

# Sun SPARC Enterprise T5120 and T5220 Servers

## Internal HBA Card Installation Guide



Part No.: E23172-01,  
Manual Code.: C120-E522-03XA  
June 2011

Copyright © 2007, 2011, Oracle and/or its affiliates. All rights reserved.

FUJITSU LIMITED provided technical input and review on portions of this material.

Oracle and/or its affiliates and Fujitsu Limited each own or control intellectual property rights relating to products and technology described in this document, and such products, technology and this document are protected by copyright laws, patents, and other intellectual property laws and international treaties.

This document and the product and technology to which it pertains are distributed under licenses restricting their use, copying, distribution, and decompilation. No part of such product or technology, or of this document, may be reproduced in any form by any means without prior written authorization of Oracle and/or its affiliates and Fujitsu Limited, and their applicable licensors, if any. The furnishings of this document to you does not give you any rights or licenses, express or implied, with respect to the product or technology to which it pertains, and this document does not contain or represent any commitment of any kind on the part of Oracle or Fujitsu Limited, or any affiliate of either of them.

This document and the product and technology described in this document may incorporate third-party intellectual property copyrighted by and/or licensed from the suppliers to Oracle and/or its affiliates and Fujitsu Limited, including software and font technology.

Per the terms of the GPL or LGPL, a copy of the source code governed by the GPL or LGPL, as applicable, is available upon request by the End User. Please contact Oracle and/or its affiliates or Fujitsu Limited.

This distribution may include materials developed by third parties.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and in other countries, exclusively licensed through X/Open Company, Ltd.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Fujitsu and the Fujitsu logo are registered trademarks of Fujitsu Limited.

All SPARC trademarks are used under license and are registered trademarks of SPARC International, Inc. in the U.S. and other countries. Products bearing SPARC trademarks are based upon architectures developed by Oracle and/or its affiliates. SPARC64 is a trademark of SPARC International, Inc., used under license by Fujitsu Microelectronics, Inc. and Fujitsu Limited. Other names may be trademarks of their respective owners.

United States Government Rights - Commercial use. U.S. Government users are subject to the standard government user license agreements of Oracle and/or its affiliates and Fujitsu Limited and the applicable provisions of the FAR and its supplements.

Disclaimer: The only warranties granted by Oracle and Fujitsu Limited, and/or any affiliate of either of them in connection with this document or any product or technology described herein are those expressly set forth in the license agreement pursuant to which the product or technology is provided. EXCEPT AS EXPRESSLY SET FORTH IN SUCH AGREEMENT, ORACLE OR FUJITSU LIMITED, AND/OR THEIR AFFILIATES MAKE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND (EXPRESS OR IMPLIED) REGARDING SUCH PRODUCT OR TECHNOLOGY OR THIS DOCUMENT, WHICH ARE ALL PROVIDED AS IS, AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID. Unless otherwise expressly set forth in such agreement, to the extent allowed by applicable law, in no event shall Oracle or Fujitsu Limited, and/or any of their affiliates have any liability to any third party under any legal theory for any loss of revenues or profits, loss of use or data, or business interruptions, or for any indirect, special, incidental or consequential damages, even if advised of the possibility of such damages.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.



Please  
Recycle



Adobe PostScript

Copyright © 2007, 2011, Oracle et/ou ses sociétés affiliées. Tous droits réservés.

FUJITSU LIMITED a fourni et vérifié des données techniques de certaines parties de ce composant.

Oracle et/ou ses sociétés affiliées et Fujitsu Limited détiennent et contrôlent chacune des droits de propriété intellectuelle relatifs aux produits et technologies décrits dans ce document. De même, ces produits, technologies et ce document sont protégés par des lois sur le copyright, des brevets, d'autres lois sur la propriété intellectuelle et des traités internationaux.

Ce document, le produit et les technologies afférents sont exclusivement distribués avec des licences qui en restreignent l'utilisation, la copie, la distribution et la décompilation. Aucune partie de ce produit, de ces technologies ou de ce document ne peut être reproduite sous quelque forme que ce soit, par quelque moyen que ce soit, sans l'autorisation écrite préalable d'Oracle et/ou ses sociétés affiliées et de Fujitsu Limited, et de leurs éventuels bailleurs de licence. Ce document, bien qu'il vous ait été fourni, ne vous confère aucun droit et aucune licence, expresses ou tacites, concernant le produit ou la technologie auxquels il se rapporte. Par ailleurs, il ne contient ni ne représente aucun engagement, de quelque type que ce soit, de la part d'Oracle ou de Fujitsu Limited, ou des sociétés affiliées de l'une ou l'autre entité.

Ce document, ainsi que les produits et technologies qu'il décrit, peuvent inclure des droits de propriété intellectuelle de parties tierces protégés par copyright et/ou cédés sous licence par des fournisseurs à Oracle et/ou ses sociétés affiliées et Fujitsu Limited, y compris des logiciels et des technologies relatives aux polices de caractères.

Conformément aux conditions de la licence GPL ou LGPL, une copie du code source régi par la licence GPL ou LGPL, selon le cas, est disponible sur demande par l'Utilisateur final. Veuillez contacter Oracle et/ou ses sociétés affiliées ou Fujitsu Limited.

Cette distribution peut comprendre des composants développés par des parties tierces.

Des parties de ce produit peuvent être dérivées des systèmes Berkeley BSD, distribués sous licence par l'Université de Californie. UNIX est une marque déposée aux États-Unis et dans d'autres pays, distribuée exclusivement sous licence par X/Open Company, Ltd.

Oracle et Java sont des marques déposées d'Oracle Corporation et/ou de ses sociétés affiliées. Fujitsu et le logo Fujitsu sont des marques déposées de Fujitsu Limited.

Toutes les marques SPARC sont utilisées sous licence et sont des marques déposées de SPARC International, Inc., aux États-Unis et dans d'autres pays. Les produits portant la marque SPARC reposent sur des architectures développées par Oracle et/ou ses sociétés affiliées. SPARC64 est une marque de SPARC International, Inc., utilisée sous licence par Fujitsu Microelectronics, Inc. et Fujitsu Limited. Tout autre nom mentionné peut correspondre à des marques appartenant à d'autres propriétaires.

United States Government Rights - Commercial use. U.S. Government users are subject to the standard government user license agreements of Oracle and/or its affiliates and Fujitsu Limited and the applicable provisions of the FAR and its supplements.

Avis de non-responsabilité : les seules garanties octroyées par Oracle et Fujitsu Limited et/ou toute société affiliée de l'une ou l'autre entité en rapport avec ce document ou tout produit ou toute technologie décrits dans les présentes correspondent aux garanties expressément stipulées dans le contrat de licence régissant le produit ou la technologie fournis. SAUF MENTION CONTRAIRE EXPRESSÉMENT STIPULÉE DANS CE CONTRAT, ORACLE OU FUJITSU LIMITED ET LES SOCIÉTÉS AFFILIÉES À L'UNE OU L'AUTRE ENTITÉ REJETTENT TOUTE REPRÉSENTATION OU TOUTE GARANTIE, QUELLE QU'EN SOIT LA NATURE (EXPRESSE OU IMPLICITE) CONCERNANT CE PRODUIT, CETTE TECHNOLOGIE OU CE DOCUMENT, LESQUELS SONT FOURNIS EN L'ÉTAT. EN OUTRE, TOUTES LES CONDITIONS, REPRÉSENTATIONS ET GARANTIES EXPRESSES OU TACITES, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE À LA QUALITÉ MARCHANDE, À L'APTITUDE À UNE UTILISATION PARTICULIÈRE OU À L'ABSENCE DE CONTREFAÇON, SONT EXCLUES, DANS LA MESURE AUTORISÉE PAR LA LOI APPLICABLE. Sauf mention contraire expressément stipulée dans ce contrat, dans la mesure autorisée par la loi applicable, en aucun cas Oracle ou Fujitsu Limited et/ou l'une ou l'autre de leurs sociétés affiliées ne sauraient être tenues responsables envers une quelconque partie tierce, sous quelque théorie juridique que ce soit, de tout manque à gagner ou de perte de profit, de problèmes d'utilisation ou de perte de données, ou d'interruptions d'activités, ou de tout dommage indirect, spécial, secondaire ou consécutif, même si ces entités ont été préalablement informées d'une telle éventualité.

LA DOCUMENTATION EST FOURNIE « EN L'ÉTAT » ET TOUTE AUTRE CONDITION, DÉCLARATION ET GARANTIE, EXPRESSE OU TACITE, EST FORMELLEMENT EXCLUE, DANS LA MESURE AUTORISÉE PAR LA LOI EN VIGUEUR, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE À LA QUALITÉ MARCHANDE, À L'APTITUDE À UNE UTILISATION PARTICULIÈRE OU À L'ABSENCE DE CONTREFAÇON.



# Contents

---

## Using This Documentation vii

### 1. Installing the StorageTek SAS RAID Internal HBA Into the SPARC Enterprise T5120 and T5220 Servers 1

Verifying the Current Devices on the Server 2

▼ To Verify the Current Devices 2

Observing ESD and Handling Precautions 2

Preparing the StorageTek SAS RAID Internal HBA for Installation 3

About the StorageTek SAS RAID Internal HBA Component Layout 3

About the StorageTek SAS RAID Internal HBA Features 4

▼ Prepare the StorageTek SAS RAID Internal HBA Card 5

Installing the Battery Backup Module 7

▼ Install the Battery Backup Module 7

Installing the StorageTek SAS RAID Internal HBA Into the SPARC Enterprise T5120 Server 9

▼ Prepare the Sun SPARC Enterprise T5120 Server 9

▼ Install the StorageTek SAS RAID Internal HBA Into a 4-Disk Capable Server 12

▼ Install the StorageTek SAS RAID Internal HBA Into an 8-Disk Capable Server 14

Installing the StorageTek SAS RAID Internal HBA Into the SPARC Enterprise T5220 Server 18

- ▼ Prepare the Sun SPARC Enterprise T5220 Server 18
- ▼ Install the StorageTek SAS RAID Internal HBA Into an 8-Disk Capable T5220 Server 21
- ▼ Install the StorageTek SAS RAID Internal HBA Into a 16-Disk Capable Server 23

Finishing Up 25

## **2. Installing the Sun Storage 6 Gb SAS PCIe RAID HBA Into a Sun SPARC Enterprise T5120 or T5220 Server 27**

Verifying the Current Devices on the Server 28

- ▼ To Verify the Current Devices 28

Observing ESD and Handling Precautions 28

About the Sun Storage 6 Gb SAS PCIe RAID HBA 29

About the Sun Storage 6 Gb SAS PCIe RAID HBA Component Layout 29

About the Sun Storage 6 Gb SAS PCIe RAID HBA Features 30

- ▼ Prepare the Sun Storage 6 Gb SAS PCIe RAID HBA Card 31

Installing the Sun Storage 6 Gb SAS PCIe RAID HBA Into the SPARC Enterprise T5120 Server 33

- ▼ Prepare the Sun SPARC Enterprise T5120 Server 33
- ▼ Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into a 4-Disk Capable T5120 Server 36
- ▼ Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into an 8-Disk Capable T5120 Server 38

Installing the Sun Storage 6 Gb SAS PCIe RAID HBA Into the SPARC Enterprise T5220 Server 42

- ▼ Prepare the Sun SPARC Enterprise T5220 Server 42
- ▼ Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into an 8-Disk Capable Server 45
- ▼ Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into a 16-Disk Capable Server 47

Finishing Up 49

# Using This Documentation

---

This guide describes procedures for installing a StorageTek SAS RAID Internal HBA or Sun Storage 6 Gb SAS PCIe RAID HBA into Oracle's SPARC Enterprise T5120 or T5220 server.

