Oracle® ZFS Storage Appliance Cabling Guide, Release 2013.1.3.0

For ZS4-4, ZS3-x, 7x20 Controllers, and DE2-24, Sun Disk Shelves
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Getting Started with Cabling

This section contains guidelines for properly placing and connecting the disk shelves.

Cabinet Configuration

- For safety reasons, mount the heaviest equipment, typically disk shelves, at the bottom of the cabinet. Refer to the appropriate Oracle Safety and Compliance Guide for rack-mounting guidelines.
- To best prepare for cabling controllers to disk shelves, now and in the future, mount controllers in the middle of the cabinet.
- Do not span disk chains across multiple cabinets.
- Do not remove cabinet panels to run cables between cabinets.

Load Distribution

- Balance the number of disk shelves across the disk chains in your system.
- The maximum number of disk shelves supported by each disk chain is six.
- Connect each disk chain to two HBAs if available.
- Do not mix disks with different capacities or rotation speeds within a single disk shelf.
- To maximize performance, use the maximum number of disk chains supported by the controller’s SAS HBAs. For example, four SAS HBAs with eight chains and eight disk shelves will have better performance than two SAS HBAs with four chains and eight disk shelves.

Cable Lengths

- The maximum cable length between DE2-24 disk shelves is three meters.
- The maximum cable length between Sun Disk Shelves is 0.5 meters.
- The maximum cable length between a controller and disk shelves is six meters.
Using DE2-24 and Sun Disk Shelves Together

- For controllers that support using DE2-24 and Sun Disk Shelves together, the controller must use 4X4 port SAS-2 HBAs.
- Do not use DE2-24 and Sun Disk Shelves in the same disk chain.

Maximum Number of Disk Shelves per Controller Configuration

The following table shows the maximum supported controller configurations.

**NOTE:** Controllers cannot use 2X4 port SAS-2 HBAs and 4X4 port SAS-2 HBAs at the same time. For controllers that support using DE2-24 and Sun Disk Shelves together, the controller must use 4X4 port SAS-2 HBAs, which are only supported with software version 2013.1.0 and later.

**TABLE 1** Maximum Number of Disk Shelves per Controller Configuration

<table>
<thead>
<tr>
<th>Controller</th>
<th>Max. Shelves</th>
<th>Max. 2X4 Port SAS-2 HBA</th>
<th>Max. 4X4 Port SAS-2 HBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS4-4</td>
<td>36</td>
<td>NA</td>
<td>4</td>
</tr>
<tr>
<td>ZS3-4</td>
<td>36</td>
<td>NA</td>
<td>4</td>
</tr>
<tr>
<td>ZS3-2</td>
<td>16</td>
<td>NA</td>
<td>2</td>
</tr>
<tr>
<td>7420</td>
<td>36</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7320</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7120</td>
<td>2</td>
<td>1</td>
<td>NA</td>
</tr>
</tbody>
</table>

HBA Support for Disk Shelves

Disk shelves may require adding or replacing HBAs in your configuration. For procedures, see the following sections:

- ZS4-4 Maintenance Procedures: “ZS4-4 Controller Replacement Tasks” in “Oracle ZFS Storage Appliance Customer Service Manual, Release 2013.1.3.0 For ZS4-4, ZS3-x, 7x20 Controllers, and DE2-24, Sun Disk Shelves ”
- ZS3-4 Maintenance Procedures: “ZS3-4 PCIe Cards and Risers” in “Oracle ZFS Storage Appliance Customer Service Manual, Release 2013.1.3.0 For ZS4-4, ZS3-x, 7x20 Controllers, and DE2-24, Sun Disk Shelves ”
- ZS3-2 Maintenance Procedures: “ZS3-2 PCIe Cards and Risers” in “Oracle ZFS Storage Appliance Customer Service Manual, Release 2013.1.3.0 For ZS4-4, ZS3-x, 7x20 Controllers, and DE2-24, Sun Disk Shelves ”
7x20 Maintenance Procedures: “PCIe Cards and Risers” in “Oracle ZFS Storage Appliance Customer Service Manual, Release 2013.1.3.0 For ZS4-4, ZS3-x, 7x20 Controllers, and DE2-24, Sun Disk Shelves”

Installation, Cabling, and Powering On Sequence

When installing a new appliance, this is the installation, cabling, and powering on sequence:

1. Plan for disk shelf placement as described in “Getting Started with Cabling”
2. Install disk shelves into rack as described in “Oracle ZFS Storage Appliance Installation Guide”. Do not apply power.
3. Install controllers into rack as described in “Oracle ZFS Storage Appliance Installation Guide”. Do not apply power.
4. If clustered controllers, connect the cluster cables as described in “Configuring Clustering” in “Oracle ZFS Storage Appliance Administration Guide, Release 2013.1.3.0”.
5. Connect disk shelves to controllers as described in this guide.
6. Apply power to disk shelves as described in “Powering On and Configuring the System” in “Oracle ZFS Storage Appliance Installation Guide”.
7. Apply power to controllers as described in “Powering On and Configuring the System” in “Oracle ZFS Storage Appliance Installation Guide”.
8. Perform the initial configuration, which is automatically started after powering on the controllers. See “Initial Configuration” in “Oracle ZFS Storage Appliance Installation Guide”.

