
Overview.....	107
Platform requirements.....	107
Upgrade kit hardware contents	108
Hardware requirements	108
Upgrading a model - basic steps	109
Installing licenses and activating specifications	109
Model upgrades using the CLI	110
Model upgrades using the Management Console	111
A - Monitoring and Managing Desktop CX Appliances with BMC	115
Setting up the BMC for initial access.....	116
Logging in to the BMC.....	116
Using the BMC dashboard	117
Viewing field-replaceable unit information.....	118
Monitoring server health	118
Viewing sensor readings.....	118
Viewing event logs.....	119
Configuring the BMC.....	120
Configuring the network.....	120
Configuring platform event filtering.....	121
Configuring users	122
Configuring SSL.....	123
Controlling the power	125
Updating the firmware.....	125
Changing the BMC administrator password.....	127

B - Monitoring and Managing GX, xx70, Interceptor 9600, and Core 3500 with BMC.....	129
Setting up the BMC for initial access	130
Setting up BMC on SteelHead and SteelFusion Core 3500.....	130
Setting up BMC on NetProfiler.....	130
Setting Up BMC on NetShark.....	130
Logging in to the BMC	131
Viewing System Information	133
Viewing Server Health	133
Configuring the BMC.....	134
Remotely controlling the appliance	135
Changing the BMC administrator password.....	135

Welcome

About this guide

Welcome to the *Upgrade and Maintenance Guide*. This guide describes how to replace and upgrade Riverbed appliance components.

- Procedures and references to the 250 and 550 appliances apply to the SteelHead (in the cloud) models CSH-250 and CSH-550.
- For detailed information about replacing components in the SteelHead EX560 or EX760 appliances, see the *Series EX560 and EX760 Systems Owner's Manual*.
- For information about SteelFusion Edge appliances, see the *SteelFusion Edge Hardware and Maintenance Guide*.
- The CX255, CX570, CX770, SMC9000, and SCC1000 appliances don't contain field replaceable components. This guide only describes how to remove hard drives for these desktop models.

Audience

This guide is written for storage and network administrators managing networks with Riverbed products.

Document conventions

This manual uses the following standard set of typographical conventions to introduce new terms, illustrate screen displays, describe command syntax, and so forth.

Convention	Meaning
<i>italics</i>	Within text, new terms and emphasized words appear in <i>italic</i> typeface.
boldface	Within text, CLI commands, CLI parameters, and REST API properties appear in bold typeface.
Courier	Code examples appear in Courier font: <pre>amnesiac > enable amnesiac # configure terminal</pre>
< >	Values that you specify appear in angle brackets: interface <ip-address>
[]	Optional keywords or variables appear in brackets: ntp peer <ip-address> [version <number>]
{ }	Elements that are part of a required choice appear in braces: {<interface-name> ascii <string> hex <string>}
	The pipe symbol separates alternative, mutually exclusive elements of a choice. The pipe symbol is used in conjunction with braces or brackets; the braces or brackets group the choices and identify them as required or optional: { delete <filename> upload <filename>}

Electrostatic discharge guidelines

Follow these ESD guidelines to ensure that your equipment isn't damaged from improper handling:

- When you install or perform maintenance tasks, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.
- Periodically check the resistance value of the antistatic strap to ensure it is functioning properly.
- If you remove or replace system components, you must transport the component in a conductive container or an ESD bag that has been grounded or neutralized.
- Store any system components in their protective packaging until you are ready to install them.
- Don't touch the electronic components on system hardware.

Safety guidelines

Follow the safety precautions outlined in the *Safety and Compliance Guide* when installing and setting up your equipment.

Caution: Failure to follow these safety guidelines can result in injury or damage to the equipment. Mishandling of the equipment voids all warranties. Read and follow safety guidelines and installation instructions carefully.

Many countries require the safety information to be presented in their national languages. If this requirement applies to your country, consult the *Safety and Compliance Guide*. Before you install, operate, or service the Riverbed products, you must be familiar with the safety information. Refer to the *Safety and Compliance Guide* if you don't clearly understand the safety information provided in the product documentation.

Documentation and release notes

To obtain the most current version of all Riverbed documentation, go to the Riverbed Support site at <https://support.riverbed.com>.

If you need more information, see the Riverbed Knowledge Base for any known issues, how-to documents, system requirements, and common error messages. You can browse titles or search for keywords and strings. To access the Riverbed Knowledge Base, log in to the Riverbed Support site at <https://support.riverbed.com>.

Each software release includes release notes. The release notes identify new features in the software as well as known and fixed problems. To obtain the most current version of the release notes, go to the Software and Documentation section of the Riverbed Support site at <https://support.riverbed.com>.

Examine the release notes before you begin the installation and configuration process.

Contacting Riverbed

- **Technical support** - Problems installing, using, or replacing Riverbed products? Contact Riverbed Support or your channel partner who provides support. To contact Riverbed Support, open a trouble ticket by calling 1-888-RVBD-TAC (1-888-782-3822) in the United States and Canada or +1 415-247-7381 outside the United States. You can also go to <https://support.riverbed.com>.
- **Professional services** - Need help with planning a migration or implementing a custom design solution? Contact Riverbed Professional Services. Email proserve@riverbed.com or go to <http://www.riverbed.com/services/index.html>.
- **Documentation** - Have questions about Riverbed's documentation? Send your comments to techpubs@riverbed.com.

Replacing SteelHead GX, xx70, Interceptor 9600, SteelFusion Core 3500 Components

This chapter describes how to replace components in SteelHead GX10000, CX xx70, SteelCentral xx70, SteelHead Interceptor 9600, and SteelFusion Core 3500 appliances. It includes these sections:

- [“Appliances included in this chapter” on page 11](#)
- [“Required tools” on page 12](#)
- [“Removing and installing the bezel” on page 12](#)
- [“Removing and installing the chassis cover” on page 13](#)
- [“Removing and installing the air duct” on page 16](#)
- [“Replacing disk drives” on page 20](#)
- [“Replacing power supply units” on page 30](#)
- [“Replacing memory modules” on page 31](#)
- [“Replacing fans” on page 35](#)

Appliances included in this chapter

This chapter describes how to replace components in the following appliances:

- 1U xx70 appliances, including SteelHead CX3070, SteelCentral NetExpress 470, SteelCentral NetProfiler 4270-DB/UI/DP, SteelCentral Flow Gateway 2270, SteelCentral NetShark 2170, and SteelCentral AppResponse 2170.
- 2U GX10000 appliances.
- 2U xx70 appliances, including SteelHead CX5070, SteelHead CX7070, SteelCentral NetProfiler 2270, SteelCentral NetProfiler 4270-EX, SteelCentral NetProfiler 4270-AN, SteelCentral NetShark 4170, SteelCentral NetShark 6170, and SteelCentral AppResponse 4170, SteelCentral AppResponse 6170, and SteelCentral AppResponse 8170.
- 2U SteelHead Interceptor 9600 appliances.
- 2U SteelFusion Core 3500 appliances.

For information about SteelFusion Core 2000 and 3000 appliances, see [Chapter 2, “Replacing CX xx55, EX xx60, and SteelFusion Core Components.”](#)

Required tools

You need the following tools and equipment to replace appliance components:

- You must use approved components for the appliance to function properly. Installation of unapproved components will result in boot failure. To order components, contact Riverbed Support at <https://support.riverbed.com>.
- An antistatic strap. When you replace appliance components, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.
- Use the magnetic Phillips screwdriver enclosed with your shipment to remove screws in the appliance. The magnetic screwdriver ensures screws aren't lost in the appliance.

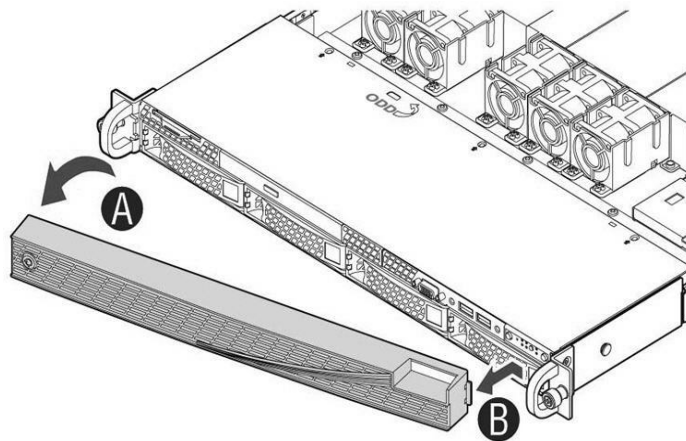
Removing and installing the bezel

This procedure describes how to remove and install the front bezel on 1U and 2U GX and xx70 appliances.

To remove the bezel

1. If locked, unlock the bezel.
2. Remove the left end of the front bezel from the rack handle. See **Figure 1-1**, letter A.
3. Pull the left side of the front bezel toward you to release the latches on the right end from the rack handle. See **Figure 1-1**, letter B.

Figure 1-1. Removing the bezel on 1U and 2U GX and xx70 appliances



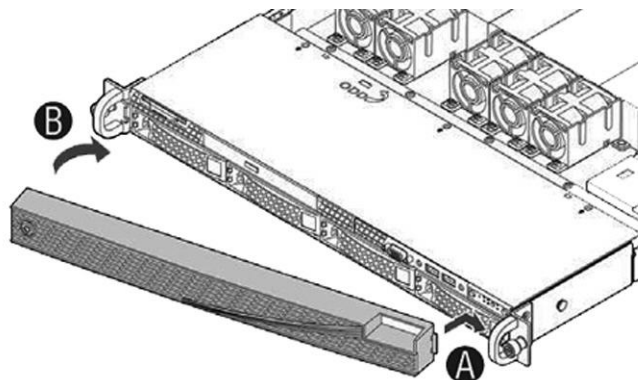
Note: The bezel that ships with your appliance might look different from the bezel in the figure.

To install the bezel

1. Insert the tab on the right end of the front bezel to the rack handle. See **Figure 1-2**, letter A.
Before installing the bezel, you must install the rack handles.

2. Push the left end of the bezel toward the appliance until it clicks into place. See [Figure 1-1](#), letter B.
3. Lock the bezel, if needed.

Figure 1-2. Installing the bezel on 1U and 2U GX and xx70 appliances (xx70 shown)



Removing and installing the chassis cover

You need to remove the top cover to add or replace components inside the appliance. This section describes how to work with the chassis cover on GX and xx70 appliances.

The appliance must be operated with the appliance cover in place to ensure proper cooling.

Removing the chassis cover on 1U and 2U appliances

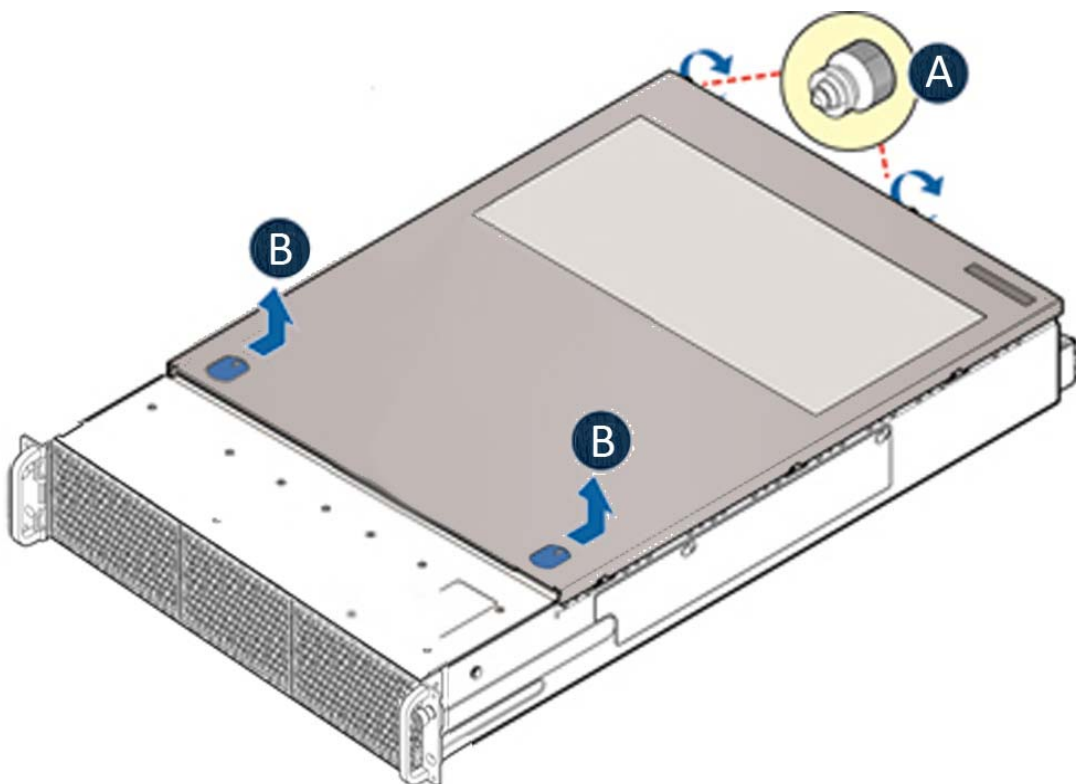
This section describes how to remove the chassis covers for the 1U and 2U GX and xx70 appliances.

To remove the chassis cover on 1U and 2U appliances

1. Power down the appliance and unplug all peripheral devices and the power cable.
2. Perform one of the following actions:
 - For GX10000 appliances, remove the two thumb screws on the rear of the appliance (see [Figure 1-3](#) letter A).

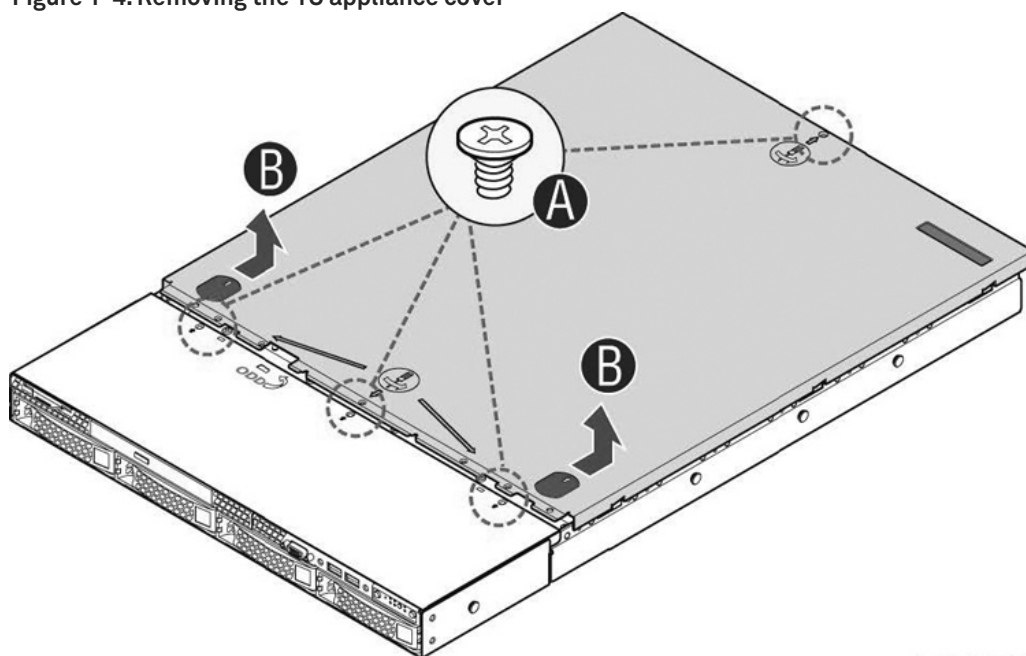
- Press the blue tabs and push straight back to remove the cover (see [Figure 1-3](#) letter B).

Figure 1-3. GX10000 removing the appliance cover



- For all other 2U appliances, remove the four screws (letter A). If your appliance doesn't have screws on the cover, go to the next step.

Figure 1-4. Removing the 1U appliance cover



- Place your thumbs on the recessed tabs (letter B) and slide the cover straight back.

Installing the chassis cover on 1U and 2U appliances

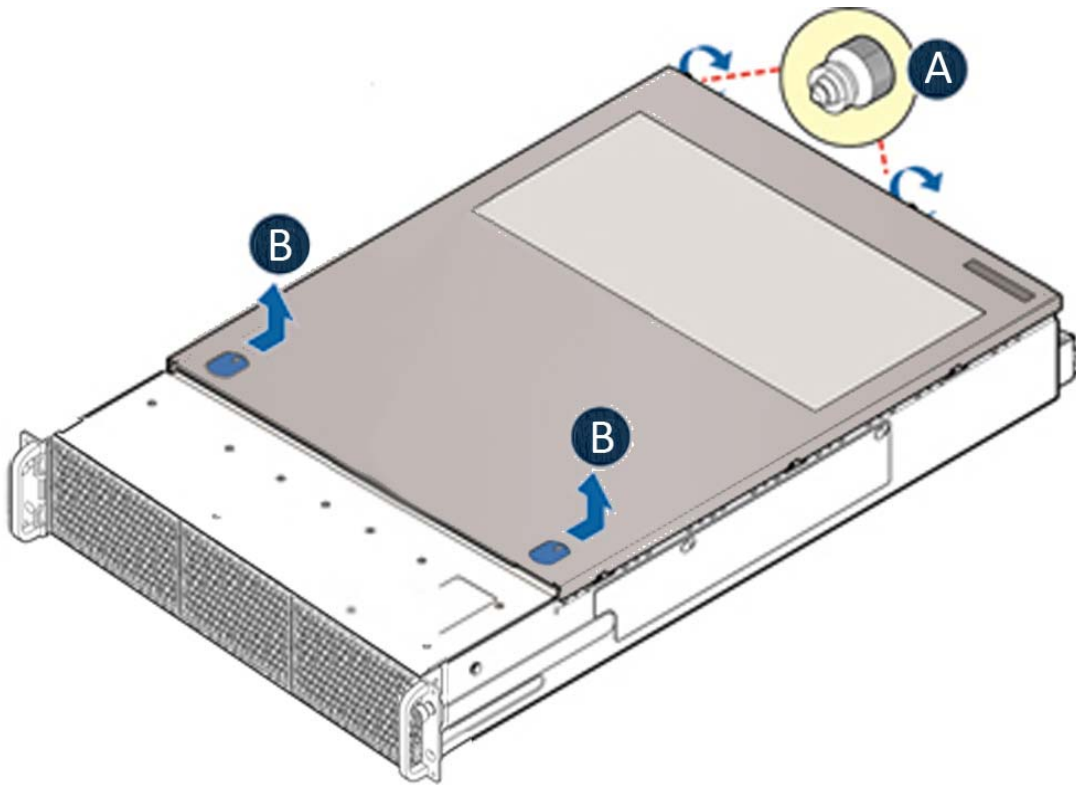
This section describes how to install the chassis covers for the 1U and 2U GX and xx70 appliances.

To install the chassis cover on 1U and 2U appliances

1. Perform one of the following actions:

- For GX10000 appliances, place the top cover on the appliance and slide it toward the front of the chassis until the recessed front edge fits smoothly under the chassis edge and the locking pins (see [Figure 1-5](#) letter B) are fully engaged.
- Install the two thumb screws on the rear of the appliance (see [Figure 1-5](#) letter A).

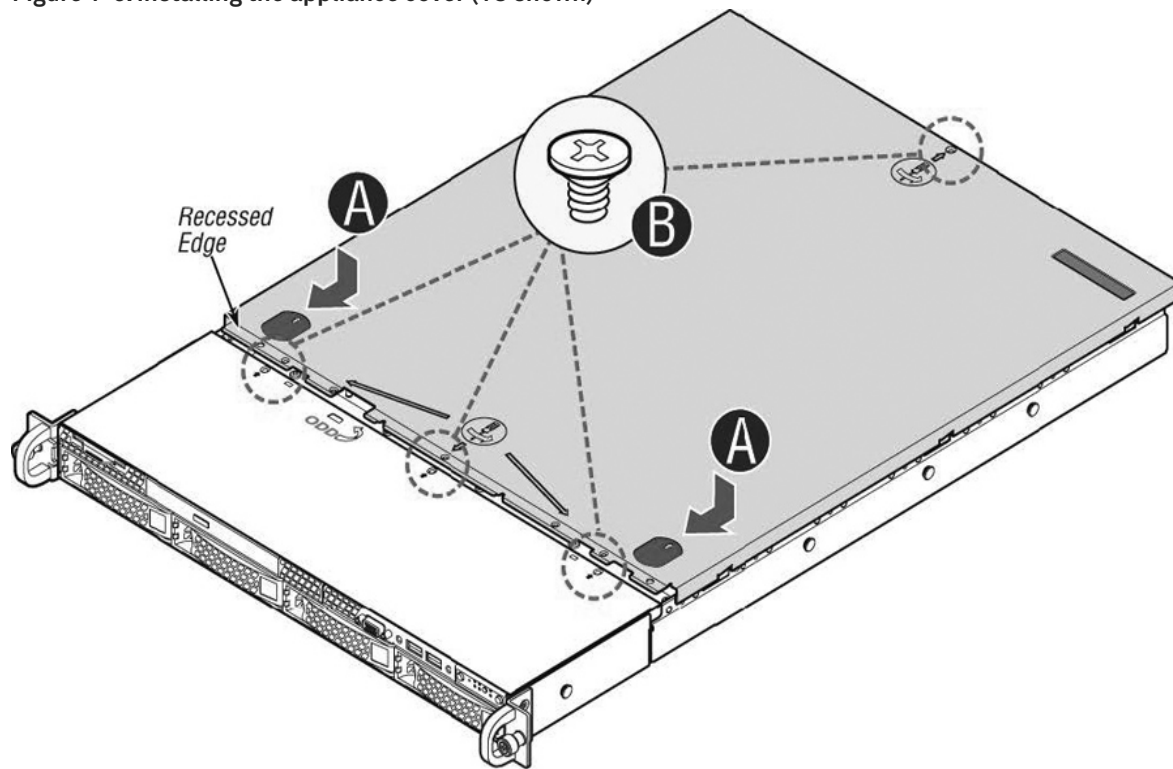
Figure 1-5. GX10000 installing the appliance cover



- For all other 2U appliances, place the top cover on the appliance and slide it toward the front of the chassis until the recessed front edge fits smoothly under the chassis edge and the locking pins (see [Figure 1-6](#), letter A) are fully engaged. If your appliance doesn't require screws, the installation is complete.

- Install the four screws (see [Figure 1-6](#), letter B). If your appliance doesn't have screws on the cover, go to the next step.

Figure 1-6. Installing the appliance cover (1U shown)



Removing and installing the air duct

The appliances in this chapter require an air duct for proper airflow. Always operate your appliance with the air duct in place.

You need to remove the air duct to access many internal components.

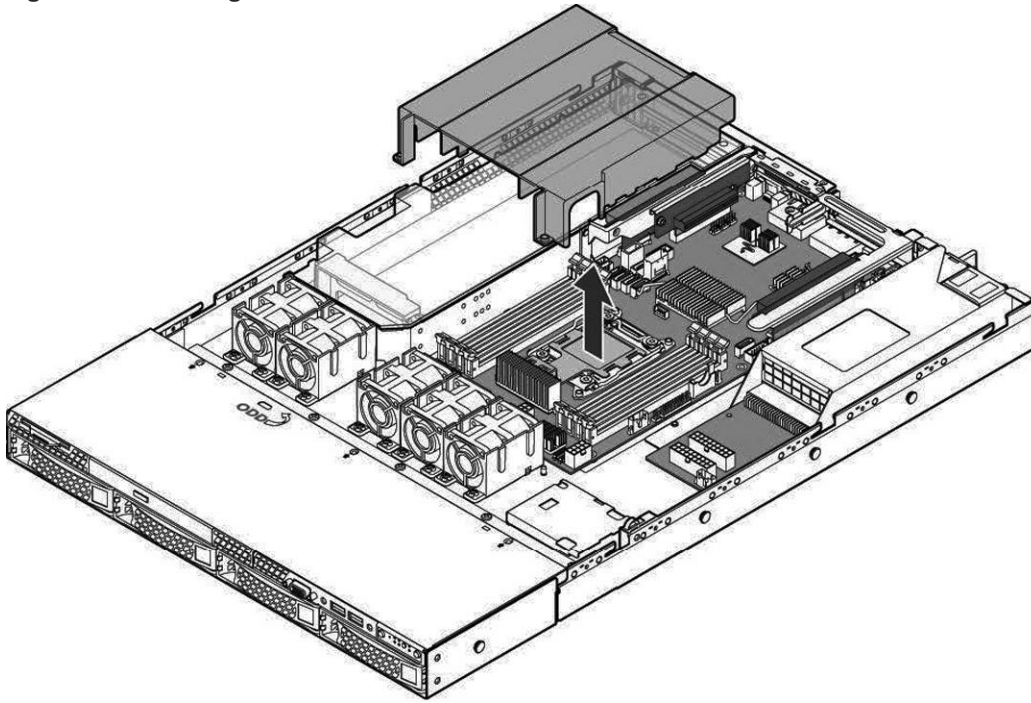
Removing and installing the air duct for 1U appliances

Follow these instructions to remove and install the air duct for the 1U appliances.

To remove the air duct in 1U appliances

- Lift the air duct straight up.

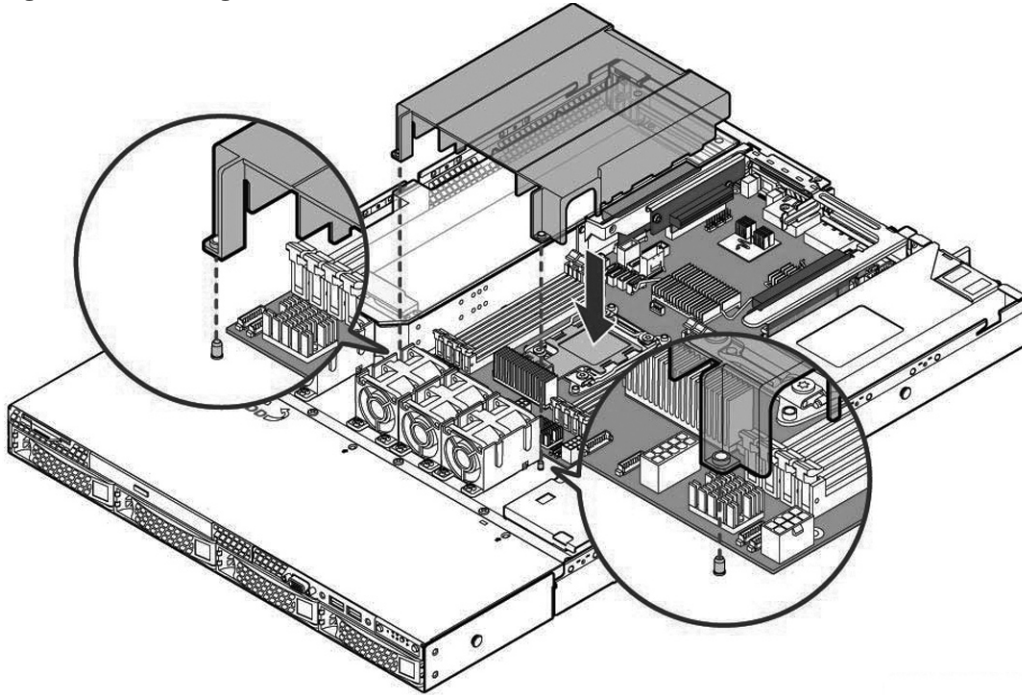
Figure 1-7. Removing the air duct



To install the air duct in 1U appliances

- Ensure the HDD cable is inside the air duct, align the two holes on the air duct with the alignment pins on the chassis, and lower the air duct into place.

Figure 1-8. Installing the air duct



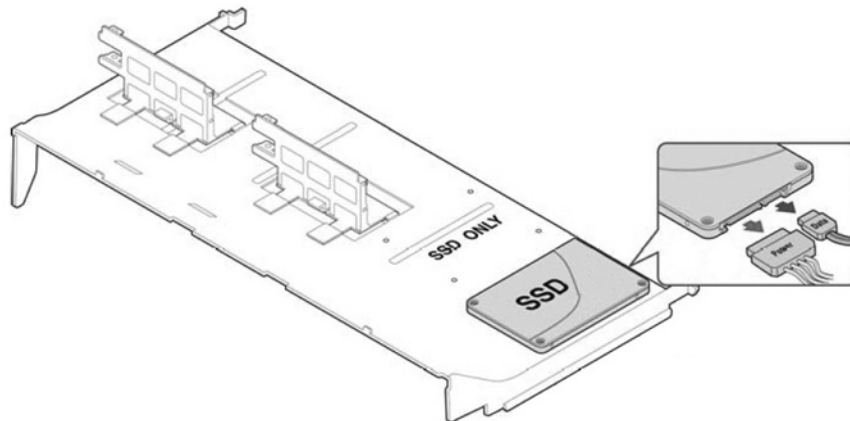
Removing and installing the air duct for 2U appliances

Follow these instructions to remove and install the air duct for the 2U appliances.

To remove the air duct in 2U appliances

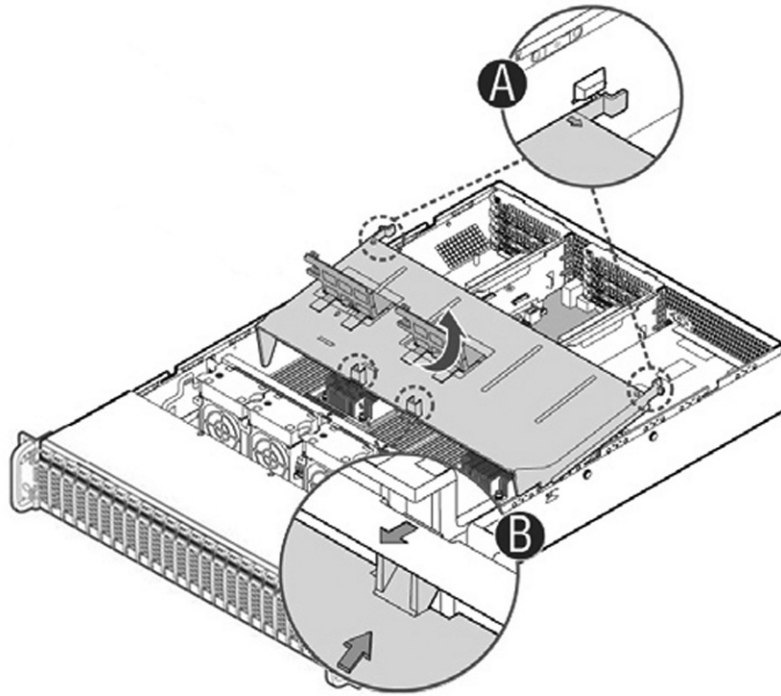
1. For SteelHead GX, CX, SteelHead Interceptor 9600, and SteelFusion Core 3500, unplug the cables on the SSD boot drive.

Figure 1-9. Unplugging the SSD drive cable



2. Carefully push in the two latches on the air duct (letter A) in [Figure 1-10](#).
3. Rotate the front edge of the air duct up to disengage the two tabs from the fan bulkhead (see [Figure 1-10](#), letter B).

Figure 1-10. Removing the air duct

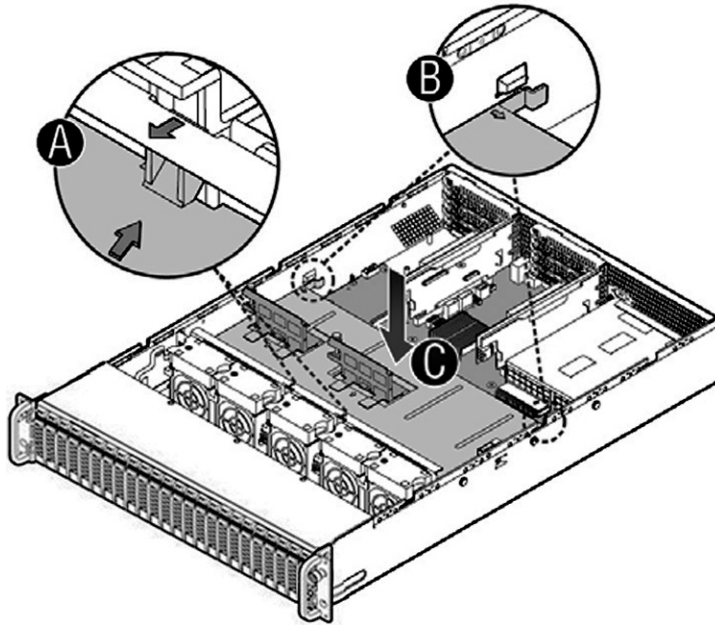


To install the air duct in 2U appliances

1. Lower back edge of the air duct to engage the two tabs on the fan bulkhead (see [Figure 1-11](#), letter A).
2. Carefully push in the two latches on the air duct (see [Figure 1-11](#), letter B).

3. Push down on the air duct to move it into place (see [Figure 1-11](#), letter C).

Figure 1-11. Installing the air duct



4. For SteelHead GX, CX, SteelHead Interceptor 9600, and SteelFusion Core 3500, plug in the SSD boot drive cable.

Replacing disk drives

This section describes how to remove and replace disk drives in the SteelHead GX10000, SteelHead CX xx70, SteelCentral xx70, SteelHead Interceptor 9600, and SteelFusion Core 3500 appliances.

This section includes the following procedures:

- [“Replacing disk drives in 1U appliances with 3.5-inch drives” on page 20](#)
- [“Replacing disk drives in 2U appliances with 2.5-inch drives” on page 24](#)
- [“Replacing disk drives in 2U appliances with 3.5-inch drives” on page 26](#)

Note: If you need to replace an appliance, you can’t move the disks to preserve your data. Each disk is encoded with machine-level information and moving disks isn’t supported.

Replacing disk drives in 1U appliances with 3.5-inch drives

SteelHead CX3070, SteelCentral NetExpress 470, SteelCentral NetProfiler 4270DP, SteelCentral Flow Gateway 2270, and SteelCentral NetShark 2170 appliances are equipped with replaceable, hot-swappable 3.5-inch hard-disk drives (HDD). SteelHead CX3070 appliances include HDDs and solid-state drives (SSD). SteelCentral NetProfiler 4270DB/UI includes SSDs.

When replacing a drive, replace only one drive at a time. You must use approved disk drives. To order disk drives, contact Riverbed Support at <https://support.riverbed.com>.

Note: When you replace disk drives, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.



Caution: Use caution when you remove or replace appliance components; they can become hot to the touch.

To replace the disk drive in 1U appliances

1. Remove the bezel.

See “Removing and installing the bezel” on page 12.

2. Identify the faulty disk drive.

The web interface identifies the faulty disk drive. On a SteelHead, the Alarm Status page in the Management Console identifies the faulty drive.

The disk drive LED is orange for failed drives.

The drives are numbered in ascending order from left to right (that is, 0, 1, 2, 3).