This preface contains the following topics:

- "Related Documentation" on page vii
- "Documentation, Support, and Training" on page viii

---

## Related Documentation

Application	Title	Format	Location
Online documentation	<i>Sun SPARC Enterprise T5120 Server Topic Set</i>	HTML	Online at:  <a href="http://download.oracle.com/docs/cd/E19839-01">http://download.oracle.com/docs/cd/E19839-01</a>
Online documentation	<i>Sun SPARC Enterprise T5220 Server Topic Set</i>	HTML	Online at:  <a href="http://download.oracle.com/docs/cd/E19637-01">http://download.oracle.com/docs/cd/E19637-01</a>
Latest information	<i>Sun SPARC Enterprise T5120 and T5220 Server Product Notes</i>	PDF	Online
Service	<i>Sun SPARC Enterprise T5120 and T5220 Server Service Manual</i>	PDF	Online

---

Application	Title	Format	Location
Installation	<i>Sun StorageTek SAS RAID HBA Installation Guide</i>	HTML, PDF	Online at:  <a href="http://download.oracle.com/docs/cd/E19494-01">http://download.oracle.com/docs/cd/E19494-01</a>
	<i>Sun Storage 6 Gb SAS PCIe RAID HBA, Internal Installation Guide</i>	HTML, PDF	Online at:  <a href="http://download.oracle.com/docs/cd/E19221-01">http://download.oracle.com/docs/cd/E19221-01</a>

---

---

## Documentation, Support, and Training

These web sites provide additional resources:

- Documentation <http://www.oracle.com/technetwork/indexes/documentation/index.html>
- Support <https://support.oracle.com>
- Training <https://education.oracle.com>



# Installing the StorageTek SAS RAID Internal HBA Into the SPARC Enterprise T5120 and T5220 Servers

---

This chapter describes procedures for installing a StorageTek SAS RAID Internal HBA into a Oracle's SPARC Enterprise T5120 or T5220 server.

This chapter includes the following:

- [“Verifying the Current Devices on the Server” on page 2](#)
- [“Observing ESD and Handling Precautions” on page 2](#)
- [“Preparing the StorageTek SAS RAID Internal HBA for Installation” on page 3](#)
- [“Installing the StorageTek SAS RAID Internal HBA Into the SPARC Enterprise T5120 Server” on page 9](#)
- [“Installing the StorageTek SAS RAID Internal HBA Into the SPARC Enterprise T5220 Server” on page 18](#)
- [“Finishing Up” on page 25](#)

---

# Verifying the Current Devices on the Server

## ▼ To Verify the Current Devices

1. Access the OpenBoot Prompt (ok) and use the `show-disks` command to list the current devices.

```
{0} ok show-disks
> a) /pci@0/pci@0/pci@2/scsi@0/disk
> b) /pci@0/pci@0/pci@1/pci@0/pci@1/pci@0/usb@0,2/storage@2/disk
> q) NO SELECTION
> Enter Selection, q to quit: q
{0} ok
```

---

**Note** – Device paths might vary from this example, depending on the SPARC system you are using and into which PCIe slot the card is plugged.

---

2. Take note of the devices.

This action helps you determine which device is the SAS RAID internal HBA after you install the card.

---

# Observing ESD and Handling Precautions



---

**Caution** – Damage to the internal HBA card can occur as the result of careless handling or electrostatic discharge (ESD). Always handle the internal HBA card and its components with care to avoid damage to electrostatic sensitive components.

---

To minimize the possibility of ESD-related damage, use both a workstation antistatic mat and an ESD wrist strap. You can get an ESD wrist strap from any reputable electronics store. Observe the following precautions to avoid ESD-related problems:

- Leave the internal HBA card in its antistatic bag until you are ready to install it in the system.

- Always use a properly fitted and grounded wrist strap or other suitable ESD protection when handling the internal HBA card and observe proper ESD grounding techniques.
- Hold the internal HBA card by the edge of the PCB, not the connectors.
- Place the internal HBA card on a properly grounded antistatic work surface pad when it is out of its protective antistatic bag.

---

## Preparing the StorageTek SAS RAID Internal HBA for Installation

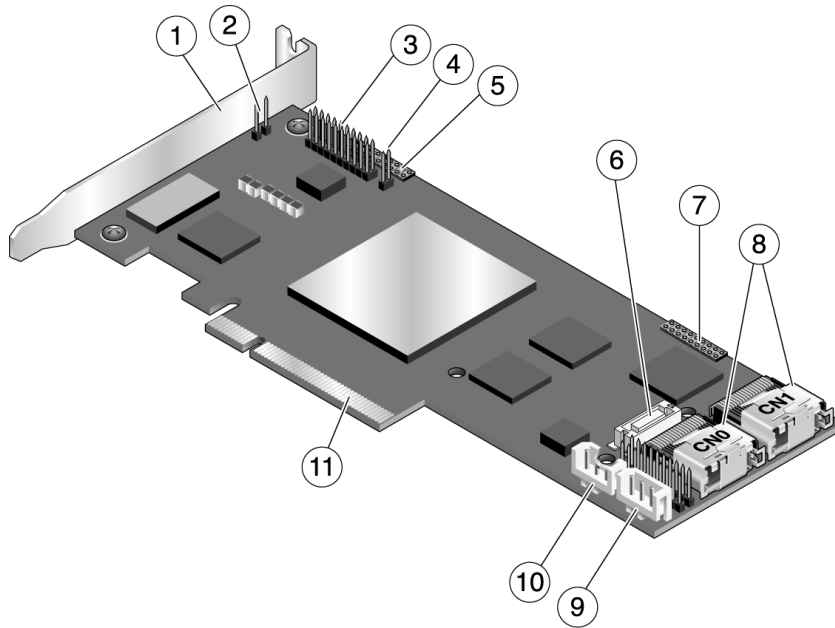
This section includes the following:

- [“About the StorageTek SAS RAID Internal HBA Component Layout” on page 3](#)
- [“About the StorageTek SAS RAID Internal HBA Features” on page 4](#)
- [“Installing the Battery Backup Module” on page 7](#)

### About the StorageTek SAS RAID Internal HBA Component Layout

[FIGURE 1-1](#) shows the component layout for the StorageTek SAS RAID Internal HBA.

**FIGURE 1-1** StorageTek SAS RAID Internal HBA Component Layout



**Figure Legend**

- 
- 1 Mounting bracket
  - 2 Alarm connector
  - 3 Drive Activity LED connectors for CN0/CN1
  - 4 Mode 0 Flash connector
  - 5 Drive Activity LEDs for CN0/CN1
  - 6 Battery connector
  - 7 Diagnostic LEDs
  - 8 Internal SAS connectors
  - 9 I<sup>2</sup>C connector for CN1
  - 10 I<sup>2</sup>C connector for CN0
  - 11 PCIe x4 connector
- 

## About the StorageTek SAS RAID Internal HBA Features

The following table lists the features of the StorageTek SAS RAID Internal HBA.

**TABLE 1-1** StorageTek SAS RAID Internal HBA Features

Feature	Specification
Form factor	Low-profile MD2
Bus compatibility	PCIe
PCIe bus width	x8
PCIe bus speed	2.5 Gb/s
PHYs	8
Standard cache	256 MB DDR2
Connectors, internal	Two mini SAS x4 (SFF-8087)
RAID levels	0, 1, 1E, 10, 5, 5EE, 50,6, 60, JBOD
Simple volume	
Disk drives	SATA, SATA II, SAS
Maximum number of disk drives	8 (or up to 100 with expanders)
Hot-spares	
Enclosure support	I2C and SGPIO
Automatic failover	
Audible alarm	
Battery backup module	ABM-800

## ▼ Prepare the StorageTek SAS RAID Internal HBA Card

1. Read [“Observing ESD and Handling Precautions”](#) on page 2.
2. Familiarize yourself with the physical features of the StorageTek SAS RAID Internal HBA and the RAID levels that it supports.  
See [“About the StorageTek SAS RAID Internal HBA Component Layout”](#) on page 3.

3. Ensure that you have the right quantity of disk drives for the RAID level you want to use for the arrays.

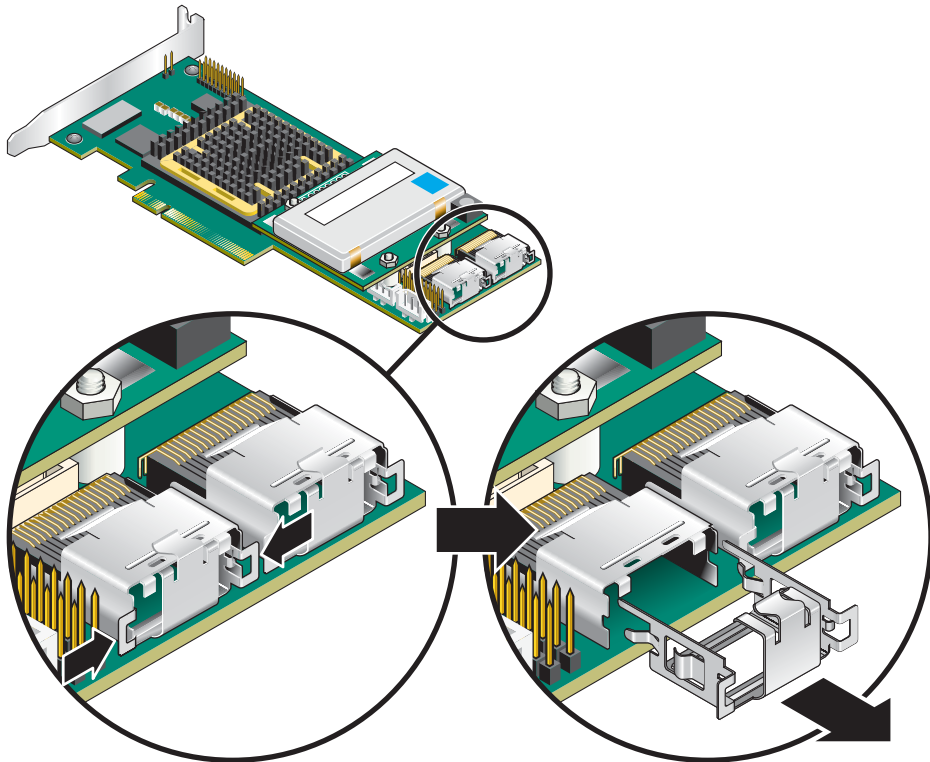
All the disk drives must have the same performance level. You can use different-sized disk drives in the array, but the array will be limited to the capacity of the smallest and slowest disk drive.

The StorageTek SAS RAID Internal HBA supports both SAS and SATA disk drives.

For more information, refer to the *StorageTek SAS RAID HBA Installation Guide, Eight-Port, Internal HBA* and the *StorageTek RAID Manager Software User's Guide* or online Help.

4. Remove the safety clip from each internal SAS connector by using your thumb and forefinger to gently press the tabs of the safety clip and pull the clip out (FIGURE 1-2).

**FIGURE 1-2** Removing the Safety Clips From the SAS Connectors



# Installing the Battery Backup Module

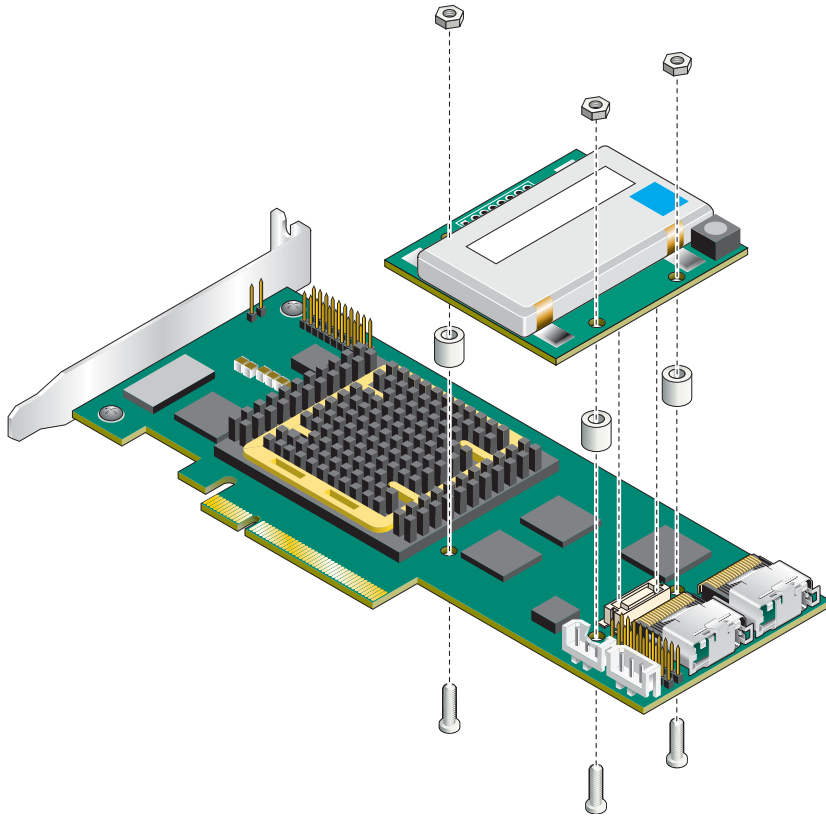
Tools required:

- Small Phillips screwdriver to tighten the screws
- (Suggested) Small needle nose pliers or tweezers
- ESD wrist strap

## ▼ Install the Battery Backup Module

1. **Use a properly fitted and grounded wrist strap or other suitable ESD protection to avoid ESD-related problems during the battery backup module installation.**  
You can get an ESD wrist strap from any reputable electronics store.
2. **Lay the top square piece of packing foam from the StorageTek SAS RAID Internal HBA ship kit on your work surface, smooth side up.**
3. **Take the StorageTek SAS RAID Internal HBA out of the antistatic bag and set it on the packing foam with the heat sink facing up.**
4. **Slightly lift the StorageTek SAS RAID Internal HBA, and from underneath it, insert three plastic screws from the battery backup module kit through the following three mounting holes in the card (FIGURE 1-3):**
  - The bottom left hole, which is about 3 inches from the right edge of the StorageTek SAS RAID Internal HBA.
  - The bottom right hole, which is about 1 inch from the right edge of the StorageTek SAS RAID Internal HBA.
  - The top right hole., which is about 1 inch from the right edge of the StorageTek SAS RAID Internal HBA.