To further configure the disk shelves, see “Storage Configuration” in “Oracle ZFS Storage Appliance Administration Guide, Release 2013.1.3.0”.

Adding a Disk Shelf to an Appliance

Disk shelves can be added to standalone or clustered storage controllers without powering down the appliance or loss of service to clients, as described in “How to Add a New Disk Shelf” in “Oracle ZFS Storage Appliance Customer Service Manual, Release 2013.1.3.0 For ZS4-4, ZS3-x, 7x20 Controllers, and DE2-24, Sun Disk Shelves”.

Getting Started with Cabling
Connecting to Attached Storage

Use the diagrams in this section to connect one or more disk shelves to the controllers and other disk shelves. After connecting the disk shelves, verify that you have redundant paths to each disk shelf.

**Caution** - Improper orientation of mini-SAS HD cables during installation can damage the HBA connector and cause the HBA to malfunction. These cables are used with 4X4 port SAS-2 HBAs. Position the blue release tab downward for horizontally mounted HBAs or to the right for vertically mounted HBAs. See *My Oracle Support* Doc ID 1643673.1.

The following list provides links to cable diagrams for standalone and clustered controllers.

**Oracle DE2-24 Disk Shelf to 2X4 Port SAS-2 HBAs**
- DE2-24 Disk Shelves to 7420 Standalone
  - “7420 Standalone to DE2-24 Disk Shelves (2 HBAs)” on page 13
  - “7420 Standalone to DE2-24 Disk Shelves (3 HBAs)” on page 16
  - “7420 Standalone to DE2-24 Disk Shelves (4 HBAs)” on page 19
  - “7420 Standalone to DE2-24 Disk Shelves (5 HBAs)” on page 21
  - “7420 Standalone to DE2-24 Disk Shelves (6 HBAs)” on page 24
- DE2-24 Disk Shelves to 7420 Clustered
  - “7420 Clustered to DE2-24 Disk Shelves (2 HBAs)” on page 27
  - “7420 Clustered to DE2-24 Disk Shelves (3 HBAs)” on page 31
  - “7420 Clustered to DE2-24 Disk Shelves (4 HBAs)” on page 34
  - “7420 Clustered to DE2-24 Disk Shelves (5 HBAs)” on page 37
  - “7420 Clustered to DE2-24 Disk Shelves (6 HBAs)” on page 40
- DE2-24 Disk Shelves to 7320
  - “7320 Standalone to DE2-24 Disk Shelves” on page 44
  - “7320 Clustered to DE2-24 Disk Shelves” on page 46
- DE2-24 Disk Shelves to 7120
  - “7120 Standalone to DE2-24 Disk Shelves” on page 48

**Oracle DE2-24 Disk Shelf to 4X4 Port SAS-2 HBAs**
- DE2-24 Disk Shelves to ZS4-4/ZS3-4 Standalone
  - “ZS4-4/ZS3-4 Standalone to DE2-24 Disk Shelves (2 HBAs)” on page 51
■ “ZS4-4/ZS3-4 Standalone to DE2-24 Disk Shelves (3 HBAs)” on page 53
■ “ZS4-4/ZS3-4 Standalone to DE2-24 Disk Shelves (4 HBAs)” on page 56

DE2-24 Disk Shelves to ZS4-4/ZS3-4 Clustered
■ “ZS4-4/ZS3-4 Clustered to DE2-24 Disk Shelves (2 HBAs)” on page 61
■ “ZS4-4/ZS3-4 Clustered to DE2-24 Disk Shelves (3 HBAs)” on page 63
■ “ZS4-4/ZS3-4 Clustered to DE2-24 Disk Shelves (4 HBAs)” on page 67

DE2-24 Disk Shelves to ZS3-2 Standalone
■ “ZS3-2 Standalone to DE2-24 Disk Shelves (1 HBA)” on page 74
■ “ZS3-2 Standalone to DE2-24 Disk Shelves (2 HBAs)” on page 75

DE2-24 Disk Shelves to ZS3-2 Clustered
■ “ZS3-2 Clustered to DE2-24 Disk Shelves (1 HBA)” on page 78
■ “ZS3-2 Clustered to DE2-24 Disk Shelves (2 HBAs)” on page 80

DE2-24 Disk Shelves to 7420 Standalone
■ “7420 Standalone to DE2-24 Disk Shelves (2 HBAs)” on page 83
■ “7420 Standalone to DE2-24 Disk Shelves (3 HBAs)” on page 86
■ “7420 Standalone to DE2-24 Disk Shelves (4 HBAs)” on page 88