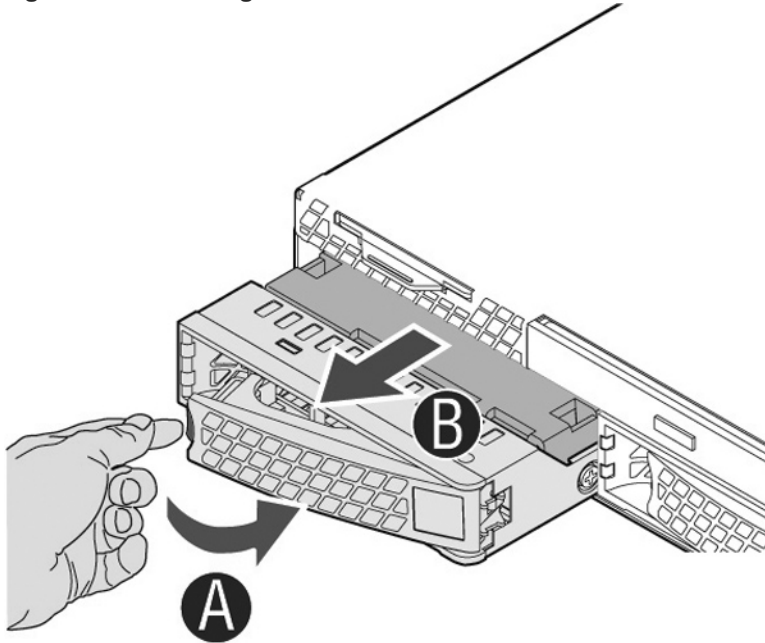
- SteelHead CX3070 HDDs can be in slots 0 and 1; SSDs can be in slot 2 and 3.
- SteelCentral NetProfiler 4270-DB/UI have SSDs in slots 0 and 1.
- SteelCentral NetProfiler 4270-DP has HDDs in slots 0 and 1.
- SteelCentral NetExpress 470 has 4-TB drives in slots 0 and 1 and 2-TB drives in slots 2 and 3.
- SteelCentral Flow Gateway has 1-TB HDDs in slots 0 and 1.
- SteelCentral NetShark 2170 has 2-TB SATA drives in slots 0 and 1 and 4-TB SATA drives in slots 2 and 3.
- SteelCentral AppResponse 2170 has 2-TB SATA drives in slots 0 and 1 and 4-TB SATA drives in slots 2 and 3.

Figure 1-12. Disk drive numbers



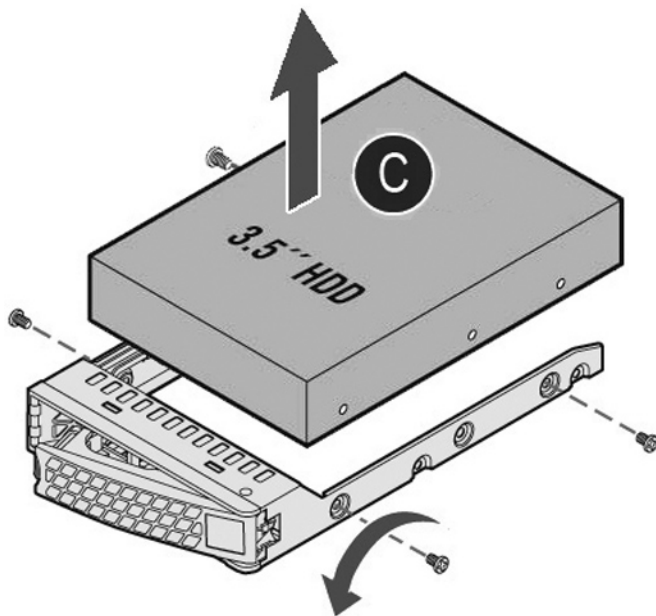
3. Press the orange release button and pull the drive handle toward you (letter A and B).

Figure 1-13. Removing the disk drive



4. Slide the faulty disk drive out of the slot.
5. Remove the four screws securing the drive from the carrier and remove the failed drive (letter C).

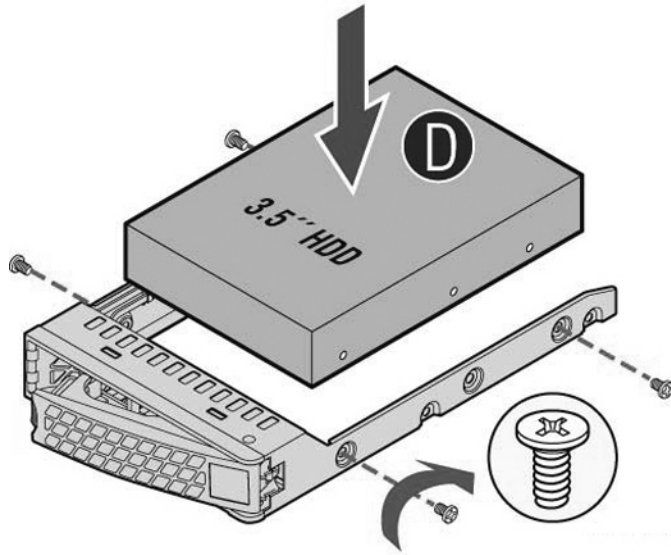
Figure 1-14. Removing the drive from the carrier



6. Insert the new drive in the carrier and secure using the four screws (see [Figure 1-15](#)).

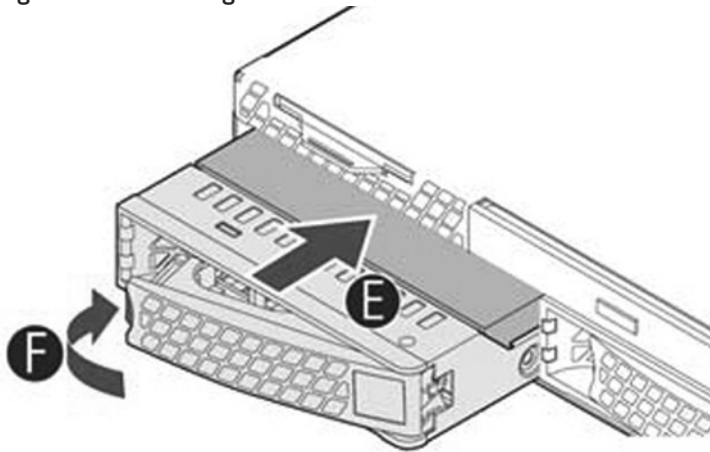
Make sure the drive connector matches the backplane connector.

Figure 1-15. Inserting the drive in the carrier



7. Open the new disk-drive handle by pressing the orange release button.
8. Slide in the new disk drive until it mates with the back connectors in the chassis (see [Figure 1-16](#), letter E and F). The disk drive LED lights blue when connected.

Figure 1-16. Inserting the disk drive



9. Press in the disk-drive handle to close.

The new disk drive runs through a self-test automatically. The disk drive automatically begins proper operation with the other disk drives. You don't need to set up or configure the new disk drive.

Note: When replacing drive 2 or 3 on a NetShark 2170, Packet Storage appears as Inoperable in the NetShark Web interface Status page. Choose System > Maintenance; the new HDD is labeled New. Click **Reinitialize Packet Storage** to restore operation.

Important: It takes approximately 3 to 4 hours, depending on the system load, to rebuild a new disk drive. You can configure the system to send an email to the administrator user when the disk drive has finished rebuilding.

Replacing disk drives in 2U appliances with 2.5-inch drives

2U SteelHead GX10000, CX (CX5070 and CX7070), and SteelHead Interceptor 9600 appliances are equipped with replaceable, hot-swappable 2.5-inch drives.

When replacing a drive, replace only one drive at a time. You must use approved disk drives. To order disk drives, contact Riverbed Support at <https://support.riverbed.com>.

Note: When you replace disk drives, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.



Caution: Use caution when you remove or replace components; they can become hot to the touch.

To replace a 2.5-inch disk drive in the 2U appliances

1. Remove the bezel.

See “Removing and installing the bezel” on page 12.

2. Identify the faulty disk drive.

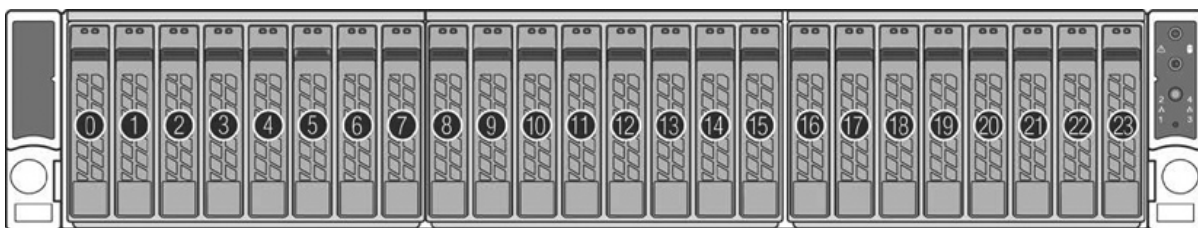
The web interface identifies the faulty disk drive. On a SteelHead, the Alarm Status page in the Management Console identifies the faulty drive.

The disk drive LED is orange for failed drives.

The drives are numbered in ascending order from left to right (that is, starting with 0 on the left and ending with 23 on the right).

- For the SteelHead GX10000 appliances, disks 0 and 24 are HDDs and disks 1 through 10 are SSDs.
- For the CX appliances, disks 0 and 23 are HDDs and disks 1 through 22 are SSDs.
- For the Interceptor 9600 appliances, disks 0 and 23 are HDDs.

Figure 1-17. Disk drive numbers



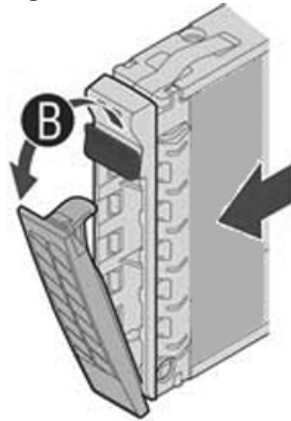
3. Press the release button and pull the drive handle toward you to release the disk drive (letter A).

Figure 1-18. Releasing the disk drive



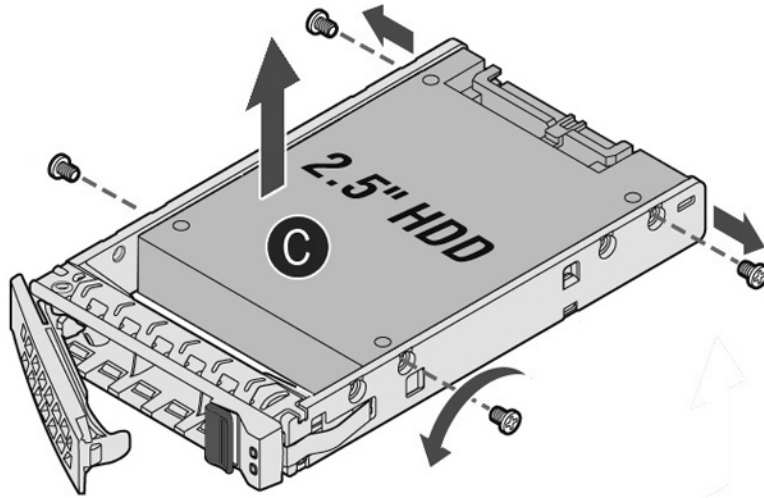
4. Slide the faulty disk drive out of the slot (letter B).

Figure 1-19. Remove the disk drive



5. Remove the four screws securing the drive from the carrier and remove the failed drive (letter C).

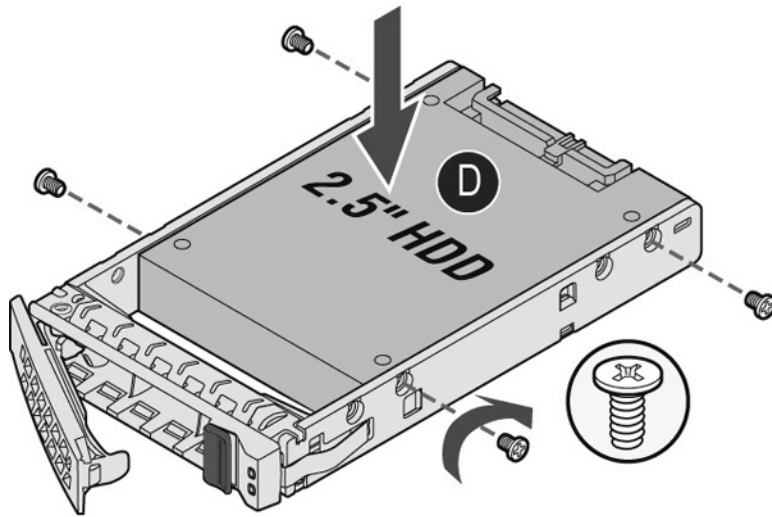
Figure 1-20. Removing the drive from the carrier



6. Insert the new drive in the carrier and secure using the four screws (see [Figure 1-21](#), letter D).

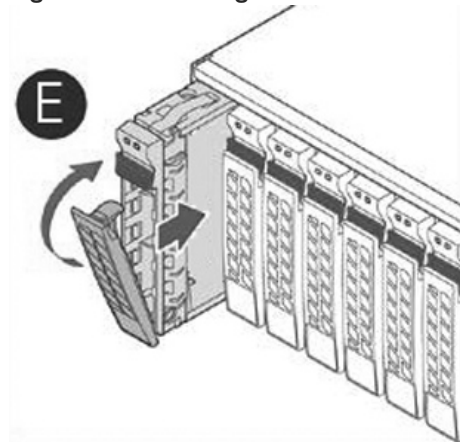
Make sure the drive connector matches the backplane connector.

Figure 1-21. Inserting the drive in the carrier



7. Open the new disk-drive handle by pressing the release button.
8. Slide in the new disk drive until it mates with the back connectors in the chassis (see [Figure 1-22](#), letter E). The disk drive LED lights blue when connected.
9. Press in the disk-drive handle to close.

Figure 1-22. Inserting the disk drive



The new disk drive runs through a self-test automatically. The disk drive automatically begins proper operation with the other disk drives. You don't need to set up or configure the new disk drive.

Replacing disk drives in 2U appliances with 3.5-inch drives

2U SteelFusion Core 3500, SteelCentral NetProfiler (2270, 4270-EX, and 4270-AN), SteelCentral 4170, 6170, and 8170 appliances and SteelCentral Storage Units (48 TB and 72 TB) are equipped with replaceable, hot-swappable 3.5-inch HDDs.

When replacing a drive, replace only one drive at a time.

You must use approved disk drives. To order disk drives, contact Riverbed Support at <https://support.riverbed.com>.

Note: When you replace disk drives, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.



Caution: Use caution when you remove or replace components; they can become hot to the touch.

To replace a disk drive in 2U appliances with 3.5-inch drives

1. Remove the bezel.

See “[Removing and installing the bezel](#)” on page 12.

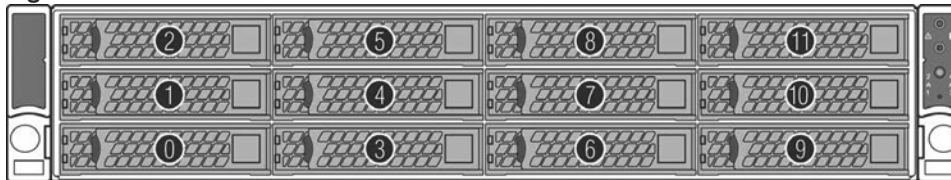
2. Identify the faulty disk drive.

The web interface displays an alarm that identifies the faulty disk drive.

The disk drive LED is orange for failed drives.

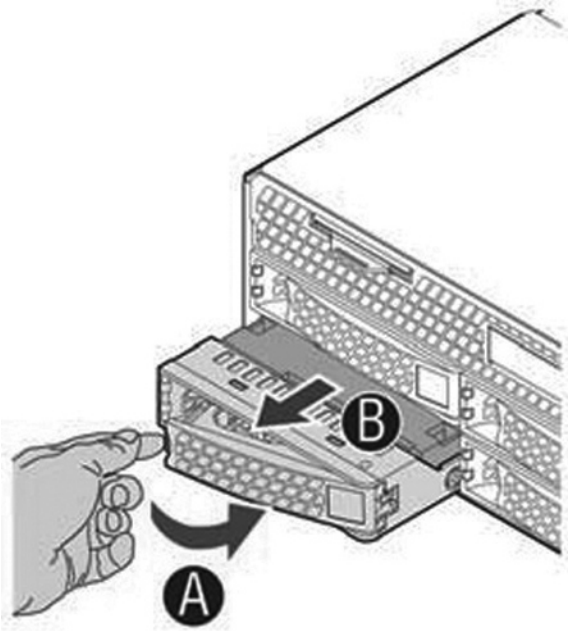
- SteelFusion Core 3500 has 1-TB HDD drives in slots 0 to 3 and 80-GB SSDs in slots 4 and 5.
- NetShark 4170 has 2-TB SATA drives in slots 0 to 3 and 4-TB SATA drives in slots 4 to 11.
- NetShark 6170 has 2-TB SATA drives in slots 0 to 3.
- SteelCentral NetProfiler 2170 has 2-TB drives in slots 0 to 11.
- SteelCentral NetProfiler 4270-EX and 4270-AN have 4-TB drives in slots 0 to 11.
- SteelCentral AppResponse 4170 has 2-TB SATA drives in slots 0 to 3 and 4-TB SATA drives in slots 4 to 11.
- SteelCentral AppResponse 6170 has 2-TB SATA drives in slots 0 to 3.
- SteelCentral AppResponse 8170 has 2-TB SATA drives in slots 0 to 3.

Figure 1-23. Disk drive numbers



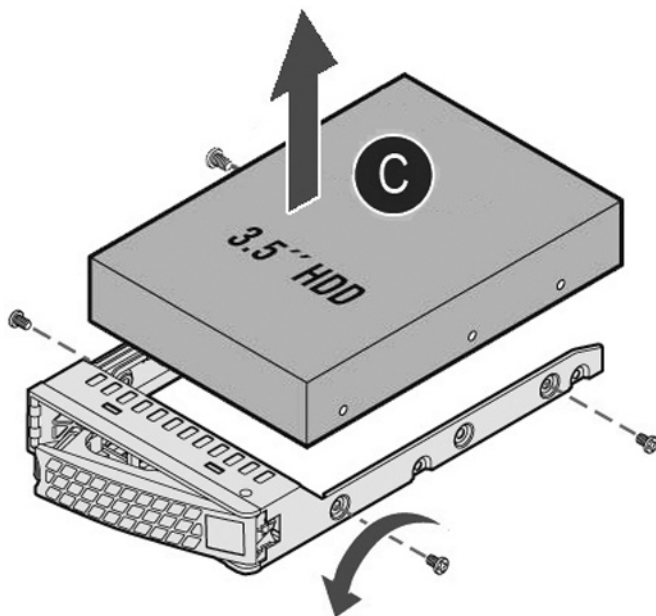
3. Press the orange release button and pull the drive handle toward you to release the disk drive (letter A and B).

Figure 1-24. Releasing the disk drive



4. Slide the faulty disk drive out of the slot.
5. Remove the four screws securing the drive from the carrier and remove the failed drive (letter C).

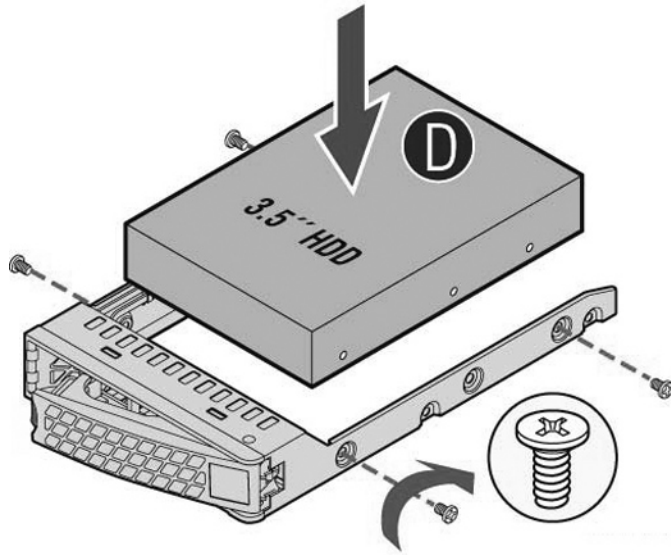
Figure 1-25. Removing the drive from the carrier



6. Insert the new drive in the carrier and secure using the four screws (see [Figure 1-26](#), letter D).

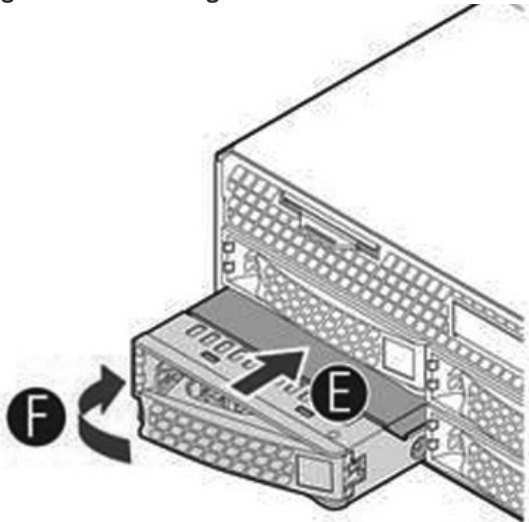
Make sure the drive connector matches the backplane connector.

Figure 1-26. Inserting the drive in the carrier



7. Open the new disk-drive handle by pressing the orange release button (see [Figure 1-27](#), letter E and F).
8. Slide in the new disk drive until it mates with the back connectors in the chassis. The disk drive LED lights blue when connected.

Figure 1-27. Inserting the disk drive



9. Press in the disk-drive handle to close.

The new disk drive runs through a self-test automatically. The disk drive automatically begins proper operation with the other disk drives. You don't need to set up or configure the new disk drive.

Note: When replacing a drive on a NetShark 4170, NetShark 6170, or Storage Unit, Packet Storage appears as Inoperable in the NetShark web interface Status page. Choose System > Maintenance; the new HDD is labeled New. Click **Reinitialize Packet Storage** to restore operation.

Replacing power supply units

This section describes how to replace a power supply in 1U and 2U appliances. These appliances are equipped with replaceable, hot-swappable power supply units.

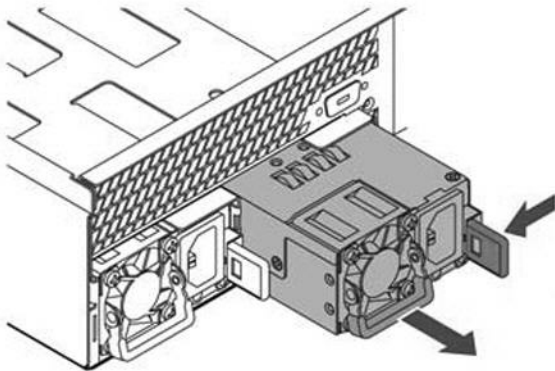


Caution: Use caution when replacing the power supply units; they can become hot to the touch.

To replace power supply units in 1U and 2U appliances

1. Locate the defective power supply unit and remove the power cord.
2. Press the release tab toward the black handle, and pull the power supply unit toward you.

Figure 1-28. Removing the power supply unit from 1U and 2U appliances



Power supply 1 (PS1) is on the right and Power supply 2 (PS2) is on the left.

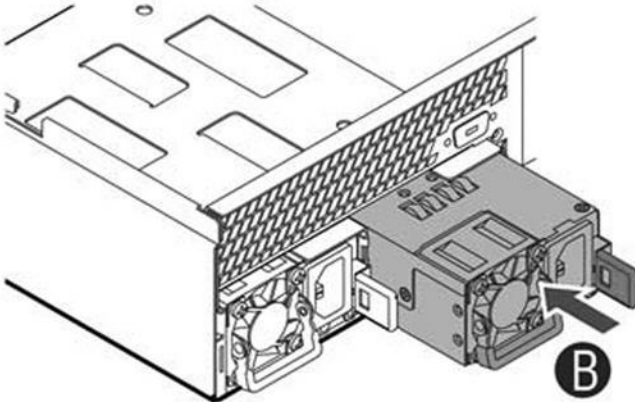
3. Pull the power supply unit out of the chassis.



Caution: Put the defective power supply unit aside; wait until it cools down before touching it.

4. Slide in the new power supply unit until it clicks into place (letter B).

Figure 1-29. Inserting the power supply unit for 1U and 2U appliances



5. Plug the AC power cord into the new power supply unit.

Replacing an AC power supply with a DC power supply

By default, the 2U appliance ships with AC power supplies. You can order DC power supplies as a replacement part for the AC power supplies in 2U appliances.

To install the DC power supply

1. Remove the AC power supply and insert the DC power supply.
2. Attach the O-ring terminal adapter to the DC power supply.
3. Loosen the three screws on the adapter.
4. Connect the positive, negative, and ground wires to the marked location.
5. Tighten the screws around the wires.

Replacing memory modules

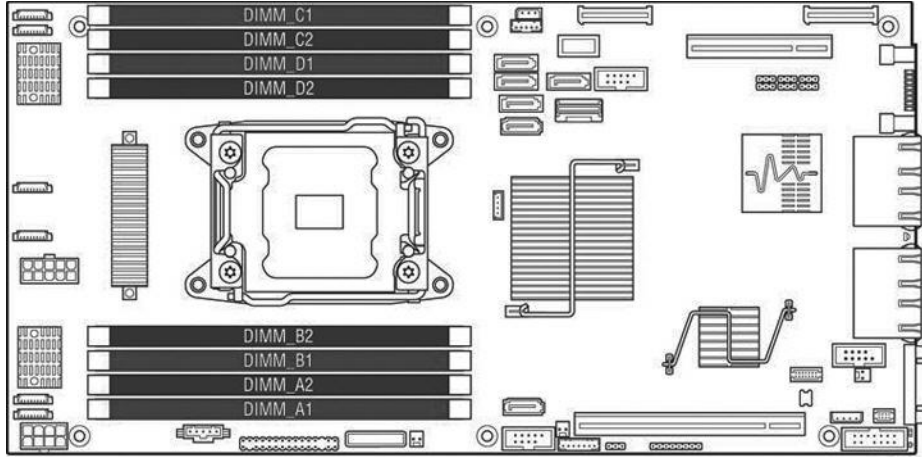
This section describes how to remove and replace memory modules in the SteelHead GX10000, xx70, Interceptor 9600, and Core 3500 appliances. This section includes the following procedures:

- [“Replacing memory modules in 1U appliances” on page 32](#)
- [“Replacing memory modules in 2U appliances” on page 34](#)

Replacing memory modules in 1U appliances

This section describes how to replace memory modules in 1U appliances. **Figure 1-30** shows memory module slot locations in these appliances.

Figure 1-30. Memory module slot locations in 1U appliances



When adding new memory to the 1U appliances, add the memory in the blue slots first. Once the blue slots are full, populate the black slots. Use the lowest lettered/numbered slots first.

To replace the memory modules in the 1U appliances

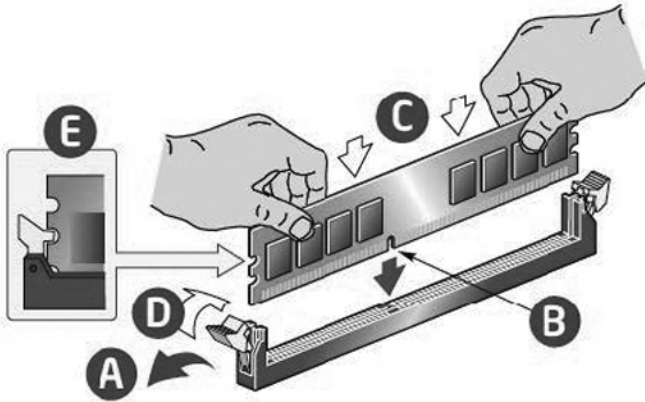
1. Power down the appliance.
2. Remove the chassis cover.
See **“Removing and installing the chassis cover”** on page 13.
3. Remove the air duct.
See **“Removing and installing the air duct for 1U appliances”** on page 17.
4. Press the ejector tabs on the memory slots down and outward, and gently pull the memory module out of the slot.
5. Replace the memory module with an approved memory module of the same size.

Note: Replacing the existing memory module with a module of a different size causes the appliance to fail. You must use approved memory modules. Contact Riverbed Support at <https://support.riverbed.com> to obtain the correct memory modules.

6. Align the memory-module edge connector with the slot alignment keys and insert it into the slot.

The module slot has two alignment keys that allow you to install the module in only one direction.

Figure 1-31. Inserting the memory modules into the connector slot and securing



7. Press down on the memory module with your thumbs (letter C and B) while pulling up on the ejectors (letter A and D) with your index fingers to lock the module into the slot (letter E).
8. Ensure that all ejector tabs are in the upright locked position.
9. Replace the chassis cover.
10. Replace the power cords and peripherals.
11. Power on the appliance.

Replacing memory modules in 2U appliances

This section describes how to replace memory modules in the 2U appliances.

Figure 1-32 shows memory module slot locations in these appliances.

Figure 1-32. Memory module slot locations in GX and 2U appliances

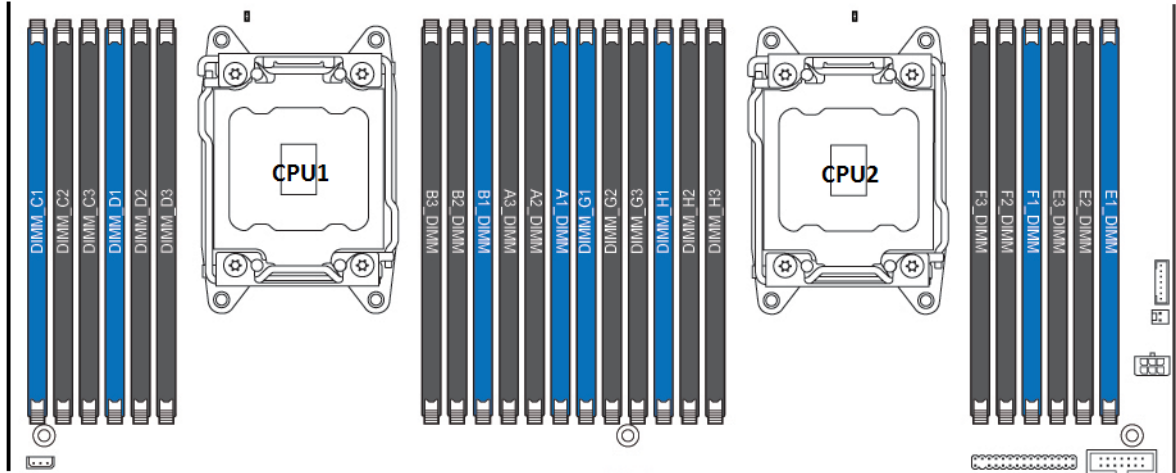


Figure 1-33. GX DIMM locations

MODEL	# of DIMMs	DIMM SIZE	DIMM Location																									
			C 1	C 2	C 3	D 1	D 2	D 3	CPU 1	B 3	B 2	B 1	A 3	A 2	A 1	G 1	G 2	G 3	H 1	H 2	H 3	CPU 2	F 3	F 2	F 1	E 3	E 2	E 1
GX10000	8	32GB	X			X										X			X	X			X					X

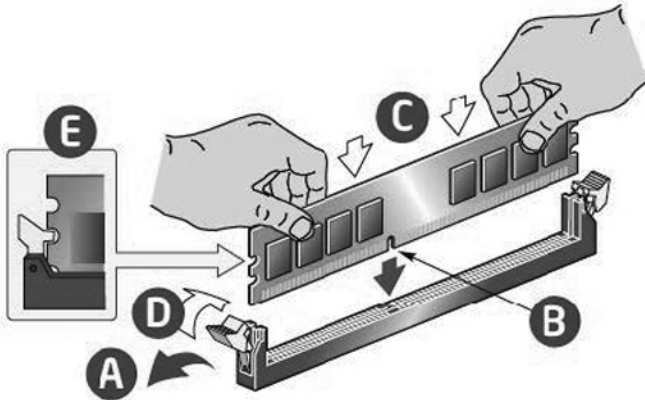
When adding new memory to the 2U appliances, add the memory in the blue slots first. Once the blue slots are full, populate the black slots. Use the lowest lettered/numbered slots first.

To replace memory modules in the 2U appliances

1. Power down the appliance.
2. Remove the chassis cover.
See “Removing and installing the chassis cover” on page 13.
3. Remove the air duct.
See “Removing and installing the air duct for 2U appliances” on page 18.
4. Press the ejector tabs on the memory slots down and outward, and gently pull the memory module out of the slot.
5. Replace the memory module with an approved memory module of the same size.
Note: Replacing the existing memory module with a module of a different size causes the appliance to fail. You must use approved memory modules. Contact Riverbed Support at <https://support.riverbed.com> to obtain the correct memory modules.
6. Align the memory-module edge connector with the slot alignment keys and insert it into the slot.

The module slot has two alignment keys that allow you to install the module in only one direction.

Figure 1-34. Inserting the memory modules into the connector slot and securing



7. Press down on the memory module with your thumbs (letter C and B) while pulling up on the ejectors with your index fingers (letter A and D) to lock the module into the slot (letter E).
8. Ensure that all ejector tabs are in the upright locked position.
9. Replace the chassis cover.
10. Replace the power cords and peripherals.
11. Power on the appliance.

Replacing fans

This section describes how to identify fan status and replace fans in the 1U and 2U appliances. The section includes the following procedures:

- [“Determining fan status” on page 35](#)
- [“Replacing fans in 1U appliances” on page 36](#)
- [“Replacing fans in 2U appliances” on page 39](#)

You must power down appliances prior to replacing fans.

Determining fan status

This section describes how to determine the status of individual fans in the appliance.

To determine fan status on SteelHead

1. Connect to the CLI.

For details, see the *Riverbed Command-Line Interface Reference Manual*.

2. At the system prompt, enter the **show stats fan** command:

```
amnesiac> show stats fan
FanId   RPM      Min RPM Status
1        4508      1715   ok
2        4508      1715   ok
3        4508      1715   ok
4        4459      1715   ok
5        4557      1715   ok
```

On appliances where each fan has two rotors, each rotor has a unique status entry.

The output and number of fans vary depending on your appliance.

Note: Fan status isn't available on NetShark.

Replacing fans in 1U appliances

This section describes how to replace fans in the 1U appliances. These appliances are equipped with four fans. The fans aren't hot swappable; you must power down the appliance before replacing the fans.