**FIGURE 1-3** Installing the Battery Backup Module



**5. Place a spacer over each screw.**

The battery backup module connector on the StorageTek SAS RAID Internal HBA is just below the screw closest to the right edge of the card.

**6. Line up the battery backup module connector on the module with the connector on the StorageTek SAS RAID Internal HBA.**

The screws you inserted will line up with matching holes in the battery backup module.

**7. Gently press down on the right edge of the battery backup module until the connectors click into place.**



---

**Caution** – *Do not* force the connection. If a gentle push does not mate the connectors, realign the components and try again.

---



8. Obtain the three nuts from the battery backup module kit, and for each nut, do the following:
  - a. Place the nut onto the screw and hold the nut in place.
  - b. With the Phillips screwdriver, reach underneath the StorageTek SAS RAID Internal HBA and, while holding the nut in place with your other hand, screw the plastic screw into the nut.
  - c. Repeat [Step a](#) and [Step b](#) for the remaining nuts.

---

**Note** – If you are unable to place a nut onto the screw that is close to the heat sink, use a small pair of needle nose pliers or tweezers.

---



---

**Caution** – Do not over-tighten the screws.

---

## Installing the StorageTek SAS RAID Internal HBA Into the SPARC Enterprise T5120 Server

This section includes the following:

- [“Prepare the Sun SPARC Enterprise T5120 Server” on page 1-9](#)
- [“Install the StorageTek SAS RAID Internal HBA Into a 4-Disk Capable Server” on page 1-12](#)
- [“Install the StorageTek SAS RAID Internal HBA Into an 8-Disk Capable Server” on page 1-14](#)

### ▼ Prepare the Sun SPARC Enterprise T5120 Server

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for specific instructions for more details on the following steps.

1. **Power off the server.**
2. **Disconnect all external cables.**

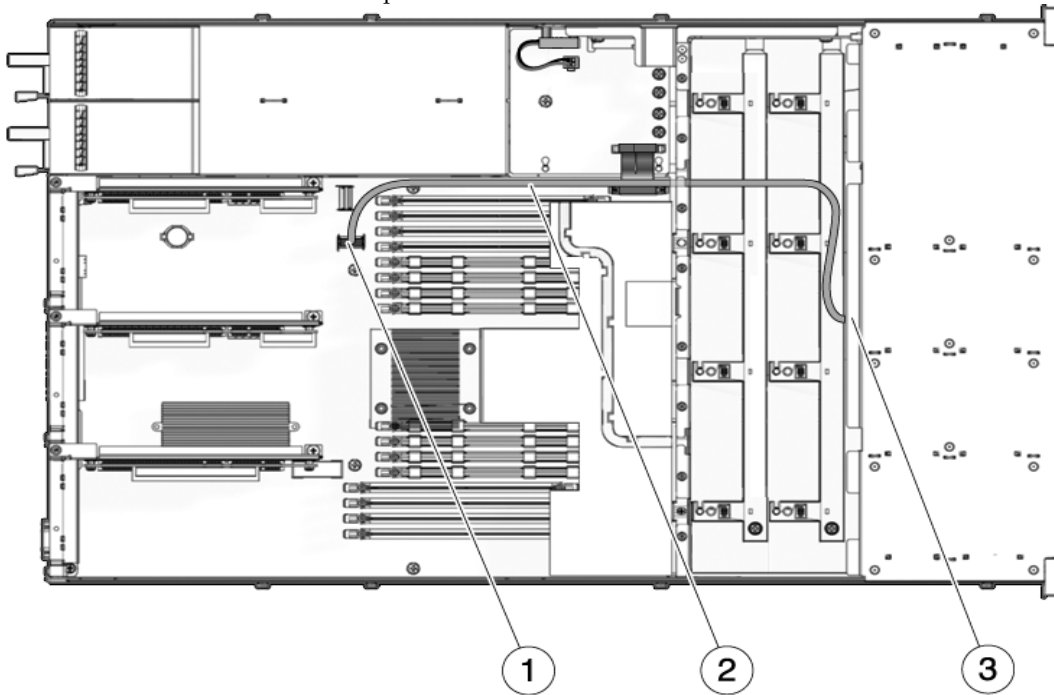
3. Remove the server from the rack.  
Place the server on a hard, flat surface.
4. Attach an antistatic wrist strap.
5. Remove the top cover.
6. Remove all of the fan modules.
7. Disconnect the hard drive data cable(s).

---

**Note** – For 4-disk capable servers, there is one data cable. See [FIGURE 1-4](#).

---

**FIGURE 1-4** Removing the Existing Hard Drive Cable From a Four-Disk Capable SPARC Enterprise T5120 Server



**Figure Legend**

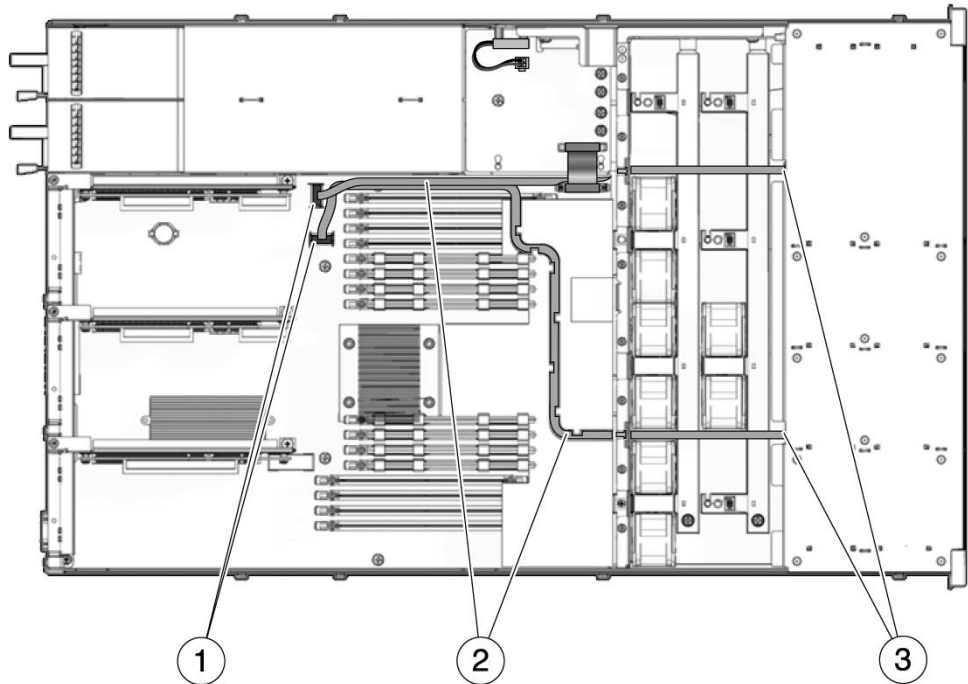
- 
- |   |                                   |
|---|-----------------------------------|
| 1 | Connector on motherboard          |
| 2 | Hard drive data cable             |
| 3 | Connector on hard drive backplane |
-

---

**Note** – For 8-disk capable servers, there are two data cables.

---

**FIGURE 1-5** Removing the Existing Hard Drive Cable From an Eight-Disk Capable SPARC Enterprise T5120 Server



**Figure Legend**

- 
- 1 Connectors on motherboard
  - 2 Hard drive data cables
  - 3 Connectors on hard drive backplane
- 

- a. Locate each hard drive data cable connector on the motherboard.
- b. Press the latch to release the cable plug. Pull each plug out of its connector on the motherboard.  
If you have difficulty releasing the cable plug, first push the plug slightly into the connector, then press the latch.
- c. Locate each hard drive cable connector on the hard drive backplane, and repeat [Step b](#) to remove the hard drive data cable from the hard drive backplane.

---

**Note** – If you can't easily remove the cable from the hard drive backplane, you might have to remove the hard drive cage to provide better access. Refer to the *Sun SPARC Enterprise T5120 and T5220 Servers Service Manual* for those procedures, then return here.

---

**8. Remove the hard drive data cables(s) from the server.**

Remove each cable from its channel in the air duct.

## ▼ Install the StorageTek SAS RAID Internal HBA Into a 4-Disk Capable Server

Follow these instructions for SPARC Enterprise T5120 servers that are 4-disk capable.

**1. Use the following table to locate the connectors and cables for your server .**

HBA Connector	Cable Part Number and Length	Hard Drive Backplane Connector
CN0	530-4119 (71 cm)	P1

---

**Note** – Other cables are included in the Internal HBA optional component box. However, those additional cables are used for other configurations. You will not use those additional cables for this system.

---

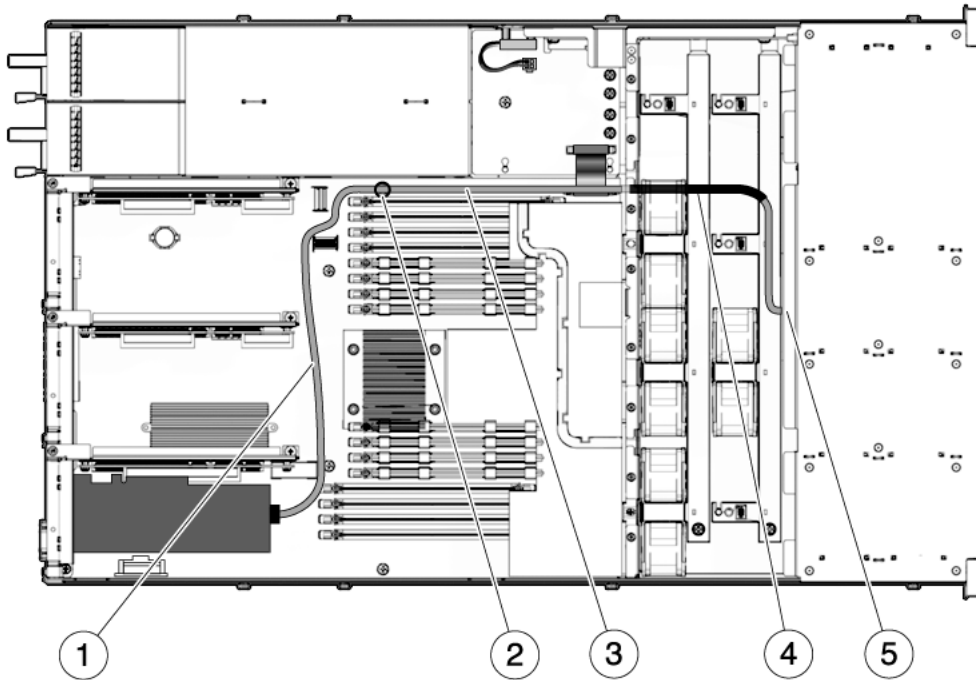
**2. Lay the cable out in the system so that the end with the heat-shrink tubing is closer to the hard drive backplane (FIGURE 1-7).**

---

**Note** – Verify that the cable is oriented correctly, with the heat-shrink tubing closer to the hard drive backplane as shown in [FIGURE 1-7](#), before proceeding.

---

**FIGURE 1-6** Routing the Hard Drive Data Cable in a Four-Disk Capable SPARC Enterprise T5120 Server. For specific cable connections, see text.