DE2-24 Disk Shelves to 7420 Clustered
■ “7420 Clustered to DE2-24 Disk Shelves (2 HBAs)” on page 93
■ “7420 Clustered to DE2-24 Disk Shelves (3 HBAs)” on page 95
■ “7420 Clustered to DE2-24 Disk Shelves (4 HBAs)” on page 99

DE2-24 Disk Shelves to 7320
■ “7320 Standalone to DE2-24 Disk Shelves” on page 106
■ “7320 Clustered to DE2-24 Disk Shelves” on page 107

Sun Disk Shelf
■ Sun Disk Shelves to 7420 Standalone
■ “7420 Standalone to Sun Disk Shelves (2 HBAs)” on page 111
■ “7420 Standalone to Sun Disk Shelves (3 HBAs)” on page 113
■ “7420 Standalone to Sun Disk Shelves (4 HBAs)” on page 116
■ “7420 Standalone to Sun Disk Shelves (5 HBAs)” on page 118
■ “7420 Standalone to Sun Disk Shelves (6 HBAs)” on page 120

■ Sun Disk Shelves to 7420 Clustered
■ “7420 Clustered to Sun Disk Shelves (2 HBAs)” on page 123
■ “7420 Clustered to Sun Disk Shelves (3 HBAs)” on page 126
■ “7420 Clustered to Sun Disk Shelves (4 HBAs)” on page 129
■ “7420 Clustered to Sun Disk Shelves (5 HBAs)” on page 132
■ “7420 Clustered to Sun Disk Shelves (6 HBAs)” on page 135

■ Sun Disk Shelves to 7320
• “7320 Standalone to Sun Disk Shelves” on page 138
• “7320 Clustered to Sun Disk Shelves” on page 140

Sun Disk Shelves to 7120
• “7120 Standalone to Sun Disk Shelves” on page 142

Mixed DE2-24 and Sun Disk Shelves
• DE2-24 and Sun Disk Shelves to ZS3-4 Standalone
  • “ZS3-4 Standalone to Mixed Disk Shelves (2 HBAs)” on page 145
  • “ZS3-4 Standalone to Mixed Disk Shelves (3 HBAs)” on page 147
  • “ZS3-4 Standalone to Mixed Disk Shelves (4 HBAs)” on page 150
• DE2-24 and Sun Disk Shelves to ZS3-4 Clustered
  • “ZS3-4 Clustered to Mixed Disk Shelves (2 HBAs)” on page 154
  • “ZS3-4 Clustered to Mixed Disk Shelves (3 HBAs)” on page 157
  • “ZS3-4 Clustered to Mixed Disk Shelves (4 HBAs)” on page 161
• DE2-24 and Sun Disk Shelves to ZS3-2 Standalone
  • “ZS3-2 Standalone to Mixed Disk Shelves (1 HBA)” on page 167
  • “ZS3-2 Standalone to Mixed Disk Shelves (2 HBAs)” on page 169
• DE2-24 and Sun Disk Shelves to ZS3-2 Clustered
  • “ZS3-2 Clustered to Mixed Disk Shelves (1 HBA)” on page 171
  • “ZS3-2 Clustered to Mixed Disk Shelves (2 HBAs)” on page 173
• DE2-24 and Sun Disk Shelves to 7420 Standalone
  • “7420 Standalone to Mixed Disk Shelves (2 HBAs)” on page 176
  • “7420 Standalone to Mixed Disk Shelves (3 HBAs)” on page 179
  • “7420 Standalone to Mixed Disk Shelves (4 HBAs)” on page 182
• DE2-24 and Sun Disk Shelves to 7420 Clustered
  • “7420 Clustered to Mixed Disk Shelves (2 HBAs)” on page 186
  • “7420 Clustered to Mixed Disk Shelves (3 HBAs)” on page 189
  • “7420 Clustered to Mixed Disk Shelves (4 HBAs)” on page 193
• DE2-24 and Sun Disk Shelves to 7320
  • “7320 Standalone to Mixed Disk Shelves” on page 199
  • “7320 Clustered to Mixed Disk Shelves” on page 201
Oracle DE2-24 Disk Shelf to 2X4 Port SAS-2 HBAs

DE2-24 to 7420

7420 Standalone to DE2-24 Disk Shelves

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

7420 Standalone to DE2-24 Disk Shelves (2 HBAs)

FIGURE 1  Standalone controller with two HBAs connected to one DE2-24 disk shelf in a single chain
FIGURE 2  Standalone controller with two HBAs connected to two DE2-24 disk shelves in two chains

FIGURE 3  Standalone controller with two HBAs connected to four DE2-24 disk shelves in two chains
FIGURE 4   Standalone controller with two HBAs connected to 12 DE2-24 disk shelves in two chains

