Technical Guide

English

System Disk Mirroring for Brisque and Brisque Serve

399Z3R606D

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System Disk Mirroring for Brisque and Brisque Serve

Technical Guide

creo™

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4743091	5291273	5459505	5625766	5854883	6014471	6159659
4992864	5296935	5473733	5636330	5861904	6016752	6164637
5049901	5313278	5481379	5649220	5861992	6031932	6180325
5079721	5323248	5488906	5650076	5864651	6043865	6181362
5103407	5325217	5497252	5652804	5875288	6060208	6181439
5111308	5331439	5508828	5691823	5894342	6063528	6186068
5113249	5333064	5509561	5691828	5900981	6063546	6189452
5122871	5339176	5517359	5696393	5934196	6072518	6191882
5124547	5343059	5519852	5699174	5942137	6090529	6204874
5132723	5355446	5526143	5699740	5946426	6096461	6208369
5150225	5359451	5532728	5708736	5947028	6098544	6252522
5153769	5359458	5561691	5713287	5958647	6107011	6260482
5155782	5367360	5568595	5739819	5966504	6112663	
5157516	5367388	5576754	5742743	5969872	6115056	
5208818	5384648	5579115	5764381	5973801	6121996	
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Who Should Use This Manual

This manual is intended for Brisque or Brisque Serve engineers.

To use this manual, you should have a working knowledge of the IBM AIX 4.3.3 operating system.

Conventions Used in This Manual

This section describes the symbols used in this manual.

Symbols



Important: This symbol indicates things that may cause process delays or reduce functionality, reliability, or quality.



Note: A note provides additional information that you may need to consider.

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1 Overview

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This chapter introduces you to the concept of system disk mirroring and provides you with an overview of the procedures detailed in this guide. You can also refer to this chapter to check whether you satisfy all the hardware and software requirements necessary for mirroring the system disk.

1.1 Introduction

This guide describes how you prevent the loss of system data from Brisque or Brisque Serve as the result of a hard disk failure. You achieve this capability by mirroring the system disk.

Mirroring the system disk is the process of duplicating the data stored on one hard disk onto a second hard disk, and thereby creating system data redundancy. After the system disk is mirrored, system data is written to both hard disks.

1.2 Procedural Overview

This topic provides a general overview of the procedures you need to perform to mirror the system disk on the Brisque or Brisque Serve.

The first requirement for creating system data redundancy on the IBM 6F1 or F50 platforms is to install a second hard disk that is identical in size to the source system disk supplied with system. After you activate the mirroring procedure from scismit, both hard disks operate in parallel with one another.

The mirroring procedure does the following: the **mirrordisk.sh** script launches the redundancy script **check-redundancy.sh**, which monitors the platform's power supply, fan, and hard disks. If one of these items fail, the customer is alerted with a flashing message that is displayed on the screen hourly.

If one of the system's hard disks fails, you need to restore the functioning disk to the system's initial single-disk setup by activating the unmirror procedure from scismit. You or the customer then replaces the failed hard disk.

Next, you again activate the mirror procedure to mirror the system data from the functioning hard disk to the new hard disk. After logging on to Brisque or Brisque Serve, you can activate all scripts remotely, a capability that significantly reduces customer downtime.

Descriptions and diagrams of each script can be found in the appendixes of this guide, as follows:

- **mirrordisk.sh** script: *Appendix A, mirrordisk.sh Script,* on page 21.
- **unmirrordisk.sh** script: *Appendix B, unmirrordisk.sh Script,* on page 25.
- **check-redundancy.sh** script: *Appendix C, check-redundancy.sh Script,* on page 29.

1.3 Hardware and Software Requirements

The hardware and software that are required for system disk mirroring are listed in the next two sections.

1.3.1 Hardware Requirements

The following hardware is required for system disk mirroring:

- Two hard disks of 9 GB, 18 GB, or 36 GB for the source and destination disks
- IBM 6F1 or F50 platform with two, four, or six CPUs
- For the IBM 6F1 platform (optional):
  - Four fans in redundant configuration
  - Three power supply units in redundant configuration
- 1 GB, 1.5 GB, or 2 GB of memory

1.3.2 Software Requirements

The following software is required for system disk mirroring:

Brisque:

- IBM AIX version 4.3.3 operating system
- Brisque version 4.1
- Helios EtherShare version 2.5

Brisque Serve:

- IBM AIX version 4.3.3 operating system
- Brisque Serve software version 4



Note: Make sure there is a complete system backup of your BrisqueServe station.

2

Mirroring Operations

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This chapter describes the hardware and software installation procedures you require to enable mirroring of the system disk.