**Figure Legend**

- 
- 1 Routing the cable between the PCIe slots and FB-DIMMs
  - 2 Routing the cable through the cable retainer
  - 3 Routing the cable along the power supply midwall
  - 4 Proper location of Heat-shrink tubing
  - 5 Routing the cable through the fan midwall to the hard drive backplane
-

3. **Connect one end of the 530-4119 cable into connector CN0 on the internal HBA.**
4. **Install the internal HBA into PCIe slot 2 (the rightmost slot when viewed from the rear).**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for the procedures for installing a PCIe card into the server, then return here.

5. **Connect the other end of the 530-4119 cable into connector P1 on the hard drive backplane.**
6. **Route the cable through the system as shown in [FIGURE 1-6](#), ensuring the following:**
  - a. **Route the cable between the PCIe slots and the FB-DIMMs.**
  - b. **Route the cable through the cable retainer to the fan midwall.**

The cable retainer is located on the motherboard, next to the power supply midwall.

---

**Note** – You might need to loosen the cable retainer screw in order to insert the cable.

---

- c. **Route the cable along the power supply midwall.**
  - d. **Viewing the system from the rear, route the cable along the side of the air duct and through the second slot from the left on the fan midwall.**
7. **Reinstall the fan modules.**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for those procedures, then return here. Note that the heat-shrink tubing on the 530-4119 cable should be routed underneath the fan modules.
8. **Go to “[Finishing Up](#)” on [page 25](#) to reinstall your server and power it back on.**

## ▼ Install the StorageTek SAS RAID Internal HBA Into an 8-Disk Capable Server

Follow these instructions for SPARC Enterprise T5120 servers that are 8-disk capable.

1. Use the following table to locate the correct cables and connectors for your server.

HBA Connector	Cable Part Number and Length	Hard Drive Backplane Connector
CN0	530-4118 (78 cm)	P2
CN1	530-3893 (60 cm)	P3

---

**Note** – Other cables are included in the Internal HBA optional component box. However, those additional cables are used for other configurations. You will not use those additional cables for this system.

---

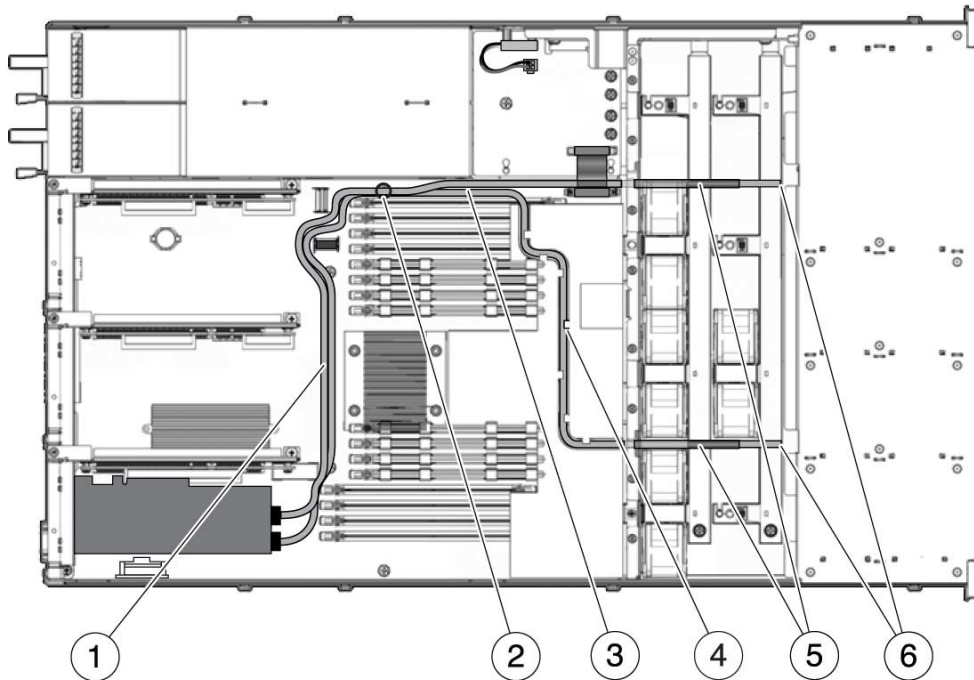
2. Lay the cable out in the system so that the end with the heat-shrink tubing is closer to the hard drive backplane (FIGURE 1-7).

---

**Note** – Verify that the cable is oriented correctly, with the heat-shrink tubing closer to the hard drive backplane, before proceeding.

---

**FIGURE 1-7** Routing the Hard Drive Data Cable in an Eight-Disk Capable SPARC Enterprise T5120 Server. For specific cable connections, see text.



**Figure Legend**

- 
- |   |   |
|---|---|
| 1 | Routing the cable between the PCIe slots and FB-DIMMs                 |
| 2 | Routing the cable through the cable retainer                          |
| 3 | Routing the cable along the power supply midwall                      |
| 4 | 78 cm cable routing through the channel on the clear plastic air duct |
| 5 | Proper positions of Heat-shrink tubing                                |
| 6 | Routing the cable through the fan midwall to the hard drive backplane |
- 

**3. Connect the 530-4118 cable from CN0 on the internal HBA to P2 on the hard drive backplane.**

**4. Connect the 530-3893 cable from CN1 on the internal HBA to P3 on the hard drive backplane.**

**5. Install the internal HBA into PCIe slot 2 (the rightmost slot when viewed from the rear).**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for the procedures for installing a PCIe card into the server, then return here.



6. Route the cables through the system as shown in [FIGURE 1-7](#), ensuring the following:
  - a. Route the cables between the PCIe slots and the FB-DIMMs.
  - b. Route the cables through the cable retainer to the fan midwall.

The cable retainer is located on the motherboard, next to the power supply midwall.

---

**Note** – You might need to loosen the cable retainer screw in order to insert the cables.

---

- c. Route the cables along the power supply midwall.
  - d. Viewing the system from the rear, route the cables along the side of the air duct and through the second slot from the left on the fan midwall.
7. Reinstall the fan modules.

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for those procedures, then return here.
8. Go to [“Finishing Up” on page 25](#) to reinstall your server and power it back on.

---

# Installing the StorageTek SAS RAID Internal HBA Into the SPARC Enterprise T5220 Server

This section includes the following:

- “Prepare the Sun SPARC Enterprise T5220 Server” on page 1-18
- “Install the StorageTek SAS RAID Internal HBA Into an 8-Disk Capable T5220 Server” on page 1-21
- “Install the StorageTek SAS RAID Internal HBA Into a 16-Disk Capable Server” on page 1-23

## ▼ Prepare the Sun SPARC Enterprise T5220 Server

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for specific instructions for more details on the following steps.

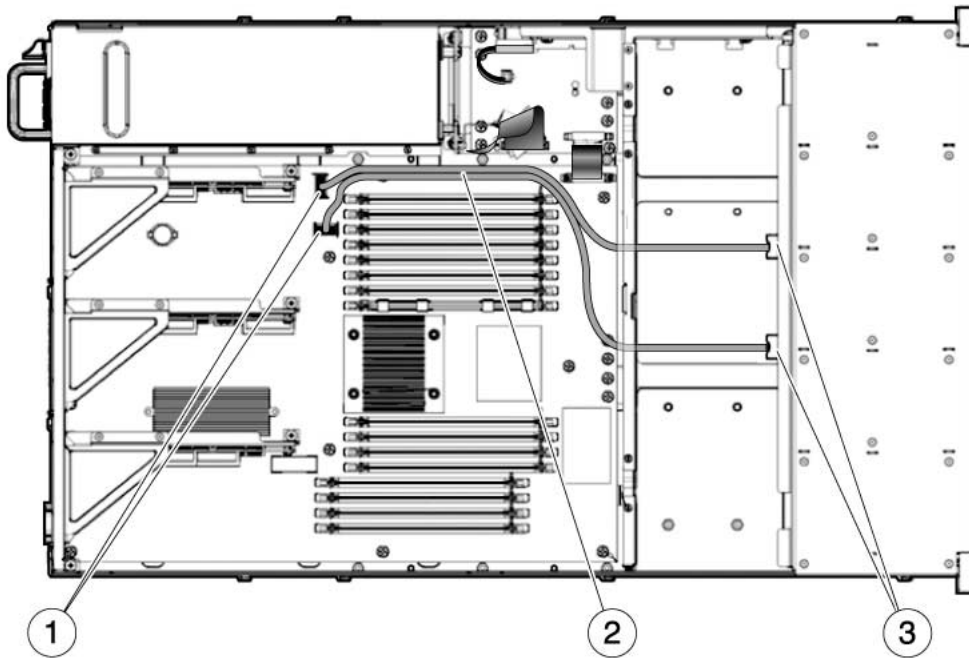
1. **Power off the server.**
2. **Disconnect all external cables.**
3. **Remove the server from the rack.**  
Place the server on a hard, flat surface.
4. **Attach an antistatic wrist strap.**
5. **Remove the top cover.**
6. **Remove the air duct.**
7. **Remove all of the fan modules.**
8. **Remove both fan boards.**
9. **Disconnect the hard drive data cable(s).**

---

**Note** – For 8-disk capable servers, there are two data cables. See [FIGURE 1-8](#).

---

**FIGURE 1-8** Removing the Existing Hard Drive Cable From an Eight-Disk Capable SPARC Enterprise T5220 Server.



**Figure Legend**

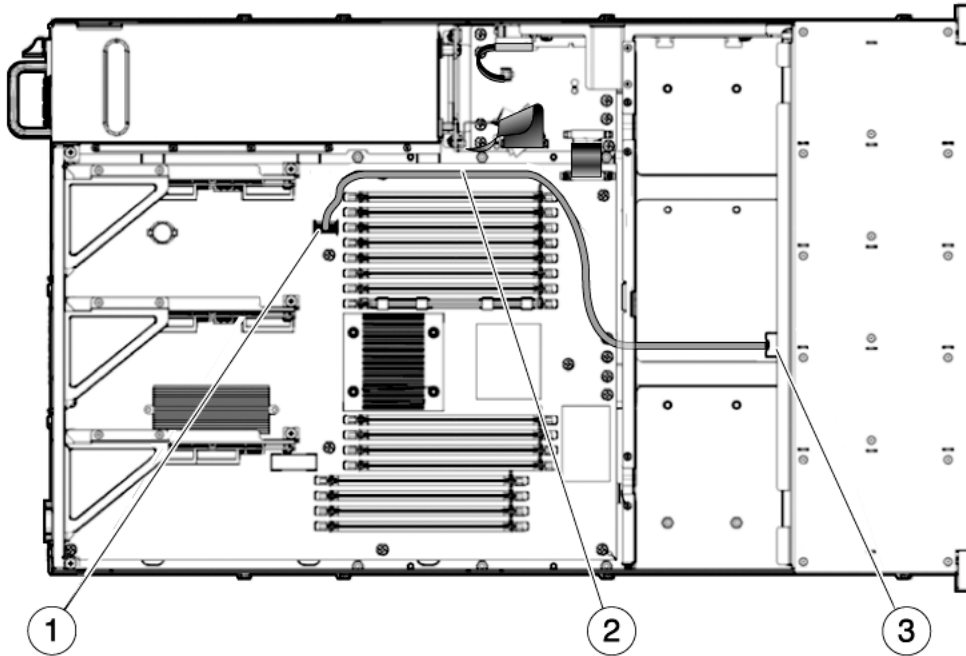
- 
- 1 Connectors on motherboard
  - 2 Hard drive data cables
  - 3 Connectors on hard drive backplane
- 

---

**Note** – For 16-disk capable servers, there is one data cable. See [FIGURE 1-9](#).

---

**FIGURE 1-9** Removing the Existing Hard Drive Cable From a 16-Disk Capable SPARC Enterprise T5220 Server.



**Figure Legend**

- 
- |   |                                   |
|---|-----------------------------------|
| 1 | Connector on motherboard          |
| 2 | Hard drive data cable             |
| 3 | Connector on hard drive backplane |
- 

- a. **Locate each hard drive data cable connector on the motherboard.**
- b. **Press the latch to release the cable plug. Pull each plug out of its connector on the motherboard.**  
If you have difficulty releasing the cable plug, first push the plug slightly into the connector, then press the latch.
- c. **Locate each hard drive cable connector on the hard drive backplane, and repeat [Step b](#) to remove the hard drive data cable from the hard drive backplane.**

---

**Note** – If you can't easily remove the cable from the hard drive backplane, you might have to remove the hard drive cage to provide better access. Refer to the *Sun SPARC Enterprise T5120 and T5220 Servers Service Manual* for those procedures, then return here.