FIGURE 5   Multiple disk shelves in a single chain
7420 Standalone to DE2-24 Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 6**  
Standalone controller with three HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 7**  
Standalone controller with three HBAs connected to two DE2-24 disk shelves in two chains
FIGURE 8 Standalone controller with three HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 9 Standalone controller with three HBAs connected to six DE2-24 disk shelves in three chains
**FIGURE 10**  Standalone controller with three HBAs connected to 18 DE2-24 disk shelves in three chains

**FIGURE 11**  Multiple disk shelves in a single chain
7420 Standalone to DE2-24 Disk Shelves (4 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

FIGURE 12  Standalone controller with four HBAs connected to one DE2-24 disk shelf in a single chain

FIGURE 13  Standalone controller with four HBAs connected to two DE2-24 disk shelves in two chains
**FIGURE 14** Standalone controller with four HBAs connected to three DE2-24 disk shelves in three chains

**FIGURE 15** Standalone controller with four HBAs connected to four DE2-24 disk shelves in four chains

**FIGURE 16** Standalone controller with four HBAs connected to eight DE2-24 disk shelves in four chains
FIGURE 17  Standalone controller with four HBAs connected to 24 DE2-24 disk shelves in four chains

FIGURE 18  Multiple disk shelves in a single chain

7420 Standalone to DE2-24 Disk Shelves (5 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with five HBAs. To cable the controller to the disk shelves, use
“Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 19** Standalone controller with five HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 20** Standalone controller with five HBAs connected to two DE2-24 disk shelves in two chains

**FIGURE 21** Standalone controller with five HBAs connected to three DE2-24 disk shelves in three chains
FIGURE 22  Standalone controller with five HBAs connected to four DE2-24 disk shelves in four chains

FIGURE 23  Standalone controller with five HBAs connected to five DE2-24 disk shelves in five chains

FIGURE 24  Standalone controller with five HBAs connected to ten DE2-24 disk shelves in five chains
FIGURE 25  Standalone controller with five HBAs connected to 30 DE2-24 disk shelves in five chains

FIGURE 26  Multiple disk shelves in a single chain

7420 Standalone to DE2-24 Disk Shelves (6 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with six HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.
**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 27**  Standalone controller with six HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 28**  Standalone controller with six HBAs connected to two DE2-24 disk shelves in two chains

**FIGURE 29**  Standalone controller with six HBAs connected to three DE2-24 disk shelves in three chains
**FIGURE 30** Standalone controller with six HBAs connected to four DE2-24 disk shelves in four chains

**FIGURE 31** Standalone controller with six HBAs connected to five DE2-24 disk shelves in five chains

**FIGURE 32** Standalone controller with six HBAs connected to six DE2-24 disk shelves in six chains

**FIGURE 33** Standalone controller with six HBAs connected to 12 DE2-24 disk shelves in six chains
FIGURE 34 Standalone controller with six HBAs connected to 36 DE2-24 disk shelves in six chains

FIGURE 35 Multiple disk shelves in a single chain

7420 Clustered to DE2-24 Disk Shelves

7420 Clustered to DE2-24 Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.
Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 36** Clustered controllers with two HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 37** Clustered controllers with two HBAs connected to two DE2-24 disk shelves in two chains
FIGURE 38  Clustered controllers with two HBAs connected to four DE2-24 disk shelves in two chains
FIGURE 39  Clustered controllers with two HBAs connected to 12 DE2-24 disk shelves in two chains

---

FIGURE 40  Multiple disk shelves in a single chain
7420 Clustered to DE2-24 Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 41**  Clustered controllers with three HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 42**  Clustered controllers with three HBAs connected to two DE2-24 disk shelves in two chains
FIGURE 43  Clustered controllers with three HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 44  Clustered controllers with three HBAs connected to six DE2-24 disk shelves in three chains
FIGURE 45  Clustered controllers with three HBAs connected to 18 DE2-24 disk shelves in three chains

FIGURE 46  Multiple disk shelves in a single chain
7420 Clustered to DE2-24 Disk Shelves (4 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 47**  Clustered controllers with four HBAs connected to one DE2-24 disk shelf in a single chain

![Diagram of clustered controllers with four HBAs connected to one DE2-24 disk shelf in a single chain]

**FIGURE 48**  Clustered controllers with four HBAs connected to two DE2-24 disk shelves in two chains

![Diagram of clustered controllers with four HBAs connected to two DE2-42 disk shelves in two chains]
FIGURE 49  Clustered controllers with four HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 50  Clustered controllers with four HBAs connected to four DE2-24 disk shelves in four chains
FIGURE 51  Clustered controllers with four HBAs connected to eight DE2-24 disk shelves in four chains

FIGURE 52  Clustered controllers with four HBAs connected to 24 DE2-24 disk shelves in four chains
The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with five HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