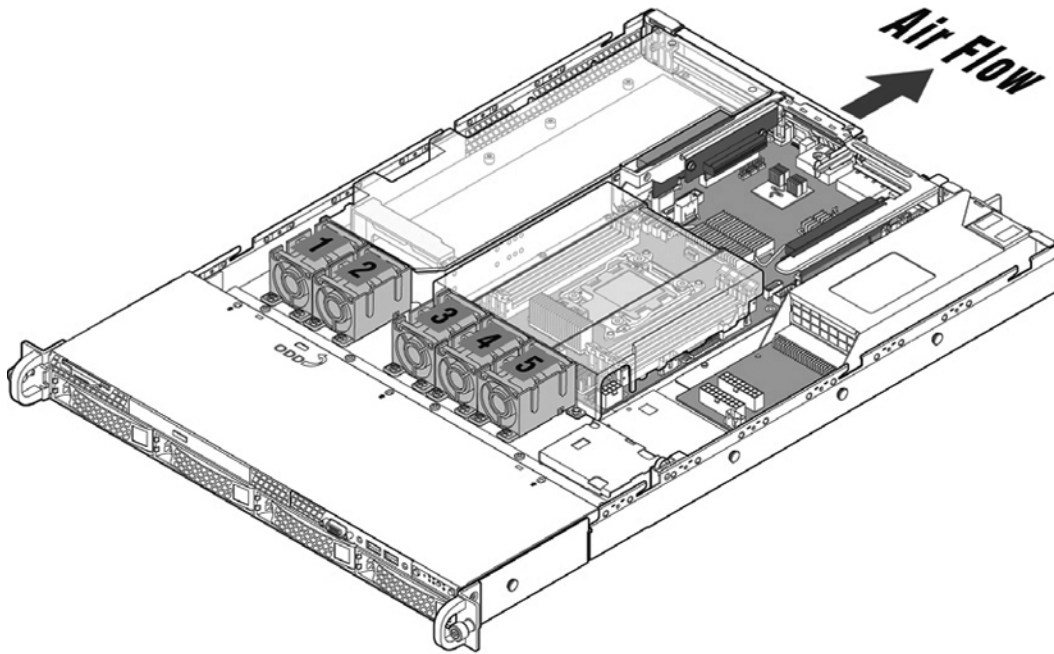
Note: You must use approved fans. To order fans, contact Riverbed Support at <https://support.riverbed.com>.

To replace the fans in the 1U appliances

1. Power down the appliance.
2. Remove the chassis cover.
See [“To remove the chassis cover on 1U and 2U appliances” on page 13](#).
3. Identify the faulty fan.

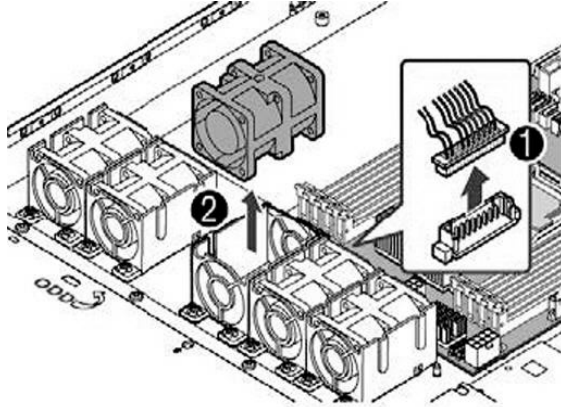
The 1U appliance has four fans, in slots 2, 3, 4, and 5.

Figure 1-35. 1U fan numbers



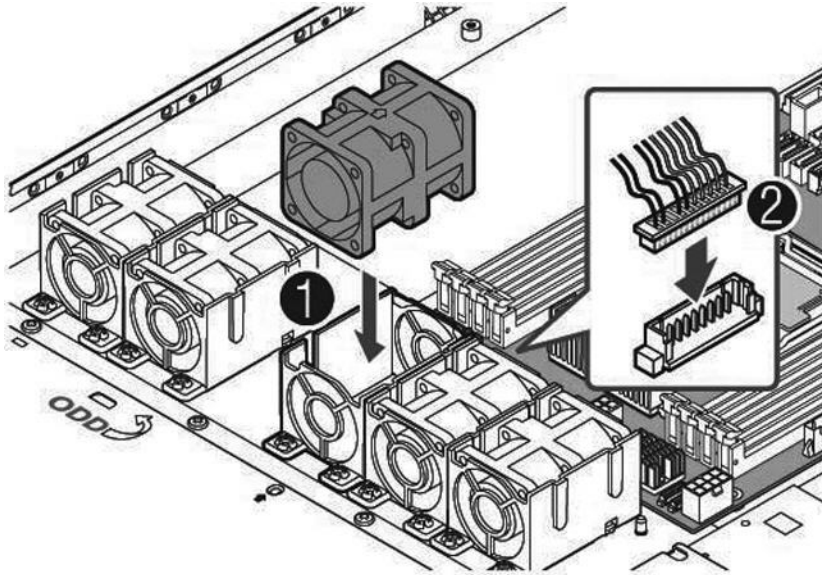
4. Unplug the fan cable from the cable jack on the motherboard (number 1) and remove the faulty fan from the dock (number 2).

Figure 1-36. Fan cable jacks and removing fan unit



5. Insert the replacement fan into the dock (number 1) and plug the cables of the replacement fan unit into the cable jack (number 2).

Figure 1-37. Replacing a fan



6. Replace the chassis cover.

Note: If the RiOS IPMI alarm triggers when you open the chassis cover, enter the **clear hardware error-log** command in the CLI to clear the alarm. For details, see the *Riverbed Command-Line Interface Reference Manual*.

Replacing fans in 2U appliances

This section describes how to replace fans in the 2U appliances. The SteelHead GX10000 is equipped with six hot-swappable fans at the front of the chassis. The 2U CX, xx70, Interceptor 9600, and SteelFusion Core 3500 are equipped with five fans at the front of the chassis.

Important: You must use approved fans. To order fans, contact Riverbed Support at <https://support.riverbed.com>.

To replace the fans in the 2U appliances

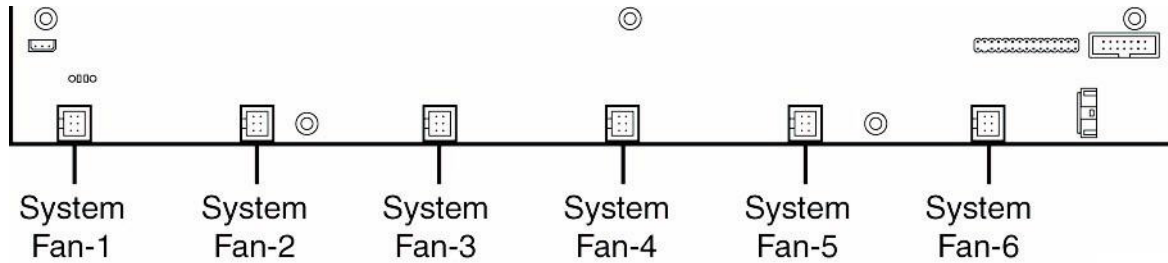
1. Power down the appliance.
2. Remove the chassis cover.

See “To install the chassis cover on 1U and 2U appliances” on page 15.

3. Identify the faulty fan.

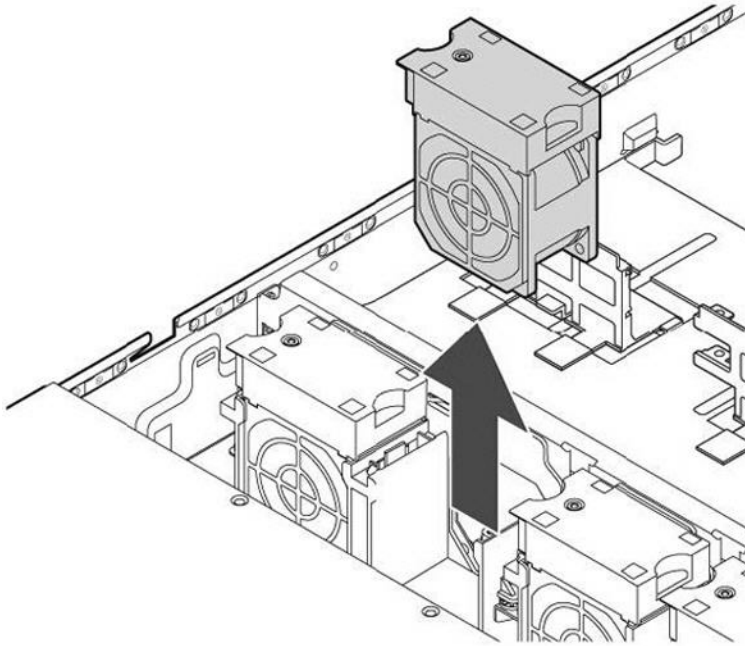
Depending on your appliance, there can be up to six fans. An LED on the fan indicates a failure.

Figure 1-38. 2U fan layout with fan ID numbers



4. Pull the fan straight up to remove it.

Figure 1-39. Removing the fan in 2U appliances



5. Insert the replacement fan.
6. Replace the chassis cover.
7. Power on the appliance.

Note: If the IPMI alarm triggers when you open the chassis cover, enter the **clear hardware error-log** command in the CLI to clear the alarm. For details, see the *Riverbed Command-Line Interface Reference Manual*.

Replacing CX xx55, EX xx60, and SteelFusion Core Components

This chapter describes how to replace components in SteelHead CX xx55, EX, and SteelFusion Core 2000/3000 appliances. It includes these sections:

- “Appliances included in this chapter” on page 41
- “Required tools” on page 41
- “Opening the bezel” on page 42
- “Removing the chassis cover” on page 43
- “Replacing disk drives” on page 45
- “Replacing power supply units” on page 52
- “Replacing memory modules” on page 53
- “Replacing fans” on page 62

Appliances included in this chapter

This chapter describes how to replace hardware components in the following CX, EX, and SteelFusion appliances:

- Desktop appliances, including CX255, CX555, CX755, CX570, CX770, SMC9000, and SSC1000.
- 1U appliances, including CX1555 and EX1160.

For detailed information about replacing components in the EX560 or EX760 appliances, see the *Series EX560 and EX760 Systems Owner’s Manual*.

- 2U appliances, including CX5055, CX7055, DX8000, EX1260, EX1360, and SteelFusion (Granite) Core 2000/3000 appliances.

For information about SteelFusion Core 3500 appliances, see [Chapter 1, “Replacing SteelHead GX, xx70, Interceptor 9600, SteelFusion Core 3500 Components.”](#)

Required tools

You need the following tools and equipment to replace components:

- You must use approved components for the appliance to function properly. Installation of unapproved components will result in boot failure. To order appliance components, contact Riverbed Support at <https://support.riverbed.com>.

- An antistatic strap. When you replace components, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.
- Use the magnetic Phillips screwdriver enclosed with your shipment to remove screws in the appliance. The magnetic screwdriver ensures screws aren't lost in the appliance.

Opening the bezel

This procedure describes how to open the front bezel on xx55, xx60, and SteelFusion Core appliances.

- To release the bezel, press the tabs on each side of the bezel and pull toward you. The bezel remains attached to the appliance on hinges.

Figure 2-1. Opening the bezel on 1U and 2U xx55, xx60, and SteelFusion Core 2000 appliances

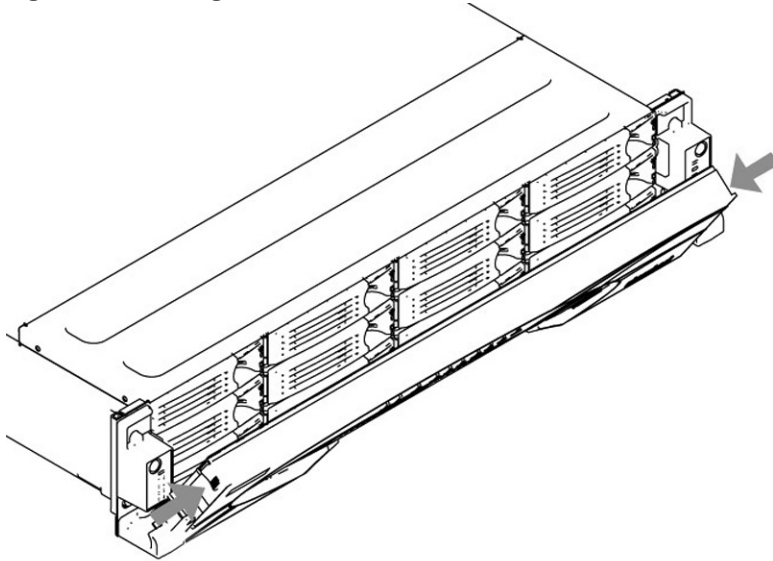
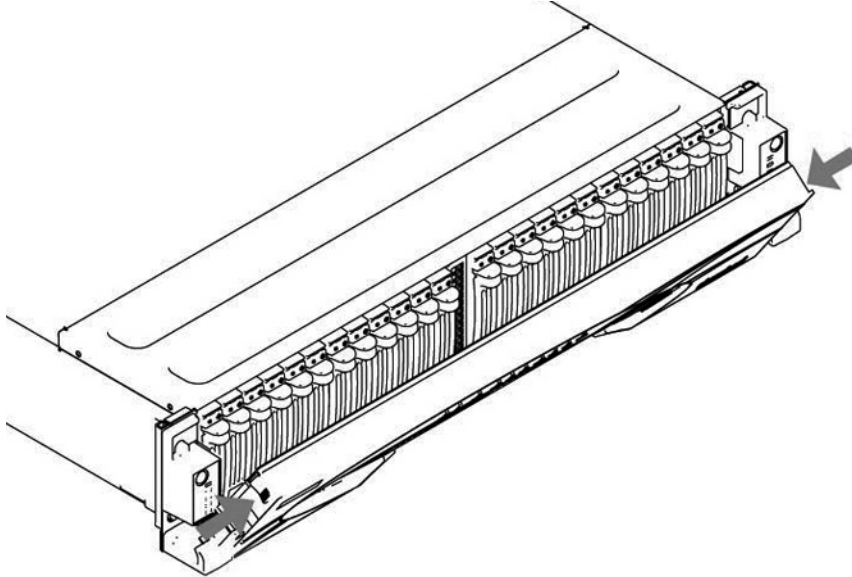


Figure 2-2. Opening the bezel on 2U xx55, xx60, and SteelFusion Core 3000 appliances



Removing the chassis cover

This section describes how to remove the chassis cover on x55, xx60, and SteelFusion Core appliances. It includes the following procedures:

- **“Removing the chassis cover on the desktop appliances” on page 43**, including the CX555 and CX755 appliances.
- **“Removing the chassis cover on 1U appliances” on page 43**, including the CX1555 and EX1160 appliances.
- **“Removing the chassis cover on 2U appliances” on page 44**, including the CX5055, CX7055, DX8000, EX1260, EX1360, SteelFusion 2000, and SteelFusion 3000 appliances.

Removing the chassis cover on the desktop appliances

This section describes how to remove the chassis covers for the CX555 and CX755 appliances.

For instructions to remove the cover on CX255, CX570, CX770, SMC9000, and SSC1000 see **“Removing disk drives in desktop appliances” on page 45**.

To remove the chassis cover on desktop appliances

1. With the included screwdriver, remove the two locking screws on the back of the chassis cover.

Figure 2-3. Removing the locking screws



2. Position your thumbs on the top of the appliance and slide the cover back from the chassis.

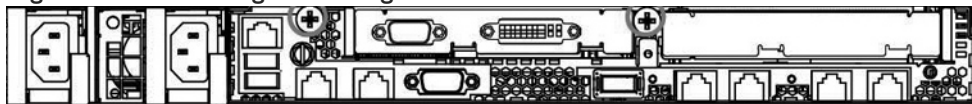
Removing the chassis cover on 1U appliances

This section describes how to remove the chassis covers for the CX1555 and EX1160 appliances.

To remove the chassis cover on 1U appliances

1. Loosen the two locking screws on the back of the chassis.

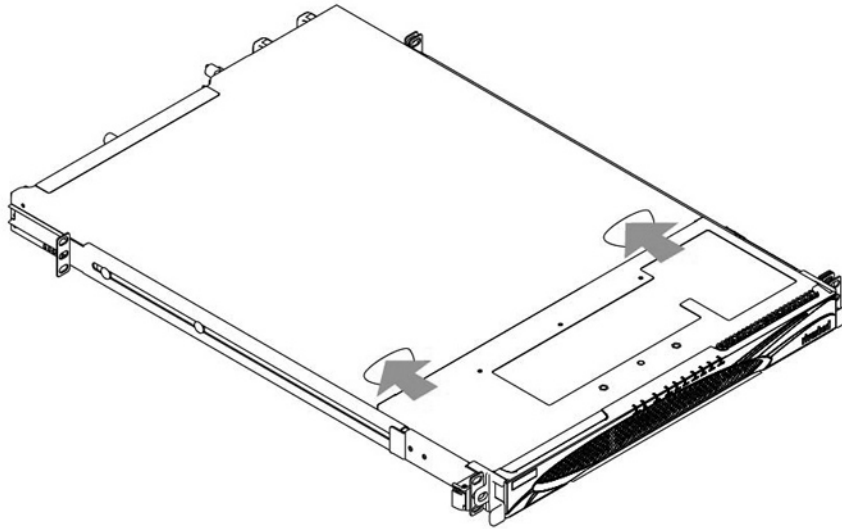
Figure 2-4. Unscrewing the locking screws



2. Remove the third locking screw on the left side near the back of the top cover.

3. Position your thumbs in the indentations at the front of the appliance and slide the cover back from the chassis.

Figure 2-5. Removing the chassis cover



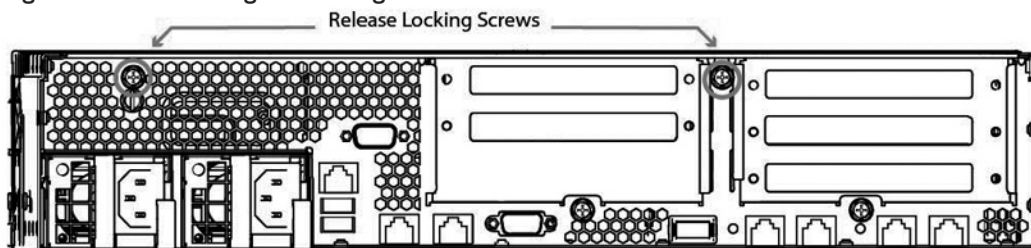
Removing the chassis cover on 2U appliances

This section describes how to remove the chassis covers for the CX5055, CX7055, DX8000, EX1260, EX1360, SteelFusion Core 2000, and SteelFusion Core 3000 appliances.

To remove the chassis cover on 2U appliances

1. Loosen the two locking screws on the back of the chassis.

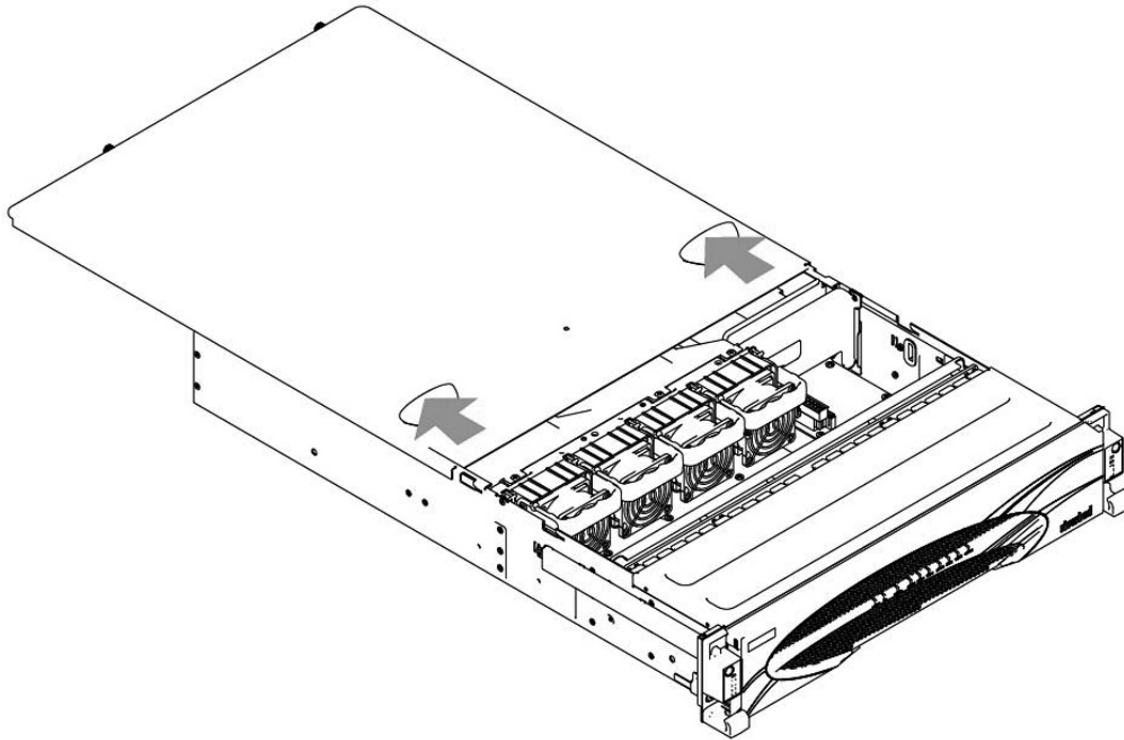
Figure 2-6. Unscrewing the locking screws



2. Remove the third locking screw on the right side of the top cover.

3. Position your thumbs in the indentations at the front of the appliance and slide the cover back from the chassis.

Figure 2-7. Removing the chassis cover



Replacing disk drives

This section describes how to remove and replace disk drives in the CX, EX, and SteelFusion Core appliances.

This section includes the following procedures:

- [“Removing disk drives in desktop appliances” on page 45](#)
- [“Replacing disk drives in 1U appliances” on page 48](#)
- [“Replacing disk drives in 2U appliances” on page 49](#)
- [“Replacing disk drives in 2U appliances” on page 51](#)

Note: If you need to replace an appliance, you can’t move the disks to preserve your data. Each disk is encoded with machine-level information, and moving disks isn’t supported.

Removing disk drives in desktop appliances

The following desktop appliances are equipped with removable disk drives:

- CX255
- CX570
- CX770

- SMC9000
- SCC1000



Caution: When removing or replacing disk drives, be careful not to touch the adjacent power supply unit. Touching the power supply unit can cause electric shock.

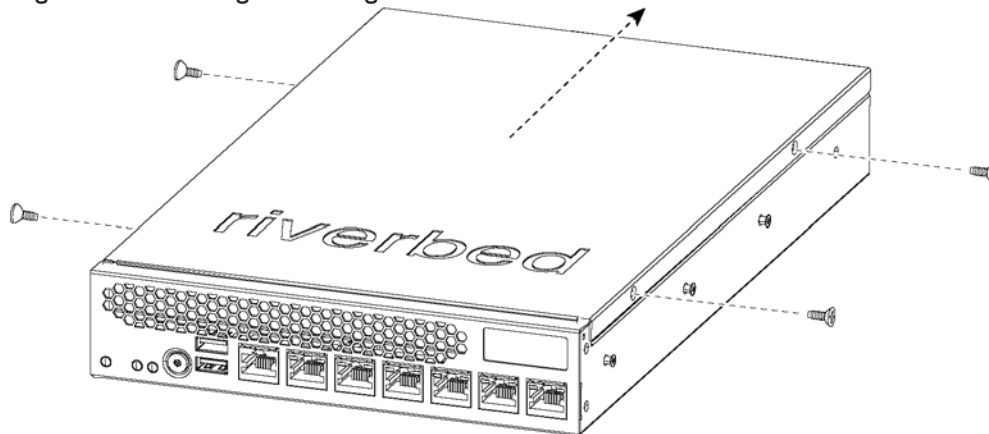


Caution: Use caution when you remove or replace components; they can become hot to the touch.

To replace the disk drive

1. Power down the appliance.
2. Unplug the power cord from the AC circuit.
3. If necessary, remove the appliance from its mounting rack.
4. Remove the locking screws on the cover of the chassis. There is one locking screw located at the rear and two on each side.

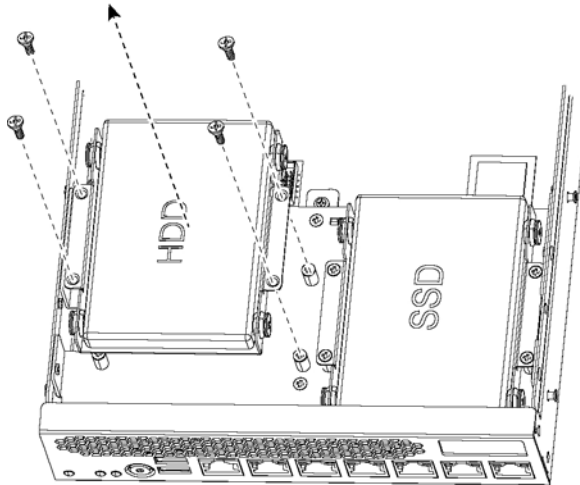
Figure 2-8. Removing the locking screws



5. Slide the cover back from the appliance to remove it.
6. Locate the disk drives in the appliance and use a Phillips screw driver to remove the four screws from the disk drive casing.

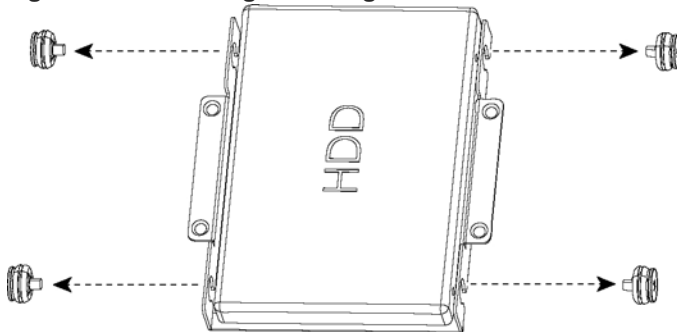
The following figure shows a possible configuration. The drives installed depend on your appliance model.

Figure 2-9. Removing the disk drive



7. Detach any cables or cable units connected to the disk drive.
8. Remove the disk drive in the casing from the appliance and place the casing on an antistatic surface.
9. Remove the disk drive from the casing by removing the four screws and washers holding the disk drive casing to the chassis.

Figure 2-10. Removing the casing



Caution: Use caution when removing the screws and washers; don't drop them into the appliance.

10. Reinsert the empty disk drive casing back in the original position and secure the casing with the original screws.
11. Replace the appliance cover using the original screws.

Replacing disk drives in 1U appliances

The 1U CX1555 and EX1160 appliances are equipped with replaceable, hot-swappable hard-disk drives (HDD) and solid-state drives (SSD).

You must use approved disk drives. To order disk drives, contact Riverbed Support at <https://support.riverbed.com>.

Note: When you replace disk drives, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.



Caution: Use caution when you remove or replace components; they can become hot to the touch.

To replace the disk drive in 1U appliances

1. Open the bezel.

See [“Opening the bezel” on page 42](#).

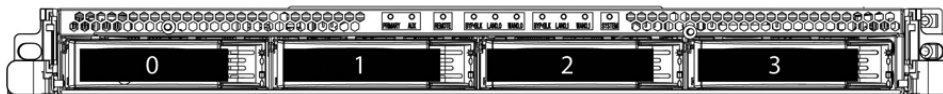
2. Identify the faulty disk drive.

The Alarm Status page in the Management Console identifies the faulty disk drive.

The disk drive LED is orange for failed drives.

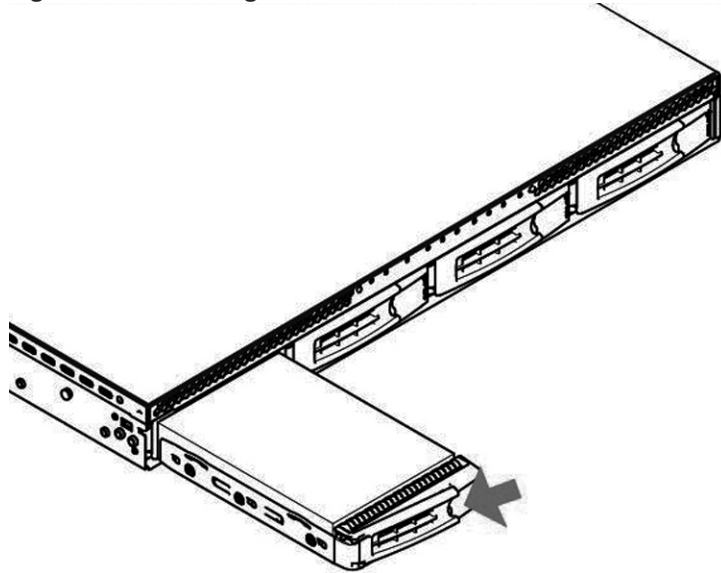
The drives are numbered in ascending order from left to right (that is, 0, 1, 2, 3). HDDs can be in any slot. SSDs can be in slots 2 and 3.

Figure 2-11. Disk drive numbers



3. Press the orange release button and pull the drive handle toward you.

Figure 2-12. Releasing the disk drive



4. Slide the faulty disk drive out of the slot.
Make sure you remove the correct drive.
5. Open the new disk-drive handle by pressing the orange release button.
6. Slide in the new disk drive until it mates with the back connectors in the chassis.
The disk drive LED lights blue when connected.
7. Press in the disk-drive handle to close.

The new disk drive runs through a self-test automatically. The disk drive automatically begins proper operation with the other disk drives. You don't need to set up or configure the new disk drive.

Note: It takes approximately 3 to 4 hours, depending on the system load, to rebuild a new disk drive. When the disk drive has finished rebuilding, the system sends an email to the administrator user.

Replacing disk drives in 2U appliances

The 2U CX5055, CX7055, DX8000, EX1360, and SteelFusion Core 3000 appliances are equipped with replaceable, hot-swappable disk drives. You must use approved disk drives. To order disk drives, contact Riverbed Support at <https://support.riverbed.com>.

Note: When you replace disk drives, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.



Caution: Use caution when you remove or replace components; they can become hot to the touch.

To replace a 2.5-inch disk drive in the 2U appliances

1. Open the bezel.

See [“Opening the bezel” on page 42](#).

2. Identify the faulty disk drive.

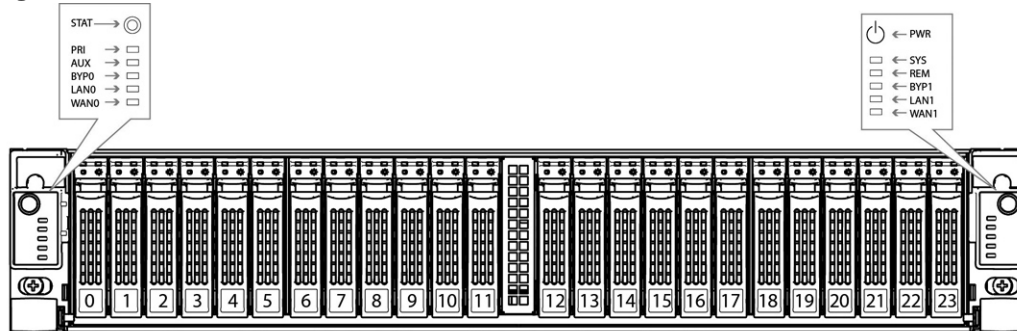
The Alarm Status page in the Management Console identifies the faulty disk drive.

The disk drive LED is orange for failed drives.

The drives are numbered in ascending order from left to right (that is, starting with 0 on the left and ending with 23 on the right).

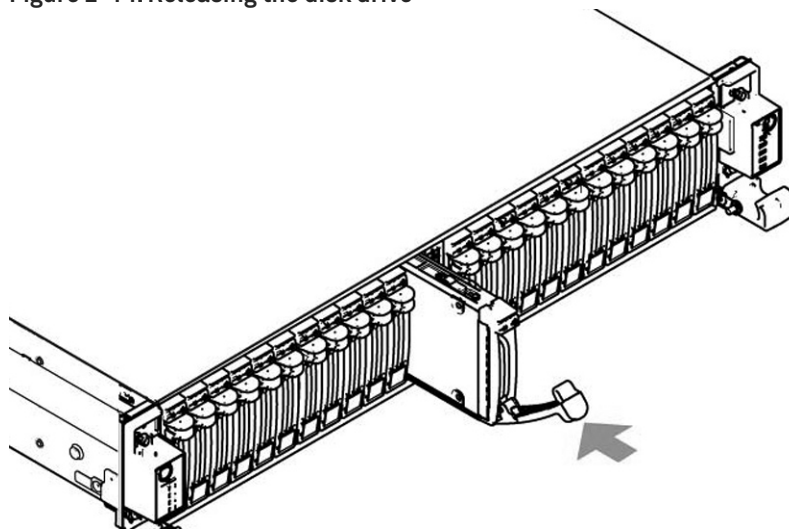
- For the CX5055 and CX7055 appliances, disks 0 and 1 are HDDs and disks 2 to 23 are SSDs.
- For the EX1360 appliances, disks 0 to 20 are HDDs and 20 to 23 are SSDs.
- For SteelFusion Core 3000 appliances, disks 0 and 1 are HDDs. SteelFusion Core 3000 appliances don't contain SSDs.

Figure 2-13. Disk drive numbers



3. Press the release button and pull the drive handle toward you to release the disk drive.

Figure 2-14. Releasing the disk drive



4. Slide the faulty disk drive out of the slot.

Make sure you remove the correct drive.

5. Open the new disk-drive handle by pressing the release button.
6. Slide in the new disk drive until it mates with the back connectors in the chassis.

The disk drive LED lights blue when connected.

7. Press in the disk-drive handle to close.

The new disk drive runs through a self-test automatically. The disk drive automatically begins proper operation with the other disk drives. You don't need to set up or configure the new disk drive.

Replacing disk drives in 2U appliances

The 2U EX1260 and SteelFusion Core 2000 appliances are equipped with replaceable, hot-swappable disk drives. You must use approved disk drives. To order disk drives, contact Riverbed Support at <https://support.riverbed.com>.

Note: When you replace disk drives, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.



Caution: Use caution when you remove or replace components; they can become hot to the touch.

To replace a disk drive in the 2U xx60 and SteelFusion Core 2000 appliances

1. Open the bezel.
See [“Opening the bezel” on page 42](#).

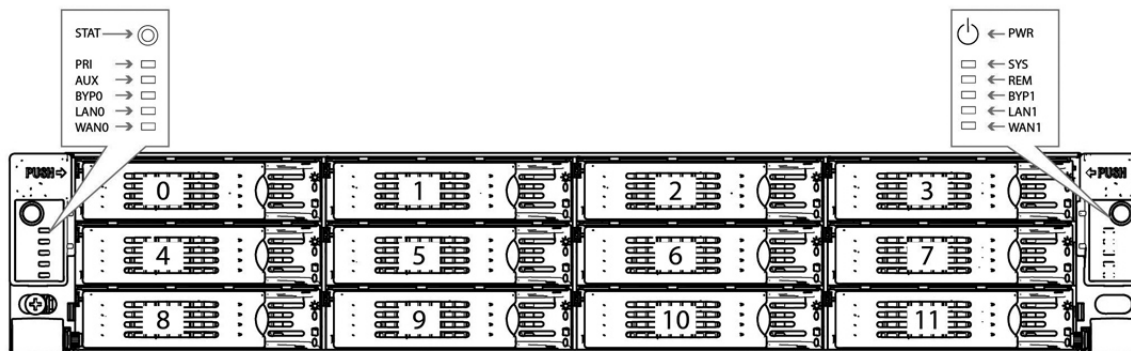
2. Identify the faulty disk drive.

The Alarm Status page in the Management Console identifies the faulty disk drive.

The disk drive LED is orange for failed drives.

The drives are numbered in ascending order from the upper-left corner to the lower-right corner. HDDs can be in any slot. SSDs can be in slots 8 to 11.