---

10. Remove the hard drive data cables(s) from the server.

## ▼ Install the StorageTek SAS RAID Internal HBA Into an 8-Disk Capable T5220 Server

Follow these instructions for SPARC Enterprise T5220 servers that are 8-disk capable.

1. Use the following table to locate the correct cables and connectors for your server.

HBA Connector	Cable Part Number and Length	Hard Drive Backplane Connector
CN0	530-4119 (71 cm)	P2
CN1	530-3892 (67 cm)	P3

---

**Note** – Other cables are included in the Internal HBA optional component box. However, those additional cables are used for other configurations. You will not use those additional cables for this system.

---

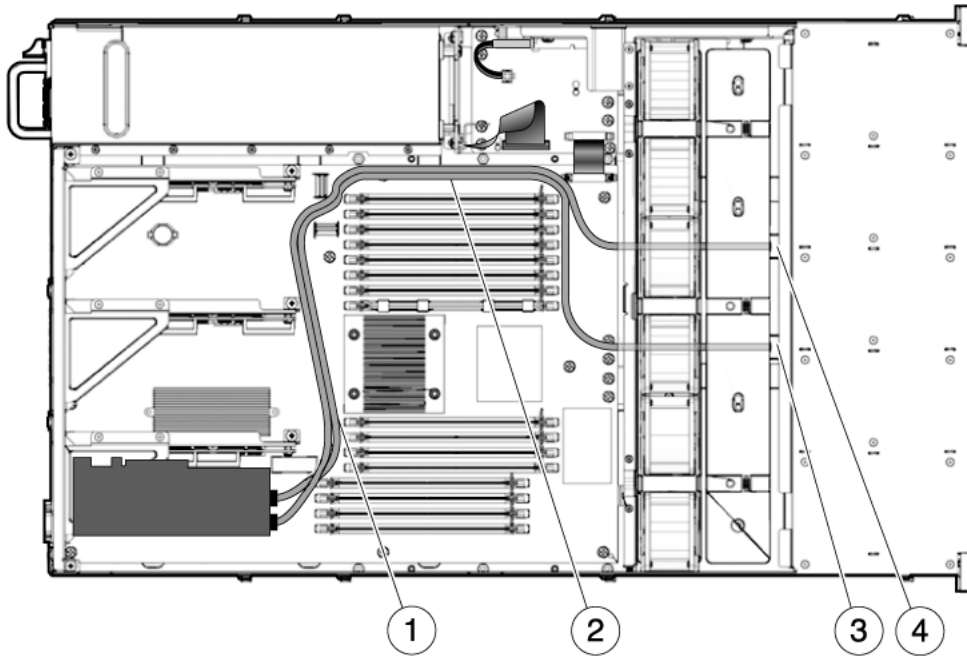
2. Lay the cables out in the system so that the ends with the heat-shrink tubing are closer to the hard drive backplane ([FIGURE 1-10](#)).

---

**Note** – Verify that the cables are oriented correctly, with the heat-shrink tubing closer to the hard drive backplane, before proceeding.

---

**FIGURE 1-10** Routing the Hard Drive Data Cables in an Eight-Disk Capable SPARC Enterprise T5220 Server from Oracle. For specific cable connections, see text.



**Figure Legend**

- 
- |   |   |
|---|---|
| 1 | Routing the cable between the PCIe slots and FB-DIMMs |
| 2 | Routing the cable through the cable retainer          |
| 3 | Routing the cable to P2 on the hard drive backplane.  |
| 4 | Routing the cable to P3 on the hard drive backplane   |
- 

3. Connect the 530-4119 cable from CN0 on the internal HBA to P2 on the hard drive backplane.
4. Connect the 530-3892 cable from CN1 on the internal HBA to P3 on the hard drive backplane.
5. Install the internal HBA into PCIe slot 2 (the rightmost slot when viewed from the rear).

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for the procedures for installing a PCIe card into the server, then return here.

6. Route the cables through the system as shown in [FIGURE 1-10](#), ensuring the following:

- a. Route the cables between the PCIe slots and the FB-DIMMs.
- b. Route the cables through the cable retainer to the fan midwall.

The cable retainer is located on the motherboard, next to the power supply midwall.

**Note** – You might need to loosen the cable retainer screw in order to insert the cables.

- c. Route the cables along the power supply midwall.

Route the cables through the second slot from the left on the fan midwall.

**7. Reinstall the air duct.**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

**Viewing the system from the rear, ensure the hard drive backplane cables are routed along the side of the air duct.**

**8. Reinstall the fan boards**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

**9. Reinstall the fan modules.**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

**10. Go to “Finishing Up” on page 25 to reinstall your server and power it back on.**

## ▼ Install the StorageTek SAS RAID Internal HBA Into a 16-Disk Capable Server

Follow these instructions for SPARC Enterprise T5220 servers that are 16-disk capable.

- 1. Use the following table to locate the correct cable and connectors for your server.

HBA Connector	Cable Part Number and Length	Hard Drive Backplane Connector
CN0	530-4119 (71 cm)	J0301

---

**Note** – Other cables are included in the Internal HBA optional component box. However, those additional cables are used for other configurations. You will not use those additional cables for this system.

---

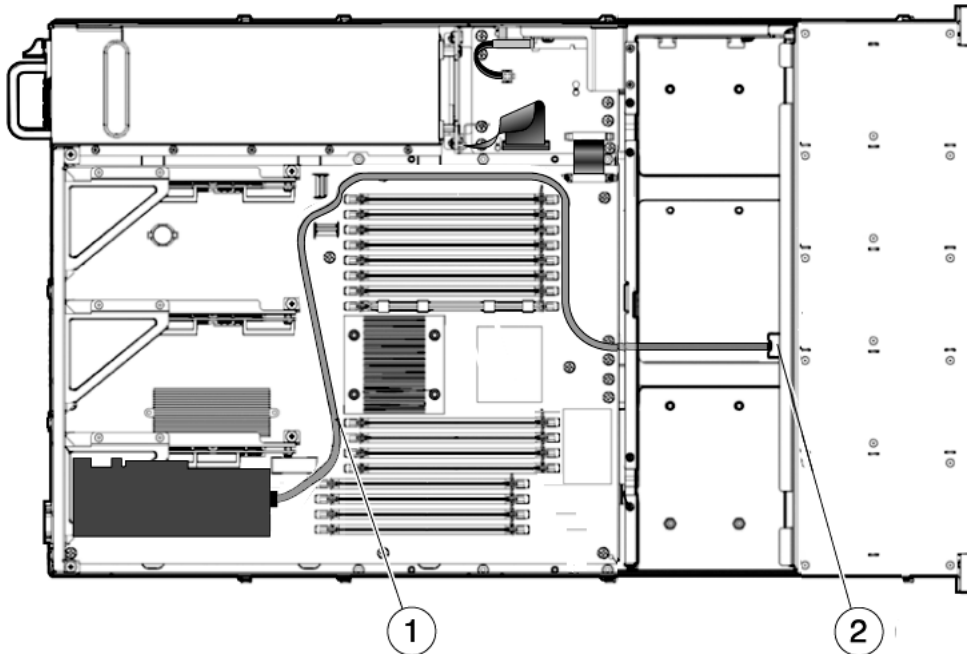
2. Lay the cable out in the system so that the end with the heat-shrink tubing is closer to the hard drive backplane (FIGURE 1-11).

---

**Note** – Verify that the cable is oriented correctly, with the heat-shrink tubing closer to the hard drive backplane, before proceeding.

---

**FIGURE 1-11** Routing the Hard Drive Data Cable in an 16-Disk Capable SPARC Enterprise T5120 Server from Oracle. For specific cable connections, see text.



**Figure Legend**

- 
- |   |   |
|---|---|
| 1 | Routing the cable between the PCIe slots and FB-DIMMs |
| 2 | Routing the cable to P2 on the hard drive backplane   |
- 

3. Connect the 530-4119 cable from CN0 on the internal HBA to J0301 on the hard drive backplane.



4. **Install the internal HBA into PCIe slot 2 (the rightmost slot when viewed from the rear).**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for the procedures for installing a PCIe card into the server, then return here.

5. **Route the cable through the system as shown in [FIGURE 1-11](#), ensuring the following:**

- a. **Route the cable between the PCIe slots and the FB-DIMMs.**

- b. **Route the cable through the cable retainer to the fan midwall.**

The cable retainer is located on the motherboard, next to the power supply midwall.

---

**Note** – You might need to loosen the cable retainer screw in order to insert the cable.

---

- c. **Route the cable along the power supply midwall.**

Route the cable **through the second slot from the left on the fan midwall.**

6. **Reinstall the air duct.**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

**Viewing the system from the rear, ensure the hard drive backplane cables are routed along the side of the air duct.**

7. **Reinstall the fan boards**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

8. **Reinstall the fan modules.**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

9. **Go to [“Finishing Up” on page 25](#) to reinstall your server and power it back on.**

---

## Finishing Up

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for specific instructions for each of the procedures in this section.

1. **Install the top cover.**
2. **Install the server into the rack.**
3. **Connect all external cables.**

4. Power on the server.
5. Perform any additional card-specific tasks.

# Installing the Sun Storage 6 Gb SAS PCIe RAID HBA Into a Sun SPARC Enterprise T5120 or T5220 Server

---

This chapter describes how to install the Sun Storage 6 Gb SAS PCIe RAID HBA into Oracle's Sun SPARC Enterprise T5120 or T5220 server.

This chapter includes the following:

- [“Verifying the Current Devices on the Server” on page 28](#)
- [“Observing ESD and Handling Precautions” on page 28](#)
- [“About the Sun Storage 6 Gb SAS PCIe RAID HBA” on page 29](#)
- [“Installing the Sun Storage 6 Gb SAS PCIe RAID HBA Into the SPARC Enterprise T5120 Server” on page 33](#)
- [“Installing the Sun Storage 6 Gb SAS PCIe RAID HBA Into the SPARC Enterprise T5220 Server” on page 42](#)
- [“Finishing Up” on page 49](#)

---

# Verifying the Current Devices on the Server

## ▼ To Verify the Current Devices

1. Access the OpenBoot Prompt (ok) and use the `show-disks` command to list the current devices.

```
{0} ok show-disks
> a) /pci@0/pci@0/pci@2/scsi@0/disk
> b) /pci@0/pci@0/pci@1/pci@0/pci@1/pci@0/usb@0,2/storage@2/disk
> q) NO SELECTION
> Enter Selection, q to quit: q
{0} ok
```

---

**Note** – Device paths might vary from this example, depending on the SPARC system you are using and into which PCIe slot the card is plugged.

---

2. Take note of the devices.

This action helps you determine which device is the SAS RAID internal HBA after you install the card.

---

# Observing ESD and Handling Precautions



---

**Caution** – Damage to the can occur as the result of careless handling or electrostatic discharge (ESD). Always handle the internal HBA card and its components with care to avoid damage to electrostatic sensitive components.

---

To minimize the possibility of ESD-related damage, use both a workstation antistatic mat and an ESD wrist strap. You can get an ESD wrist strap from any reputable electronics store. Observe the following precautions to avoid ESD-related problems:

- Leave the internal HBA card in its antistatic bag until you are ready to install it in the system.

- Always use a properly fitted and grounded wrist strap or other suitable ESD protection when handling the internal HBA card and observe proper ESD grounding techniques.
- Hold the internal HBA card by the edge of the PCB, not the connectors.
- Place the internal HBA card on a properly grounded antistatic work surface pad when it is out of its protective antistatic bag.