FIGURE 53 Multiple disk shelves in a single chain

FIGURE 54 Clustered controllers with five HBAs connected to one DE2-24 disk shelf in a single chain
FIGURE 55  Clustered controllers with five HBAs connected to two DE2-24 disk shelves in two chains

FIGURE 56  Clustered controllers with five HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 57  Clustered controllers with five HBAs connected to four DE2-24 disk shelves in four chains
FIGURE 58  Clustered controllers with five HBAs connected to ten DE2-24 disk shelves in five chains

FIGURE 59  Clustered controllers with five HBAs connected to ten DE2-24 disk shelves in five chains
FIGURE 60  Clustered controllers with five HBAs connected to 30 DE2-24 disk shelves in five chains

FIGURE 61  Multiple disk shelves in a single chain

7420 Clustered to DE2-24 Disk Shelves (6 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with six HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.
Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

FIGURE 62  Clustered controllers with six HBAs connected to one DE2-24 disk shelf in a single chain

FIGURE 63  Clustered controllers with six HBAs connected to two DE2-24 disk shelves in two chains

FIGURE 64  Clustered controllers with six HBAs connected to three DE2-24 disk shelves in three chains
FIGURE 65  Clustered controllers with six HBAs connected to four DE2-24 disk shelves in four chains

FIGURE 66  Clustered controllers with six HBAs connected to five DE2-24 disk shelves in five chains

FIGURE 67  Clustered controllers with six HBAs connected to six DE2-24 disk shelves in six chains
FIGURE 68  Clustered controllers with six HBAs connected to 12 DE2-24 disk shelves in six chains

FIGURE 69  Clustered controllers with six HBAs connected to 36 DE2-24 disk shelves in six chains
DE2-24 to 7320

7320 Standalone to DE2-24 Disk Shelves

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7320 standalone controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

FIGURE 70  Multiple disk shelves in a single chain

FIGURE 71  Standalone controller with one HBA connected to one DE2-24 disk shelf in a single chain
FIGURE 72  Standalone controller with one HBA connected to two DE2-24 disk shelves in a single chain

FIGURE 73  Standalone controller with one HBA connected to six DE2-24 disk shelves in a single chain
FIGURE 74  Multiple disk shelves in a single chain

![Multiple disk shelves in a single chain](image)

7320 Clustered to DE2-24 Disk Shelves

The following figures show a subset of the supported configurations for the Oracle ZFS Storage 7320 clustered controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

FIGURE 75  Clustered controllers with one HBA connected to one DE2-24 disk shelf in a single chain

![Clustered controllers with one HBA connected to one DE2-24 disk shelf](image)
FIGURE 76  Clustered controllers with one HBA connected to two DE2-24 disk shelves in a single chain

FIGURE 77  Clustered controllers with one HBA connected to six DE2-24 disk shelves in a single chain
DE2-24 to 7120

7120 Standalone to DE2-24 Disk Shelves

The following figures show the supported configurations for the Oracle ZFS Storage 7120 standalone controller. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

FIGURE 79  Standalone controller with one HBA connected to one DE2-24 disk shelf in a single chain
FIGURE 80  Standalone controller with one HBA connected to two DE2-24 disk shelves in a single chain

FIGURE 81  Multiple disk shelves in a single chain
Oracle DE2-24 Disk Shelf to 4X4 Port SAS-2 HBAs

DE2-24 to ZS4-4/ZS3-4

ZS4-4/ZS3-4 Standalone to DE2-24 Disk Shelves

ZS4-4/ZS3-4 Standalone to DE2-24 Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS4-4/ZS3-4 standalone controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

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**FIGURE 82**  
Standalone controller with two HBAs connected to one DE2-24 disk shelf in a single chain
FIGURE 83  Standalone controller with two HBAs connected to two DE2-24 disk shelves in two chains

FIGURE 84  Standalone controller with two HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 85  Standalone controller with two HBAs connected to four DE2-24 disk shelves in four chains
**FIGURE 86**  Standalone controller with two HBAs connected to multiple DE2-24 disk shelves in four chains

**FIGURE 87**  Multiple disk shelves in a single chain

**ZS4-4/ZS3-4 Standalone to DE2-24 Disk Shelves (3 HBAs)**

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS4-4/ZS3-4 standalone controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
**FIGURE 88**  Standalone controller with three HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 89**  Standalone controller with three HBAs connected to two DE2-24 disk shelves in two chains

**FIGURE 90**  Standalone controller with three HBAs connected to three DE2-24 disk shelves in three chains
FIGURE 91  Standalone controller with three HBAs connected to four DE2-24 disk shelves in four chains

FIGURE 92  Standalone controller with three HBAs connected to five DE2-24 disk shelves in five chains