2.1 Mirroring a System Disk

This procedure describes how to install the hardware and software necessary to perform mirroring of the system disk.

2.1.1 Preparing the Hardware

Before you can mirror two disks, you must install a new hard disk that is identical in size to the source disk.

Install the destination disk into the appropriate slot, as follows:.

- On the IBM F50 platform, install the destination disk into a free bay.
- On the IBM 6F1 platform, install the destination hard disk into a free bay in the cage, but do not install the disk in the same bay which houses the system disk.



Note: See drawing below for the exact disk configuration.

2.1.2 Executing the Mirroring

This procedure describes how to activate the script **mirordisk.sh**, which mirrors (duplicates) the system data stored on the source system disk to the destination disk.

You can also activate this script after remotely logging in to Brisque or Brisque Serve.

To create the mirror:

1. Log out from the Brisque application.
2. From the AIX command line, type `scismit`. The Scismit menu appears.
3. From the Scismit menu, select **Devices** > **Fixed Disks** > **Mirror System Disk**. A list displays the destination disks available on which to create the mirror.

4. Select the destination disk on which to create the mirror. The mirrordisk.sh script launches and starts the mirroring process, which takes several minutes to complete.



Note: If an error occurs while the script is processing, the script exits and displays an error message. For descriptions of error messages, see *Error Messages During Mirroring (mirrordsk.sh script)* on page 14.

5. Verify that the mirror has been successfully created. To find out how to perform this verification, see the next procedure.
6. Restart the Brisque or Brisque Serve application.

After the **mirrordisk.sh** script finishes running, you need to verify whether the mirror was successfully created between the source disk and the destination disk.

To verify that the disk is mirrored:

1. From the AIX command line, type the following command to search for active physical volumes (PVs) and state information:

   ```
   lsvg -l rootvg
   ```

2. Type the following command:

   ```
   lspv
   ```

   Check in the output displayed that **rootvg** possesses two disks, as is indicated in the first two lines of the following example:

   ```
   hdisk0     00403daaba4c6026    rootvg
   hdisk3     00403daaba4c1234    rootvg
   hdisk1     009676863a0a15d2    svg1
   hdisk2     00422907f3614805    svg2
   hdisk4     0005259628fcc3ae    svg4
   ```

3. Type the following command:

   ```
   lsvg -l rootvg
   ```

   Check in the output displayed that two physical partitions (PVs) are listed for each logical volume (LV), as in the following example:

```
rootvg:
LV NAME         TYPE       LPs   PPs   PVs  LV STATE      MOUNT POINT
hd5             boot       1     1     2    closed/syncd  N/A
hd6             paging     57    57    2    open/syncd    N/A
hd8             jfslog     1     1     2    open/syncd    N/A
hd4             jfs        2     2     2    open/syncd    /
hd2             jfs        32    32    2    open/syncd    /usr
hd9var          jfs        7     7     1    open/syncd    /var
hd3             jfs        2     2     2    open/syncd    /tmp
hd1             jfs        1     1     2    open/syncd    /home
scitexlv        jfs        83    83    2    open/syncd    /scitex
scitemplv       jfs        16    16    2    open/syncd    /scitex/version/temp
psfontslv       jfs        8     8     2    open/syncd    /scitex/version/usr/
                                                          local/es/psfonts
scistoredblv    jfs        2     2     2    open/syncd    /scitex/version/storeb
SharedItemslv   jfs        20    20    2    open/syncd    /scitex/version/
                                                          SharedItems
mngr_DBRoot     jfs        16    16    2    open/syncd    N/A
```

4. Type the following command:

   ```
   onstat -d | grep DBR
   ```

   Check in the output displayed that DBRootM chunk is not listed, as is indicated in the following example:

   ```
   5010b918 1    1    125    63875   63875  PO-   /dev/DBRoot
   ```

5. Type the following command:

   ```
   crontab -l
   ```

   The last line of the output should appears as follows:

   ```
   0 * * * * /scitex/version/scripts/check-redundancy.sh
   ```

2.2 Restoring the System to a Single-Disk-Setup

If one of system's hard disks fails, a flashing message on the screen alerts the customer hourly.

This procedure describes how you remove the mirror from a failed disk and restore the system to its former single-disk setup using the functioning disk. You perform this action by activating the unmirror procedure from scismit either locally, at the customer's site, or remotely, after you have logged in to the Brisque or Brisque Serve.

You or the customer then physically replaces the failed disk.

Your final step is to once again mirror the system data from the functioning disk to the new disk by activating the mirroring procedure from scismit either locally or remotely. To find out how to perform this procedure, see *Executing the Mirroring* on page 6.