---

## About the Sun Storage 6 Gb SAS PCIe RAID HBA

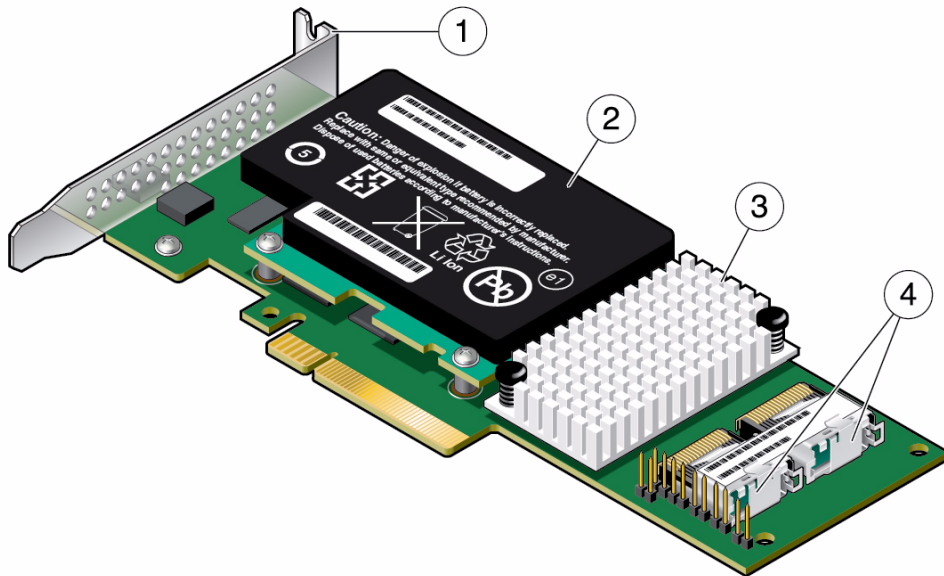
This section includes the following:

- [“About the Sun Storage 6 Gb SAS PCIe RAID HBA Component Layout” on page 29](#)
- [“About the Sun Storage 6 Gb SAS PCIe RAID HBA Features” on page 30](#)

## About the Sun Storage 6 Gb SAS PCIe RAID HBA Component Layout

**FIGURE 2-1** shows the component layout for Oracle’s Sun Storage 6 Gb SAS PCIe RAID HBA.

**FIGURE 2-1** Sun Storage 6 Gb SAS PCIe RAID HBA Component Layout



**Figure Legend**

- 
- 1 Mounting bracket
  - 2 Battery module
  - 3 Heat sink
  - 4 Internal SAS connectors
- 

**Note** – The Sun Storage 6 Gb SAS PCIe RAID HBA is shipped with the battery module attached to the card.

---

## About the Sun Storage 6 Gb SAS PCIe RAID HBA Features

The following table lists the features of the Sun Storage 6 Gb SAS PCIe RAID HBA.

**TABLE 2-1** Sun Storage 6 Gb SAS PCIe RAID HBA Features

<b>Feature</b>	<b>Specification</b>
Form factor	Low-profile MD2
Bus compatibility	PCIe
PCIe bus width	x8
PCIe bus speed	Up to 5 Gb/s per port
PHYs	8
Standard cache	512 MB DDR2
Connectors, internal	Two mini SAS x4 (SFF-8087)
RAID levels	RAID levels 0, 1, 5, and 6 RAID spans 10, 50, and 60
Simple volume	
Disk drives	SATA, SATA II, SAS, SAS-2
Maximum number of disk drives	Up to 32 SAS and/or SATA drives Up to 64 logical drives
Hot-spares	
Enclosure support	I2C and SGPIO
Automatic failover	
Audible alarm	
Battery backup	

## ▼ Prepare the Sun Storage 6 Gb SAS PCIe RAID HBA Card

1. Read [“Observing ESD and Handling Precautions”](#) on page 28.
2. Familiarize yourself with the physical features of the Sun Storage 6 Gb SAS PCIe RAID HBA and the RAID levels that it supports.  
See [“About the Sun Storage 6 Gb SAS PCIe RAID HBA”](#) on page 29.

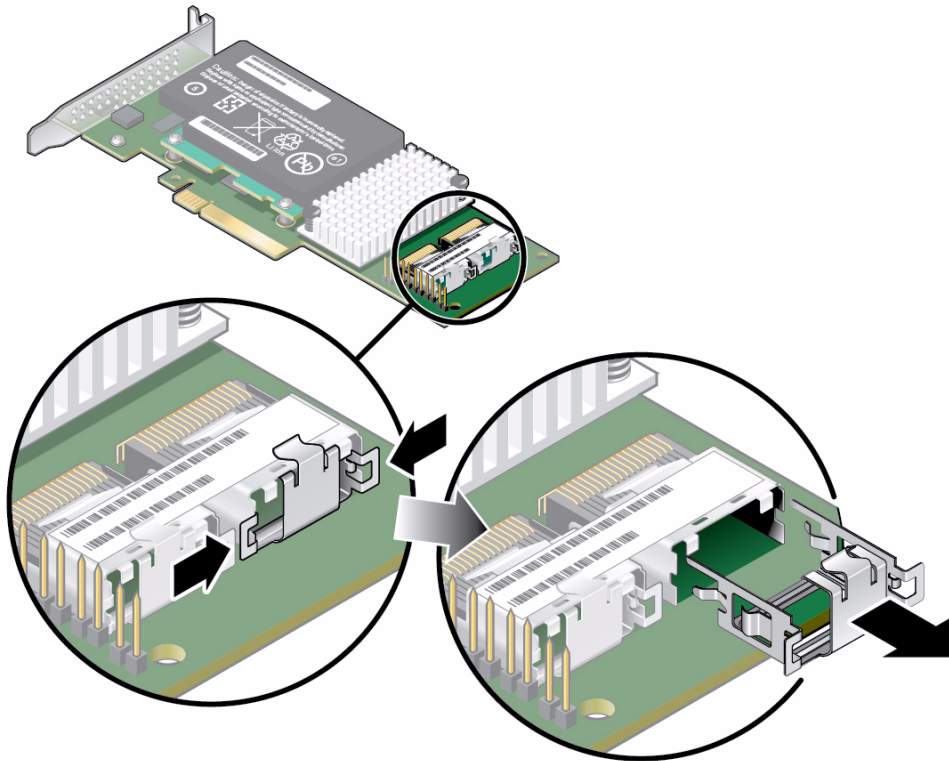
3. Ensure that you have the right quantity of disk drives for the RAID level you want to use for the arrays.

All the disk drives must have the same performance level. You can use different-sized disk drives in the array, but the array will be limited to the capacity of the smallest and slowest disk drive.

The Sun Storage 6 Gb SAS PCIe RAID HBA supports SAS, SAS-2, and SATA disk drives.

4. Remove the safety clip from each internal SAS connector by using your thumb and forefinger to gently press the tabs of the safety clip and pull the clip out (FIGURE 2-2).

**FIGURE 2-2** Removing the Safety Clips From the SAS Connectors





---

# Installing the Sun Storage 6 Gb SAS PCIe RAID HBA Into the SPARC Enterprise T5120 Server

This section includes the following:

- [“Prepare the Sun SPARC Enterprise T5220 Server” on page 2-42](#)
- [“Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into an 8-Disk Capable Server” on page 2-45](#)
- [“Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into a 16-Disk Capable Server” on page 2-47](#)

## ▼ Prepare the Sun SPARC Enterprise T5120 Server

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for specific instructions for more details on the following steps.

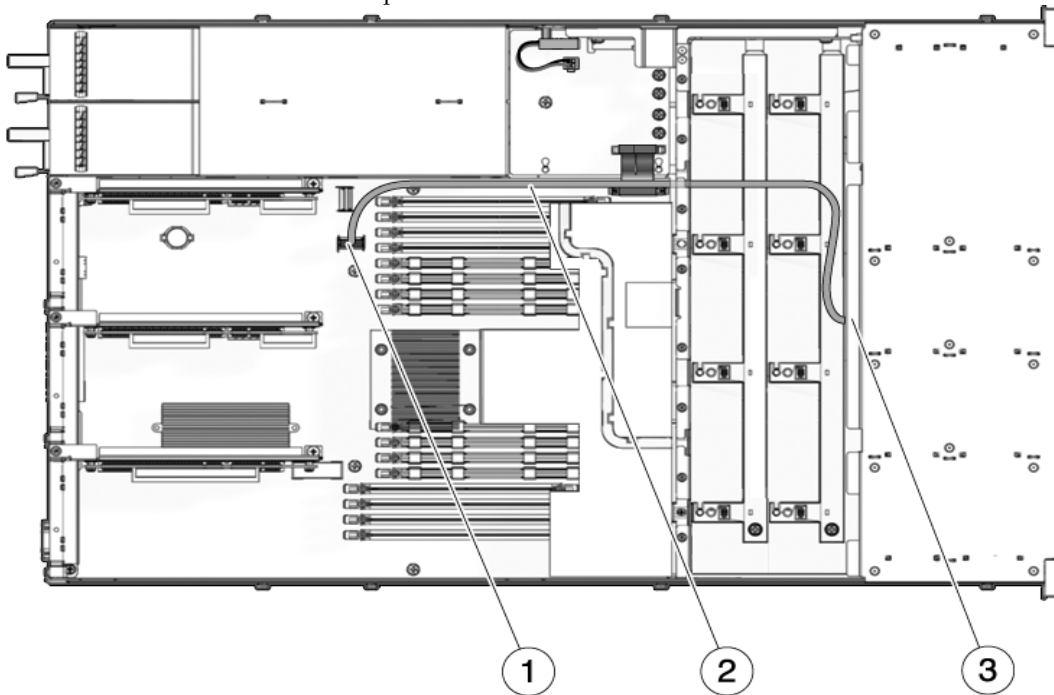
1. **Power off the server.**
2. **Disconnect all external cables.**
3. **Remove the server from the rack.**  
Place the server on a hard, flat surface.
4. **Attach an antistatic wrist strap.**
5. **Remove the top cover.**
6. **Remove all of the fan modules.**
7. **Disconnect the hard drive data cable(s).**

---

**Note** – For 4-disk capable servers, there is one data cable. See [FIGURE 2-3](#).

---

**FIGURE 2-3** Removing the Existing Hard Drive Cable From a Four-Disk Capable SPARC Enterprise T5120 Server



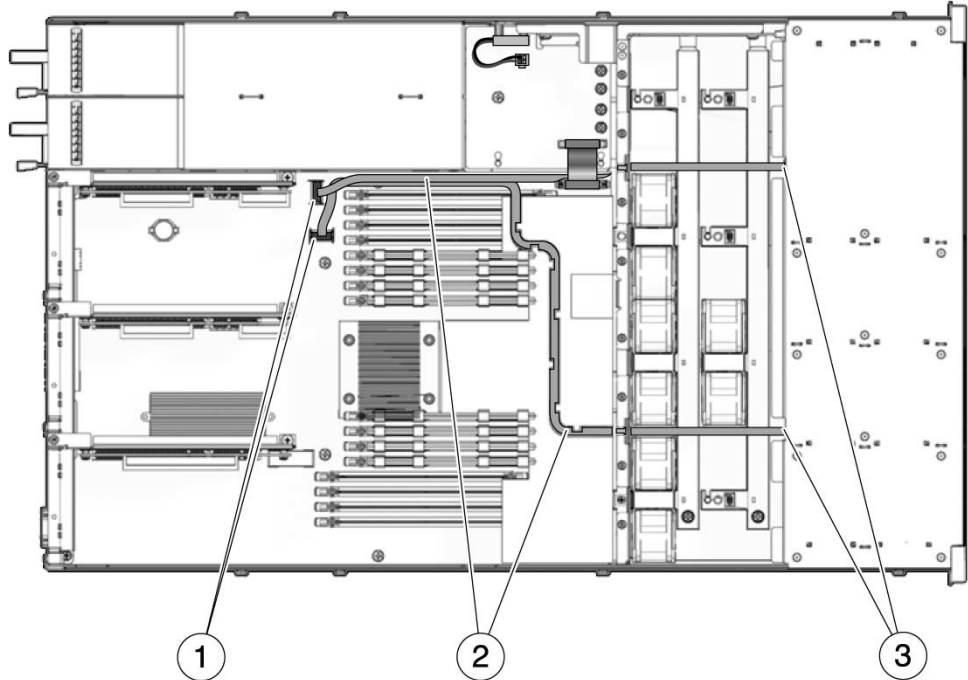
**Figure Legend**

- 
- 1 Connector on motherboard
  - 2 Hard drive data cable
  - 3 Connector on hard drive backplane
- 

**Note** – For 8-disk capable servers, there are two data cables See [FIGURE 2-4](#).

---

**FIGURE 2-4** Removing the Existing Hard Drive Cable From an Eight-Disk Capable SPARC Enterprise T5120 Server.



**Figure Legend**

- 
- 1 Connectors on motherboard
  - 2 Hard drive data cables
  - 3 Connectors on hard drive backplane
- 

- a. **Locate each hard drive data cable connector on the motherboard.**
- b. **Press the latch to release the cable plug. Pull each plug out of its connector on the motherboard.**  
If you have difficulty releasing the cable plug, first push the plug slightly into the connector, then press the latch.
- c. **Locate each hard drive cable connector on the hard drive backplane, and repeat [Step b](#) to remove the hard drive data cable from the hard drive backplane.**

---

**Note** – If you can't easily remove the cable from the hard drive backplane, you might have to remove the hard drive cage to provide better access. Refer to the *Sun SPARC Enterprise T5120 and T5220 Servers Service Manual* for those procedures, then return here.