FIGURE 93  Standalone controller with three HBAs connected to six DE2-24 disk shelves in six chains
FIGURE 94  Standalone controller with three HBAs connected to multiple DE2-24 disk shelves in six chains

FIGURE 95  Multiple disk shelves in a single chain

ZS4-4/ZS3-4 Standalone to DE2-24 Disk Shelves (4 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS4-4/ZS3-4 standalone controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 96  Standalone controller with four HBAs connected to one DE2-24 disk shelf in a single chain

FIGURE 97  Standalone controller with four HBAs connected to two DE2-24 disk shelves in two chains

FIGURE 98  Standalone controller with four HBAs connected to three DE2-24 disk shelves in three chains
FIGURE 99  Standalone controller with four HBAs connected to four DE2-24 disk shelves in four chains

FIGURE 100  Standalone controller with four HBAs connected to five DE2-24 disk shelves in five chains

FIGURE 101  Standalone controller with four HBAs connected to six DE2-24 disk shelves in six chains
FIGURE 102  Standalone controller with four HBAs connected to seven DE2-24 disk shelves in seven chains

FIGURE 103  Standalone controller with four HBAs connected to eight DE2-24 disk shelves in eight chains
FIGURE 104  Standalone controller with four HBAs connected to multiple DE2-24 disk shelves in eight chains

FIGURE 105  Multiple disk shelves in a single chain

ZS4-4/ZS3-4 Clustered to DE2-24 Disk Shelves
ZS4-4/ZS3-4 Clustered to DE2-24 Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS4-4/ZS3-4 clustered controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 106**  Clustered controllers with two HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 107**  Clustered controllers with two HBAs connected to two DE2-24 disk shelves in two chains
**FIGURE 108** Clustered controllers with two HBAs connected to three DE2-24 disk shelves in three chains

![Diagram showing clustered controllers with two HBAs connected to three DE2-24 disk shelves in three chains.]

**FIGURE 109** Clustered controllers with two HBAs connected to four DE2-24 disk shelves in four chains

![Diagram showing clustered controllers with two HBAs connected to four DE2-24 disk shelves in four chains.]

FIGURE 110  Clustered controllers with two HBAs connected to multiple DE2-24 disk shelves in four chains

FIGURE 111  Multiple disk shelves in a single chain

ZS4-4/ZS3-4 Clusters to DE2-24 Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS4-4/ZS3-4 clustered controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.
**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 112** Clustered controllers with three HBAs connected to one DE2-24 disk shelf in a single chain

![Diagram of a single chain connection](image1)

**FIGURE 113** Clustered controllers with three HBAs connected to two DE2-24 disk shelves in two chains

![Diagram of a dual chain connection](image2)
**FIGURE 114** Clustered controllers with three HBAs connected to three DE2-24 disk shelves in three chains

**FIGURE 115** Clustered controllers with three HBAs connected to four DE2-24 disk shelves in four chains
FIGURE 116  Clustered controllers with three HBAs connected to five DE2-24 disk shelves in five chains

FIGURE 117  Clustered controllers with three HBAs connected to six DE2-24 disk shelves in six chains
FIGURE 118 Clustered controllers with three HBAs connected to multiple DE2-24 disk shelves in six chains

FIGURE 119 Multiple disk shelves in a single chain

ZS4-4/ZS3-4 Clustered to DE2-24 Disk Shelves (4 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS4-4/ZS3-4 clustered controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 120  Clustered controllers with four HBAs connected to one DE2-24 disk shelf in a single chain

FIGURE 121  Clustered controllers with four HBAs connected to two DE2-24 disk shelves in two chains
FIGURE 122  Clustered controllers with four HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 123  Clustered controllers with four HBAs connected to four DE2-24 disk shelves in four chains
FIGURE 124  Clustered controllers with four HBAs connected to five DE2-24 disk shelves in five chains

FIGURE 125  Clustered controllers with four HBAs connected six DE2-24 disk shelves in six chains
FIGURE 126  Clustered controllers with four HBAs connected to seven DE2-24 disk shelves in seven chains
FIGURE 127  Clustered controllers with four HBAs connected to eight DE2-24 disk shelves in eight chains
**FIGURE 128** Clustered controllers with four HBAs connected to multiple DE2-24 disk shelves in eight chains

**FIGURE 129** Multiple disk shelves in a single chain
DE2-24 to ZS3-2

ZS3-2 Standalone to DE2-24 Disk Shelves

ZS3-2 Standalone to DE2-24 Disk Shelves (1 HBA)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-2 standalone controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

FIGURE 130  Standalone controller with one HBA connected to one DE2-24 disk shelf in a single chain

FIGURE 131  Standalone controller with one HBA connected to two DE2-24 disk shelves in two chains
FIGURE 132  Standalone controller with one HBA connected to six DE2-24 disk shelves in two chains