Descriptions and diagrams of each script, which is activated by scismit, can be found in the appendixes of this guide, as follows:

- **mirrordisk.sh** script: *Appendix A, mirrordisk.sh Script,* on page 21.
- **unmirrordisk.sh** script: *Appendix B, unmirrordisk.sh Script,* on page 25.
- **check-redundancy.sh** script: *Appendix C, check-redundancy.sh Script,* on page 29.



Important: Before you install new software onto either the Brisque or Brisque Serve platform, run the unmirror.sh script. After you finish installing the new software, run the mirror.sh script to restore system data redundancy.

To remove a mirror:

1. Log out from the Brisque application.
2. From the AIX command line, type `scismit`. The Scismit menu appears.
3. From the Scismit menu, select **Devices** > **Fixed Disks** > **Unmirror System Disk**. A list displays the system (source) disk and mirrored (destination) disks.

4. Select the disk from which to remove the mirror. The unmirrordisk.sh script launches and starts the unmirroring process, which takes several minutes to complete.



Note: If an error occurs while the script is processing, the script exits and displays an error message. For descriptions of error messages, see *Error Messages During Mirror Removal (unmirrordsk.sh script)* on page 17.

5. Verify that the mirror has been successfully removed:

   a. From the AIX command line, type the following command:

      ```
      lspv
      ```

      Check in the output displayed that **rootvg** possesses one disk, as is indicated in the first line of the following example:

```
hdisk0     00403daaba4c6026   rootvg
hdisk3     00403daaba4c1234   NONE
hdisk1     009676863a0a15d2   svg1
hdisk2     00422907f3614805   svg2
hdisk4     0005259628fcc3ae   svg4
```

   b. Type the following command:

      ```
      lsvg -l rootvg
      ```

      Check in the output displayed that only one physical partition (PV) is listed for each logical volume (LV), as in the following example:

```
rootvg:

LV NAME        TYPE        LPs  PPs   PVs  LV STATE      MOUNT POINT
hd5            boot        1    1     1    closed/syncd  N/A
hd6            paging      57   57    1    open/syncd    N/A
hd8            jfslog      1    1     1    open/syncd    N/A
hd4            jfs         2    2     1    open/syncd    /
hd2            jfs         32   32    1    open/syncd    /usr
hd9var         jfs         7    7     1    open/syncd    /var
hd3            jfs         2    2     1    open/syncd    /tmp
hd1            jfs         1    1     1    open/syncd    /home
scitexlv       jfs         83   83    1    open/syncd    /scitex
```

```
LV NAME         TYPE        LPs   PPs   PVs  LV STATE      MOUNT POINT
scitemplv       jfs         16    16    1    open/syncd    /scitex/version/temp
psfontslv       jfs         8     8     1    open/syncd    /scitex/version/usr/
                                                           local/es/psfonts
scistoredblv    jfs         2     2     1    open/syncd    /scitex/version/storeb
SharedItemslv   jfs         20    20    1    open/syncd    /scitex/version/
                                                           SharedItems
mngr_DBRoot     jfs         16    16    1    open/syncd    N/A
```

c. Type the following command:

```
onstat -d | grep DBR
```

Check in the output displayed that DBRootM chunk is listed, as is indicated in the following example:

```
5010b918 1    1    125    63875    63875  PO-    /dev/DBRoot
5010ba80 1    1    125    63875    0      MO-    /dev/DBRootM
```

6. Restart the Brisque or Brisque Serve application.
7. From the AIX command line, type the following command to clear the configuration in the ODM database:

   ```
   rmdev -dl hdisk<x>
   ```

   where <x> represents the number of the failed hard disk to replace. For example, `hdisk1`.
8. Replace the failed hard disk or request the customer replaces the failed hard disk. To find out how to install a new hard disk, see *Preparing the Hardware* on page 6.
9. Mirror the system data from the system's functioning hard disk to the newly-installed destination disk. To find out how to mirror (duplicate) the system data stored on the source system disk to the destination disk, see *Executing the Mirroring* on page 6.



Note: You can perform this step remotely after dialing in to the Brisque or Brisque Serve.

3 Error Messages

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This chapter provides you with the action to take for error messages that may be displayed during processing of the **mirrordsk.sh** or **unmirrordsk.sh** scripts.

3.1 Error Messages During Mirroring (mirrordsk.sh script)

This section lists the error messages that may be displayed if the processing of the **mirrordsk.sh** script is not successful. Actions are provided for each case.

After an error occurs and you implement the recommended action, re-activate the **mirrordsk.sh** disk mirroring script. For further information, see *Chapter 2, Executing the Mirroring* on page 6.

For a description of this script, see the following appendix:

- **mirrordisk.sh** script: *Appendix A, mirrordisk.sh Script,* on page 21.