Figure 2-15. Disk drive numbers



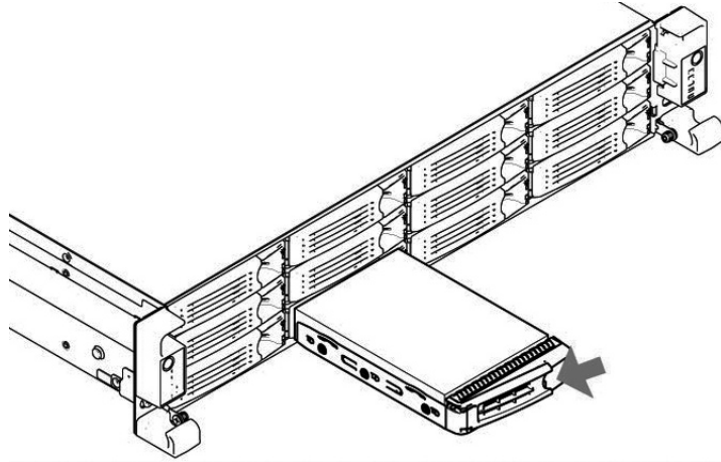
3. Connect to the CLI and enter the **raid swraid fail-disk** command:

```
amnesiac> raid swraid fail-disk <slot-number>
```

This command ensures the RAID system removes the disk partitions before the drive is removed from the slot. For details, see the *Riverbed Command-Line Interface Reference Manual*.

4. Press the orange release button and pull the drive handle toward you to release the disk drive.

Figure 2-16. Releasing the disk drive



5. Slide the faulty disk drive out of the slot.

Make sure you remove the correct drive.

6. Wait 60 seconds between removing the old drive and adding the new drive.

Waiting ensures the system detects the drive removal so it can rebuild properly after you insert the new drive. If you insert the new drive before the system detects the removal, data might be corrupted.

7. Open the new disk-drive handle by pressing the orange release button.

8. Slide in the new disk drive until it mates with the back connectors in the chassis.

The disk drive LED lights blue when connected.

9. Press in the disk-drive handle to close.

The new disk drive runs through a self-test automatically. The disk drive automatically begins proper operation with the other disk drives. You don't need to set up or configure the new disk drive.

Replacing power supply units

This section describes how to remove and replace a power supply unit in GX, CX, EX, and SteelFusion appliances.

Replacing power supply units in 1U and 2U appliances

This section describes how to replace a power supply in 1U CX1555 and EX1160 and 2U CX5055, CX7055, DX8000, EX1260, EX1360, SteelFusion Core 2000, and SteelFusion Core 3000 appliances. These appliances are equipped with replaceable, hot-swappable power supply units.

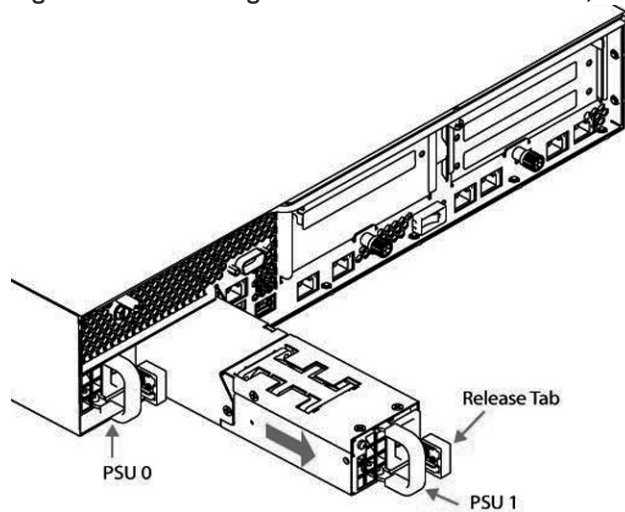


Caution: Use gloves when replacing the power supply units; they can become hot to the touch.

To replace power supply units in 1U and 2U appliances

1. Locate the defective power supply unit and remove the power cord.
2. Press the release tab toward the black handle, and pull the power supply unit toward you.

Figure 2-17. Removing the PSU from 1U and 2U xx55, xx60, SteelFusion Core 2000, and SteelFusion Core 3000



Power supply 0 (PS0) is on the left, and Power supply 1 (PS1) is on the right.

3. Pull the power supply unit out of the chassis.



Caution: Put the defective power supply unit aside; wait until it cools down before touching it.

4. Slide in the new power supply unit until it mates with the back connectors in the chassis.
When the power supply unit is pushed all the way in, the button clicks to the right.
5. Plug the AC power cord into the new power supply unit.

Replacing memory modules

This section describes how to remove and replace memory modules in the CX, EX, and SteelFusion appliances. This section includes the following procedures:

- “Replacing memory modules in desktop appliances” on page 54
- “Replacing memory modules in 1U appliances” on page 55
- “Replacing memory modules in 2U appliances” on page 58

Replacing memory modules in desktop appliances

This section describes how to replace memory modules in desktop CX555 and CX755 appliances.

Note: You must use approved memory modules. Contact Riverbed Support at <https://support.riverbed.com> to obtain the correct memory modules.

To replace the memory modules in the desktop CX555 and CX755 appliances

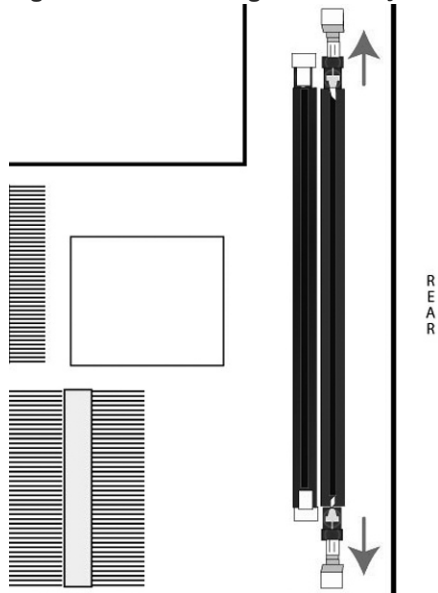
1. Power down the appliance.
2. Disconnect the appliance from the electrical outlet and peripherals.
3. Remove the chassis cover.
See “Removing the chassis cover on the desktop appliances” on page 43.



Caution: Be careful not to touch the adjacent power supply unit. Touching the power supply unit could cause electric shock.

4. Press the ejector tabs on the memory slots down and outward, and gently pull the memory module out of the slot.

Figure 2-18. Accessing the memory modules

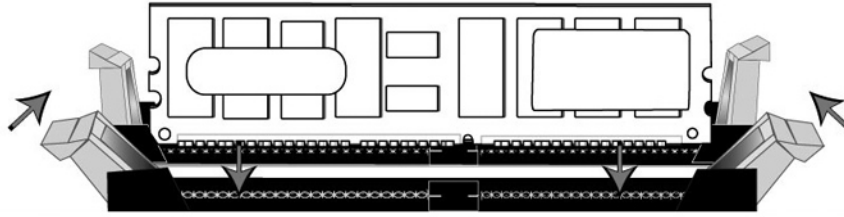


5. If you are replacing memory, remove the existing memory module and replace it with the approved memory module.

6. Align the memory-module edge connector with the slot alignment keys and insert it into the slot.

The module slot has two alignment keys that allow you to install the module in only one direction.

Figure 2-19. Inserting and securing the memory module in the DIMM slot

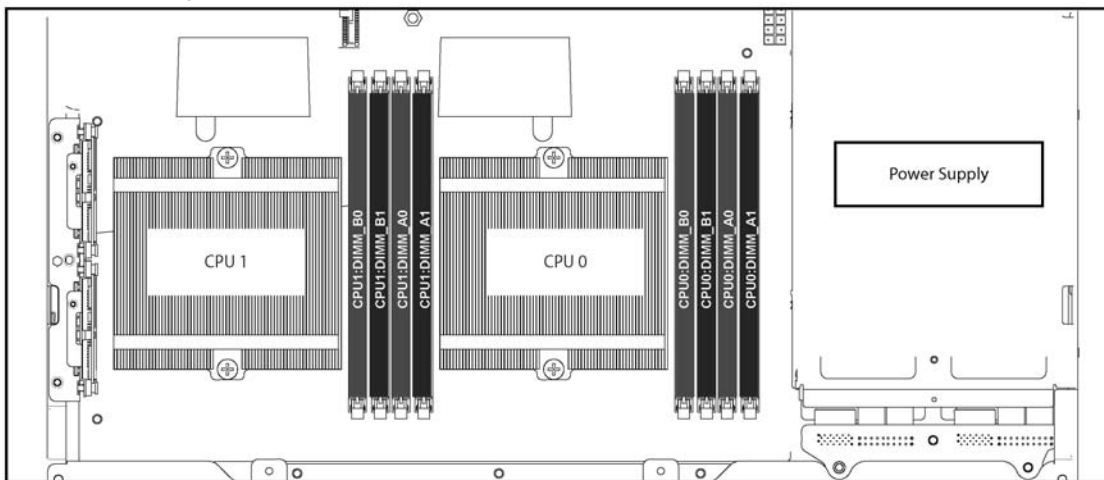


7. Press down on the memory module with your thumbs while pulling up on the ejectors with your index fingers to lock the module into the slot.
8. Ensure that all ejector tabs are in the upright locked position.
9. Replace the chassis cover.
10. Reconnect the power and power on the appliance.

Replacing memory modules in 1U appliances

This section describes how to replace memory modules in 1U CX1555 and EX1160 appliances. The following diagram shows memory module slot locations in these appliances.

Figure 2-20. Memory module slot locations in 1U xx55 and xx60



When adding new memory to the 1U xx55 and xx60 appliances, add the memory in the black slots first. Once the black slots are full, populate the blue slots. Make sure the memory is equally distributed on both sides.

To replace the memory modules in the 1U CX1555 and EX1160 appliances

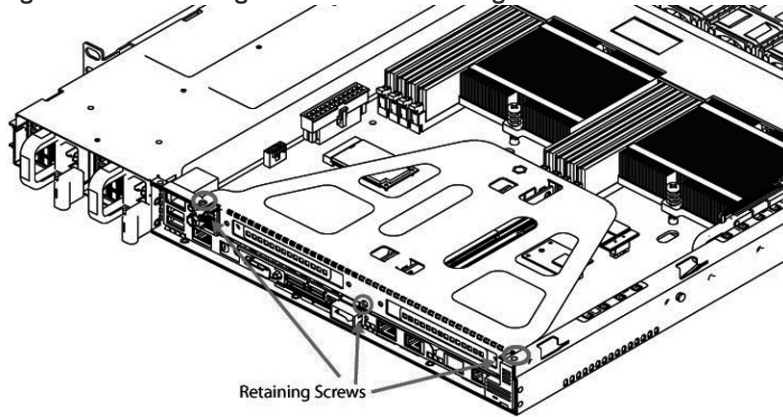
1. Power down the appliance.

2. Remove the chassis cover.

See [“To remove the chassis cover on 1U appliances” on page 43.](#)

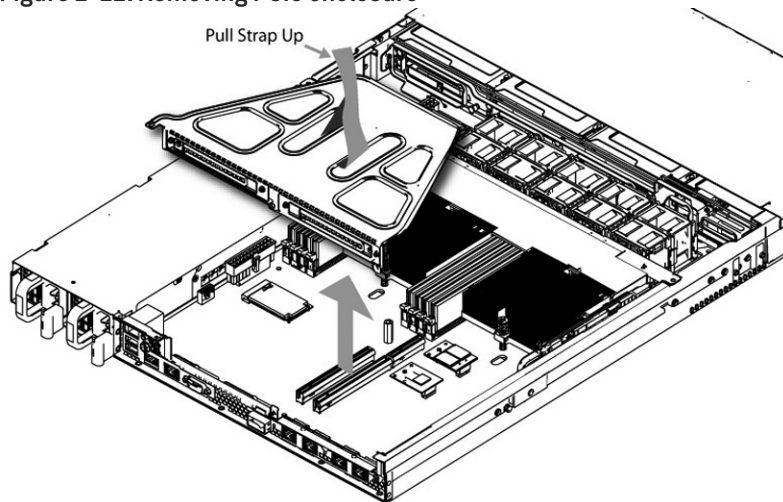
3. To access CPU 1 memory modules, you must remove the PCIe enclosure. Remove the locking screws of the PCIe enclosure on the back of the appliance.

Figure 2-21. Removing PCIe enclosure locking screws



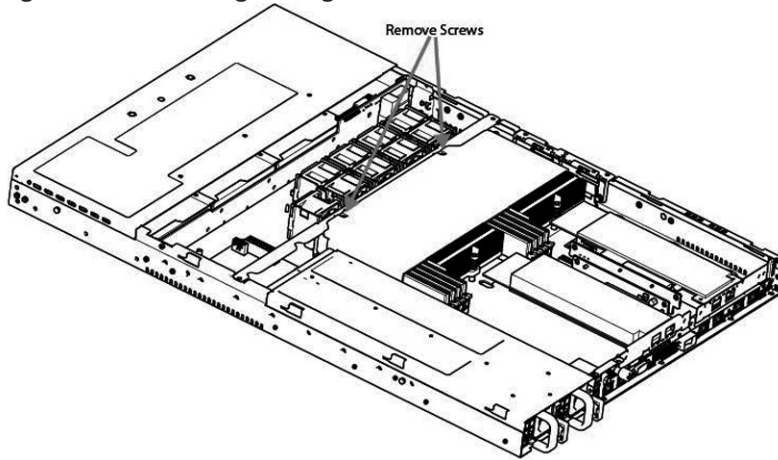
4. Lift the PCIe enclosure straight out of the appliance using the attached strap.

Figure 2-22. Removing PCIe enclosure



5. Remove the two screws securing the cooling shroud.

Figure 2-23. Removing cooling shroud screws



6. Lift the cooling shroud straight up and out of the appliance.



Caution: Lift the shroud straight up to avoid damaging any components of the appliance.

7. Press the ejector tabs on the memory slots down and outward, and gently pull the memory module out of the slot.

Figure 2-24. Accessing the memory modules



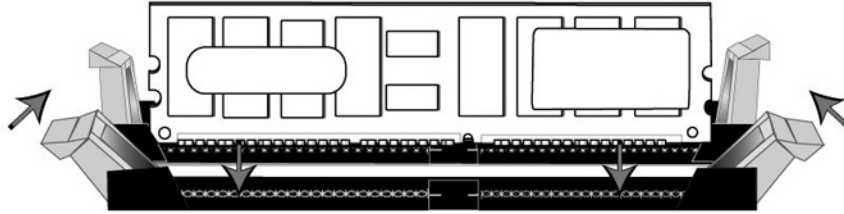
8. Remove the existing memory module and replace it with an approved memory module of the same size.

Note: Replacing the existing memory module with a module of a different size causes the appliance to fail. You must use approved memory modules. Contact Riverbed Support at <https://support.riverbed.com> to obtain the correct memory modules.

9. Align the memory-module edge connector with the slot alignment keys and insert it into the slot.

The module slot has two alignment keys that allow you to install the module in only one direction.

Figure 2-25. Inserting the memory modules into the connector slot and securing



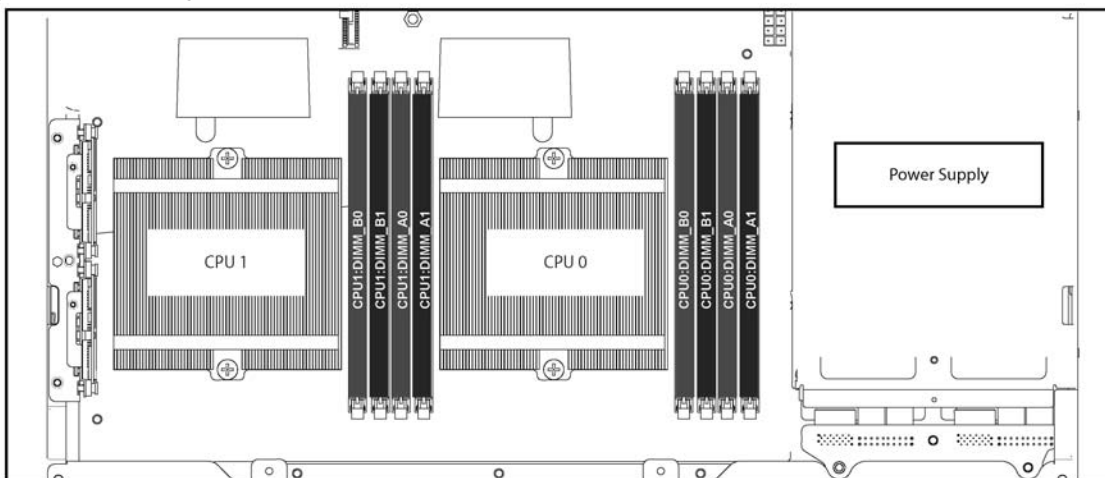
10. Press down on the memory module with your thumbs while pulling up on the ejectors with your index fingers to lock the module into the slot.
11. Ensure that all ejector tabs are in the upright locked position.
12. If necessary, replace the PCIe enclosure.
13. Replace the cooling shroud.
14. Replace the chassis cover.
15. Replace the power cords and peripherals.
16. Power on the appliance.

Replacing memory modules in 2U appliances

This section describes how to replace memory modules in the 2U CX5055, CX7055, EX1260, EX1360, SteelFusion Core 2000, and SteelFusion Core 3000 appliances.

Figure 2-26 shows memory module slot locations in these appliances.

Figure 2-26. Memory module slot locations in 2U xx55, xx60, and SteelFusion Core appliances

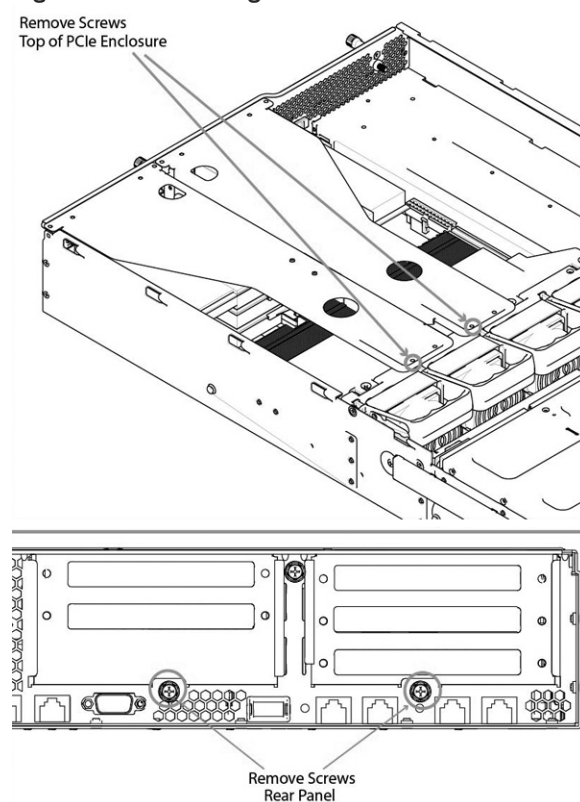


When adding new memory to the 2U appliances, add the memory in the black slots first. Once the black slots are full, populate the blue slots. Make sure the memory is equally distributed on both sides. All memory slots for DX8000 appliances are populated.

To replace memory modules in the 2U xx55, xx60, and SteelFusion Core appliances

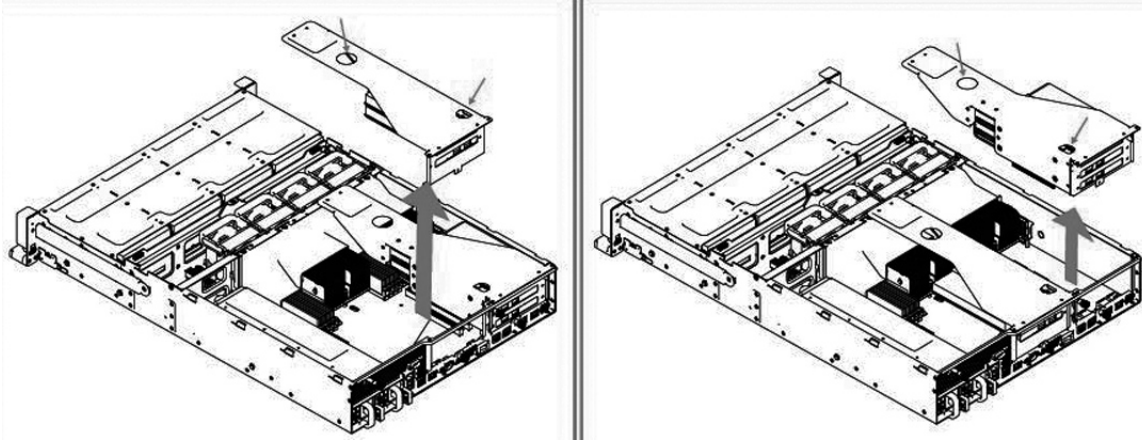
1. Power down the appliance.
2. Remove the chassis cover.
See [“To remove the chassis cover on 2U appliances” on page 44.](#)
3. To release the PCIe enclosure, remove the two locking screws on the top of the enclosure and the two locking screws on the rear panel.

Figure 2-27. Removing PCIe enclosures



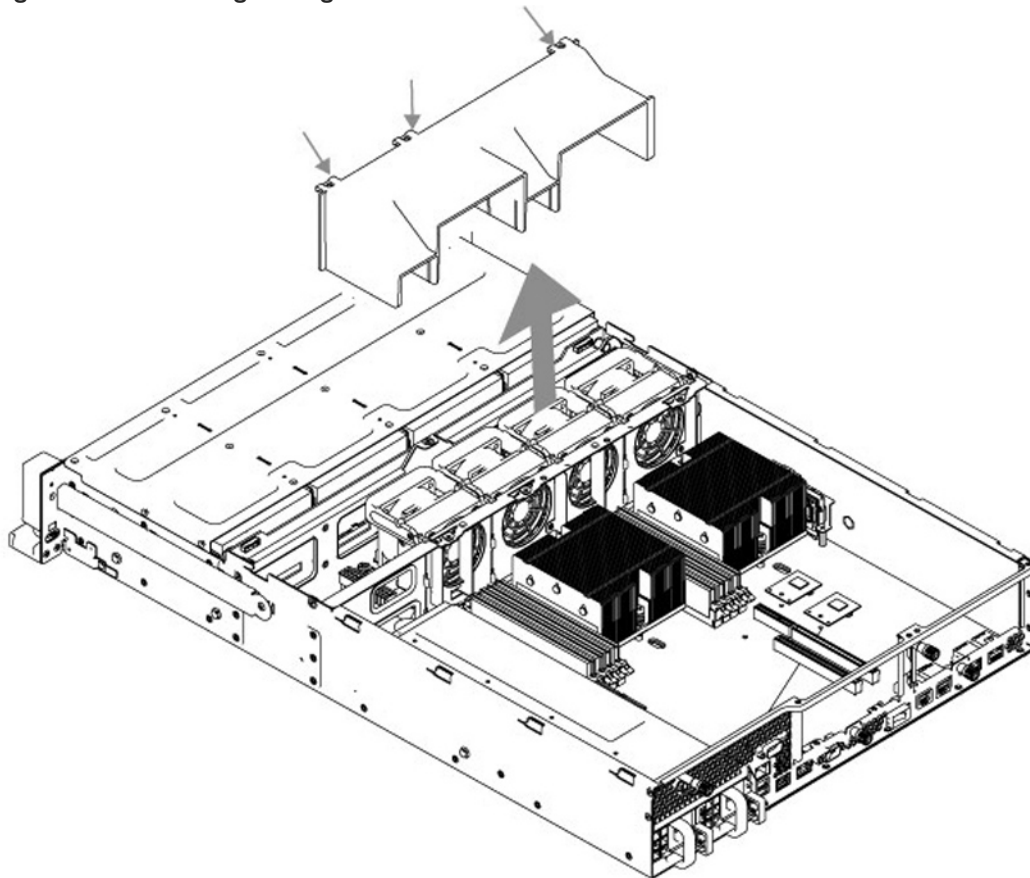
4. To remove the right and left PCIe enclosure from the chassis, place your fingers in the enclosure holes and lift straight up.

Figure 2-28. Removing the PCIe enclosures from the chassis



5. Remove the screws securing the cooling shroud to access the memory module slots.

Figure 2-29. Removing cooling shroud

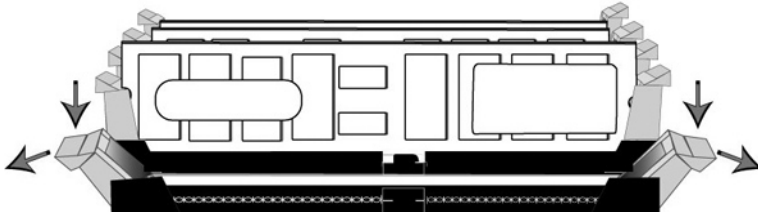




Caution: Be careful not to damage any surrounding components when removing and installing the cooling shroud. Lift the shroud straight up to avoid damaging any components of the appliance.

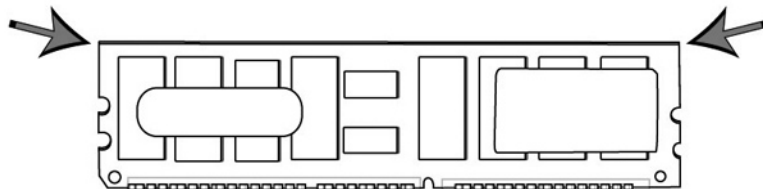
6. Press the ejector tabs on the memory module slot down and outward and gently pull the memory module out of the slot.

Figure 2-30. Accessing the memory modules



7. Hold the memory module on the outside edges to prevent damage to the module.

Figure 2-31. Proper handling of the memory module

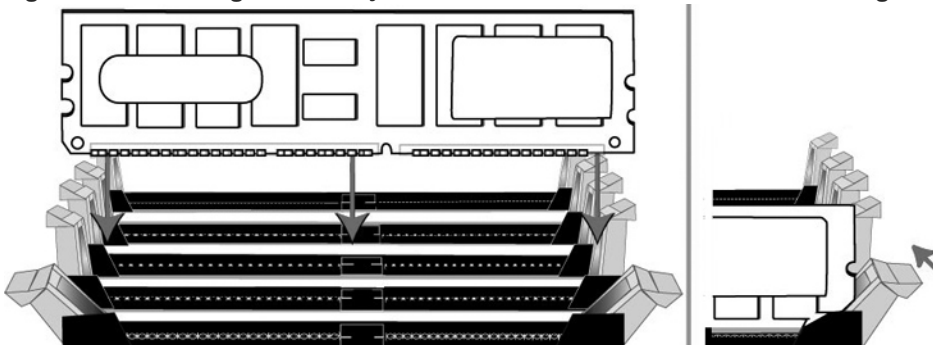


8. Remove the existing memory module and replace it with an approved memory module of the same size. When adding memory, always replace the memory in the black slots first. Make sure the memory is equally distributed on both sides.

Note: Replacing the existing memory module with a module of a different size causes the appliance to fail. You must use approved memory modules. Contact Riverbed Support at <https://support.riverbed.com> to obtain the correct memory modules.

9. Align the memory-module edge connector with the slot alignment keys and insert it into the slot.
The module slot has two alignment keys that allow you to install the module in only one direction.

Figure 2-32. Inserting the memory modules into the connector slot and securing



10. Press down on the memory module with your thumbs while pulling up on the ejectors with your index fingers to lock the module into the slot.
11. Ensure that all ejector tabs are in the upright locked position.
12. Repeat [Step 6](#) to [Step 11](#) of this procedure to install the remaining memory modules.
13. Replace the cooling shroud.
14. Replace the chassis cover.
15. Plug in the power cords and the peripherals.
16. Power on the appliance.

Replacing fans

This section describes how to identify fan status and replace fans in the desktop x55, the 1U and 2U xx55 and xx60, and SteelFusion Core 2000 appliances. The section includes the following procedures:

- [“Determining fan status” on page 62](#)
- [“Replacing fans in 1U appliances” on page 63](#)
- [“Replacing fans in 2U appliances” on page 65](#)

The 2U CX, EX, and SteelFusion Core appliances contain hot swappable fans. You must power down desktop (CX555 and CX755) and 1U (CX1555 and EX1160) appliances prior to replacing fans.

Determining fan status

This section describes how to determine the status of individual fans in the appliance.

To determine fan status

1. Connect to the CLI.
For details, see the *Riverbed Command-Line Interface Reference Manual*.
2. At the system prompt, enter the **show stats fan** command:

```
amnesiac> show stats fan
FanId  RPM    Min RPM Status
0      4963    1080    ok
1      4963    1080    ok
2      4821    1080    ok
3      4963    1080    ok
4      4963    1080    ok
5      4821    1080    ok
```

The output and number of fans vary depending on your appliance.

Replacing fans in 1U appliances

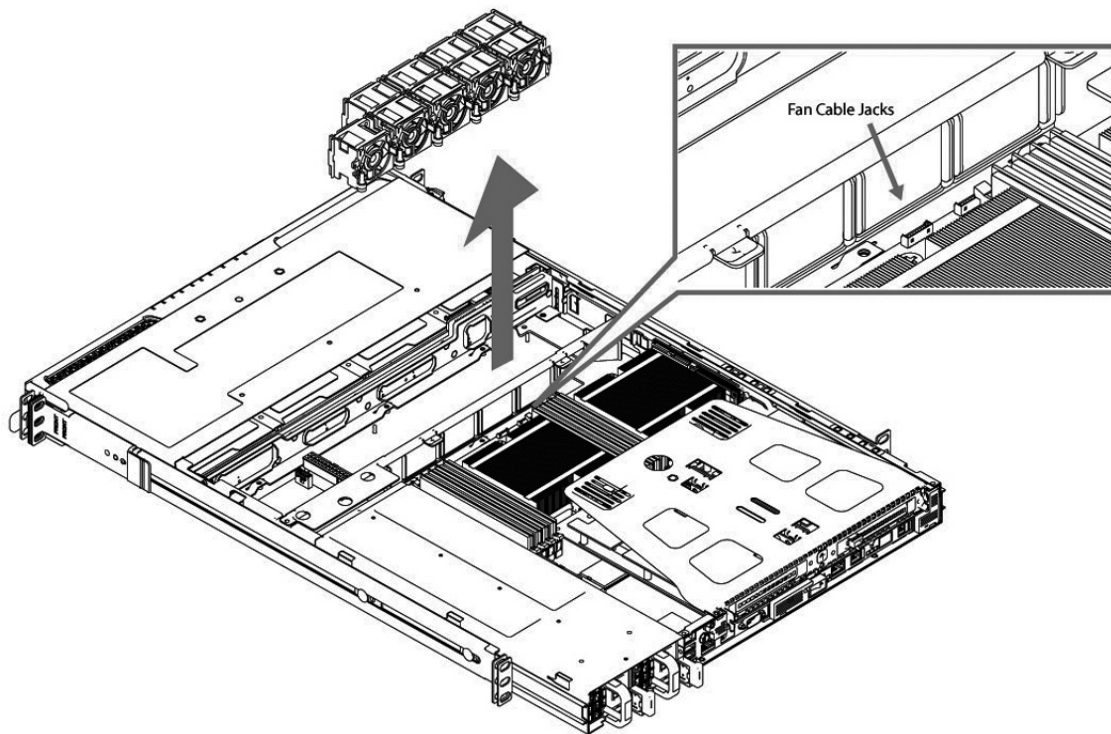
This section describes how to replace fans in the 1U CX1555 and EX1160 appliances. These appliances are equipped with nine fans in a single casing. The fans aren't hot swappable; you must power down the appliance before replacing the fans.

Important: You must use approved fans. To order fans, contact Riverbed Support at <https://support.riverbed.com>.

To replace the fans in the 1U CX1555 and EX1160 appliances

1. Remove the chassis cover.
See [“To remove the chassis cover on 1U appliances” on page 43](#).
2. Unplug the fan cables from the cable jacks on the motherboard.
3. Pull the fan unit up and out of the chassis. The fans are encased in one unit.

Figure 2-33. Fan cable jacks and removing fan unit



4. Seat the fan unit on the metal peg on the floor of the chassis.
5. Plug the cables of the replacement fan unit into the cable jacks.

6. Replace the chassis cover.

Note: If the RiOS IPMI alarm triggers when you open the chassis cover, run the **clear hardware error-log** command in the CLI to clear the alarm. For details, see the *Riverbed Command-Line Interface Reference Manual*.

Replacing fans in 2U appliances

This section describes how to replace fans in the 2U CX5055, CX7055, DX8000, EX1260, EX1360, SteelFusion Core 2000, and SteelFusion Core 3000 appliances. These appliances are equipped with four dual-unit hot-swappable fans at the front of the chassis.

Note: You must use approved fans. To order fans, contact Riverbed Support at <https://support.riverbed.com>.

To replace the fans in the 2U appliances

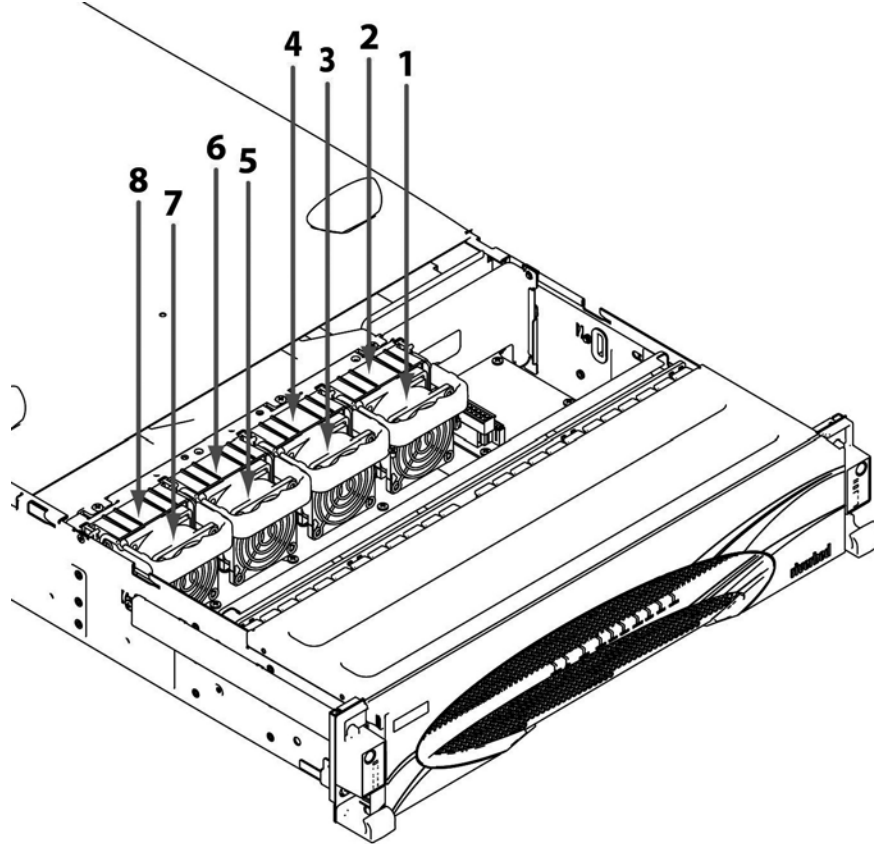
1. Remove the chassis cover.