---

**8. Remove the hard drive data cables(s) from the server.**

Remove each cable from its channel in the air duct.

## ▼ Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into a 4-Disk Capable T5120 Server

Follow these instructions for SPARC Enterprise T5120 servers that are 4-disk capable.

**1. Use the following table to locate the connectors and cables for your server .**

HBA Connector	Cable Part Number and Length	Hard Drive Backplane Connector
SAS 0	530-4119 (71 cm)	P1

---

**Note** – Other cables are included in the Internal HBA optional component box. However, those additional cables are used for other configurations. You will not use those additional cables for this system.

---

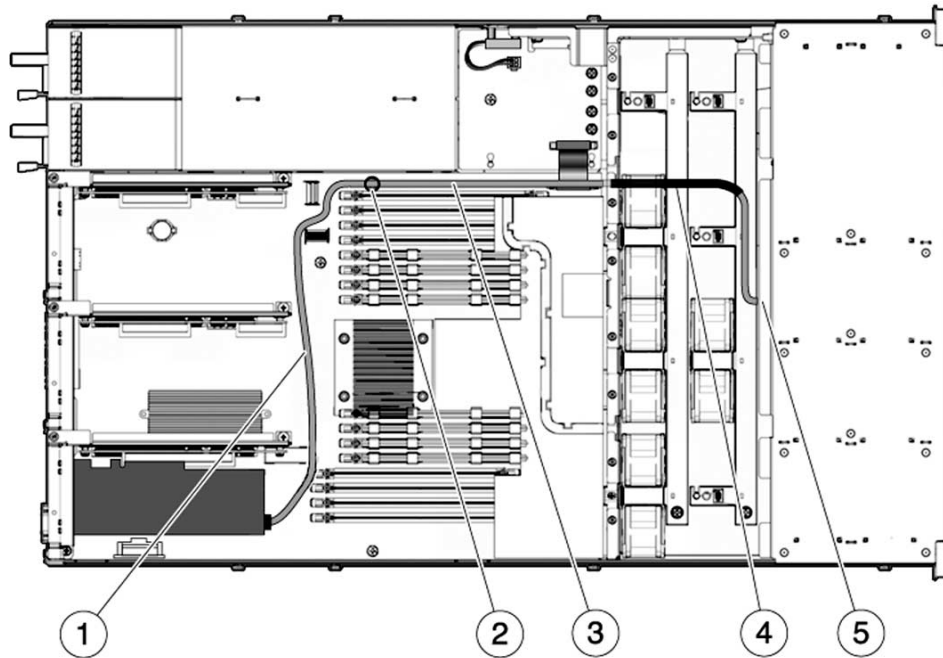
**2. Lay the cable out in the system so that the end with the heat-shrink tubing is closer to the hard drive backplane (FIGURE 2-5).**

---

**Note** – Verify that the cable is oriented correctly, with the heat-shrink tubing closer to the hard drive backplane before proceeding.

---

**FIGURE 2-5** Routing the Hard Drive Data Cable in a Four-Disk Capable SPARC Enterprise T5120 Server. For specific cable connections, see text.



**Figure Legend**

- 
- 1 Routing the cable between the PCIe slots and FB-DIMMs
  - 2 Routing the cable through the cable retainer
  - 3 Routing the cable along the power supply midwall
  - 4 Proper location of Heat-shrink tubing
  - 5 Routing the cable through the fan midwall to the hard drive backplane
-

3. Connect one end of the 530-4119 cable into connector SAS 0 on the internal HBA.
4. Install the internal HBA into PCIe slot 2 (the rightmost slot when viewed from the rear).

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for the procedures for installing a PCIe card into the server, then return here.

5. Connect the other end of the 530-4119 cable into connector P1 on the hard drive backplane.
6. Route the cable through the system as shown in [FIGURE 2-5](#) ensuring the following:
  - a. Route the cable between the PCIe slots and the FB-DIMMs.
  - b. Route the cable through the cable retainer to the fan midwall.

The cable retainer is located on the motherboard, next to the power supply midwall.

---

**Note** – You might need to loosen the cable retainer screw in order to insert the cable.

---

- c. Route the cable along the power supply midwall.
  - d. Viewing the system from the rear, route the cable along the side of the air duct and through the second slot from the left on the fan midwall.
7. Reinstall the fan modules.

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for those procedures, then return here. Note that the heat-shrink tubing on the 530-4119 cable should be routed underneath the fan modules.
8. Go to [“Finishing Up” on page 49](#) to reinstall your server and power it back on.

## ▼ Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into an 8-Disk Capable T5120 Server

Follow these instructions for SPARC Enterprise T5120 servers that are 8-disk capable.

1. Use the following table to locate the correct cables and connectors for your server.

HBA Connector	Cable Part Number and Length	Hard Drive Backplane Connector
SAS 0	530-4118 (78 cm)	P2
SAS 1	530-3893 (60 cm)	P3

---

**Note** – Other cables are included in the Internal HBA optional component box. However, those additional cables are used for other configurations. You will not use those additional cables for this system.

---

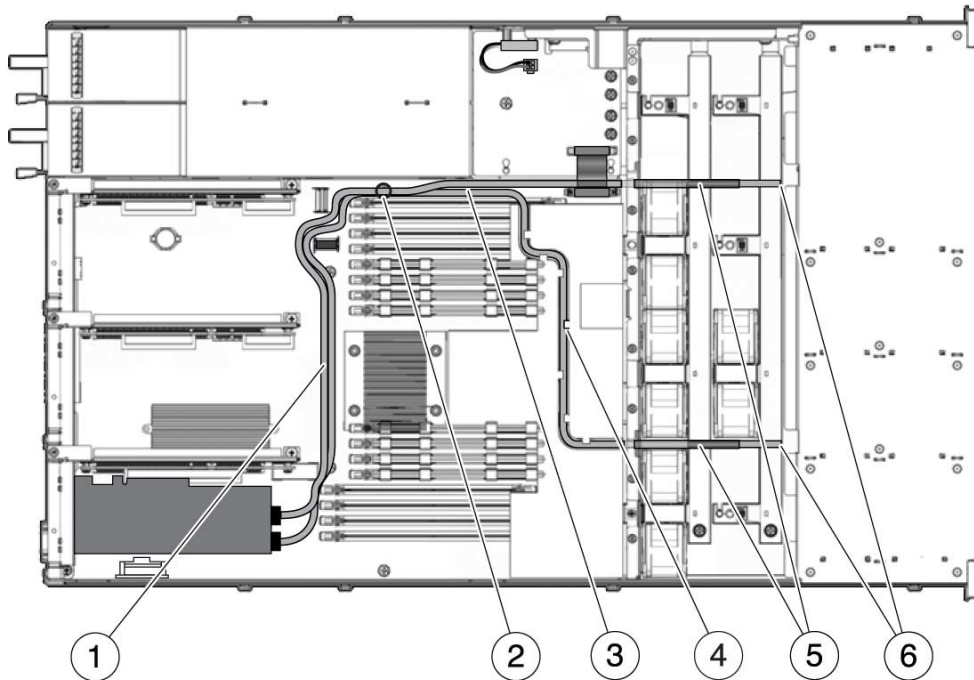
2. Lay the cable out in the system so that the end with the heat-shrink tubing is closer to the hard drive backplane ([FIGURE 2-6](#)).

---

**Note** – Verify that the cable is oriented correctly, with the heat-shrink tubing closer to the hard drive backplane, before proceeding.

---

**FIGURE 2-6** Routing the Hard Drive Data Cable in an Eight-Disk Capable SPARC Enterprise T5120 Server from Oracle. For specific cable connections, see text.



**Figure Legend**

- 
- |   |   |
|---|---|
| 1 | Routing the cable between the PCIe slots and FB-DIMMs                 |
| 2 | Routing the cable through the cable retainer                          |
| 3 | Routing the cable along the power supply midwall                      |
| 4 | 78 cm cable routing through the channel on the clear plastic air duct |
| 5 | Proper positions of Heat-shrink tubing                                |
| 6 | Routing the cable through the fan midwall to the hard drive backplane |
- 

**3. Connect the 530-4118 cable from SAS0 on the internal HBA to P2 on the hard drive backplane.**

**4. Connect the 530-3893 cable from SAS1 on the internal HBA to P3 on the hard drive backplane.**

**5. Install the internal HBA into PCIe slot 2 (the rightmost slot when viewed from the rear).**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for the procedures for installing a PCIe card into the server, then return here.



6. Route the cables through the system as shown in [FIGURE 2-6](#), ensuring the following:

a. Route the cables between the PCIe slots and the FB-DIMMs.

b. Route the cables through the cable retainer to the fan midwall.

The cable retainer is located on the motherboard, next to the power supply midwall.

---

**Note** – You might need to loosen the cable retainer screw in order to insert the cables.

---

c. Route the cables along the power supply midwall.

d. Viewing the system from the rear, route the cables along the side of the air duct and through the second slot from the left on the fan midwall.

7. Reinstall the fan modules.

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for those procedures, then return here.

8. Go to “[Finishing Up](#)” on [page 49](#) to reinstall your server and power it back on.

---

# Installing the Sun Storage 6 Gb SAS PCIe RAID HBA Into the SPARC Enterprise T5220 Server

This section includes the following:

- [“Prepare the Sun SPARC Enterprise T5220 Server” on page 2-42](#)
- [“Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into an 8-Disk Capable Server” on page 2-45](#)
- [“Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into a 16-Disk Capable Server” on page 2-47](#)

## ▼ Prepare the Sun SPARC Enterprise T5220 Server

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for specific instructions for more details on the following steps.

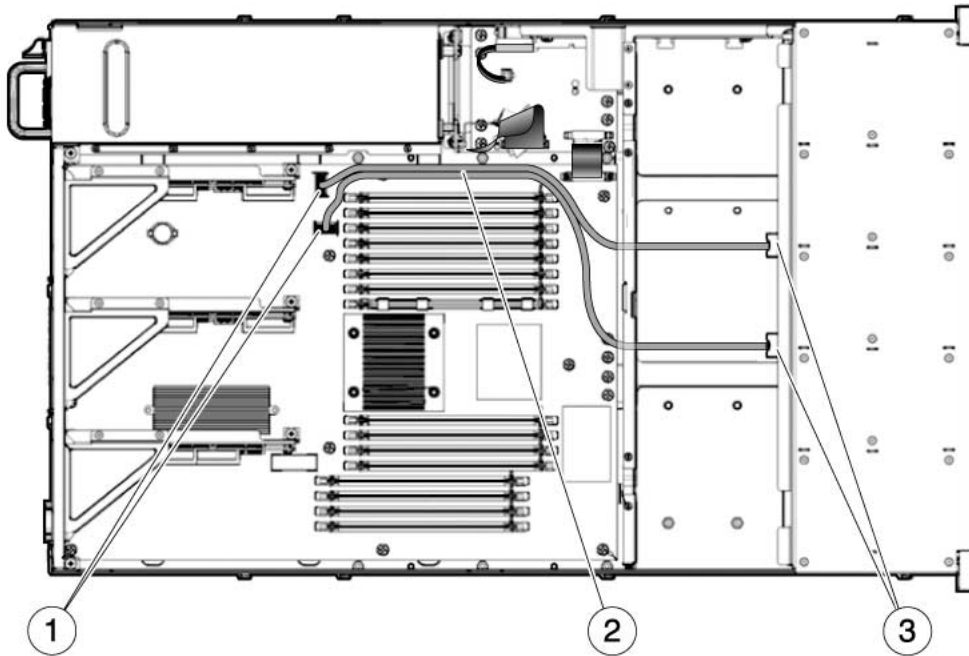
1. **Power off the server.**
2. **Disconnect all external cables.**
3. **Remove the server from the rack.**  
Place the server on a hard, flat surface.
4. **Attach an antistatic wrist strap.**
5. **Remove the top cover.**
6. **Remove the air duct.**
7. **Remove all of the fan modules.**
8. **Remove both fan boards.**
9. **Disconnect the hard drive data cable(s).**