3.1.1 $DEST_DISK is not in available state !!!

Action:

1. Make sure that the functioning hard disk is plugged in correctly.
2. From the AIX command line, type the following command:

   ```
   cfgmgr
   ```

3.1.2 DEST_DISK has a VG defined on it !!!

Action:

- Check whether a volume group has been defined on the destination disk. If so, export the volume group to another location. After you export the volume group, its status changes to `none`.

3.1.3 The $DEST_DISK disk is too small !

Action:

- Make sure that the destination hard disk is the same size as the source system disk.

3.1.4 The $DEST_DISK disk is too large !

Action:

- Make sure that the destination hard disk is the same size as the source system disk.

3.1.5 The destination disk $DEST_DISK is not bootable !

Action:

1. Replace the destination hard disk.
2. Check whether the destination hard disk is bootable. Type the following command:

   ```
   bootinfo -B hdisk1
   ```

3.1.6 Cannot extend rootvg to the destination disk DEST_DISK

Action:

1. From the AIX command line, type the following command to make sure that there are no additional error messages:

   ```
   # extendvg -f rootvg DEST_DISK
   ```

2. Run the **errpt** command to check whether there are errors on the destination disk. The **errpt** command generates an error report from the entries in the error log.
3. Replace the destination hard disk.

3.1.7 Cannot mirror rootvg to the destination disk $DEST_DISK

Action:

1. Run the **errpt** command to check whether there are errors on the destination disk. The **errpt** command generates an error report from the entries in the error log.
2. Replace the destination hard disk.
3. From the AIX command line, type the following command:

   ```
   # mirrorvg rootvg DEST_DISK
   ```

3.1.8 Cannot create bosboot on the source disk $SOURCE_DISK

Action:

1. Run the **errpt** command to check whether there are errors on the destination disk. The **errpt** command generates an error report from the entries in the error log.
2. From the AIX command line, type the following command:

   ```
   # bosboot -a -d /dev/SOURCE_DISK
   ```

3.1.9 Cannot add the destination disk $DEST_DISK to a bootlist

Action:

1. Run the **errpt** command to check whether there are errors on the destination disk. The **errpt** command generates an error report from the entries in the error log.
2. From the AIX command line, type the following command:

   # bootlist -m normal SOURCE_DISK DEST_DISK

3.1.10 Cannot switch off the Quorum on rootvg !

Action:

1. Run the **errpt** command to check whether there are errors on the destination disk. The **errpt** command generates an error report from the entries in the error log.
2. From the AIX command line, type the following command:

   ```
   #chvg -Q 'n' rootvg
   ```

3.1.11 Removing DBRoot chunk mirror failed. Exiting ...

Action:

1. Run the **errpt** command to check whether there are errors on the destination disk. The **errpt** command generates an error report from the entries in the error log.
2. Check the status of the DB.

3.2 Error Messages During Mirror Removal (unmirrordsk.sh script)

This section lists the error messages that may be displayed if the processing of the **unmirrordsk.sh** script is not successful. Actions are provided for each case.

After an error occurs and you implement the recommended action, re-activate the **unmirrordsk.sh** script to remove the mirror from the failed disk and restore the system to its former single-disk setup. For further information, see *Chapter 2, Restoring the System to a Single-Disk-Setup* on page 9.

For a description of this script, see the following appendix:

- **unmirrordisk.sh** script: *Appendix B, unmirrordisk.sh Script,* on page 25.

3.2.1 Cannot unmirror rootvg to the destination disk $DEST_DISK

Action:

- Run the **errpt** command to check whether there are errors on the destination disk. The **errpt** command generates an error report from the entries in the error log.

3.2.2 Cannot create bosboot on the source disk $SOURCE_DISK

Action:

1. From the AIX command line, type the following command:

   ```
   chpv -c DEST_DISK
   ```

2. Run the **errpt** command to check whether there are errors on the source disk. The **errpt** command generates an error report from the entries in the error log.
3. Type the following command:

   ```
   # bosboot -a -d /dev/SOURCE_DISK
   ```



Note: If this action does not work, the following error message is displayed:

```
Cannot reduce rootvg
```

For further information, see *Cannot reduce rootvg* on page 18.