See [“To remove the chassis cover on 2U appliances” on page 44](#).

2. Identify the faulty fan.

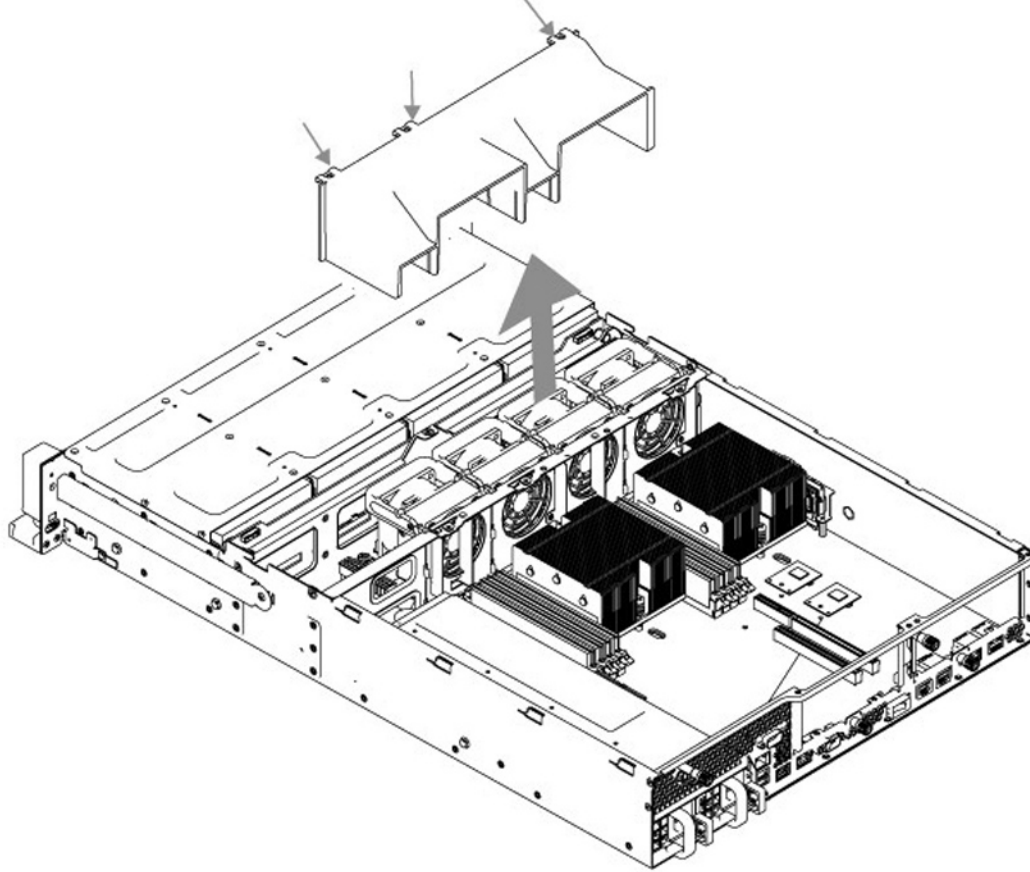
The appliance has four fan units, each with two fans.

Figure 2-34. 2U Fan layout with fan ID numbers



3. Pull the fan release lever upward and pull the fan up from the chassis.

Figure 2-35. Removing the fan in 2U appliances



4. Plug the replacement fan into the chassis.
5. Replace the chassis cover.

Note: If the IPMI alarm triggers when you open the chassis cover, enter the **clear hardware error-log** command in the CLI to clear the alarm. For details, see the *Riverbed Command-Line Interface Reference Manual*.

Replacing SteelHead xx50 Components

This chapter describes how to replace components in SteelHead xx50 (including Interceptor 9350) appliances. It includes the following sections:

- “Required tools” on page 67
- “Replacing disk drives” on page 67
- “Replacing power supply units” on page 72
- “Replacing memory” on page 73
- “Replacing fans” on page 80

To access instructional videos describing how to identify specific SteelHead appliances as well as how to replace disk drives for each appliance family, go to <https://support.riverbed.com/kb/multimedia.htm>.

Note: You must use approved components for the system to function properly. Installation of unapproved components will result in boot failure. To order components, contact Riverbed Support at <https://support.riverbed.com>.

Required tools

You need the following tools and equipment to replace appliance components:

- You must use approved components for the appliance to function properly. Installation of unapproved components will result in boot failure. To order components, contact Riverbed Support at <https://support.riverbed.com>.
- An antistatic strap. When you replace components, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment. For details, see “[Electrostatic discharge guidelines](#)” on page 8.
- Use the magnetic Phillips screwdriver enclosed with your shipment to remove screws in the appliance. The magnetic screwdriver ensures screws aren’t lost in the appliance.

Replacing disk drives

The following sections describe how to replace disk drives in the xx50 appliances.

Note: When you replace the disk drive, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.

If you have older hardware (for example, xx20 appliances), see the documentation set for RiOS 6.5.x or earlier. To service appliance 50, 100, 200, and 300 disk drives, contact Riverbed Support at <https://support.riverbed.com>.

Replacing disk drives in SteelHead 150, 250, and 550 appliances

SteelHead 150, 250, and 550 appliances are equipped with a replaceable disk drive. The disk drive isn't hot swappable; you must first turn off the system and remove the power cord before you replace the disk drives.

You must use approved disk drives. To order disk drives, contact your sales representative.



Caution: SteelHead 150, 250, and 550 disk drives aren't hot swappable. You must turn off the system and remove the power cable before you replace the disk drive.



Caution: When removing or replacing disk drives, be careful not to touch the adjacent power supply unit. Touching the power supply unit can cause electric shock.

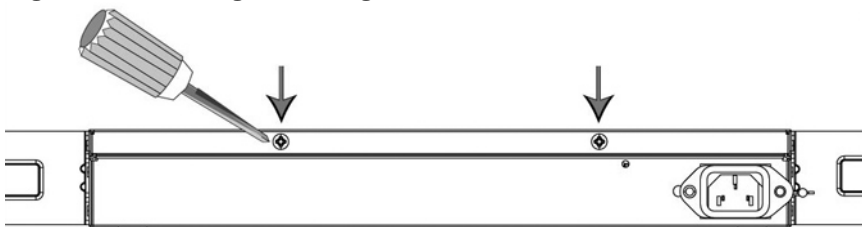


Caution: Use caution when you remove or replace components; they can become hot to the touch.

To replace the disk drive

1. Power down the SteelHead.
2. Unplug the power cord from the AC circuit.
3. Remove the SteelHead from its mounting rack, if necessary.
4. Remove the two locking screws on the back of the chassis.

Figure 3-1. Removing the locking screws

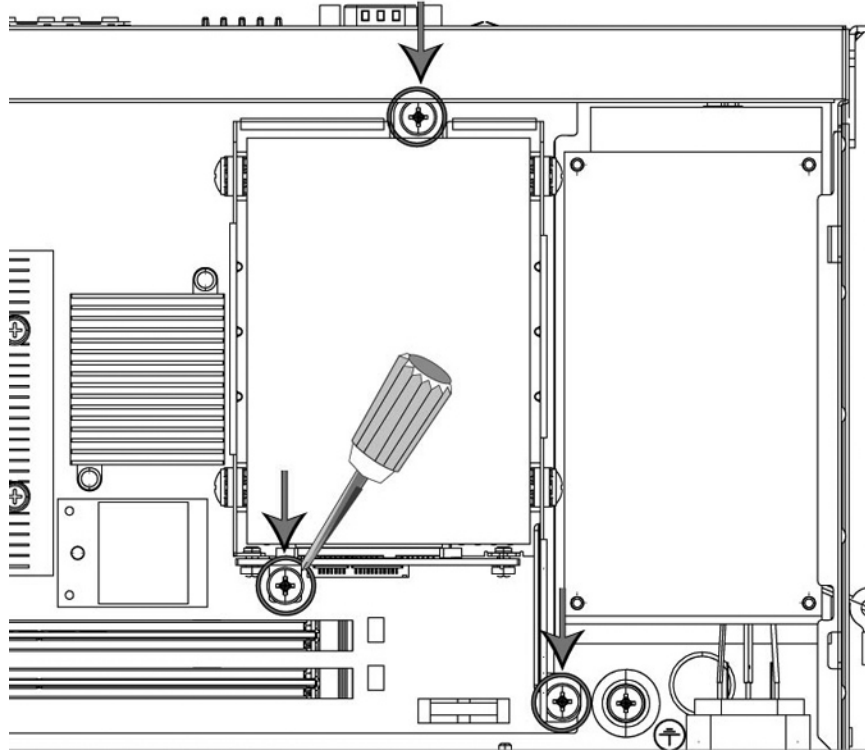


5. Position your thumbs on the top of the appliance and slide the cover back from the chassis.
6. To remove the disk drive, unscrew the three screws and washers holding the disk drive casing to the chassis.



Caution: Use the magnetic screw driver that ships with the disk drive to remove the screws. Use caution when removing the screws and washers; don't drop them into the appliance.

Figure 3-2. Removing disk drive screws



7. Remove the old disk drive with casing from the appliance.
8. Insert the new disk drive with casing in the same position and secure the casing with the three included screws.
9. Replace the appliance cover, making sure the tabs of the cover are under the front frame.
10. Plug the power cord into the AC circuit.
11. Power on the appliance.

The new disk drive runs through a self-test automatically. You don't need to set up or configure the new disk drive.

Replacing disk drives in the Interceptor 9350

Interceptor 9350 appliances are equipped with replaceable, hot-swappable disk drives.

Note: Upgrading appliances can impact the data store. For detailed information about the impact of upgrading your system on the data store and RSP, see [“Platform requirements” on page 107](#).

You must use approved disk drives. To order disk drives, contact your sales representative.

Note: When you replace disk drives, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment.



Caution: Use caution when you remove or replace components; they can become hot to the touch.

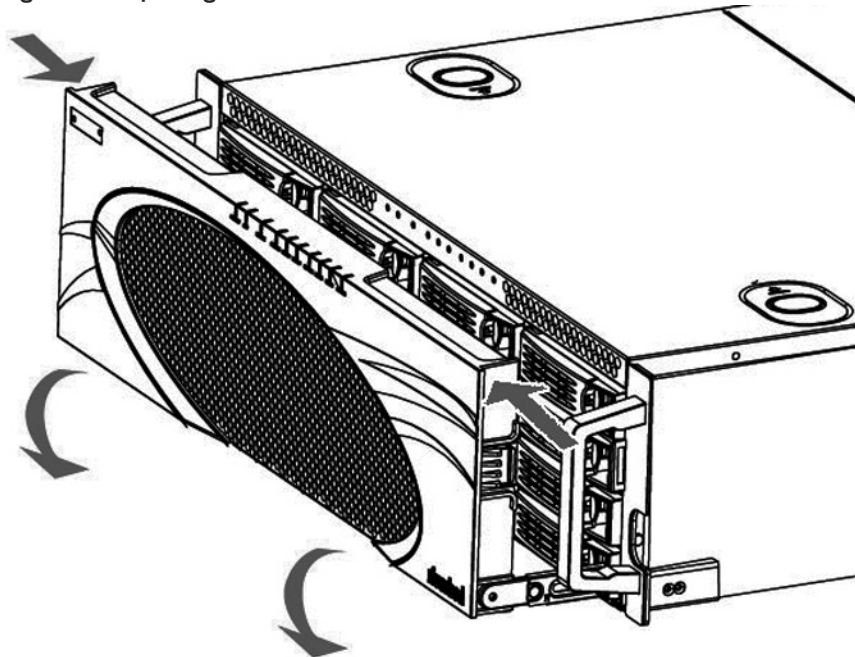
To replace the disk drive

1. Open the bezel.

Press the buttons on each side of the bezel and pull toward you.

The bezel remains attached to the appliance on hinges.

Figure 3-3. Opening the bezel on the SteelHead

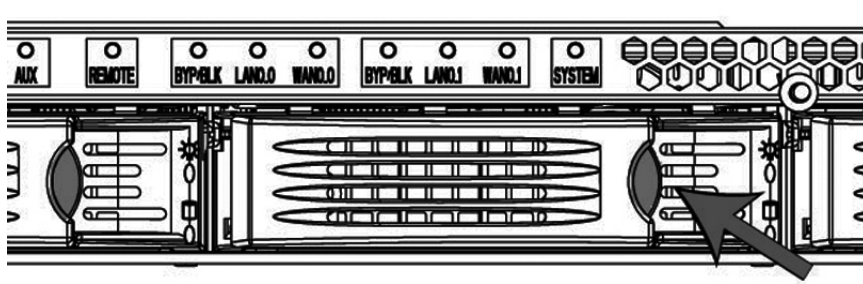


2. Identify the faulty disk drive.

The Alarm Status page in the Management Console identifies the faulty disk drive.

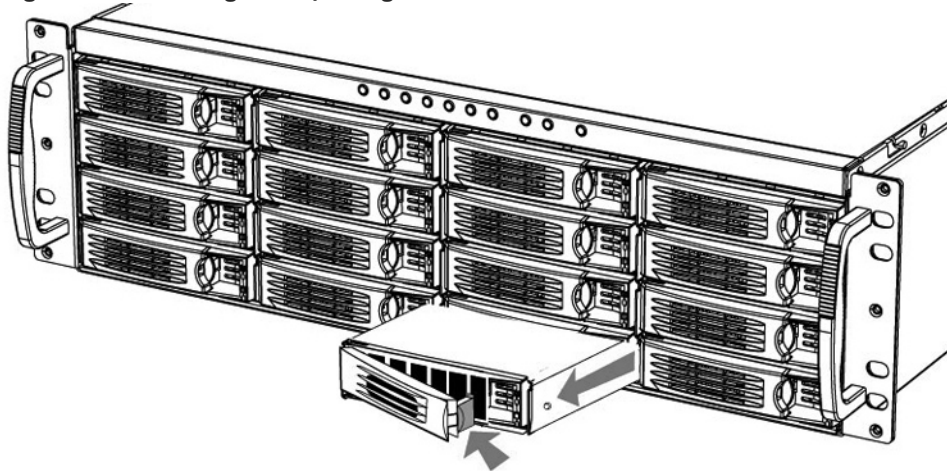
The drives are numbered in ascending order from left to right (that is, 0, 1, 2, 3). On Interceptor 9350 appliances, the bottom LED light indicates which drive to remove.

Figure 3-4. Disk drive numbers



3. Press the orange release button to the left and pull the drive handle toward you to release the disk drive.
4. Slide the faulty disk drive out of the slot.
Make sure you remove the correct drive.

Figure 3-5. Removing and replacing the disk drives



5. Open the new disk-drive handle by pressing the orange release button.
6. Slide in the new disk drive until it mates with the back connectors in the chassis.
7. Press in the disk-drive handle to close.

The new disk drive runs through a self-test automatically. The disk drive automatically begins proper operation with the other disk drives. You don't need to set up or configure the new disk drive.

It takes approximately 3 to 4 hours, depending on the system load, to rebuild a new disk drive. The administrator user receives email when the disk drive has finished rebuilding.

Replacing power supply units

This section describes how to add or replace power supply units for the xx50 appliances. This section includes the following procedures:

- “Replacing power supply units in Interceptor 9350 appliances” on page 72

Replacing power supply units in Interceptor 9350 appliances

Interceptor 9350 appliances are equipped with replaceable, hot-swappable power supply units.

Note: You must use approved power supply units. To order power supply units, contact your sales representative.

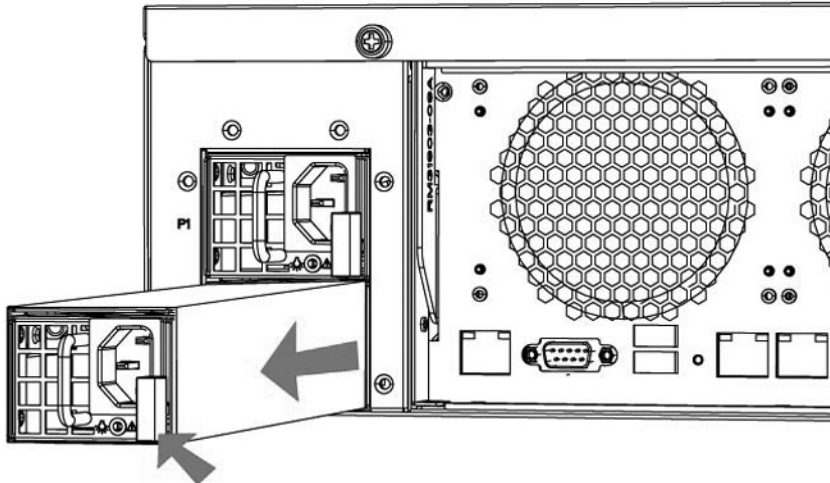


Caution: Use gloves when replacing the power supply units; they can become hot to the touch.

To replace a power supply unit

1. Locate the defective power supply unit and remove the power cord.
Power Supply 0 (PS0) is on the bottom, and Power Supply 1 (PS1) is on the top.
2. Press the green release tab toward the black handle, and pull the power supply unit out of the chassis.

Figure 3-6. Pulling out the power supply unit



Caution: Put the defective power supply unit aside; wait until it cools down before touching it.

3. Slide in the new power supply until it mates with the back connectors in the chassis.
When the power supply unit is pushed all the way in, the button clicks to the right.
4. Plug the AC power cord into the new power supply unit.

Replacing memory

This section describes how to replace memory in the xx50 appliances.

DIMM slot locations

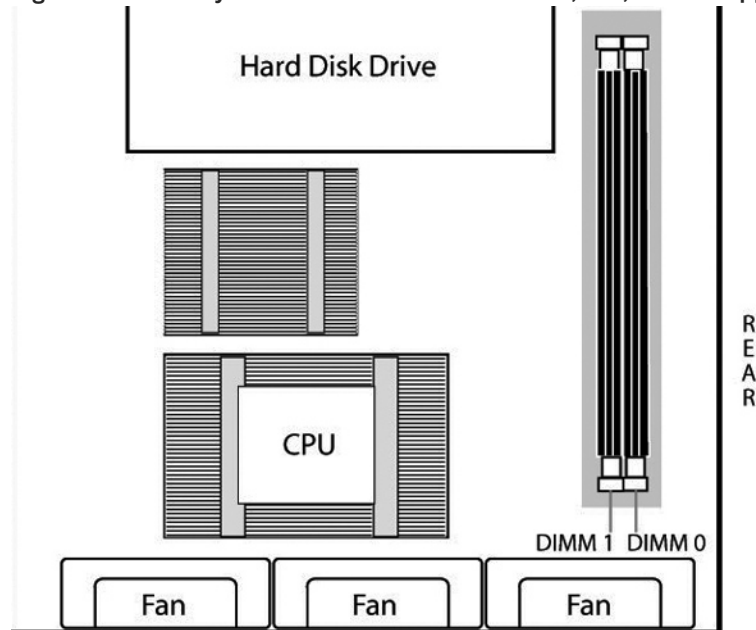
Memory modules and slot locations vary according to the motherboard in your appliance. Before you begin, you must obtain the correct replacement memory and slot location from Riverbed Support. The following sections identify the slot location for the memory modules according to the hardware platform.

- “DIMM slot locations in SteelHead 150, 250, and 550 appliances” on page 73
- “DIMM slot locations in Interceptor 9350 appliances” on page 74

DIMM slot locations in SteelHead 150, 250, and 550 appliances

Figure 3-7 shows the memory module slot locations for SteelHead 150, 250, and 550 appliances.

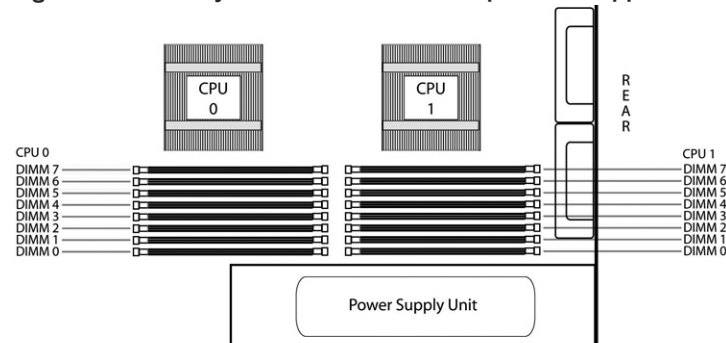
Figure 3-7. Memory module slots in SteelHead 150, 250, and 550 appliances



DIMM slot locations in Interceptor 9350 appliances

Figure 3-8 shows the memory module slot locations for Interceptor 9350 appliances.

Figure 3-8. Memory module slots in Interceptor 9350 appliances



Replacing memory modules in SteelHead 150, 250, and 550 appliances

This section describes how to replace memory modules in a SteelHead 150, 250, and 550 appliance.

Before you begin, work with Riverbed Support at <https://support.riverbed.com> to determine the type of memory for the motherboard in your appliance and to determine the correct slot location for the memory. Memory modules and slot locations vary according to the motherboard in your appliance.

When replacing memory, you must use approved memory modules. Contact your Riverbed sales representative to obtain the correct memory modules.

Note: When you replace memory modules, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment. For details, see “[Electrostatic discharge guidelines](#)” on page 8.

To replace the memory modules

1. Power down the system.
2. Disconnect the appliance from the electrical outlet and peripherals.
3. Remove the two locking screws on the back of the chassis.

Figure 3-9. Removing the locking screws



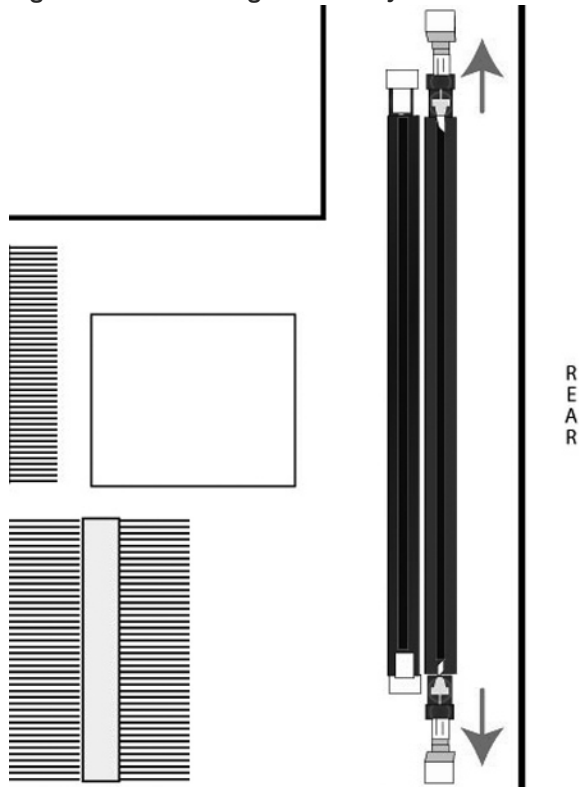
4. Position your thumbs on the top of the appliance and slide the cover back from the chassis.
5. Carefully lift the cover away from the appliance.

6. Press the ejector tabs on the memory slots down and outward, and gently pull the memory module out of the slot.



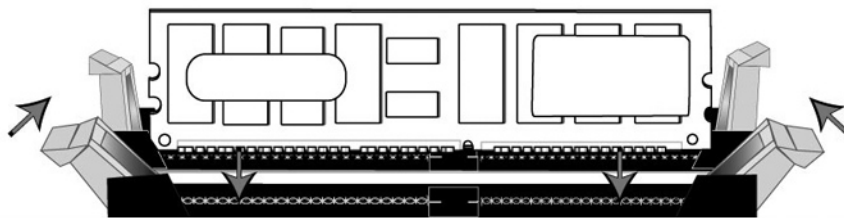
Caution: Be careful not to touch the adjacent power supply unit. Touching the power supply unit could cause electric shock.

Figure 3-10. Accessing the memory modules



7. If you are replacing memory, remove the existing memory module and replace it with the approved memory module.
8. Align the memory-module edge connector with the slot alignment keys and insert it into the slot. The module slot has two alignment keys that allow you to install the module in only one direction.

Figure 3-11. Inserting and securing the memory module in the DIMM slot



9. Press down on the memory module with your thumbs while pulling up on the ejectors with your index fingers to lock the module into the slot.

10. Ensure that all ejector tabs are in the upright locked position.
11. Replace the chassis cover.

Replacing memory modules in 1U xx50 appliances

This section describes how to replace memory modules in a 1U appliance. Before you begin, you must obtain the correct replacement memory and slot location from Riverbed Support. Memory modules and slot locations vary according to the motherboard in your appliance.

Contact Riverbed Support at <https://support.riverbed.com> to determine the type of memory and slot location for the motherboard in your appliance.

Note: When you replace memory modules, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment. For details, see “[Electrostatic discharge guidelines](#)” on page 8.

To replace the memory modules

1. Power down the system.
2. Disconnect the appliance from the electrical outlet and peripherals.
3. Carefully lift the cover away from the appliance.
4. Press the ejector tabs on the memory slots down and outward, and gently pull the memory module out of the slot.

Figure 3-12. Accessing the memory modules

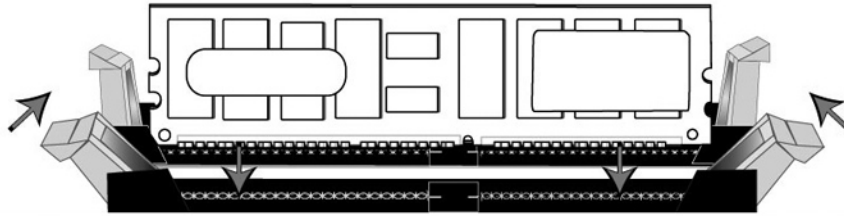


5. Remove the existing memory module and replace it with an approved memory module of the same size.

Note: Replacing the existing memory module with a module of a different size causes the system to fail. You must use approved memory modules. Contact Riverbed Support at <https://support.riverbed.com> to obtain the correct memory modules.

6. Align the memory-module edge connector with the slot alignment keys and insert it into the slot. The module slot has two alignment keys that allow you to install the module in only one direction.

Figure 3-13. Inserting the memory modules into the connector slot and securing



7. Press down on the memory module with your thumbs while pulling up on the ejectors with your index fingers to lock the module into the slot.
8. Ensure that all ejector tabs are in the upright locked position.
9. Repeat Step 3 to Step 7 of this procedure to install the remaining memory modules.
10. Replace the chassis cover.

Replacing memory modules in 3U xx50 appliances

This section describes how to replace memory modules in 3U appliances. Before you begin you must obtain the correct replacement memory and slot location from Riverbed Support. Memory modules and slot locations vary according to the motherboard in your appliance.

Contact Riverbed Support at <https://support.riverbed.com> to determine the type of memory and slot location for the motherboard in your appliance.

Note: When you replace memory modules, you must wear a grounded ESD antistatic strap to protect the hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment. For details, see [“Electrostatic discharge guidelines” on page 8](#).

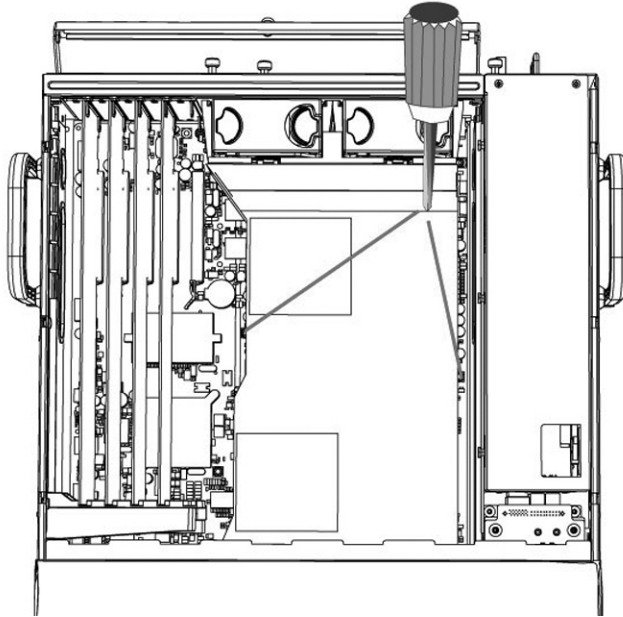
To remove the appliance cover

1. Power down the system.
2. Disconnect the appliance from the electrical outlet and peripherals.
3. Remove the top cover of the chassis.

To access the memory modules in the Interceptor 9350 appliances, you must remove the appliance cooling shroud. The following procedure describes the necessary steps to remove the cooling shroud.

To remove the cooling shroud

1. Using a magnetic Phillips screwdriver, remove the two screws securing the cooling shroud to the motherboard.

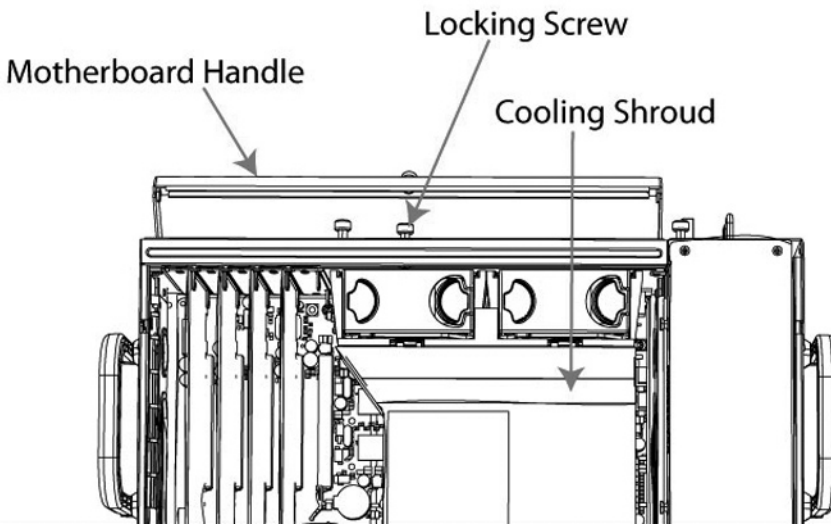
Figure 3-14. Removing the securing screws

2. Loosen the motherboard locking screw at the back of the chassis and pull the motherboard handle downward and slide the motherboard out 1 to 2 inches from the chassis to release the cooling shroud. Lift the cooling shroud straight up and out of the appliance.



Caution: Be careful not to damage any surrounding components when removing and installing the cooling shroud. Lift the shroud straight up to avoid damaging any components of the shroud.

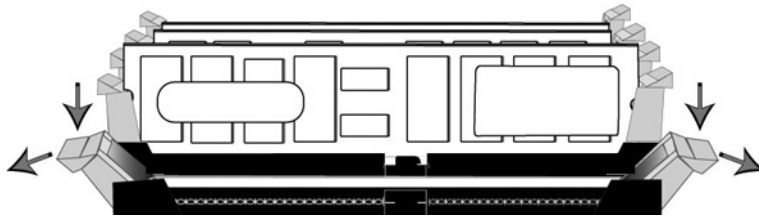
Figure 3-15. Sliding the motherboard outward to release the cooling shroud



To replace the memory modules

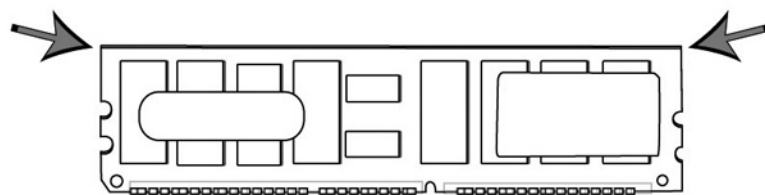
1. Press the ejector tabs on the memory module slot down and outward and gently pull the memory module out of the slot.

Figure 3-16. Accessing the memory modules



2. Hold the memory module on the outside edges to prevent damage to the module.

Figure 3-17. Proper handling of the memory module

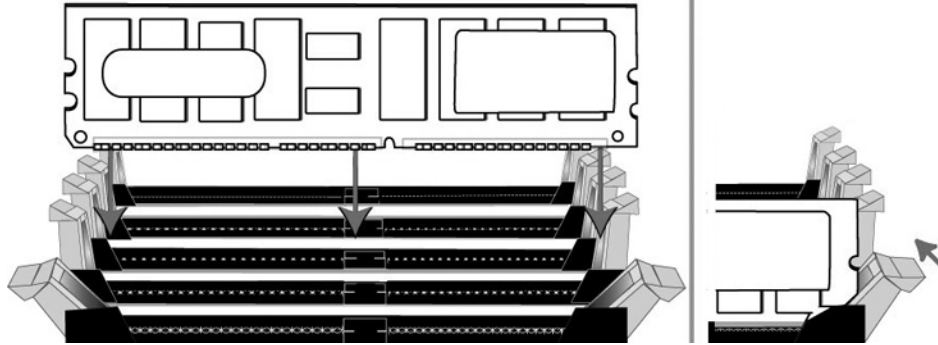


3. Remove the existing memory module and replace it with an approved memory module of the same size.

Note: Replacing the existing memory module with a module of a different size causes the system to fail. You must use approved memory modules. Contact Riverbed Support at <https://support.riverbed.com> to obtain the correct memory modules.

- Align the memory-module edge connector with the slot alignment keys and insert it into the slot. The module slot has two alignment keys that allow you to install the module in only one direction.

Figure 3-18. Inserting the memory modules into the connector slot and securing



- Press down on the memory module with your thumbs while pulling up on the ejectors with your index fingers to lock the module into the slot.
- Ensure that all ejector tabs are in the upright locked position.
- Repeat Steps 3 to Step 7 of this procedure to install the remaining memory modules.
- Replace the chassis cover.

Replacing fans

The following sections describe how to replace fans in the SteelHead xx50 appliances. These appliances are equipped with hot-swappable fans.

Determining fan status

This section describes how to determine the status of individual fans in the appliance.

To determine fan status

- Connect to the CLI.

For details, see the *Riverbed Command-Line Interface Reference Manual*.

- At the system prompt, enter **show stats fan**:

```
amnesiac> show stats fan
FanId   RPM      Min RPM Status
0        4963     1080    ok
1        4963     1080    ok
2        4821     1080    ok
3        4963     1080    ok
4        4963     1080    ok
5        4821     1080    ok
```

The output and number of fans will vary depending on your appliance.

Replacing fans in the Interceptor 9350 appliances

This section describes how to replace fans in the Interceptor 9350. These appliances are equipped with four hot-swappable fans at the front of the chassis and two hot-swappable fans at the back of the chassis.

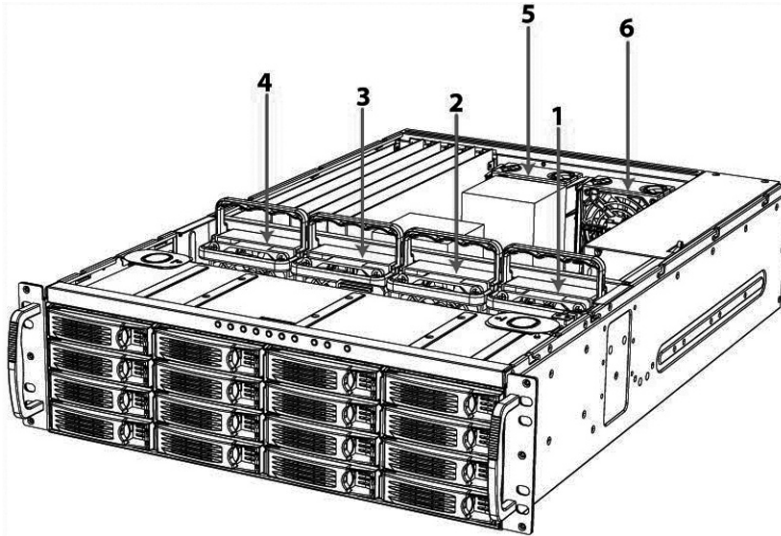
Note: You must use approved fans. To order fans, contact your sales representative.