FIGURE 133  Multiple disk shelves in a single chain

**ZS3-2 Standalone to DE2-24 Disk Shelves (2 HBAs)**

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-2 standalone controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 134  Standalone controller with two HBAs connected to one DE2-24 disk shelf in one chain

FIGURE 135  Standalone controller with two HBAs connected to two DE2-24 disk shelves in two chains

FIGURE 136  Standalone controller with two HBAs connected to three DE2-24 disk shelves in three chains
FIGURE 137  Standalone controller with two HBAs connected to four DE2-24 disk shelves in four chains

FIGURE 138  Standalone controller with two HBAs connected to eight DE2-24 disk shelves in four chains

FIGURE 139  Standalone controller with two HBAs connected to sixteen DE2-24 disk shelves in four chains
ZS3-2 Clustered to DE2-24 Disk Shelves

ZS3-2 Clustered to DE2-24 Disk Shelves (1 HBA)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-2 clustered controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 140** Multiple disk shelves in a single chain

**FIGURE 141** Clustered controllers with one HBA connected to one DE2-24 disk shelf in a single chain
FIGURE 142  Clustered controllers with one HBA connected to two DE2-24 disk shelves in two chains

FIGURE 143  Clustered controllers with one HBA connected to six DE2-24 disk shelves in two chains

FIGURE 144  Multiple disk shelves in a single chain
ZS3-2 Clustered to DE2-24 Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-2 clustered controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 145** Clustered controllers with two HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 146** Clustered controllers with two HBAs connected to two DE2-24 disk shelves in two chains
FIGURE 147  Clustered controllers with two HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 148  Clustered controllers with two HBAs connected to four DE2-24 disk shelves in four chains
FIGURE 149  Clustered controllers with two HBAs connected to eight DE2-24 disk shelves in four chains

FIGURE 150  Clustered controllers with two HBAs connected to sixteen DE2-24 disk shelves in four chains
DE2-24 to 7420

7420 Standalone to DE2-24 Disk Shelves

7420 Standalone to DE2-24 Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
**FIGURE 152** Standalone controller with two HBAs connected to one DE2-24 disk shelf in a single chain

![Diagram](image1)

**FIGURE 153** Standalone controller with two HBAs connected to two DE2-24 disk shelves in two chains

![Diagram](image2)

**FIGURE 154** Standalone controller with two HBAs connected to three DE2-24 disk shelves in three chains

![Diagram](image3)
FIGURE 155  Standalone controller with two HBAs connected to four DE2-24 disk shelves in four chains

FIGURE 156  Standalone controller with two HBAs connected to multiple DE2-24 disk shelves in four chains

FIGURE 157  Multiple disk shelves in a single chain
7420 Standalone to DE2-24 Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 158**  Standalone controller with three HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 159**  Standalone controller with three HBAs connected to two DE2-24 disk shelves in two chains

**FIGURE 160**  Standalone controller with three HBAs connected to three DE2-24 disk shelves in three chains
FIGURE 161  Standalone controller with three HBAs connected to four DE2-24 disk shelves in four chains

FIGURE 162  Standalone controller with three HBAs connected to five DE2-24 disk shelves in five chains

FIGURE 163  Standalone controller with three HBAs connected to six DE2-24 disk shelves in six chains
FIGURE 164  Standalone controller with three HBAs connected to multiple DE2-24 disk shelves in six chains

FIGURE 165  Multiple disk shelves in a single chain

7420 Standalone to DE2-24 Disk Shelves (4 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 166  Standalone controller with four HBAs connected to one DE2-24 disk shelf in a single chain

FIGURE 167  Standalone controller with four HBAs connected to two DE2-24 disk shelves in two chains

FIGURE 168  Standalone controller with four HBAs connected to three DE2-24 disk shelves in three chains
**FIGURE 169** Standalone controller with four HBAs connected to four DE2-24 disk shelves in four chains

**FIGURE 170** Standalone controller with four HBAs connected to five DE2-24 disk shelves in five chains

**FIGURE 171** Standalone controller with four HBAs connected to six DE2-24 disk shelves in six chains
FIGURE 172  Standalone controller with four HBAs connected to seven DE2-24 disk shelves in seven chains

FIGURE 173  Standalone controller with four HBAs connected to eight DE2-24 disk shelves in eight chains
FIGURE 174  Standalone controller with four HBAs connected to multiple DE2-24 disk shelves in eight chains

FIGURE 175  Multiple disk shelves in a single chain

7420 Clustered to DE2-24 Disk Shelves
7420 Clustered to DE2-24 Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 176** Clustered controllers with two HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 177** Clustered controllers with two HBAs connected to two DE2-24 disk shelves in two chains
FIGURE 178  Clustered controllers with two HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 179  Clustered controllers with two HBAs connected to four DE2-24 disk shelves in four chains
FIGURE 180  Clustered controllers with two HBAs connected to multiple DE2-24 disk shelves in four chains