---

**Note** – For 8-disk capable servers, there are two data cables.

---

**FIGURE 2-7** Removing the Existing Hard Drive Cable From an Eight-Disk Capable SPARC Enterprise T5220 Server



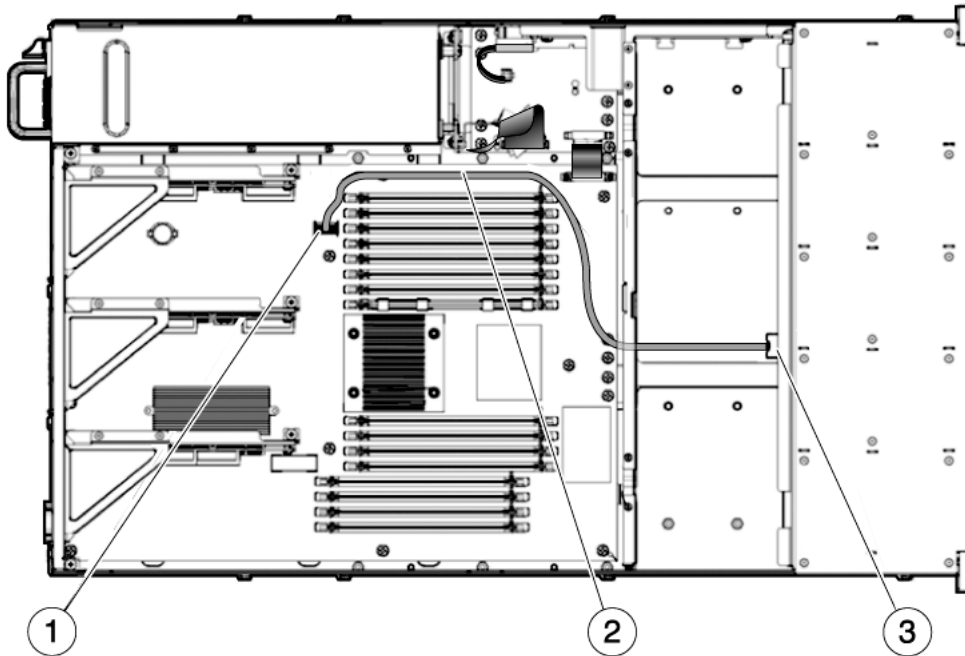
**Figure Legend**

- 
- 1 Connectors on motherboard
  - 2 Hard drive data cables
  - 3 Connectors on hard drive backplane
- 

**Note** – For 16-disk capable servers, there is one data cable. See [FIGURE 2-8](#).

---

**FIGURE 2-8** Removing the Existing Hard Drive Cable From a 16-Disk Capable SPARC Enterprise T5220 Server



**Figure Legend**

- 
- 1 Connector on motherboard
  - 2 Hard drive data cable
  - 3 Connector on hard drive backplane
- 

- a. **Locate each hard drive data cable connector on the motherboard.**
- b. **Press the latch to release the cable plug. Pull each plug out of its connector on the motherboard.**  
If you have difficulty releasing the cable plug, first push the plug slightly into the connector, then press the latch.
- c. **Locate each hard drive cable connector on the hard drive backplane, and repeat [Step b](#) to remove the hard drive data cable from the hard drive backplane.**

---

**Note** – If you can't easily remove the cable from the hard drive backplane, you might have to remove the hard drive cage to provide better access. Refer to the *Sun SPARC Enterprise T5120 and T5220 Servers Service Manual* for those procedures, then return here.

---

10. Remove the hard drive data cables(s) from the server.

## ▼ Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into an 8-Disk Capable Server

Follow these instructions for SPARC Enterprise T5220 servers that are 8-disk capable.

1. Use the following table to locate the correct cables and connectors for your server.

HBA Connector	Cable Part Number and Length	Hard Drive Backplane Connector
SAS 0	530-4119 (71 cm)	P2
SAS 1	530-3892 (67 cm)	P3

---

**Note** – Other cables are included in the Internal HBA optional component box. However, those additional cables are used for other configurations. You will not use those additional cables for this system.

---

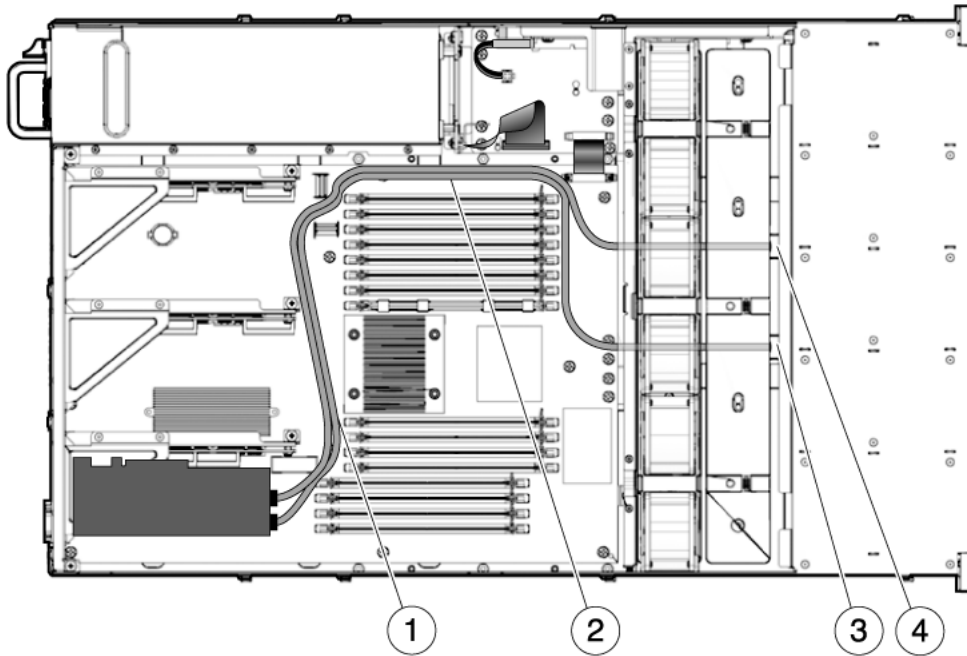
2. Lay the cables out in the system so that the ends with the heat-shrink tubing are closer to the hard drive backplane ([FIGURE 2-6](#)).

---

**Note** – Verify that the cables are oriented correctly, with the heat-shrink tubing closer to the hard drive backplane, before proceeding.

---

**FIGURE 2-9** Routing the Hard Drive Data Cables in an Eight-Disk Capable SPARC Enterprise T5120 Server from Oracle. For specific cable connections, see text.



**Figure Legend**

- 
- |   |   |
|---|---|
| 1 | Routing the cable between the PCIe slots and FB-DIMMs   |
| 2 | Routing the cable along the power supply midwall        |
| 3 | Connecting the cable to P3 on the hard drive backplane. |
| 4 | Connecting the cable to P2 on the hard drive backplane  |
- 

3. Connect the 530-4119 cable from SAS0 on the internal HBA to P2 on the hard drive backplane..
4. Connect the 530-3892 cable from SAS1 on the internal HBA to P3 on the hard drive backplane..
5. Install the internal HBA into PCIe slot 2 (the rightmost slot when viewed from the rear).

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for the procedures for installing a PCIe card into the server, then return here.

6. Route the cables through the system as shown in [FIGURE 2-6](#), ensuring the following:

- a. Route the cables between the PCIe slots and the FB-DIMMs.
- b. Route the cables through the cable retainer to the fan midwall.

The cable retainer is located on the motherboard, next to the power supply midwall.

**Note** – You might need to loosen the cable retainer screw in order to insert the cables.

- c. Route the cables along the power supply midwall.

Route the cables through the second slot from the left on the fan midwall.

**7. Reinstall the air duct.**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

**Viewing the system from the rear, ensure the hard drive backplane cables are routed along the side of the air duct.**

**8. Reinstall the fan boards**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

**9. Reinstall the fan modules.**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

**10. Go to “Finishing Up” on page 49 to reinstall your server and power it back on.**

## ▼ Install the Sun Storage 6 Gb SAS PCIe RAID HBA Into a 16-Disk Capable Server

Follow these instructions for SPARC Enterprise T5220 servers that are 16-disk capable.

- 1. Use the following table to locate the correct cable and connectors for your server.

HBA Connector	Cable Part Number and Length	Hard Drive Backplane Connector
SAS 0	530-4119 (71 cm)	J0301

---

**Note** – Other cables are included in the Internal HBA optional component box. However, those additional cables are used for other configurations. You will not use those additional cables for this system.

---

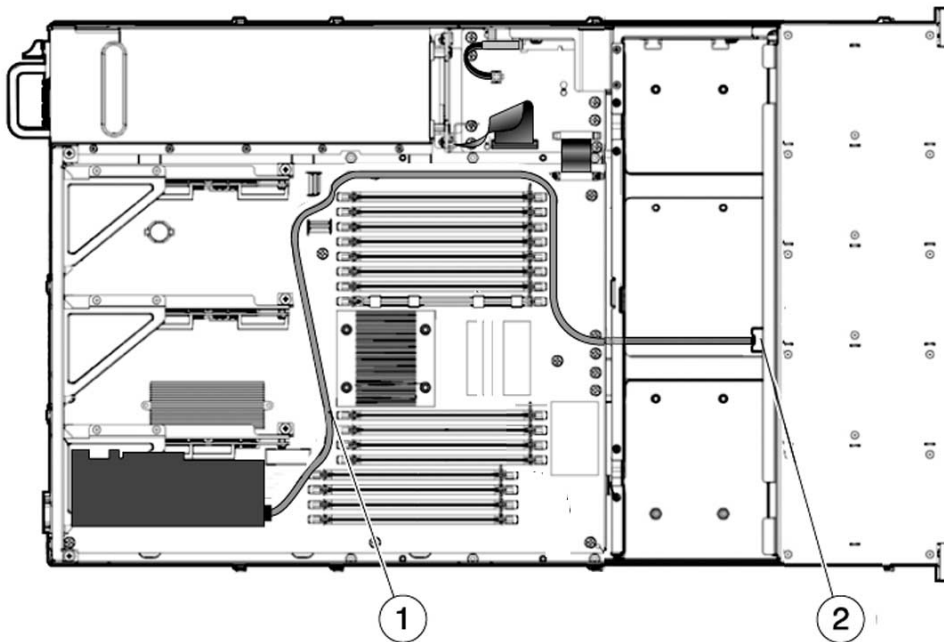
2. Lay the cable out in the system so that the end with the heat-shrink tubing is closer to the hard drive backplane (FIGURE 2-6).

---

**Note** – Verify that the cable is oriented correctly, with the heat-shrink tubing closer to the hard drive backplane, before proceeding.

---

**FIGURE 2-10** Routing the Hard Drive Data Cable in a 16-Disk Capable SPARC Enterprise T5120 Server from Oracle. For specific cable connections, see text.



**Figure Legend**

- 
- |   |  |
|---|--|
| 1 | Routing the cable between the PCIe slots and FB-DIMMs  |
| 2 | Connecting the cable to P2 on the hard drive backplane |
- 

3. Connect the 530-4119 cable from SAS0 on the internal HBA to J0301 on the hard drive backplane.



4. **Install the internal HBA into PCIe slot 2 (the rightmost slot when viewed from the rear).**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for the procedures for installing a PCIe card into the server, then return here.

5. **Route the cables through the system as shown in [FIGURE 2-6](#), ensuring the following:**

- a. **Route the cable between the PCIe slots and the FB-DIMMs.**

- b. **Route the cable through the cable retainer to the fan midwall.**

The cable retainer is located on the motherboard, next to the power supply midwall.

---

**Note** – You might need to loosen the cable retainer screw in order to insert the cable.

---

- c. **Route the cable along the power supply midwall.**

Route the cable **through the second slot from the left on the fan midwall.**

6. **Reinstall the air duct.**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

**Viewing the system from the rear, ensure the hard drive backplane cables are routed along the side of the air duct.**

7. **Reinstall the fan boards**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

8. **Reinstall the fan modules.**

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual*.

9. **Go to “[Finishing Up](#)” on page 49 to reinstall your server and power it back on.**

---

## Finishing Up

Refer to the *SPARC Enterprise T5120 and T5220 Servers Service Manual* for specific instructions for each of the procedures in this section.

1. **Install the top cover.**
2. **Install the server into the rack.**
3. **Connect all external cables.**

4. Power on the server.
5. Perform any additional card-specific tasks.