Fan locations

This section provides an overview of fan locations and fan labels in Interceptor 9350. These appliances are equipped with four fans at the front of the chassis and two fans at the back.

Fan ID	Physical Label
1	Fan 1
2	Fan 2
3	Fan 3
4	Fan 4
5	Fan 5
6	Fan 6

Figure 3-19. Interceptor 9350 fan layout with fan ID numbers

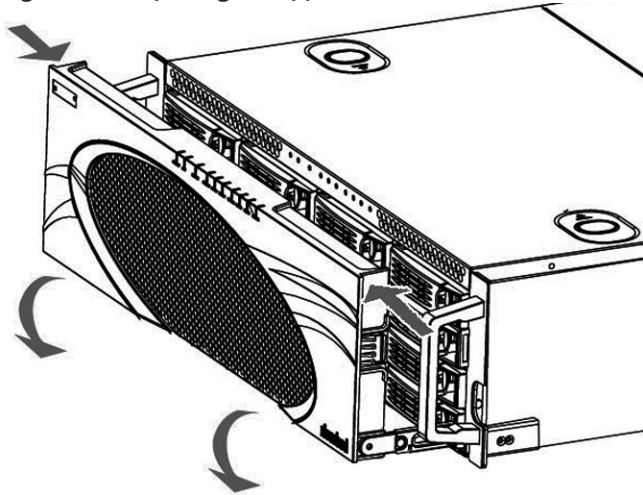


To replace the front fans

1. To open the bezel, press the buttons on each side of the bezel and pull toward you.

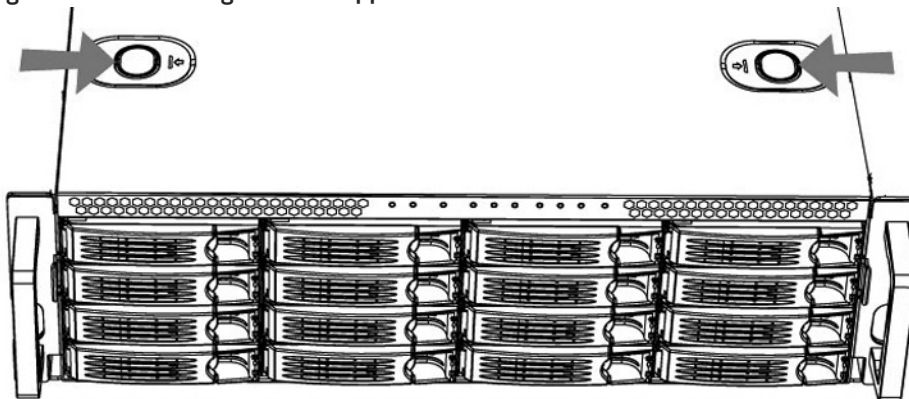
The bezel remains attached to the appliance on hinges.

Figure 3-20. Opening the appliance bezel



2. To remove the front appliance cover, press in the two buttons on top of the cover and slide the cover forward, and then lift up and away from the chassis.

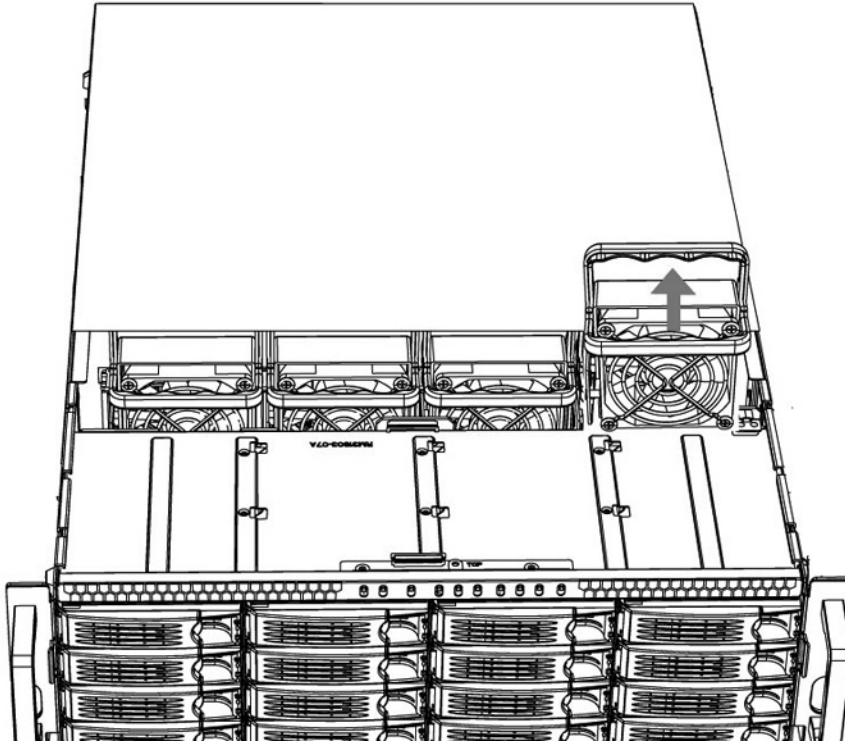
Figure 3-21. Removing the front appliance cover



3. Identify the faulty fan.

4. Pull the fan release lever upwards and pull the fan up from the chassis.

Figure 3-22. Releasing the fan



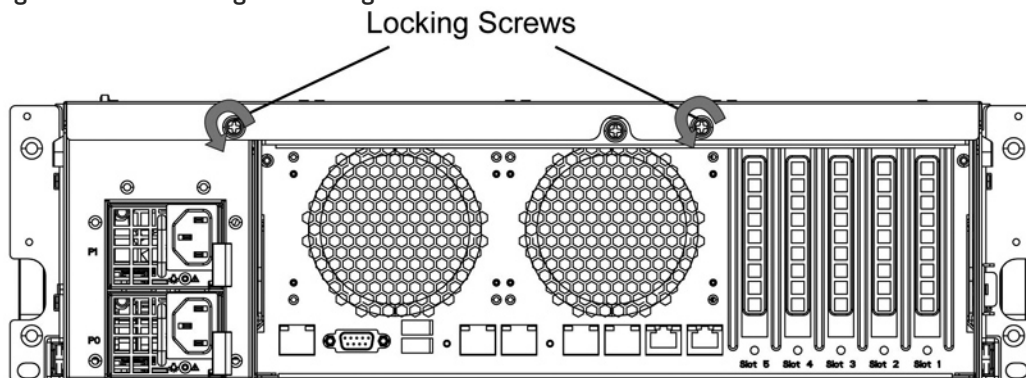
5. Plug the replacement fan into the chassis.
6. Replace the chassis front cover.

To replace the front cover, insert the rear edge of the front cover below the front edge of the rear cover.

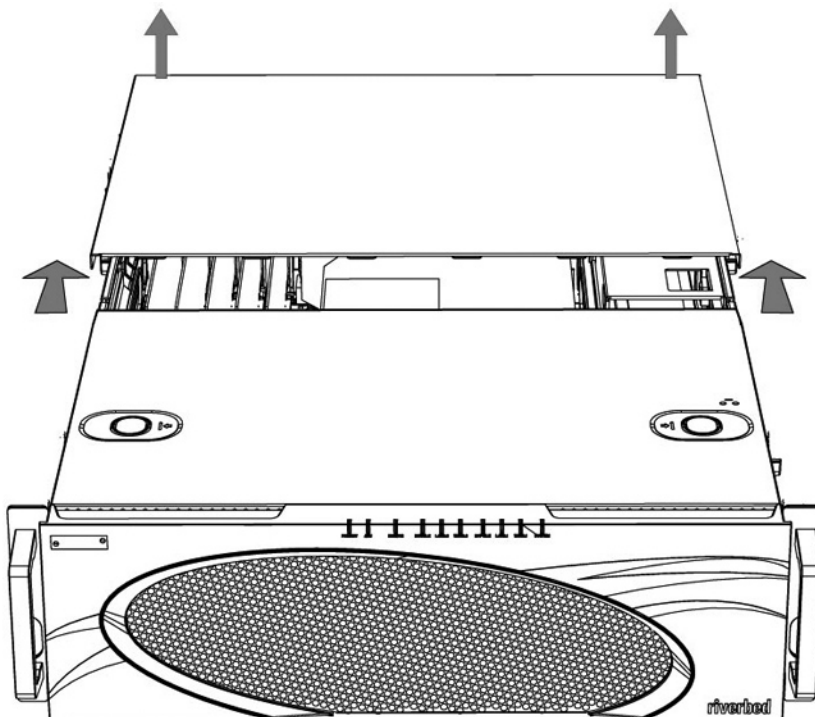
Note: The RiOS IPMI alarm triggers when the chassis cover opens on these appliances while the system is running. To clear this alarm, run the **clear hardware error-log** command in the CLI. For details, see the *Riverbed Command-Line Interface Reference Manual*.

To replace the rear fans

1. To remove the rear appliance cover, loosen the two locking screws on the back of the appliance.

Figure 3-23. Loosening the locking screws

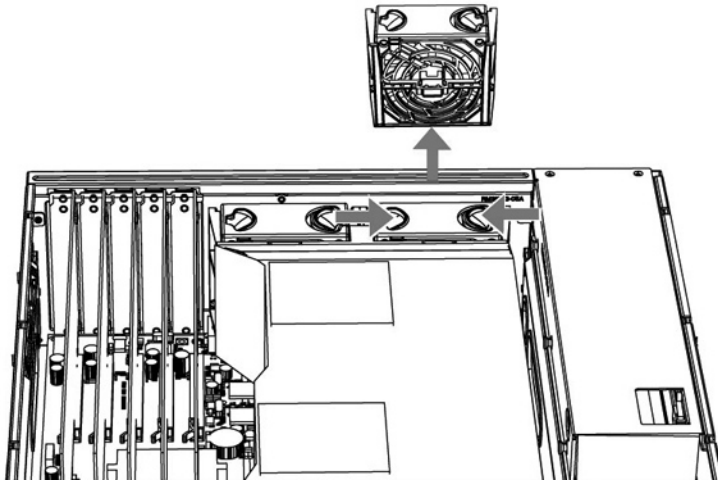
2. Slide the rear cover backward several inches, and then lift up and away from the chassis.

Figure 3-24. Removing the rear cover from the chassis

3. Identify the faulty fan.

4. Press the buttons on the top of the fan inwards and pull the fan up from the chassis.

Figure 3-25. Releasing the fan



5. Plug the replacement fan into the chassis.
6. Replace the chassis cover.

Note: The RiOS IPMI alarm is triggered when the chassis cover is opened on these appliances while the system is running. To clear this alarm, enter the **clear hardware error-log** command in the CLI. For details, see the *Riverbed Command-Line Interface Reference Manual*.

Replacing the motherboard in SteelHead 7050 appliances

For the SteelHead 7050 appliance, you can replace the motherboard. Work with Riverbed Support to complete these steps.

Note: A video showing these instructions is on the Riverbed Support Site: <https://support.riverbed.com/kb/multimedia.htm>.

To replace a motherboard in a 7050 appliance

1. Power down the system.
2. Disconnect the power cord.
3. Remove the cover.
4. Loosen the motherboard locking screw at the back of the chassis and pull the motherboard handle downward.
The motherboard will slide out 1 to 2 inches from the chassis.
5. Continue sliding the motherboard completely from the chassis.



Caution: Be sure to use both hands as the motherboard is heavy.

6. Following the same procedure, remove the replacement motherboard from the chassis.
Each motherboard ships within a chassis.
7. Place the two motherboards side by side.
This helps transfer the appropriate components.
8. Using a Phillips screwdriver, remove the flash drive from the replacement motherboard.
9. Discard this flash drive.
10. Remove the flash drive from the failed motherboard and add it to the replacement motherboard.
Align the pins and secure the flash drive with the Phillips screw.
11. Move the network cards from the failed motherboard to the replacement motherboard.
Move the cards one at a time and keep the cards in the same positions. You will need to remove the slot covers for each network card to transfer. See the *Network and Storage Card Installation Guide* for details.
12. Move the SDR acceleration card to the new motherboard.
Use the same procedure as you did with the network cards.
13. Insert the new motherboard into the chassis. Carefully align it inside the chassis, and slide it into place.
14. For the last inch, move the handle into the upright position and secure it with the locking screw.
15. Replace the back cover and secure it with the fasteners.
16. Connect the power and start the appliance.
17. From the command line, enter configuration mode and enter the **show licenses** command.
The output indicates the existing licenses are invalid.
18. Write down the MAC addresses of primary, AUX, lan0_0, wan0_0, lan0_1, and wan0_1.
19. Enter the CLI command **support motherboard update**.
Note: After you enter the command, don't press Ctrl+C before the command completes. You will destroy the BIOS. Restart the appliance when prompted using the reload command.
The commands take a while to complete as they copy the BIOS and reconfigure the MAC addresses.
The **support motherboard update** command is a hidden command.
20. When prompted, reboot the appliance using the **reload** command.
21. Once the appliance reboots, enter the **show licenses** command and ensure that the licenses are valid.
22. Verify the MAC addresses of the primary and AUX interfaces.

The primary and AUX interfaces should have new MAC addresses. The MAC addresses of lan0_0, wan0_0, lan0_1, and wan0_1 remain the same.

Upgrading SteelHead CX, EX, and SteelFusion Core Appliances

This chapter describes how to upgrade SteelHead CX, EX, and SteelFusion Core appliances. It includes the following sections:

- “Overview” on page 89
- “Installing licenses and activating specifications” on page 96
- “Installing hardware for model upgrades” on page 99
- “Installing required memory and disk drives for EX1160VH upgrades” on page 103

Overview

A model upgrade enables you to add a license to an existing CX, EX, or SteelFusion appliance to increase the capacity and the model number of the appliance within its platform family.

You can install licenses using the Riverbed command-line interface (CLI) or the SteelHead Management Console. Model upgrades always preserve the configuration of the appliance.

In some cases, model upgrades require the installation of additional disk drives and memory modules. Upgrades that require the installation of additional hardware don't preserve the data store.

Model upgrades and platform requirements

The following table describes the available model upgrades, the system requirements for the upgrade, and the impact of the upgrade on the appliance.

Source model	Destination model	Upgrade requirements	Minimum software version	Impact on data store	Impact on configuration	Reboot required
CX255U	CX255L	License only	RiOS 8.0.3a, 8.5.0	None	None	No
CX255U	CX255M	License only	RiOS 8.0.3a, 8.5.0	None	None	No
CX255U	CX255H	License only	RiOS 8.0.3a, 8.5.0	None	None	No
CX255L	CX255M	License only	RiOS 8.0.3a, 8.5.0	None	None	No

Source model	Destination model	Upgrade requirements	Minimum software version	Impact on data store	Impact on configuration	Reboot required
CX255L	CX255H	License only	RiOS 8.0.3a, 8.5.0	None	None	No
CX255M	CX255H	License only	RiOS 8.0.3a, 8.5.0	None	None	No
CX555M	CX555H	License only	RiOS 6.5.4, 7.0.1	None	None	No
CX570L	CX570M	License only	RiOS 8.0.6, 8.5.3, 8.6.1	None	None	No
CX570L	CX570H	License only	RiOS 8.0.6, 8.5.3, 8.6.1	None	None	No
CX570M	CX570H	License only	RiOS 8.0.6, 8.5.3, 8.6.1	None	None	No
CX755L	CX755M	License only	RiOS 6.5.4, 7.0.1	None	None	No
CX755L	CX755H	License and Hardware Kit	RiOS 8.0.3, 8.5	Clears RiOS data store and log files.	None	Yes
CX755M	CX755H	License and Hardware Kit	RiOS 8.0.3, 8.5	Clears RiOS data store and log files.	None	Yes
CX770L	CX770M	License only	RiOS 8.0.6, 8.5.3, 8.6.1	None	None	No
CX770L	CX770H	License only	RiOS 8.0.6, 8.5.3, 8.6.1	None	None	No
CX770M	CX770H	License only	RiOS 8.0.6, 8.5.3, 8.6.1	None	None	No
CX1555L	CX1555M	License only	RiOS 6.5.4, 7.0.1	None	None	No
CX1555L	CX1555H	License and Hardware Kit	RiOS 8.0.3, 8.5	Clears RiOS data store and log files.	None	Yes
CX1555M	CX1555H	License and Hardware Kit	RiOS 8.0.3, 8.5	Clears RiOS data store and log files.	None	Yes
CX3070L	CX3070M	License only	RiOS 8.6.2, 9.0.0a	None	None	No
CX3070M	CX3070H	License only	RiOS 8.6.2, 9.0.0a	None	None	No
CX5055M	CX5055H	License only	RiOS 7.0.5, 8.0	None	None	No

Source model	Destination model	Upgrade requirements	Minimum software version	Impact on data store	Impact on configuration	Reboot required
CX5070M	CX5070H	License only	RiOS 8.6.2, 9.0.0a	None	None	No
EX560L	EX560M	License only	EX 1.0	None	None	No
EX560L	EX560H	License only	EX 1.0	None	None	No
EX560M	EX560H	License only	EX 1.0	None	None	No
EX560G	EX560L	License only	EX 1.0	None	None	Yes
EX560G	EX560M	License only	EX 1.0	None	None	Yes
EX560G	EX560H	License only	EX 1.0	None	None	Yes
EX760L	EX760M	License only	EX 1.0	None	None	No
EX760L	EX760H	License only	EX 1.0	None	None	No
EX760M	EX760H	License only	EX 1.0	None	None	No
EX1160L	EX1160M	License only	EX 1.0/2.5.3	None	None	No
EX1160L	EX1160H	License only	EX 1.0/2.5.3	None	None	No
EX1160L	EX1160VH	License and Hardware Kit	EX 3.5	Clears RiOS data store and log files. If SteelFusion is enabled, it clears the blockstore. (Local VSP data isn't cleared.)	None	Yes
EX1160M	EX1160H	License only	EX 1.0/2.5.3	None	None	No
EX1160M	EX1160VH	License and Hardware Kit	EX 3.5	Clears RiOS data store and log files. If SteelFusion is enabled, it clears the blockstore. (Local VSP data isn't cleared.)	None	Yes

Source model	Destination model	Upgrade requirements	Minimum software version	Impact on data store	Impact on configuration	Reboot required
EX1160H	EX1160VH	License and Hardware Kit	EX 3.5	Clears RiOS data store and log files. If SteelFusion is enabled, it clears the blockstore. (Local VSP data isn't cleared.)	None	Yes
EX1160G	EX1160L	License only	EX 1.0/2.5.3	None	None	Yes
EX1160G	EX1160M	License only	EX 1.0/2.5.3	None	None	Yes
EX1160G	EX1160H	License only	EX 1.0/2.5.3	None	None	Yes
EX1160G	EX1160VH	License and Hardware Kit	EX 3.5	Clears RiOS data store, SteelFusion blockstore, and log files.	None	Yes
EX1260L	EX1260M	License only	EX 1.0/2.5.3	None	None	No
EX1260L	EX1260H	License only	EX 1.0/2.5.3	None	None	No
EX1260L	EX1260VH	License and Hardware Kit	EX 3.5	Clears RiOS data store and log files. If SteelFusion is enabled, it clears the blockstore.	None	Yes
EX1260M	EX1260H	License only	EX 1.0/2.5.3	None	None	No
EX1260M	EX1260VH	License and Hardware Kit	EX 3.5	Clears RiOS data store and log files. If SteelFusion is enabled, it clears the blockstore. (Local VSP data isn't cleared.)	None	Yes

Source model	Destination model	Upgrade requirements	Minimum software version	Impact on data store	Impact on configuration	Reboot required
EX1260H	EX1260VH	License and Hardware Kit	EX 3.5	Clears RiOS data store and log files. If SteelFusion is enabled, it clear the blockstore. (Local VSP data isn't cleared.)	None	Yes
EX1260G	EX1260L	License only	EX 1.0/2.5.3	None	None	Yes
EX1260G	EX1260M	License only	EX 1.0/2.5.3	None	None	Yes
EX1260G	EX1260H	License only	EX 1.0/2.5.3	None	None	Yes
EX1260G	EX1260VH	License and Hardware Kit	EX 3.5	Clears RiOS data store, SteelFusion blockstore, and log files.	None	Yes
EX1360G	EX1360L	License only	EX 2.5	None	None	Yes
EX1360L	EX1360M	License only	EX 2.5	None	None	No
GC2000L	GC2000M	License only	SteelFusion 1.0	None	None	No
GC2000L	GC2000H	License only	SteelFusion 1.0	None	None	No
GC2000L	GC2000VH	License only	SteelFusion 1.0	None	None	No
GC2000M	GC2000H	License only	SteelFusion 1.0	None	None	No
GC2000M	GC2000VH	License only	SteelFusion 1.0	None	None	No
GC3000L	GC3000M	License only	SteelFusion 3.0	None	None	No
GC3000L	GC3000H	License only	SteelFusion 3.0	None	None	No
GC3000M	GC3000 H	License only	SteelFusion 3.0	None	None	No

Notes:

- The CX7070 and CX7055 appliances don't provide a model upgrade through a license. To upgrade these appliances, you need to exchange the appliance. During this upgrade, there is no data store migration. For more information about this upgrade, contact the Riverbed SalesOps team.

- You can't upgrade an EX1260 (2 TB) to an EX1260 (4 TB).
- Once you perform a VH upgrade for a SteelHead EX, you can't downgrade to a software version earlier than 3.5.
- Newer EX 1160 and 1260 appliances—those with SKUs that end with a 5—require a minimum software version of 2.5.3.
- The upgrade process from a G specification to a VH specification is a two-step process: first, upgrade from a G to a L/M/H specification and then upgrade from the L/M/H specification to the VH specification.

Hardware upgrade kits

Some model upgrades require the installation of hardware. The hardware required for your model upgrade is contained in the Upgrade Kit shipped to you.

This table lists the Upgrade Kit part numbers and hardware contents for model upgrades requiring additional hardware.

Upgrade	Upgrade kit part number	Memory modules included in kit	Hard disks included in kit
CX755L--->CX755H	UPG-CXA-755-L-H	1 x 2 GB memory module	Hard disk casing with 1 x 250 GB HDD and 1 x 160 GB SSD
CX755M--->CX755H	UPG-CXA-755-M-H	1 x 2 GB memory module	Hard disk casing with 1 x 250 GB HDD and 1 x 160 GB SSD
CX1555L--->CX1555H	UPG-CXA-1555-L-H	None	2 x 160 GB SSD disks
CX1555M--->CX1555H	UPG-CXA-1555-M-H	None	2 x 160 GB SSD disks
EX1160 L/M/H (20G) ---> EX1160VH For SKU EXA-01160-B030 ---> EXA-01160-B020	UPG-EXA-1160-20G-VH	1 x 4 GB memory module	2 x 200 GB SSD disks
EX1160 L/M/H (48G) ---> EX1160VH For SKU EXA-01160-B035 ---> EXA-01160-B025	UPG-EXA-1160-48G-VH	None	2 x 200 GB SSD disks
EX1260 L/M/H ---> EX1260VH	UPG-EXA-1260-VH	None	2 x 100 GB SSD disks

For instructions on installing required hardware, see [“Installing hardware for model upgrades” on page 99](#).

Basic steps

You perform the following steps to upgrade a model.

To perform a license-only upgrade

1. Install the model upgrade license.

You can install the model upgrade license in the CLI or the Management Console. For detailed information, see [“Installing licenses and activating specifications” on page 96](#). After you install the license, the system indicates the model specifications available and if hardware is required for activation.

2. Stop the service.

You need to stop the SteelHead optimization service to activate a model upgrade specification.

3. Activate the specification.

Activate the model upgrade specification in the CLI or the Management Console. For detailed information, see [“Installing licenses and activating specifications” on page 96](#).

4. Reboot the system (if needed).

The system notifies you if a reboot is necessary.

5. Restart the service.

To perform a license and hardware kit upgrade

1. Install the model upgrade license.

You can install the model upgrade license in the CLI or the Management Console. For detailed information, see [“Installing licenses and activating specifications” on page 96](#). After you install the license, the system indicates the model specifications available and if hardware is required for activation.

2. Stop the service.

You need to stop the SteelHead optimization service to activate a model upgrade specification.

3. Activate the specification.

Activate the model upgrade specification in the CLI or the Management Console. For detailed information, see [“Installing licenses and activating specifications” on page 96](#). When you activate the specification for an upgrade requiring hardware changes, the system shuts down.

If you have SteelFusion configured on a SteelHead EX system, you need to remove the Core. From the SteelHead EX, choose EX Features > SteelFusion Edge: Storage and click **Remove Core**. For details, see the *SteelHead User's Guide*.

4. Install the required hardware.

For detailed information, see [“Installing hardware for model upgrades” on page 99](#).

5. Power on the appliance.

The system reformats the hard drives and completes the upgrade.

Installing licenses and activating specifications

This section describes how to install model upgrade licenses and activate model specifications using the CLI or the Management Console.

After you install a model upgrade license, you must stop the SteelHead service to activate the model specification.

Model upgrades using the CLI

This section describes how to install a model upgrade license and activate a specification using the CLI.

To install a model upgrade license from the CLI

1. Connect to the Riverbed CLI.

For detailed information about using the CLI, see the *Riverbed Command-Line Interface Reference Manual*.

2. Enter enable mode; at the system prompt, enter the **enable** command:

```
amnesiac > enable
```

3. Enter configuration mode; at the system prompt, enter the **configure terminal** command:

```
amnesiac # configure terminal
amnesiac (config) #
```

4. View current and available model specifications; enter the **show hardware spec** command:

Note: This step doesn't apply to SteelFusion Core.

```
amnesiac (config) # show hardware spec
Spec  Description
-----
* EX760L      BW Limit: 10000 Kb/s      Connection Limit: 900
EX760M      BW Limit: 10000 Kb/s      Connection Limit: 1500
      (activation requires license)
EX760H      BW Limit: 20000 Kb/s      Connection Limit: 2300
      (activation requires license)
* = active
```

5. Install the model upgrade license; enter the **license install <license-key>** command:

```
amnesiac (config) # license install LIC-EXAMPLE-EX760H-0000-0000-0-000X-0XX0
```

Important: We recommend you write the license to memory after it has been installed.

6. Write the model upgrade license to memory; enter the **write memory** command:

```
amnesiac (config) # write memory
```

7. View licenses installed on the appliance; enter the **show licenses** command:

```
amnesiac (config) # show licenses
```

```
LIC-EXAMPLE-EX760H-0000-0000-0-000X-0XX0
Index:      6
Feature:    MSPECEX760H
Valid:      yes
Active:     yes
```

8. View the available model upgrade specification; enter the `show hardware spec` command.

Note: This step doesn't apply to SteelFusion Core.

```
amnesiac (config) # show hardware spec
Spec  Description
-----
EX760L      BW Limit: 10000 Kb/s      Connection Limit: 900
            (activation requires license)
EX760M      BW Limit: 10000 Kb/s      Connection Limit: 1500
            (activation requires license)
* EX760H     BW Limit: 20000 Kb/s      Connection Limit: 2300

* = active
```

9. Stop the optimization service; enter the `no service enable` command:

```
amnesiac (config) # no service enable
Terminating optimization service.....
```

Note: You must stop the optimization service prior to model upgrade activation.

10. Activate the model specification; enter the `hardware spec activate <model-umber>` command.

Note: This step doesn't apply to SteelFusion Core.

```
amnesiac (config) # hardware spec activate EX760H
Appliance upgrade to EX760H successful
```

Note: Upgrades that require additional hardware automatically shut down the appliance after you activate the model upgrade specification. Install the new hardware and power on the system. The system reformats the drives and completes the upgrade.

11. Restart the optimization service for model upgrades that don't require a reboot, enter the `restart` command:

```
amnesiac (config) # restart
Terminating optimization service.....
Relaunching optimization service.
```

Note: After upgrading a model, you need to reapply admission control overrides relative to the default admission control values of the new model.

Model upgrades using the Management Console

This section describes how to install a model upgrade license and activate the specification using the SteelHead Management Console. For more information about using the Management Console, see the *SteelHead User's Guide*.

To install a model upgrade license using the Management Console

1. Choose Configure > Maintenance > Licenses to display the Licenses page.

Figure 4-1. Licenses page in the Management Console

Configure > Maintenance > Licenses ?

+ Add a New License - Remove Selected

<input type="checkbox"/>	License	Description	Status	Installation Date & Time	Method
<input type="checkbox"/>	LK1-SH10BASE-0000-0000-1-600D-2370-C170	Scalable Data Referencing (SDR)	Valid	Fri Jun 28 2013 17:53:26 PDT (2 days, 17 hours ago)	Manual
<input type="checkbox"/>	LK1-SH10EXCH-0000-0000-1-7788-0EC9-ABFA	Microsoft(R) Exchange	Valid	Fri Jun 28 2013 17:53:35 PDT (2 days, 17 hours ago)	Manual
<input type="checkbox"/>	LK1-SH10CIFS-0000-0000-1-8760-3B76-92F2	Windows(R) File Servers	Valid	Fri Jun 28 2013 17:53:30 PDT (2 days, 17 hours ago)	Manual
<input type="checkbox"/>	LK1-VLAB-0000-0000-1-D775-3A62-CB62	Unknown	Valid	Fri Jun 28 2013 17:53:44 PDT (2 days, 17 hours ago)	Manual
<input type="checkbox"/>	LK1-SH40SSL-0000-0000-1-28A2-2366-3B34	Enhanced Cryptographic License Key	Valid	Fri Jun 28 2013 17:53:40 PDT (2 days, 17 hours ago)	Manual
<input type="checkbox"/>	LK1-SH40BWO-0000-0000-1-DE04-D379-224C	Bandwidth Override	Valid	Fri Jun 28 2013 17:53:52 PDT (2 days, 17 hours ago)	Manual
<input type="checkbox"/>	LK1-SH21ACUNLOCK-0000-0000-1-E562-DA66-F64E	Admission Control Unlock	Valid	Fri Jun 28 2013 17:53:48 PDT (2 days, 17 hours ago)	Manual
<input type="checkbox"/>	LK1-SH55SCPS-0000-0000-1-F219-7149-E70C	SCPS	Valid	Fri Jun 28 2013 17:54:00 PDT (2 days, 17 hours ago)	Manual
<input type="checkbox"/>	LK1-MSPECCX1555L-0000-0000-1-17F2-6463-B224	Model CX1555L Specification	Valid	Fri Jun 28 2013 17:53:56 PDT (2 days, 17 hours ago)	Manual
	Included	Microsoft(R) SQL Server	Valid	--	Included
	Included	NFS	Valid	--	Included
	Included	HTTP	Valid	--	Included
	Included	Oracle Forms	Valid	--	Included

Fetch Updates Now Auto-licensing is currently disabled. Please contact your system administrator for assistance.

Hardware Specifications

☒ CX1555L: BW Limit: 50000 Kb/s Connection Limit: 3000
☐ CX1555M: BW Limit: 50000 Kb/s Connection Limit: 4500 (runnable)
☐ CX1555H: BW Limit: 100000 Kb/s Connection Limit: 6000 (hardware replacement required)

Apply

2. Click **Add a New License** to display the text box to add a new license.
3. Copy and paste the license key into the text box.
4. Click **Add** to add the license.
5. Click **Save** to save your settings permanently.

To activate a model upgrade specification using the Management Console

1. Choose Configure > Maintenance > Services to display the Services page.
2. Under Optimization Service click **Stop** to stop the SteelHead service.
3. Choose Configure > Maintenance > Licenses to display the Licenses page.

The hardware model specifications appear at the bottom of the page. The current specification appears in bold.

Figure 4-2. Hardware model specifications appear in the licenses page of the Management Console



4. Select the model specification you want to activate.

If a model specification requires an appliance reboot after activation, the message **activation reboots appliance** appears.

5. Click **Apply**.

Note: Upgrades that require additional hardware automatically shut down the appliance after you activate the model upgrade specification. Install the new hardware and power on the system. The system reformats the drives and completes the upgrade.

6. If your model upgrade doesn't require the installation of additional hardware, click the Restart icon to restart the optimization service.

When the upgrade is complete, the appliance is transformed into the new model. The model number appears on the appliance banner in the upper-right corner of the screen. The appliance retains its original serial number.

Note: After upgrading a model, you need to reapply admission control overrides relative to the default admission control values of the new model.

Installing hardware for model upgrades

This section describes how to install the hardware for model upgrades from CX755L and CX755M to CX755H and from CX1555L and CX1555M to CX1555H appliances. It includes the following procedures:

- [“Installing required memory and disk drives for CX755H upgrades” on page 100](#)
- [“Replacing hard disk drives for CX1555H upgrades” on page 102](#)
- [“Installing required memory and disk drives for EX1160VH upgrades” on page 103](#)
- [“Adding Disk Drives for EX1260VH Upgrades” on page 105](#)

For model upgrades that require additional hardware, you can install the license but can't fully activate the specification until you install the required hardware.

Note: Model upgrades that require additional hardware don't preserve the data store.

Installing required memory and disk drives for CX755H upgrades

This section describes how to install memory modules and replacement disk drives for CX755L and CX755M to CX755H upgrades. For the disk drive upgrade, you replace the hard drive casing that contains two HDDs with a new casing that contains one SSD and one HDD.

Note: When you install or replace memory modules, you must wear a grounded ESD strap. For details, see [“Electrostatic discharge guidelines” on page 8](#).

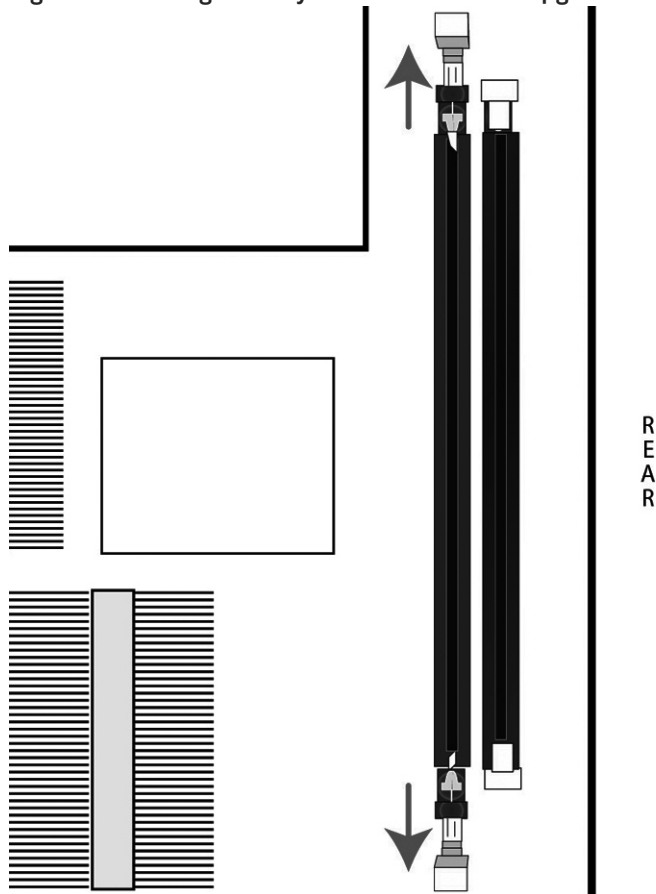
To upgrade memory and disk drives for CX755 model upgrades

1. When you activate the upgrade license, the system shuts down.
2. Disconnect the system from the electrical outlet.
3. Remove the chassis cover.
4. Install the Upgrade Kit memory module in DIMM slot 1.