3.2.3 Cannot remove the destination disk $DEST_DISK from the bootlist

Action:

1. Run the **errpt** command to check whether there are errors on the destination disk. The **errpt** command generates an error report from the entries in the error log.
2. From the AIX command line, type the following command:

   ```
   # bootlist -m normal SOURCE_DISK
   ```

3.2.4 Cannot reduce rootvg

Action:

1. Run the **errpt** command to check whether there are errors on the source and destination disks. The **errpt** command generates an error report from the entries in the error log.
2. From the AIX command line, type the following command:

   ```
   # reducevg rootvg $DEST_DISK
   ```

3. Perform the troubleshooting solutions described for the error message *Cannot reduce rootvg* on page 18.



Note: This error message is displayed if you are still unable to create bosboot on the source disk after you attempt to troubleshoot the error message:

```
Cannot create bosboot on the source disk $SOURCE_DISK
```

For further information, see *Cannot reduce rootvg* on page 18

3.2.5 Cannot switch on the Quorum on rootvg !

Action:

- Run the **errpt** command to check whether there are errors on the source and destination disks. The **errpt** command generates an error report from the entries in the error log.

3.2.6 Add DBRoot chunk mirror failed. Exiting ...

Action:

1. Run the **errpt** command to check whether there are errors on the source and destination disks. The **errpt** command generates an error report from the entries in the error log.
2. Check the status of the database.

A

mirrordisk.sh Script

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This appendix provides you with a description of the individual operations that are automatically carried out after you activate the **mirordisk.sh** script.

A.1 Operation – mirrordisk.sh

This topic describes the individual operations that are carried out after you activate the **mirordisk.sh** script. The main functions performed by this script are:

- Mirroring (duplicating) the system data stored on the source system hard disk to a new destination hard disk.
- Launching the redundancy script, **check-redundancy.sh**, which monitors the platform's power supply, fans, and hard disks. and alerts the customer if a failure occurs. For further information, see *Appendix C, check-redundancy.sh Script* on page 29.



Note: All operations processed by the mirrordisk.sh script are written to the log file **mirrordisk.log**, which is located in the following path:

/scitex/version/logs

The mirror.sh script carries out the following operations:

1. Checks whether the source system hard disk or destination hard disk is the source `rootvg`.
2. Runs the `cfgmgr` command to verifies if all disks are recognized by the system.
3. Verifies the destination disk is available and that it is not assigned to a defined volume group.
4. Verifies that the destination hard disk is identical in size to the source system disk. A margin of ± 10% in hard disk size is acceptable.
5. Verifies that the destination hard disk is bootable.
6. Runs the `extendvg` command on the destination hard disk.
7. Mirrors (duplicate) `rootvg` on the destination hard disk.
8. Runs the `bosboot` command on the source system hard disk.
9. Defines the bootlist for both the source and destination hard disks.

10. Deactivates Quorum to permit booting from both hard disks if one hard disk fails (for two-disk systems only).



Note: Quorum is activated for mirroring a three-disk system since a minimum of 66.5% of the mirrored volume group is required for booting.

Quorum is deactivated for mirroring a 2 hard disk system since 50% of the total of both hard disk's capacity is available for booting.

Quorum is deactivated for a one-disk system when the disk fails since 0% of the hard disk's capacity is available for booting.

11. Runs the **check-redundancy.sh** script.

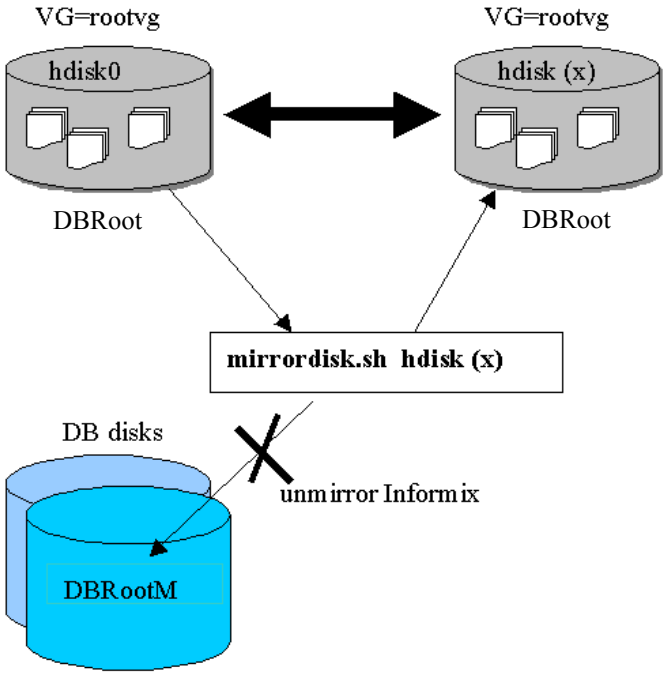
For a description of the **check-redundancy.sh** script, see *Appendix C, check-redundancy.sh Script* on page 29.



Note: For BrisqueServe only: After the mirror procedure is completed, perform a system backup. This backup enables you to restore the system to a mirrored state on two new disks if both disks should fail or if both disks have corrupt file systems.