CX755L and CX755M ship with a 2 GB memory module installed in DIMM slot 0; install the Upgrade Kit memory module in DIMM slot 1.

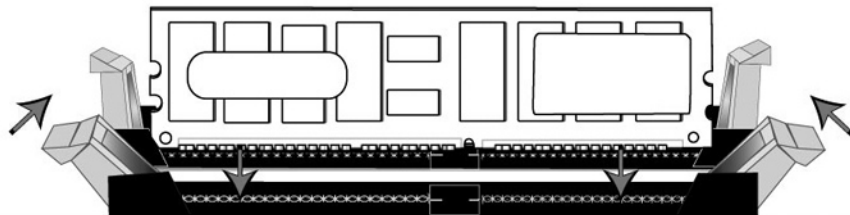
Note: If you don't install the memory module in the correct slot, the system doesn't function properly.

Figure 4-3. Adding memory modules for CX755 upgrades



5. Align the memory-module edge connector with the slot alignment keys and insert it into the slot.
The module slot has two alignment keys that allow you to install the module in only one direction.

Figure 4-4. Inserting and securing the memory module in the DIMM slot



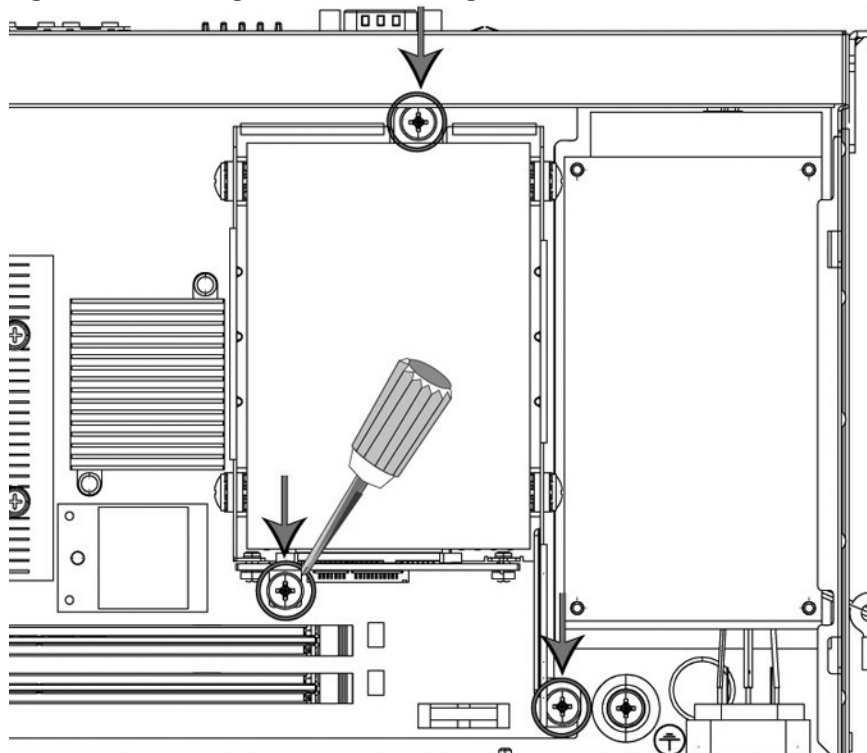
6. Ensure that all ejector tabs are in the upright locked position.
7. To remove the disk drive, remove the three screws and washers holding the disk drive casing to the chassis.



Caution: Use a magnetic screwdriver to remove the screws. Use caution when removing the screws and washers; don't drop them into the system.

8. Pull the entire disk drive casing upward and out of the chassis.

Figure 4-5. Removing the disk drive casing from chassis



9. Insert the new disk drive with casing in the same position and secure the casing to the chassis with the three screws.

10. Replace the system cover, making sure the tabs of the cover are under the front frame.
11. Plug the power cord into the AC circuit.
12. Power on the system.

The system automatically reformats the new drive. You don't need to set up or configure the new disk drive.

Replacing hard disk drives for CX1555H upgrades

This section describes how to install disk drives for CX1555H upgrades. For the upgrade, you replace two HDDs with two SSDs.

To upgrade the disk drives in the CX1555 appliances

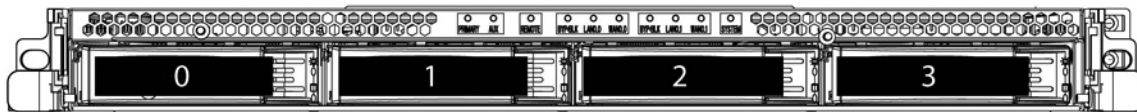
1. When you activate the upgrade license, the system shuts down.
2. Open the bezel.

See [“Opening the bezel” on page 42](#).

3. Identify the hard disk drives to replace.

The drives are numbered in ascending order from left to right (that is, 0, 1, 2, 3). You replace disks in slots 2 and 3.

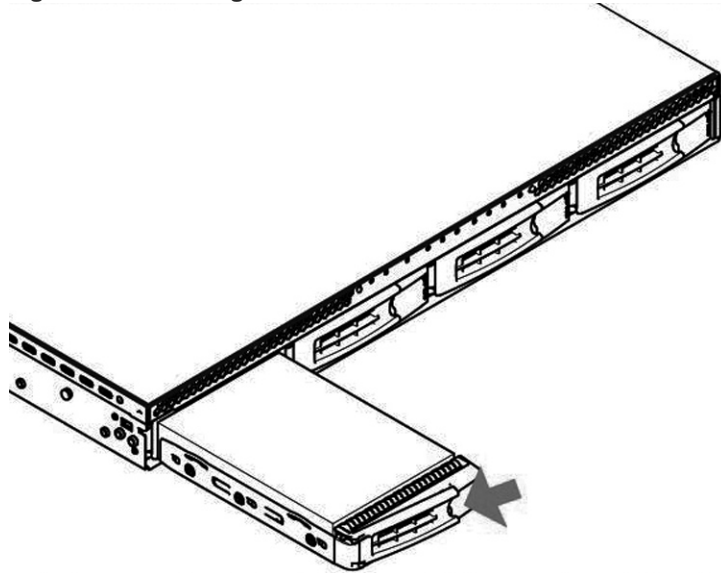
Figure 4-6. Disk drive numbers



4. Remove the disks from slots 2 and 3.

Press the orange release button and pull the drive handle toward you.

Figure 4-7. Releasing the disk drive



5. Slide the disk drive out of the slot.
6. Open the new disk-drive handles by pressing the orange release button.
7. Slide each new disk drive into the slots until they mate with the back connectors in the chassis.
8. Press in the disk-drive handles to close.
9. Restart the appliance.

The disk drive automatically begins proper operation with the other disk drives. You don't need to set up or configure the new disk drive. The disk drive LED lights blue when connected.

Installing required memory and disk drives for EX1160VH upgrades

This section describes how to install memory modules and replacement disk drives for upgrades to EX1160VH appliances. For the disk drive upgrade, you replace the two existing SSDs with two 200-GB SSDs. If your EX1160 appliance has 20 GB of memory (SKU EXA-01160-B030), you add 4 GB of memory to upgrade to the EX1160VH (SKU EXA-01160-B020). If your EX1160 appliance has 48 GB of memory (SKU EXA-01160-B035), you don't need to add memory.

Important: When you install or replace memory modules, you must wear a grounded ESD strap. For details, see ["Electrostatic discharge guidelines" on page 8](#).

To upgrade memory and disk drives for EX1160VH model upgrades

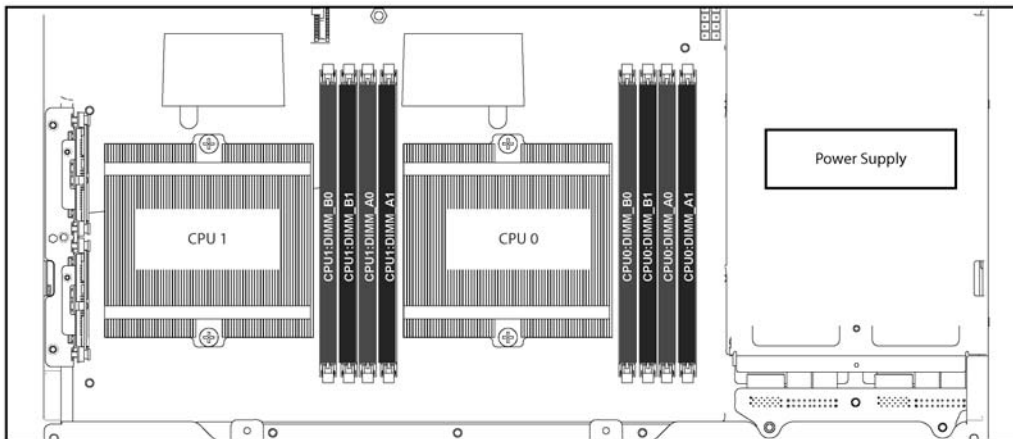
1. When you activate the upgrade license, the system shuts down.

2. Disconnect the system from the electrical outlet.
3. Remove the chassis cover.
4. For the EX1160 with 20 GB of memory (SKU EXA-01160-B030), install the Upgrade Kit memory module in slot 5 (CPU1 A1).

EX1160 L/M/H ship with memory modules installed in DIMM slots 1 (4 GB), 3 (8 GB), and 7 (8 GB). These slots correspond to CPU0 A1, CPU0 B1, and CPU1 B1.

Note: If you don't install the memory module in the correct slot, the system doesn't function properly.

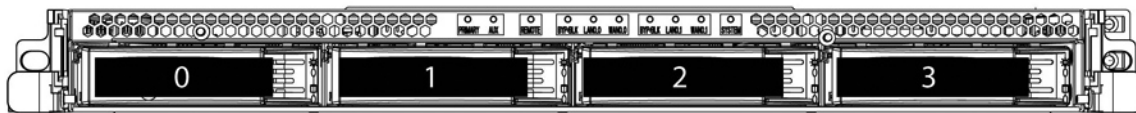
Figure 4-8. Memory module slot locations in EX1160



For complete instruction on adding memory, see [“Replacing memory modules in 1U appliances” on page 55](#).

5. Remove the existing SSD drives in slots 2 and 3 and insert the new 200-GB SSDs.
- The drives are numbered in ascending order from left to right (that is, 0, 1, 2, 3).

Figure 4-9. Disk drive numbers



For details, see [“Replacing disk drives in 1U appliances” on page 48](#).

6. Plug the power cord into the AC circuit.
7. Power on the system.

The system automatically reformats the new drives. You don't need to set up or configure the new disk drives.

Adding Disk Drives for EX1260VH Upgrades

This section describes how to install disk drives for EX1260VH upgrades. For the upgrade, you add two 100-GB SSDs to the existing configuration.

To add disk drives in the EX1260 appliances for the VH upgrade

1. When you activate the upgrade license, the system shuts down.

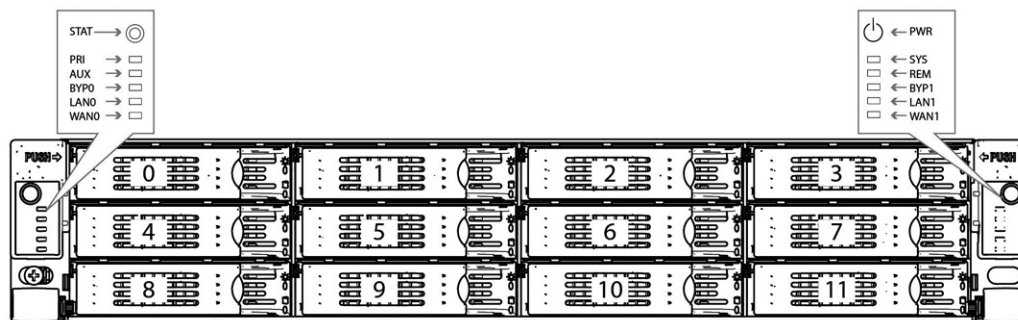
2. Open the bezel.

See [“Opening the bezel” on page 42](#).

3. Identify the location for the new SSDs.

The drives are numbered in ascending order from the upper-left corner to the lower-right corner. Add the two new SSDs to slots 10 and 11.

Figure 4-10. Disk drive numbers



4. Open the new disk-drive handles by pressing the orange release button.

5. Slide each new disk into the available SSD slots until they mate with the back connectors in the chassis.

6. Press in the disk-drive handles to close.

7. Power on the system.

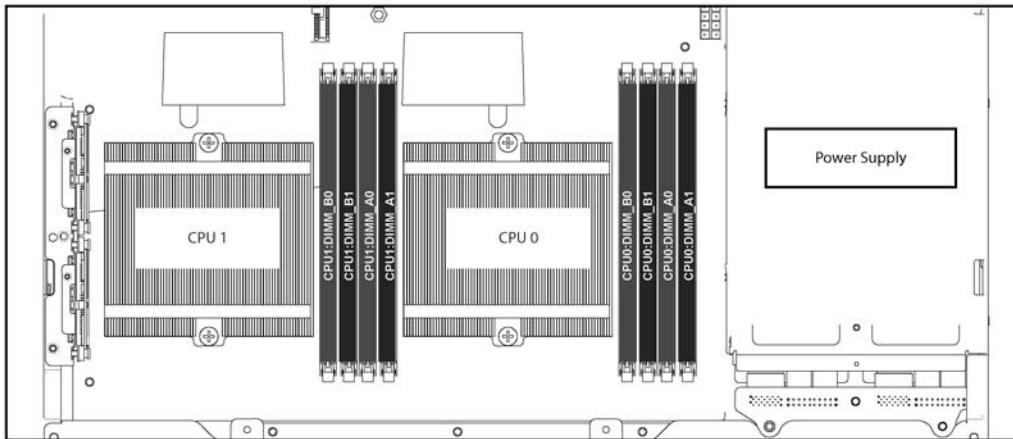
The disk drive LED lights blue when connected. The new disk drive runs through a self-test automatically. The disk drive automatically begins proper operation with the other disk drives. You don't need to set up or configure the new disk drive.

Upgrading memory for EX1260 appliances

The SteelHead EX1260 supports two memory upgrades. This section describes the memory placement for each upgrade.

Figure 4-11 shows the memory module slot locations for the EX1260.

Figure 4-11. Memory module slot locations in EX1260 appliances



Upgrading to 32 GB

You can upgrade a 2-TB 1260 from 24-GB to 32-GB memory. The 24-GB configuration includes six 4-GB DIMMS. The upgrade kit contains two additional 4-GB DIMMS. Add the additional DIMMS to the two remaining open slots.

For detailed instructions for adding memory to the system, see [“Replacing memory modules in 2U appliances” on page 58](#).

Upgrading to 64 GB

You can upgrade a 4-TB 1260 from 32-GB to 64-GB memory. The 32-GB configuration includes four 8-GB DIMMS. The upgrade kit contains four additional 8-GB DIMMS. Add the additional DIMMS to the four remaining open slots.

For detailed instructions for adding memory to the system, see [“Replacing memory modules in 2U appliances” on page 58](#).

Upgrading SteelHead xx50 Appliances

You can upgrade SteelHead xx50 appliances within their platform family to increase the appliance optimization and storage capacities. This chapter includes the following sections:

- “Overview” on page 107
- “Installing licenses and activating specifications” on page 109

Note: After upgrading an appliance, you must reapply the desired admission control overrides relative to the default admission control values of the new model.

Note: When you replace memory modules, you must wear a grounded ESD antistatic strap to protect the system hardware against electrostatic discharge. Make sure that the strap makes skin contact prior to handling equipment. For details, see “Electrostatic discharge guidelines” on page 8.

Note: You must use approved hardware for the system to function properly. Installation of unapproved hardware can result in boot failure. To order Upgrade Kits, contact Riverbed Support at <https://support.riverbed.com>.

Overview

A model upgrade enables you to add a license and hardware to an existing SteelHead xx50 appliance to increase the capacity and model number of the SteelHead within its platform family.

Model upgrades increase the WAN capacity and total number of optimized TCP connections for the appliance. RAID model upgrades also increase the size of the data store.

Model upgrades require a license and, in some cases, the installation of additional hard disk drives and memory modules. Licenses can be installed using the command-line interface (CLI) or the SteelHead Management Console. Upgrades that require the installation of additional hardware don't preserve the data store. Model upgrades always preserve the configuration of the appliance.

Platform requirements

Basic model upgrades require RiOS software 4.1.9d, 5.0.7e, 5.5.2d, or later. RAID model upgrades require RiOS software 5.0.9, 5.5.4, or later. Model upgrades always require a license and, in some cases, require the installation of additional hard disk drives and memory modules.

The following section describes the model upgrades available within an appliance family, the minimum required RiOS software version, and the impact on the appliance data store, RSP and PFS data.

Platform requirements for basic model upgrades

The following table describes the platform requirements for basic model upgrades.

Source model	Destination model	Upgrade requirements	Minimum RiOS version	Impact on data store	Impact on configuration	Reboot required
250L	250M	License only	4.1.9d 5.0.7e 5.5.2d	None	None	No
250L	250H	License only	4.1.9d 5.0.7e 5.5.2d	None	None	No
250M	250H	License only	4.1.9d 5.0.7e 5.5.2d	None	None	No
550M	550H	License only	4.1.9d 5.0.7e 5.5.2d	None	None	No

Upgrade kit hardware contents

Model upgrades always require a license and, in some cases, require the installation of hard disk drives and memory modules. This section lists the contents of the Upgrade Kits, including hardware for basic upgrades and RAID upgrades.

- **Model upgrade licenses** - Model upgrade licenses are installed using the CLI or the Management Console. For instructions on installing upgrade licenses, see [“Installing licenses and activating specifications” on page 109](#).
- **Basic model upgrade kit hardware contents** - Some model upgrades require the installation of hardware. The hardware required for your model upgrade is contained in the Upgrade Kit shipped to you.
- **RAID model upgrade kit hardware contents** - RAID model upgrades require the installation of hardware. The hardware required for your RAID model upgrade is contained in the RAID Upgrade Kit shipped to you.

Hardware requirements

You must install Riverbed-approved hardware for the system to function properly. This table lists the minimum hardware requirements for each model.

Model	Minimum RAM	Minimum # of HDDs
250L	1 x 1 GB (1 GB)	N/A
250M	1 x 1 GB (1 GB)	N/A

Model	Minimum RAM	Minimum # of HDDs
250H	1 x 1 GB (1 GB)	N/A
550M	1 x 2 GB (2 GB)	N/A
550H	1 x 2 GB (2 GB)	N/A

Note: RSP requires a license and an additional 2-GB of memory. For detailed information about RSP, see the *Riverbed Services Platform Installation Guide*. Contact Riverbed Support at <https://support.riverbed.com> for information about ordering RSP.

Upgrading a model - basic steps

You perform the following steps to upgrade a model:

- 1. Install the model upgrade license** - The model upgrade license can be installed in the CLI or the Management Console. For detailed information, see “[Installing licenses and activating specifications](#)” on page 109. After the license is installed, the system indicates the model specifications available and if hardware is required for activation.
- 2. Stop the service** - The SteelHead optimization service must be halted to activate a model upgrade specification.
- 3. Activate the specification** - The model upgrade specification can be activated in the CLI or the Management Console. For detailed information, see “[Installing licenses and activating specifications](#)” on page 109.

Note: For model upgrades that require additional hardware, the specification can’t be activated until the required hardware is installed.

- 4. Reboot the system (if needed)** - For model upgrades that require additional hardware, the system won’t notify you that a reboot is necessary. The SteelHead reboots automatically after the required hardware is installed and the specification is activated in the CLI or Management Console.
- 5. Restart the service** - The system doesn’t reboot for upgrades that don’t require the addition of hardware. License-only upgrades switch immediately to the new model after the license is installed, the SteelHead service is halted, and the specification is activated. Restart the service after activating the upgrade specification.

Installing licenses and activating specifications

This section describes how to install model upgrade licenses and activate model specifications using the CLI (RiOS software 4.1.9d, 5.0.7e, 5.0.9, 5.5.2d, 5.5.4, and later) or the Management Console (RiOS software 5.0.7e, 5.0.9, 5.5.2d, 5.5.4 and later).

After you install a model upgrade license, you must stop the SteelHead service to activate the model specification.

Model upgrades using the CLI

This section describes how to install a model upgrade license and activate a specification using the CLI. The CLI can be used to install licenses and activate specifications with RiOS software 4.1.9d, 5.0.7e, 5.0.9, 5.5.2d, 5.5.4, and later.

1. Connect to the Riverbed CLI.

For detailed information about using the CLI, see the *Riverbed Command-Line Interface Reference Manual*.

2. Enter enable mode; at the system prompt, enter the **enable** command:

```
amnesiac > enable
```

3. Enter configuration mode; at the system prompt, enter the **configure terminal** command:

```
amnesiac # configure terminal
amnesiac (config) #
```

4. View current and available model specifications; enter the **show hardware spec** command:

```
amnesiac (config) # show hardware spec
Spec      Description
-----
* 1050_LR  BW Limit: 8000 Kb/s      Connection Limit: 800
      (activation requires hardware)
 1050_MR   BW Limit: 10000 Kb/s    Connection Limit: 1300
      (activation requires hardware)
 1050H     BW Limit: 20000 Kb/s    Connection Limit: 2300
 1050_HR   BW Limit: 20000 Kb/s    Connection Limit: 2300
      (activation requires hardware)

* = active
```

5. Install the model upgrade license, enter the **license install <license-key>** command:

```
amnesiac (config) # license install LIC-EXAMPLE1050_MR-0000-0000-0-000X-0XX0
```

Important: We recommend you write the license to memory after it has been installed.

6. Write the model upgrade license to memory; enter the **write memory** command:

```
amnesiac (config) # write memory
```

7. View licenses installed on the appliance; enter the **show licenses** command:

```
amnesiac (config) # show licenses

LIC-EXAMPLE1050_MR-0000-0000-0-000X-0XX0
Index:      6
Feature:    MSPEC1050_MR
Valid:      yes
Active:     yes
```

8. View the available model upgrade specification; enter the **show hardware spec** command:

```
amnesiac (config) # show hardware spec
```

Spec	Description	
1050_LR	BW Limit: 8000 Kb/s (activation requires hardware)	Connection Limit: 800
* 1050_MR	BW Limit: 10000 Kb/s (activation requires hardware)	Connection Limit: 1300
1050H	BW Limit: 20000 Kb/s	Connection Limit: 2300
1050_HR	BW Limit: 20000 Kb/s (activation requires hardware)	Connection Limit: 2300

* = active

9. Stop the optimization service; enter the `no service enable` command:

```
amnesiac (config) # no service enable
Terminating optimization service.....
```

Note: You must stop the optimization service prior to model upgrade activation.

10. Activate the model specification; enter the `hardware spec activate <model-number>` command:

```
amnesiac (config) # hardware spec activate 1050_MR
Appliance upgrade to 1050M successful
```

Note: License only upgrades switch immediately to the new model after the license is installed, the SteelHead service is halted, and the specification is activated.

11. Restart the optimization service for model upgrades that don't require a reboot; enter the `restart` command:

```
amnesiac (config) # restart
Terminating optimization service.....
Relaunching optimization service.
```

Note: Specifications requiring additional hardware can't be activated until the hardware is installed.

Note: Upgrades that require additional hardware reboot automatically after the hardware is installed and the model upgrade specification is activated.

Note: After upgrading a model, desired admission control overrides must be reapplied relative to the default admission control values of the new model.

Model upgrades using the Management Console

This section describes how to install a model upgrade license and activate the specification using the SteelHead Management Console. Using the Management Console to install licenses and activate specifications requires RiOS software 5.0.7e, 5.0.9, 5.5.2d, 5.5.4, or later. For more information about using the Management Console, see the *SteelHead User's Guide*.

To install a model upgrade license using the Management Console

1. Choose Configure > Maintenance > Licenses to display the Licenses page.

Figure 5-1. Licenses page in the Management Console

Configure > Maintenance > Licenses ?

+ Add a New License - Remove Selected

<input type="checkbox"/>	License	Description	Status
<input type="checkbox"/>	--	Professional Services License	Not installed
<input type="checkbox"/>	LK1-SH10BASE-0000-0000-1-68BC-5601-4DAF	Scalable Data Referencing (SDR)	Valid
<input type="checkbox"/>	LK1-SH10CIFS-0000-0000-1-C034-20F6-D9D4	Windows(R) File Servers	Valid
<input type="checkbox"/>	LK1-SH10EXCH-0000-0000-1-8355-395D-E916	Microsoft(R) Exchange	Valid
<input type="checkbox"/>	LK1-SH40SSL-0000-0000-1-2E0F-D897-9F5E	Enhanced Cryptographic License Key	Valid
<input type="checkbox"/>	LK1-VLAB-0000-0000-1-0C04-3B0E-69BB	Unknown	Valid
<input type="checkbox"/>	LK1-SH40BWO-0000-0000-1-8B3F-F193-1E01	Bandwidth Override	Valid
<input type="checkbox"/>	LK1-SH55RSPM-0000-0000-1-87B9-995F-AFF4	Riverbed Services Platform Multi Instance	Valid
<input type="checkbox"/>	LK1-SH55PKGPRNT-0000-0000-1-8EE7-E3BD-139D	Riverbed Print Package	Valid
	Included	Microsoft(R) SQL Server	Valid
	Included	NFS	Valid
	Included	HTTP	Valid
	Included	Initiator	Valid

2. Click **Add a New License** to display the text box to add a new license.
3. Copy and paste the provided license key into the text box.
4. Click **Add** to add the license.
5. Click **Save** to save your settings permanently.

To activate a model upgrade specification using the Management Console

1. Choose Configure > Maintenance > Services to display the Services page.
2. Under Optimization Service click **Stop** to stop the SteelHead service.
3. Choose Configure > Maintenance > Licenses to display the Licenses page.

The model specifications appear at the bottom of the page. The current specification appears in bold. Hardware specifications that will be available for the appliance after the license or required hardware have been installed are included in the list but are dimmed.

Figure 5-2. Model specifications appear in the Licenses page of the Management Console

The screenshot shows the 'Configure > Maintenance > Licenses' page. At the top, there are buttons for '+ Add a New License' and '- Remove Selected'. Below is a table with columns: License, Description, and Status. The table lists several licenses, including Professional Services License, Scalable Data Referencing (SDR), Windows(R) File Servers, Microsoft(R) Exchange, Enhanced Cryptographic License Key, Model 1050H Specification, and Model 1050L Specification. Below the table is a section for 'Hardware Specifications' with three radio button options: 1050L (selected), 1050M, and 1050H. At the bottom is an 'Apply' button.

License	Description	Status
--	Professional Services License	Not installed
LK1-SH10BASE-0000-0000-1-300A-5ACD-9205	Scalable Data Referencing (SDR)	Valid
LK1-SH10CIFS-0000-0000-1-613E-7FD0-E72E	Windows(R) File Servers	Valid
LK1-SH10EXCH-0000-0000-1-DDDC-9024-00A2	Microsoft(R) Exchange	Valid
--	Enhanced Cryptographic License Key	Not installed
LK1-MSPEC1050H-0000-0000-1-0F32-5691-FDDE	Model 1050H Specification	Valid
LK1-MSPEC1050L-0000-0000-1-B321-EB6D-674B	Model 1050L Specification	Valid
Included	Microsoft(R) SQL Server	Valid
Included	NFS	Valid
Included	HTTP	Valid
Included	JInitiator	Valid

Hardware Specifications

☒ **1050L: BW Limit: 6000 KB/s Connection Limit: 800**
☐ 1050M: BW Limit: 6000 KB/s Connection Limit: 1300
☐ 1050H: BW Limit: 10000 KB/s Connection Limit: 2300 (activation reboots appliance)

Apply

4. Select the model specification to activate.

If a model specification requires an appliance reboot after activation, the message **activation reboots appliance** appears.

Upgrades that require additional hardware reboot automatically once you install the hardware and activate the model upgrade specification.

5. Click **Apply**.

The appliance reboots and the optimization service restarts.

6. If your model upgrade doesn't require the installation of additional hardware, click the Restart icon to restart the optimization service.

When the upgrade is complete, the appliance is transformed into the new model. The model number appears on the appliance banner in the upper-right corner of the screen. The appliance retains its original serial number.

Note: After upgrading a model, desired admission control overrides must be reapplied relative to the default admission control values of the new model.

Monitoring and Managing Desktop CX Appliances with BMC

The SteelHead CX570 and CX770 appliances include Baseboard Management Controller (BMC) support.

The BMC monitors the physical state of the appliance. The BMC tracks system and network watchdogs, error logs, and sensors. The sensors of a BMC measure internal physical variables such as temperature, power settings, and fan speeds. You can configure alerts for activity detected outside specified limits.

The BMC also lets you start, restart, and turn off the appliance remotely.

This appendix provides an overview of the features of the BMC on the CX570 and CX770 appliances. It includes the following sections:

- [“Setting up the BMC for initial access” on page 116](#)
- [“Logging in to the BMC” on page 116](#)
- [“Using the BMC dashboard” on page 117](#)
- [“Viewing field-replaceable unit information” on page 118](#)
- [“Monitoring server health” on page 118](#)
- [“Configuring the BMC” on page 120](#)
- [“Controlling the power” on page 125](#)
- [“Updating the firmware” on page 125](#)
- [“Changing the BMC administrator password” on page 127](#)

Setting up the BMC for initial access

Before you can access the BMC, you need to configure its network settings using the Riverbed CLI. For details about using the CLI, see the *Riverbed Command-Line Interface Reference Manual*.

Note: The BMC uses the Primary port of the SteelHead appliance for communication.

To configure the BMC for CX570 and CX770 appliances

- Enable DHCP on the remote management port with this command:

```
(config) # remote dhcp
```

—or—

- Set up a static network configuration using the **remote ip address**, **remote ip default-gateway**, and **remote ip netmask** commands.

The BMC address can be on a different subnet than the appliance. (Make sure that the routers are configured to support a different subnet.)

To verify the network configuration

- Enter the **show remote ip** command:

```
(config) # show remote ip

DHCP:           Enabled
IP Address:     192.168.229.185
Netmask:        255.255.255.0
Gateway:        192.168.229.1
Mac Address:    99:0e:b6:b0:2e:2f
```

Logging in to the BMC

The BMC provides a web interface for monitoring and management. You can access this interface through HTTP or HTTPS.

Note: To use HTTPS, you need BMC firmware revision 0.20 or later. The BMC dashboard displays the firmware version.

To connect to the BMC web interface

1. In a web browser, enter the IP address for the BMC management port.

To display the BMC IP address, from the SteelHead command line use the **show remote ip** command.

2. If the connection isn't trusted (possibly using a self-signed certificate), you are prompted to add and confirm a security exception.
3. When prompted, log in to the web interface.

The default user name is **admin**; the default password is **admin**.

Figure A-1. BMC log in page

You need to allow pop-ups in your browser to log in.

When you log in, the BMC dashboard appears.

Using the BMC dashboard

The dashboard displays an overview of the appliance status. The dashboard provides the following information:

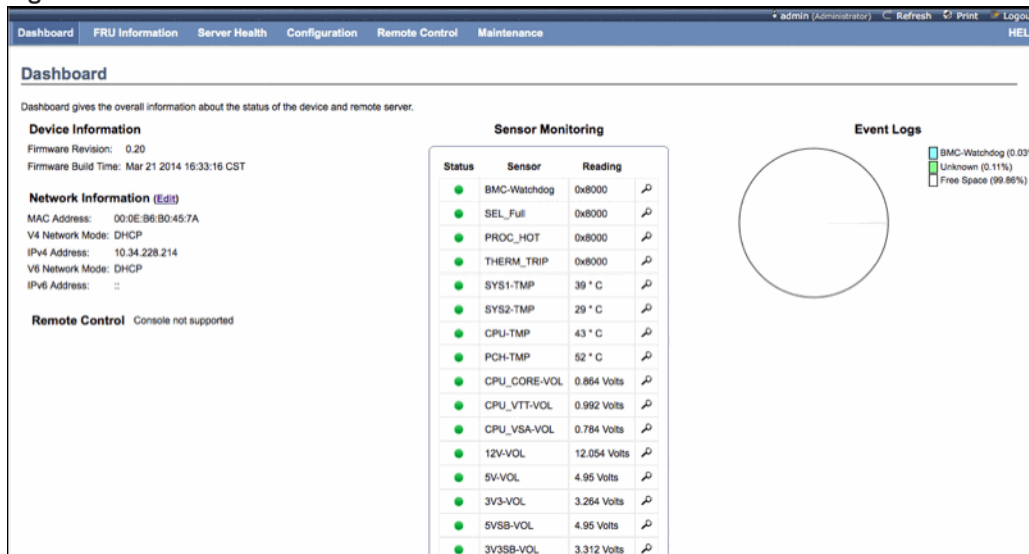
- **Device information** - Displays the firmware revision and date and time of the build for the BMC firmware.
- **Network information** - Displays network settings for the BMC. Click **Edit** to make any changes.
- **Remote control** - The CX570 and CX770 don't support the remote control functionality.
- **Sensor monitoring** - Lists the appliance sensors with information such as a status icon, name, and reading. Click the magnifying glass to view the details for the sensor.

There are three possible status icons for a sensor:

- A green dot indicates a Normal state.
- A yellow exclamation mark indicates a Warning state.
- A red x indicates a Critical state.

- **Event logs** - Provide a graphical representation of all events incurred by the sensors and available space in logs. Click an icon in the legend of the chart to view details of each type of event.

Figure A-2. BMC dashboard



The page includes a menu bar to access BMC features. A Help link appears in the upper-left corner to provide information about specific pages and features.

Viewing field-replaceable unit information

The FRU Information page displays chassis, board, and product information.

The CX570 and CX770 don't have field replaceable units.

Monitoring server health

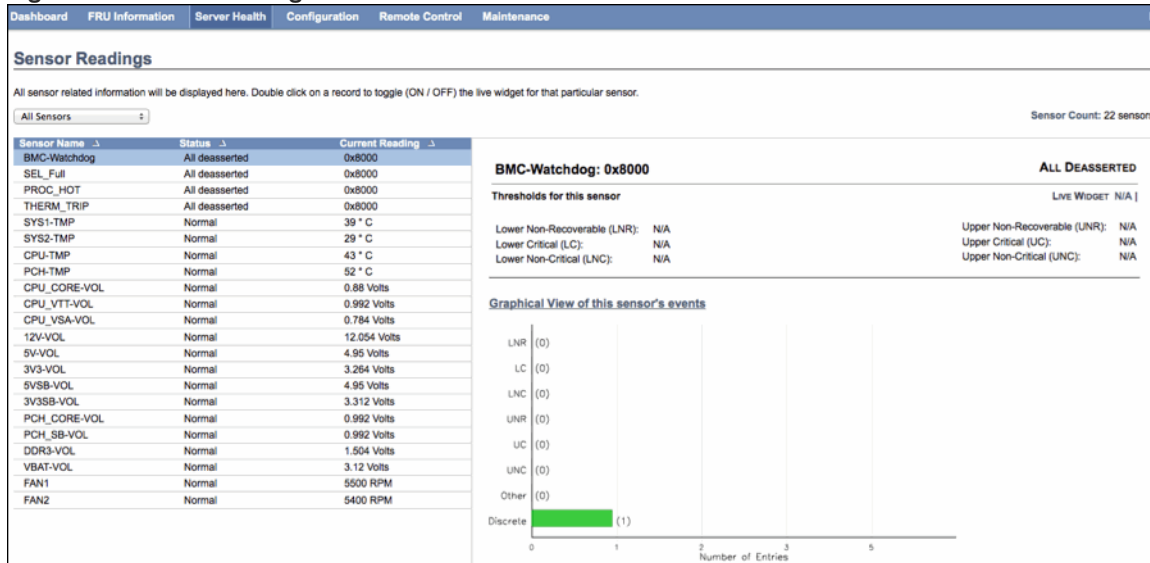
From the Server Health menu, you can view sensor information and event logs.

Viewing sensor readings

Go to Server Health > Sensor Readings to display sensors and their status. Click a sensor to display more information, including thresholds and a graphical representation of all associated events. Double click a sensor to turn on or turn off a widget that charts the sensor information.

Click View Event Log to view the log page for the selected sensor.

Figure A-3. Sensor readings

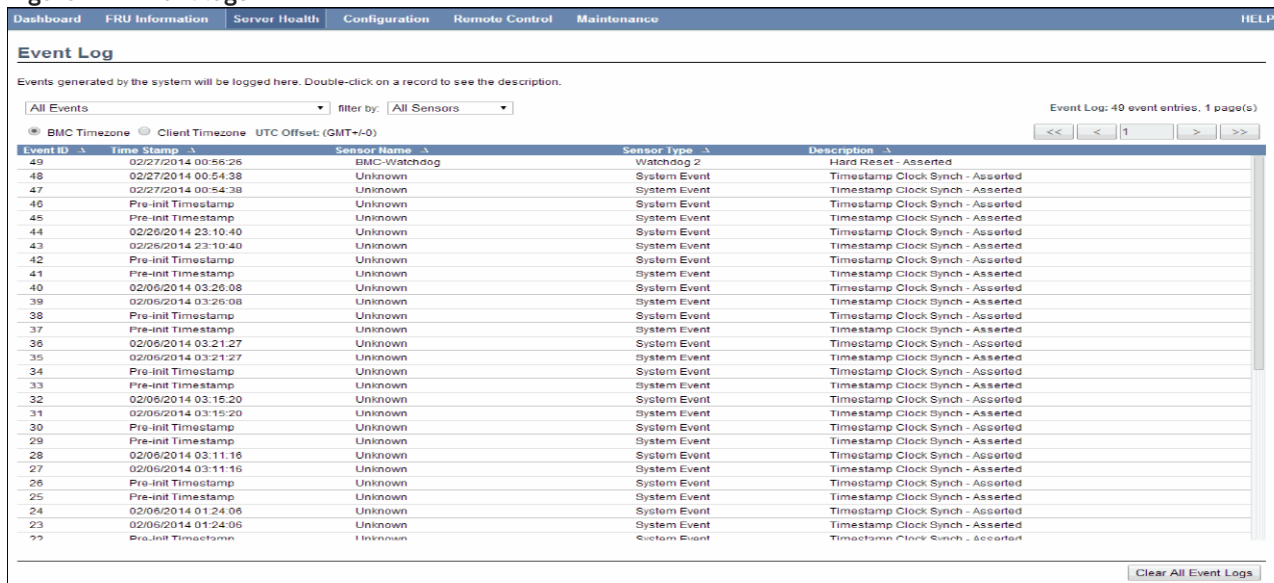


Viewing event logs

Choose Server Health > Event Logs to display a list of events incurred by different sensors on this device. Double click a record to see additional details. You can also sort the list of entries by clicking any of the column headers.

You can use the sensor type or sensor name filter options to view specific events logged in the appliance.

Figure A-4. Event logs



Configuring the BMC

From the Configuration menu, you can customize network settings, configure platform event filtering, set up authorized users, and configure SSL.

Configuring the network

Initially, you configure the network settings for the BMC through the appliance CLI. You can use the Configuration > Network page to manage or change the settings.

To change the network settings

1. Choose Configuration > Network.
2. Complete the configuration as described in this table.

Control	Description
LAN Interface	Select the LAN interface to configure.
LAN Settings	Check this option to enable LAN support for the selected interface.
MAC Address	This read-only field displays the MAC address of the selected interface.
Obtain an IP address automatically	Enable Use DHCP to dynamically configure the IP address using Dynamic Host Configuration Protocol (DHCP).
IPv4 Address, Subnet Mask, Default Gateway	If DHCP is disabled, specify a static IP address, Subnet Mask, and Default Gateway for the selected interface.
IPv6 Settings	Check this option to enable IPv6 support for the selected interface.
Subnet Prefix length	Specify the subnet prefix length for the IPv6 settings. Value ranges from 0 to 128.
VLAN Settings	Check this option to enable VLAN support for the selected interface.
VLAN ID	Specify the Identification for VLAN configuration. Value ranges from 2 to 4094. VLAN ID 0, 1, and 4095 are reserved VLAN IDs. You can't change the VLAN ID without resetting the VLAN configuration.
VLAN Priority	Specify the priority for VLAN configuration. Value ranges from 1 to 7. (7 is the highest priority for the VLAN.)

3. Click **Save**.

You are prompted to log out of the current session and log back in at the new IP address.

4. Click **Reset** to revert the changes.

Configuring platform event filtering

You can use the Configuration > PEF page to manage the Platform Event Filtering settings. You can configure the Event Filter, Alert Policy, and LAN Destination for alerts.

To view the page, you must at least be an Operator. To modify or add a PEF, the user must be an administrator.

The PEF page lets you configure the following:

- **Event Filter** - Select the Event Filter tab to display configured event filters and available slots. You can modify or add new event filter entry. By default, 15 event filter entries are configured among the 40 available slots.
- **Alert Policy** - Select the Alert policy tab to show configured Alert policies and available slots. You can modify or add a new alert policy entry from here. A maximum of 60 slots is available.
- **LAN Destination** - Select the LAN Destination tab to show configured LAN destinations and available slots. You can modify or add a new LAN destination entry. A maximum of 15 slots is available.

A tilde character (~) indicates a free slot.

Figure A-5. Platform event filtering

PEF Management

Use this page to configure Event Filter, Alert Policy and LAN Destination. To delete or modify a entry, select it in the list and click "Delete" or "Modify". To add a new entry, select an unconfigured slot and click "Add".

Event Filter

Alert Policy

LAN Destination

Configured Event Filter count: 15

PEF ID	Filter Configuration	Event Filter Action	Event Severity	Sensor Name
1	Enabled	[Alert]	Critical	Any
2	Enabled	[Alert]	Critical	CPU-TMP
3	Disabled	[Alert]	Unspecified	Any
4	Disabled	[Alert]	Unspecified	Any
5	Disabled	[Alert]	Unspecified	Any
6	Disabled	[Alert]	Unspecified	Any
7	Disabled	[Alert]	Unspecified	Any
8	Disabled	[Alert]	Unspecified	Any
9	Disabled	[Alert]	Unspecified	Any
10	Disabled	[Alert]	Unspecified	Any
11	Disabled	[Alert]	Unspecified	Any
12	Disabled	[Alert]	Unspecified	Any
13	Disabled	[Alert]	Unspecified	Any
14	Disabled	[Alert]	Unspecified	Any
15	Disabled	[Alert]	Unspecified	Any
16	~	~	~	~
17	~	~	~	~
18	~	~	~	~

Add
Modify
Delete

To add a new entry

- Select a free slot and click **Add**. Alternatively, double click a free slot.

To modify an entry

- Select a configured entry and click **Modify**. Alternatively, double click the entry.

To delete an entry

- Select the entry to be deleted and click **Delete**.

Configuring users

You can view and manage users with access to the BMC in the Configuration > Users page. The page shows all configured users and available spaces. To view the page, you must have operator privileges.

You can set up 10 users, including the defaults of admin and anonymous. To modify or add a user, you must have administrator privileges.

Figure A-6. User configuration

User Management				
The list below shows the current list of available users. To delete or modify a user, select the user name from the list and click "Delete User" or "Modify User". To add a new user, select an unconfigured slot and click "Add User"				
				Number of configured users: 2
UserID ↕	Username ↕	User Access ↕	Network Privilege ↕	Email ID ↕
1	anonymous	Disabled	User	~
2	admin	Enabled	Administrator	~
3	~	~	~	~
4	~	~	~	~
5	~	~	~	~
6	~	~	~	~
7	~	~	~	~
8	~	~	~	~
9	~	~	~	~
10	~	~	~	~
<div> Add User Modify User Delete User </div>				

A tilde character (~) indicates a free slot.

To add a user

- Select a free slot and click **Add User**. Alternatively, double click a free slot.

To modify a user

- Select a configured user and click **Modify User**. Alternatively, double click the user.

To delete a user

- Select the user to be deleted and click **Delete User**.

Configuring SSL

You can use SSL to access the BMC in a secure mode. You can upload a certificate and private key file into the BMC or you can generate an SSL certificate based on configuration details.

Note: SSL is only available in BMC firmware v0.20 and later. (The dashboard displays the firmware version.) If you have an earlier version of BMC firmware and you want to use SSL, you need to upgrade your firmware. For details, see [“Updating the firmware” on page 125](#).

To upload a certificate and private key

1. Choose Configuration > SSL and select the Upload SSL tab.

The Current Certificate and Current Privacy Key appear with the date and time of the upload.

Figure A-7. Upload SSL certificate

Upload SSL	Generate SSL	View SSL
Current Certificate Fri Apr 4 01:41:24 2014		
New Certificate Browse... No file selected.		
Current Privacy Key Fri Apr 4 01:41:24 2014		
New Privacy Key Browse... No file selected.		
Upload		

2. Click **Browse** and navigate to the certificate and privacy key file.

The file needs to be a PEM file.

3. Click **Upload** to transfer the SSL certificate and privacy key to the BMC.

Once uploaded, the HTTPS service restarts and begins using the uploaded SSL certificate.

4. Restart your browser to begin using the new certificate.

You can view the certificate details in the View SSL tab.

If this is a self-signed certificate, you need to add the certificate to the trusted list of certificates for your browser.

To generate an SSL certificate

1. Choose Configuration > SSL and select the Generate SSL tab.

Figure A-8. Generate SSL certificate

The screenshot shows the 'Generate SSL' tab selected. The form contains the following fields and controls:

- Common Name(CN)**: Text input field.
- Organization(O)**: Text input field.
- Organization Unit(OU)**: Text input field.
- City or Locality(L)**: Text input field.
- State or Province(ST)**: Text input field.
- Country(C)**: Text input field.
- Email Address**: Text input field.
- Valid for**: Text input field followed by 'days'.
- Key Length**: A dropdown menu showing '512' and a 'bits' label.
- Generate**: A button at the bottom right of the form.

2. Complete the configuration as described in this table.

Control	Description
Common Name (CN)	Specify a common name for the certificate. The name can contain up to 64 alphanumeric characters. Special characters # and \$ aren't allowed.
Organization (O)	Specify the organization name for the certificate. The name can contain up to 64 alphanumeric characters. Special characters # and \$ aren't allowed.
Organization Unit (OU)	Specify the organization section unit name for certificate. The name can contain up to 64 alphanumeric characters. Special characters # and \$ aren't allowed.
City or Locality (L)	Specify the city or locality. The name can contain up to 64 alphanumeric characters. Special characters # and \$ aren't allowed.
State or Province (ST)	Specify the state or province. The name can contain up to 64 alphanumeric characters. Special characters # and \$ aren't allowed.
Country (C)	Specify the country code. This must be two characters. Special characters aren't allowed.
Email Address	Specify the email address of the organization.
Valid for	Specify the number of days the certificate is valid. Value ranges from 1 to 3650 days.
Key Length	Choose the key length bit value of the certificate.

3. Click **Generate** to create a new SSL certificate.

The HTTPS service restarts and begins using the new SSL certificate.

4. Restart your browser to begin using the new certificate.

You can view the certificate details in the View SSL tab.

Controlling the power

You can reboot or restart the appliance from the BMC. The page also shows the current status of the appliance.

To reboot, restart, or power on the appliance

1. Choose Maintenance > Server Power Control.
2. Select one of the following power control options:
 - **Reset Server** - Reboot the system without powering off (warm boot).
 - **Power Off Server - Immediate** - Immediately power off the SteelHead.
 - **Power Off Server - Orderly Shutdown** - Shut down the operating system and then power off the SteelHead.
 - **Power On Server** - Select this option to power on the SteelHead.
 - **Power Cycle Server** - Power off and then reboot the appliance (cold boot).
3. Click **Perform Action**.

Updating the firmware

You can update the BMC firmware. A wizard steps you through the firmware upgrade process and displays the upgrade status.

Note: The appliance automatically restarts after you upgrade the firmware.

In most cases, you don't need to update the firmware. However, some early shipments of the CX570 and CX770 shipped with firmware v0.18 and SSL is only available in firmware v0.20 and later. (The dashboard displays the firmware version.) If you have an earlier version of BMC firmware and you want to use SSL, you need to upgrade your firmware.

To update the firmware

1. Download the software for the firmware update from the Riverbed support web site.

The software is available in the Related Software table in the SteelHead appliance Software & Documentation page, available at this URL:

<https://support.riverbed.com/content/support/software/steelhead/appliance.html>

2. Choose Maintenance > Firmware Update.

Figure A-9. Firmware update

Firmware Update

Upgrade firmware of the device. Press "Enter Update Mode" to put the device in update mode.

The protocol information to be used for firmware image transfer during this update is as follows. To configure, choose 'Protocol Configuration' under Firmware Update menu.

Protocol Type : HTTP/HTTPs

WARNING: Please note that after entering the update mode, the widgets, other web pages and services will not work. All the open widgets will be automatically closed. If the upgradation is cancelled in the middle of the wizard, the device will be reset.

☐ Preserve all Configuration. This will preserve all the configuration settings during the firmware update - irrespective of the individual items marked as preserve/overwrite in the table below.

All configuration items below will be preserved as default during the restore configuration operation. Click "Enter Preserve Configuration" to modify the Preserve status settings.

#	Preserve Configuration Item	Preserve Status
1	Authentication	Overwrite
2	KVM	Overwrite
3	SEL	Overwrite
4	FRU	Overwrite
5	Network	Overwrite
6	NTP	Overwrite
7	IPMI	Overwrite
8	SSH	Overwrite
9	SDR	Overwrite

3. Select the **Preserve All Configuration** check box.

4. Click **Enter Update Mode**.

A dialog box appears warning you that other BMC tasks are unavailable during the upgrade.

5. Click **OK** to continue.

You are prompted to upload the firmware.

Figure A-10. Uploading the firmware

Upload Firmware

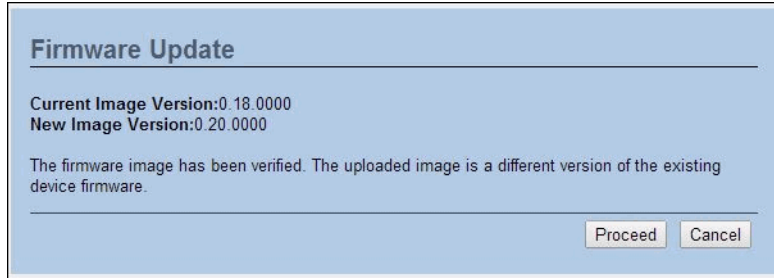
Please select the firmware image to flash

fwa3250_bmc_00_20.ima

6. Click **Choose File** to browse to the software file from Step 1 and click **Upload**.

The system verifies the firmware image and displays the current firmware version and the new firmware version.

Figure A-11. Verifying the Firmware

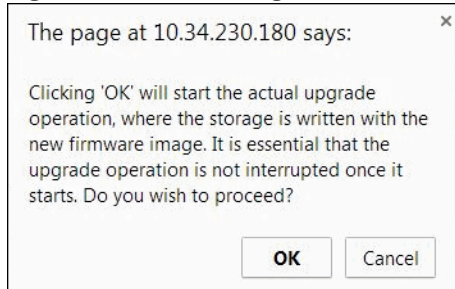


7. Click **Proceed.**

A dialog box prompts you to confirm the upgrade.

Note: don't interrupt the upgrade process.

Figure A-12. Confirm upgrade



8. Click **OK.**

The system installs the new firmware. When the upgrade completes, the appliance restarts and a message appears informing you the appliance has been reset.

Figure A-13. Upload firmware software



9. Restart your browser to start a new session with the BMC.

Changing the BMC administrator password

The System Administrator page lets you change the BMC password.

To change the BMC administrator password

1. Choose Maintenance > System Administrator.

2. Select Change Password.

3. Enter and confirm the new password.

The password must be between 8 and 64 characters and it can't contain spaces.

4. Click **Save**.

Monitoring and Managing GX, xx70, Interceptor 9600, and Core 3500 with BMC

The SteelHead GX10000, CX xx70, SteelHead Interceptor 9600, SteelFusion Core 3500, and SteelCentral xx70 appliances include Baseboard Management Controller (BMC) support.

The BMC monitors the physical state of the appliance. The BMC tracks system and network watchdogs, error logs, and sensors. The sensors of a BMC measure internal physical variables such as temperature, power settings, voltage levels, and fan speeds. You can configure alerts for activity detected outside specified limits.

The BMC also lets you start, restart, and turn off the appliance remotely.

This appendix provides an overview of the features of the BMC on these appliances. It includes the following sections:

- [“Setting up the BMC for initial access” on page 130](#)
- [“Logging in to the BMC” on page 131](#)
- [“Viewing System Information” on page 133](#)
- [“Viewing Server Health” on page 133](#)
- [“Configuring the BMC” on page 134](#)
- [“Remotely controlling the appliance” on page 135](#)
- [“Changing the BMC administrator password” on page 135](#)

Note: This chapter describes some of the key features of the BMC. For complete details about each page, log in to the BMC and click the Help icon in the upper-right corner.

Setting up the BMC for initial access

Before you can access the BMC, you need to configure its network settings.

Note: On 1U appliances, BMC uses the AUX port of the appliance for communication; 2U appliances have a dedicated port for communication.

Setting up BMC on SteelHead and SteelFusion Core 3500

For SteelHead and SteelFusion Core, you set up BMC through the CLI.

To configure the BMC on a SteelHead or SteelFusion Core 3500

- Enable DHCP on the remote management port with this command:

```
(config) # remote dhcp
```

—or—

- Set up a static network configuration using the **remote ip address**, **remote ip default-gateway**, and **remote ip netmask** commands.

The BMC address can be on a different subnet than the appliance. (Make sure that the routers are configured to support a different subnet.)

To verify the network configuration

- Enter the **show remote ip** command:

```
(config) # show remote ip
DHCP:           Enabled
IP Address:     192.168.229.185
Netmask:        255.255.255.0
Gateway:        192.168.229.1
Mac Address:    99:0e:b6:b0:2e:2f
```

Setting up BMC on NetProfiler

For NetProfiler, you configure BMC through the web interface.

To configure the BMC on NetProfiler

1. Choose Configuration > General Settings in the web user interface.
2. In the Baseboard Management Controller Settings section, click **Edit** in the Action column and specify the network settings for the BMC.

Consult the NetProfiler online help for details.

Setting Up BMC on NetShark

For NetShark, you set up BMC through the CLI.

To configure the BMC on a NetShark

- Enable DHCP on the remote management port with this command:

```
(config) # system ipmi enable dhcp
```

—or—

- Set up a static network configuration using the **system ipmi enable ipaddr netmask gateway** command.

The BMC address can be on a different subnet than the appliance. (Make sure that the routers are configured to support a different subnet.)

To verify the network configuration

- Enter the **interface show ipmi** command.

Logging in to the BMC

The BMC provides a web interface for monitoring and management. You can access this interface through HTTP or HTTPS.

To connect to the BMC Web interface

1. In a web browser, enter the IP address for the BMC management port.

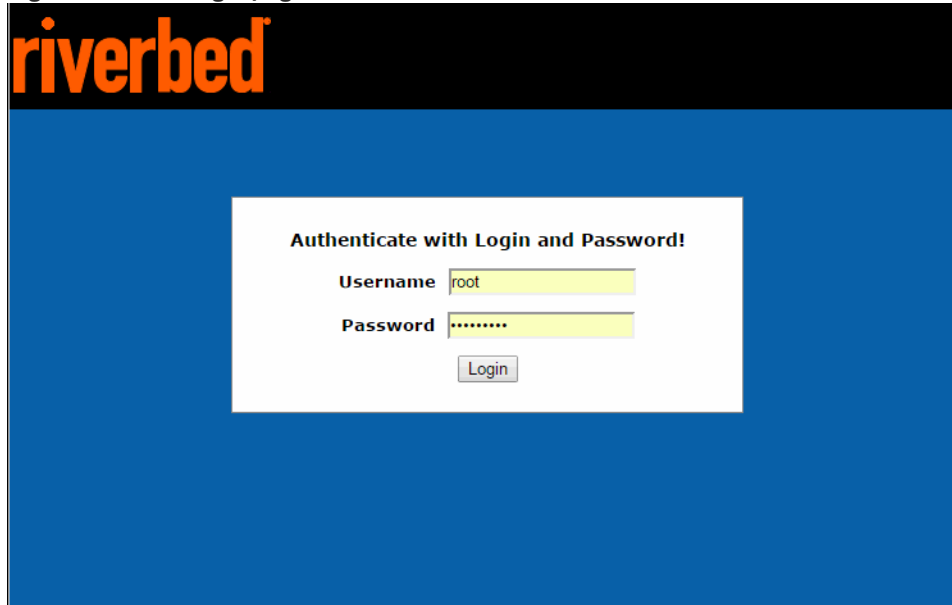
To display the BMC IP address for a SteelHead, from the command line use the **show remote ip** command.

To display the BMC IP address for a NetShark, from the command line use the **interface show ipmi** command.

2. If the connection isn't trusted (possibly using a self-signed certificate), you are prompted to add and confirm a security exception.
3. When prompted, log in to the web interface.

The default user name is **root**; the default password is **superuser**.

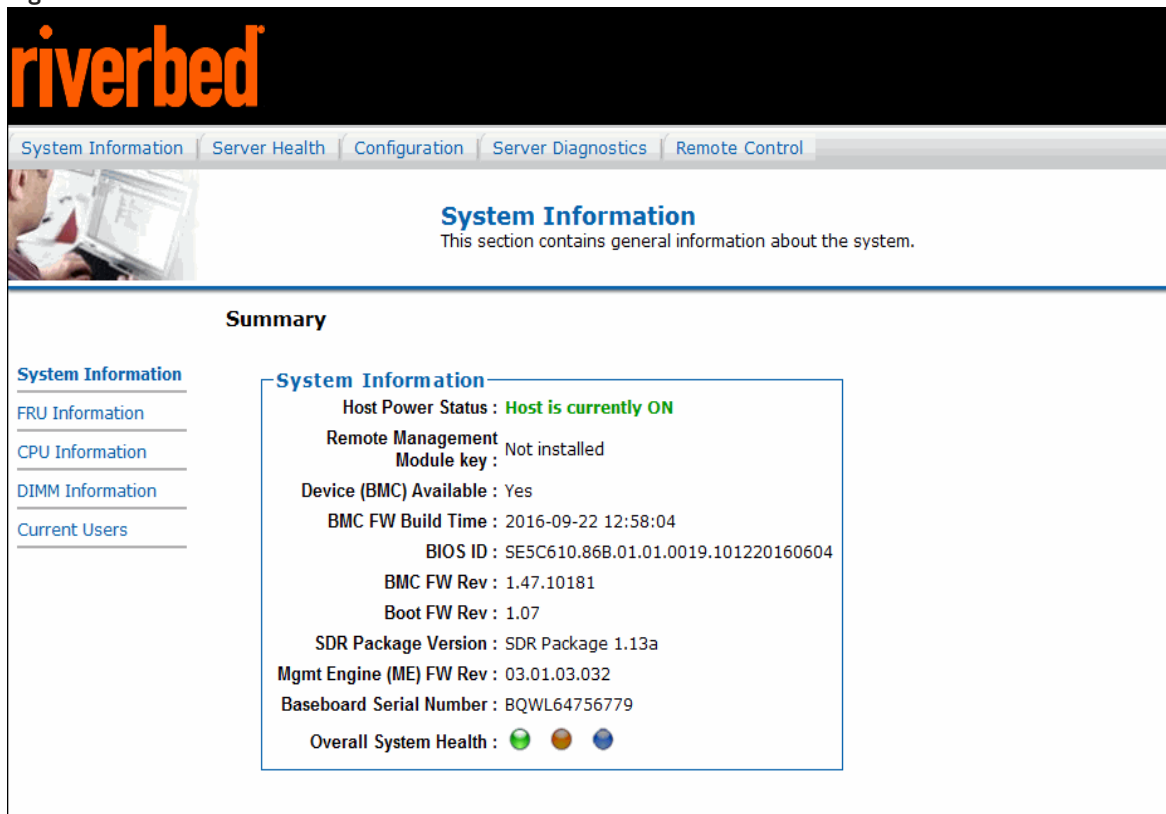
Figure B-1. BMC login page




The screenshot shows the Riverbed BMC login page. It has a black header with the 'riverbed' logo in orange. Below the header is a blue background with a white login box in the center. The box is titled 'Authenticate with Login and Password!'. It contains two input fields: 'Username' with 'root' entered and 'Password' with '*****' entered. A 'Login' button is at the bottom of the box.

When you log in, the BMC interface appears and displays the System Information page.

Figure B-2. BMC interface



The screenshot shows the Riverbed BMC interface. It has a black header with the 'riverbed' logo in orange. Below the header is a navigation bar with tabs: 'System Information', 'Server Health', 'Configuration', 'Server Diagnostics', and 'Remote Control'. The 'System Information' tab is selected. Below the navigation bar is a section titled 'System Information' with a sub-header 'This section contains general information about the system.' Below this is a 'Summary' section. On the left side of the 'Summary' section is a sidebar with links: 'System Information', 'FRU Information', 'CPU Information', 'DIMM Information', and 'Current Users'. The main content area of the 'Summary' section is titled 'System Information' and contains the following details:

- Host Power Status : **Host is currently ON**
- Remote Management Module key : Not installed
- Device (BMC) Available : Yes
- BMC FW Build Time : 2016-09-22 12:58:04
- BIOS ID : SE5C610.86B.01.01.0019.101220160604
- BMC FW Rev : 1.47.10181
- Boot FW Rev : 1.07
- SDR Package Version : SDR Package 1.13a
- Mgmt Engine (ME) FW Rev : 03.01.03.032
- Baseboard Serial Number : BQWL64756779
- Overall System Health : 

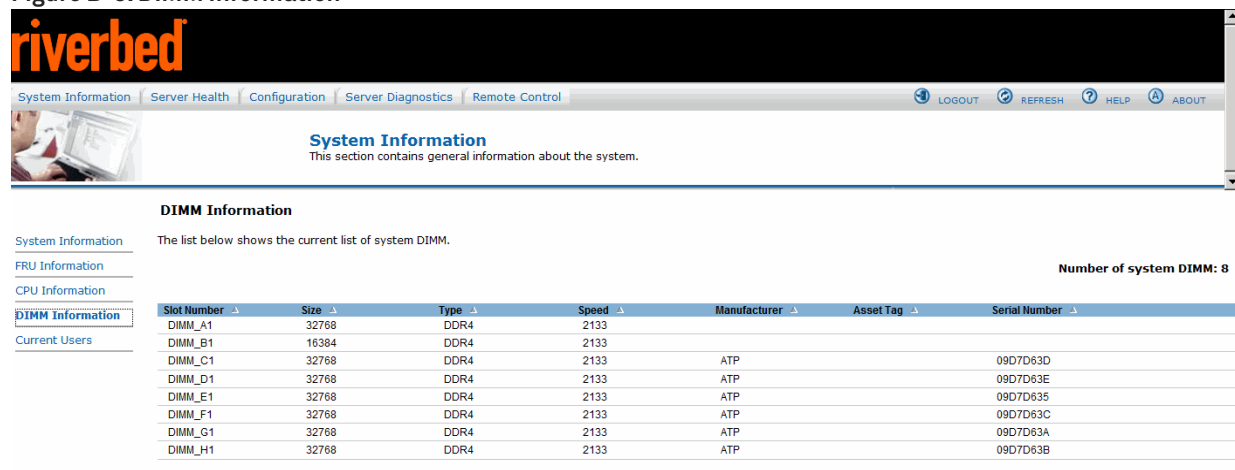
The page includes a menu bar to access BMC features. A Help link appears in the upper-right corner to provide information about specific pages and features.

Viewing System Information

The System Information section contains general information about system components. Click the System Information tab and use the navigation bar on the left to view these sections:

- **System Information** - Displays power status, build and firmware details, and overall system health.
- **FRU Information** - Displays appliance information, including the model number and the serial number.
- **System Debug Information** - Lets you generate a log file with debug information.
- **CPU Information** - Displays processor information.
- **DIMM Information** - Displays the current list of installed DIMMs, including their slot number, size, and type.
- **Current Users** - Displays a list of current users.

Figure B-3. DIMM Information



riverbed

System Information | Server Health | Configuration | Server Diagnostics | Remote Control

LOGOUT | REFRESH | HELP | ABOUT

System Information
This section contains general information about the system.

DIMM Information
The list below shows the current list of system DIMM.

Number of system DIMM: 8

Slot Number	Size	Type	Speed	Manufacturer	Asset Tag	Serial Number
DIMM_A1	32768	DDR4	2133			
DIMM_B1	16384	DDR4	2133			
DIMM_C1	32768	DDR4	2133	ATP		09D7D63D
DIMM_D1	32768	DDR4	2133	ATP		09D7D63E
DIMM_E1	32768	DDR4	2133	ATP		09D7D635
DIMM_F1	32768	DDR4	2133	ATP		09D7D63C
DIMM_G1	32768	DDR4	2133	ATP		09D7D63A
DIMM_H1	32768	DDR4	2133	ATP		09D7D63B

Viewing Server Health

From the Server Health section, you can view sensor readings and event logs. Select the Server Health tab and use the navigation bar on the left to view these sections:


- **Sensor Readings** - Displays system sensor information, including status, health, and readings.
- **Event Log** - Displays a list of events from the system event log. You can filter by category and sort by columns. You can save the log to a file or you can clear the log.

- **Power Statistics** - Displays the power usage for the appliance including the current, maximum, and average power consumption.

Figure B-4. Server Health

riverbed

System Information | **Server Health** | Configuration | Server Diagnostics | Remote Control



Server Health

This section shows you data related to the server's health, such as sensor readings and the event log.

Sensor Readings

Event Log

Power Statistics

HSBP 1 Temp	Normal	OK	25 degrees C
HSBP 2 Temp	Normal	OK	25 degrees C
HSBP 3 Temp	Normal	OK	27 degrees C
HSBP 4 Temp	Normal	OK	29 degrees C
SAS Mod Temp	Normal	OK	33 degrees C
Exit Air Temp	Normal	OK	33 degrees C
LAN NIC Temp	Normal	OK	32 degrees C
System Fan 1	Normal	OK	6784 RPM
System Fan 2	Normal	OK	6572 RPM
System Fan 3	Normal	OK	6572 RPM
System Fan 4	Normal	OK	6519 RPM
System Fan 5	Normal	OK	6625 RPM
System Fan 6	Normal	OK	6519 RPM
Fan 1 Present	reports the device has been inserted or is present	OK	0x0002
Fan 2 Present	reports the device has been inserted or is present	OK	0x0002
Fan 3 Present	reports the device has been inserted or is present	OK	0x0002
Fan 4 Present	reports the device has been inserted or is present	OK	0x0002
Fan 5 Present	reports the device has been inserted or is present	OK	0x0002
Fan 6 Present	reports the device has been inserted or is present	OK	0x0002
PS1 Status	reports the power supply's presence has been detected	OK	0x0001
PS2 Status	reports the power supply's presence has been detected	OK	0x0001
PS1 Input Power	Normal	OK	70 Watts

Configuring the BMC

From the Configuration section you can view the BMC settings and configure settings not related to your network configuration. Select the Configuration tab and use the navigation bar on the left to view these sections:

- **IPv4/IPv6 Network** - Although sections appear for network configuration, we don't recommend setting BMC network values from the BMC interface. The changes won't be saved between system restarts. Instead, configure the network settings for the BMC through the appliance CLI (or for NetProfiler, through the standard web interface). For details, see ["Setting up the BMC for initial access" on page 130](#).
- **Users** - Displays the users configured for BMC access and shows their status, access privilege, and user names. You can add, modify, and delete users from this page. You can configure up to 15 users for BMC access.
- **Security Settings** - View and configure security settings, such as the number of failed login attempts before a user is locked out, session timeout length, and protocols for sessions and network services.

We don't recommend modifying the SSH settings in the security section.

- **LDAP** - Enable or disable LDAP authentication.
- **VLAN** - We don't recommend setting VLAN configuration from the BMC interface. The changes won't be saved between system restarts.
- **SSL** - Upload an SSL certificate and privacy key to allow appliance access in secured mode.
- **Remote Session** - Set encryption on KVM or Media during a redirection session.
- **Mouse Mode** - Set mouse emulation from local window to remote screen.
- **Keyboard Macros** - Configure keyboard macro buttons for the Remote Console.
- **Alerts** - Configure which system events generate alerts and how to send notifications.
- **Alert Email** - Configure how alerts are sent by email to an external SMTP email server.
- **Node Manager** - Set node manager power policies. Note, we don't recommend setting up suspend periods.

Remotely controlling the appliance

From the Remote Control section, you can control the appliance power and view the front panel status. Select the Remote Control tab and use the navigation bar on the left to view these sections:

- **Console Redirection** - This feature isn't available on the xx70 appliances.
- **Server Power Control** - View the current power status of the appliance and reset, power off, shut down, power on, or power cycle the appliance.
- **Virtual Front Panel** - Provides visibility and virtual access to the front panel of the appliance. You can power on or power off the appliance and view the status of the LEDs.

Changing the BMC administrator password

The Configuration > Users page lets you change the BMC password.

To change the BMC administrator password

1. Choose Configuration > Users.
2. Select the root user and click **Modify User**.

The Modify User page appears.

3. Ensure the **Change Password** field is selected.
4. Enter and confirm the new password.

The password must be between 0 and 20 characters and it can't contain spaces.

5. Click **Modify**.