A.2 Flow Diagram – mirrordisk.sh

The following diagram describes the operational flow that results after you activate the **mirordisk.sh** script



B

unmirrordisk.sh Script

Operation – unmirrordisk.sh 26
Flow Diagram – unmirrordisk.sh 27

This appendix provides you with a description of the individual operations that are automatically carried out after you activate the **unirordisk.sh** script.

B.1 Operation – unmirrordisk.sh

This topic describes the individual operations that are carried out after you activate the **unmirordisk.sh** script. The main functions performed by this script are:

- Clearing the mirror configuration from a failed hard disk.
- Restoring the functioning hard disk to the system's initial one-disk state.



Note: All operations processed by the **unmirrordisk.sh** script are written to the log file **unmirrodisk.log**, which is located in the following path:

/scitex/version/logs

The unmirror.sh script carries out the following operations:

1. Checks whether the source or destination hard disk is the source of **rootvg.**
2. Runs the `unmirror rootvg` command.
3. Runs the `bosboot` command for the source hard disk.
4. Defined `bootlist` for rootvg.
5. Runs the `reducevg` command to remove the failed disk from mirror.
6. Activates Quorum.
7. Runs the following command for the IBM 6F1 Brisque or Brisque Serve platform:

   ```
   rmdev -dl $DEST_DISK
   ```

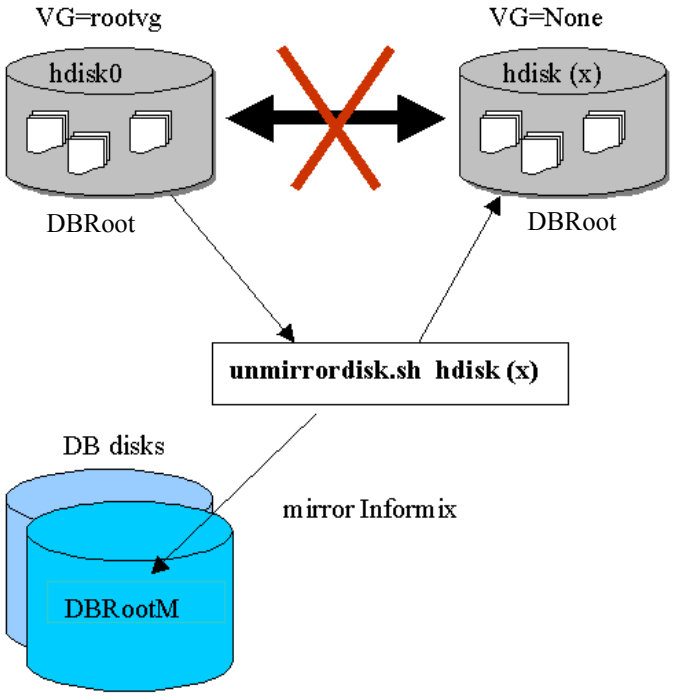
8. Replaces the failed hard disk.



Note: For a IBM 6F1 Brisque or Brisque Serve platform, a blinking message is displayed, which notifies the customer that the hard disk has failed. Replace the failed hard disk and then press the ENTER key to deactivate the blinking message.

B.2 Flow Diagram – unmirrordisk.sh

The following diagram describes the operational flow that results after you activate the **unmirordisk.sh** script



C

check-redundancy.sh Script

Operation – check-redundancy.sh 30

This appendix provides you with a description of the individual operations that are automatically carried out by the **check-redundancy.sh** script.

C.1 Operation – check-redundancy.sh

This topic describes the individual operations that are carried out by the **check-redundancy.sh** script. This script is launched automatically by the **mirrordisk.sh** script.

The main functions performed by this script are:

- Monitoring the platform's power supply, fans, and hard disks.
- Alerting the customer if a failure occurs with a flashing message which is displayed on the screen hourly.

The check-redundancy.sh script carries out the following operations:

1. Monitors the IBM 6F1 platform's power supplies, fans, and hard disks.
2. Displays a flashing warning message hourly, and sends a log mail to `backup` user if a power supply, fan or hard disk fails.
3. Sets `cron` to run the script hourly.

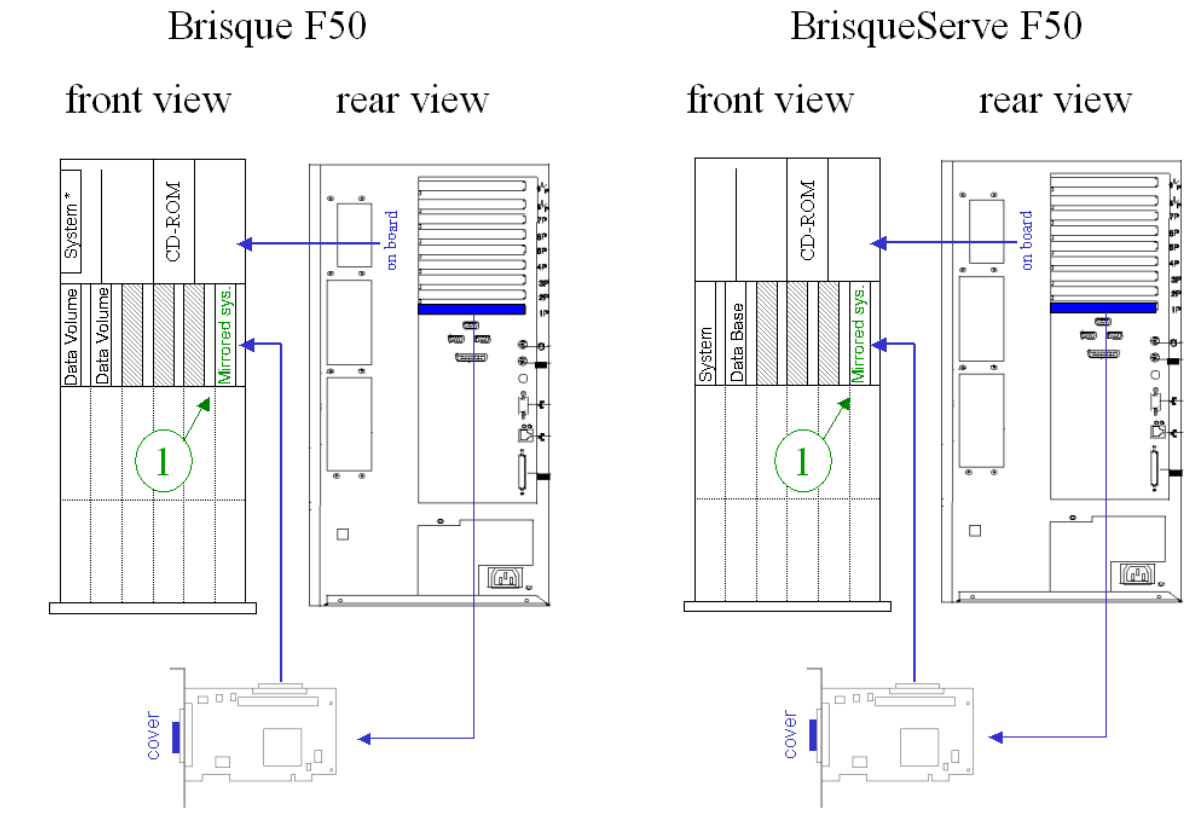
D

Disk Configurations

F50 Disk Configuration 32
6F1 Disk Configurations 33

This appendix provides you with diagrams that show disk configurations for the F50 and 6F1 platforms.

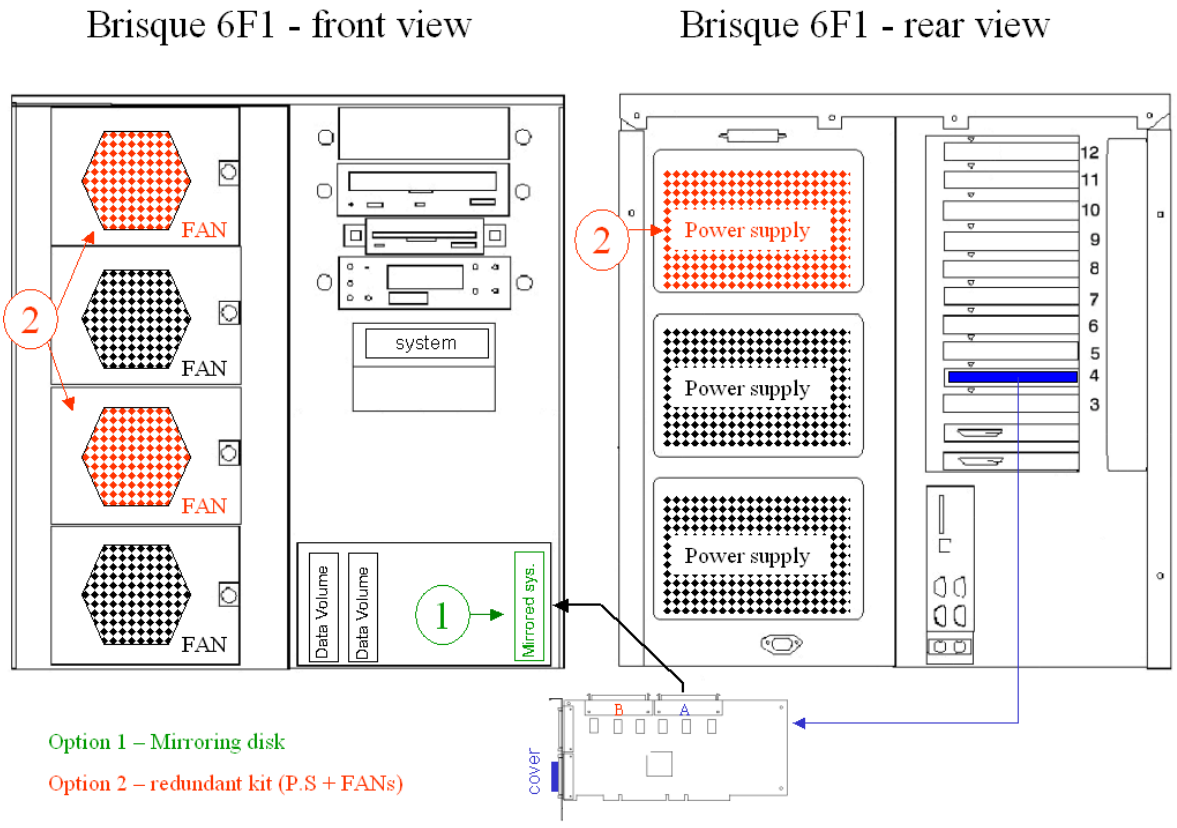
D.1 F50 Disk Configuration



* System disk on Brisque – non hot swap drive

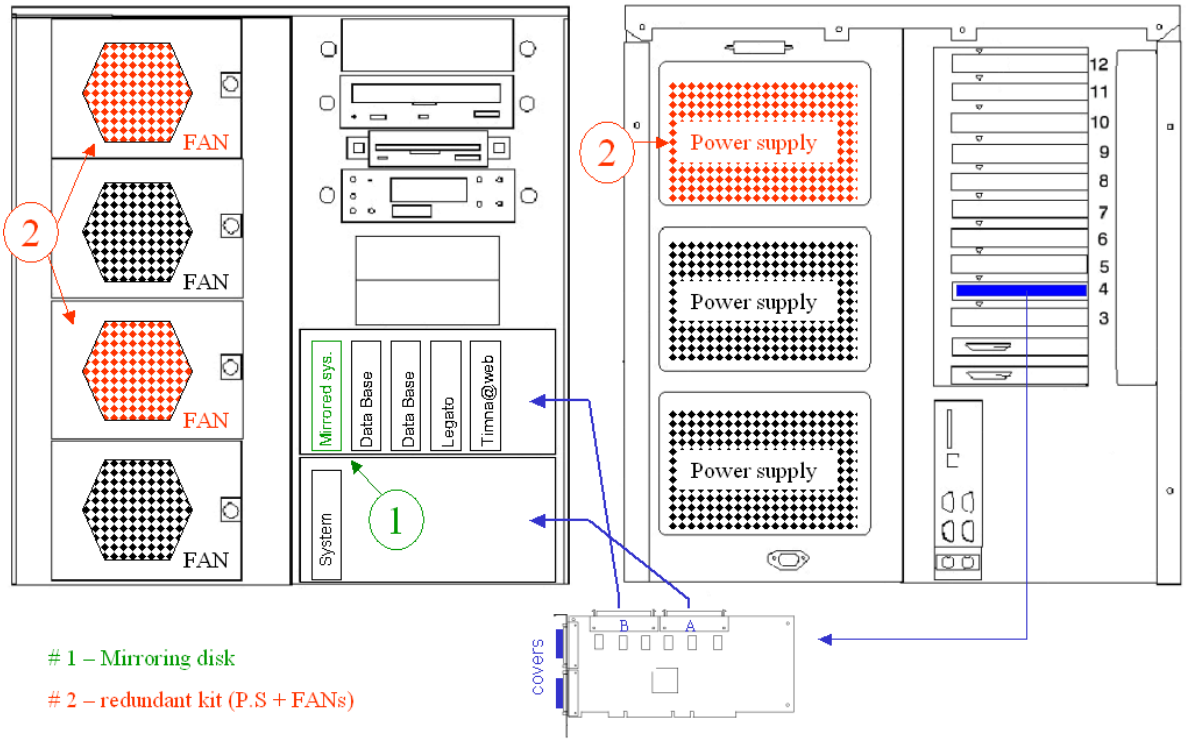
Option 1 – Mirroring disk

D.1 6F1 Disk Configurations



BrisqueServe 6F1 - front view

BrisqueServe 6F1 - rear view



1 – Mirroring disk

2 – redundant kit (P.S + FANs)

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