FIGURE 181  Multiple disk shelves in a single chain

7420 Clustered to DE2-24 Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.
**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 182** Clustered controllers with three HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 183** Clustered controllers with three HBAs connected to two DE2-24 disk shelves in two chains
FIGURE 184  Clustered controllers with three HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 185  Clustered controllers with three HBAs connected to four DE2-24 disk shelves in four chains
FIGURE 186  Clustered controllers with three HBAs connected to five DE2-24 disk shelves in five chains

FIGURE 187  Clustered controllers with three HBAs connected to six DE2-24 disk shelves in six chains
FIGURE 188  Clustered controllers with three HBAs connected to multiple DE2-24 disk shelves in six chains

FIGURE 189  Multiple disk shelves in a single chain

7420 Clustered to DE2-24 Disk Shelves (4 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
**FIGURE 190**  Clustered controllers with four HBAs connected to one DE2-24 disk shelf in a single chain

**FIGURE 191**  Clustered controllers with four HBAs connected to two DE2-24 disk shelves in two chains
FIGURE 192  Clustered controllers with four HBAs connected to three DE2-24 disk shelves in three chains

FIGURE 193  Clustered controllers with four HBAs connected to four DE2-24 disk shelves in four chains
FIGURE 194  Clustered controllers with four HBAs connected to five DE2-24 disk shelves in five chains

FIGURE 195  Clustered controllers with four HBAs connected to six DE2-24 disk shelves in six chains
FIGURE 196  Clustered controllers with four HBAs connected to seven DE2-24 disk shelves in seven chains
FIGURE 197  Clustered controllers with four HBAs connected to eight DE2-24 disk shelves in eight chains
**FIGURE 198** Clustered controllers with four HBAs connected to multiple DE2-24 disk shelves in eight chains

**FIGURE 199** Multiple disk shelves in a single chain
DE2-24 to 7320

7320 Standalone to DE2-24 Disk Shelves

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7320 standalone controllers with one HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 200**  Standalone controller with one HBA connected to one DE2-24 disk shelf in a single chain

**FIGURE 201**  Standalone controller with one HBA connected to two DE2-24 disk shelves in two chains
FIGURE 202  Standalone controller with one HBA connected to six DE2-24 disk shelves in two chains

FIGURE 203  Multiple disk shelves in a single chain

7320 Clustered to DE2-24 Disk Shelves

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7320 clustered controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 204  Clustered controllers with one HBA connected to one DE2-24 disk shelf in a single chain

FIGURE 205  Clustered controllers with one HBA connected to two DE2-24 disk shelves in two chains

FIGURE 206  Clustered controllers with one HBA connected to six DE2-24 disk shelves in two chains
FIGURE 207  Multiple disk shelves in a single chain
Sun Disk Shelf to 7420

7420 Standalone to Sun Disk Shelves

7420 Standalone to Sun Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

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**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

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**FIGURE 208** Standalone controller with two HBAs connected to one Sun Disk Shelf in a single chain
FIGURE 209  Standalone controller with two HBAs connected to two Sun Disk Shelves in two chains

FIGURE 210  Standalone controller with two HBAs connected to four Sun Disk Shelves in two chains
FIGURE 211  Standalone controller with two HBAs connected to 12 Sun Disk Shelves in two chains

7420 Standalone to Sun Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
**FIGURE 212** Standalone controller with three HBAs connected to one Sun Disk Shelf in a single chain

**FIGURE 213** Standalone controller with three HBAs connected to two Sun Disk Shelves in two chains

**FIGURE 214** Standalone controller with three HBAs connected to three Sun Disk Shelves in three chains
FIGURE 215  Standalone controller with three HBAs connected to six Sun Disk Shelves in three chains

FIGURE 216  Standalone controller with three HBAs connected to 18 Sun Disk Shelves in three chains
**7420 Standalone to Sun Disk Shelves (4 HBAs)**

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

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**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

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**FIGURE 217**  Standalone controller with four HBAs connected to one Sun Disk Shelf in a single chain

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**FIGURE 218**  Standalone controller with four HBAs connected to two Sun Disk Shelves in two chains
FIGURE 219  Standalone controller with four HBAs connected to three Sun Disk Shelves in three chains

FIGURE 220  Standalone controller with four HBAs connected to four Sun Disk Shelves in four chains

FIGURE 221  Standalone controller with four HBAs connected to eight Sun Disk Shelves in four chains
FIGURE 222  Standalone controller with four HBAs connected to 24 Sun Disk Shelves in four chains

7420 Standalone to Sun Disk Shelves (5 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with five HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

FIGURE 223  Standalone controller with five HBAs connected to one Sun Disk Shelf in a single chain
FIGURE 224  Standalone controller with five HBAs connected to two Sun Disk Shelves in two chains

FIGURE 225  Standalone controller with five HBAs connected to three Sun Disk Shelves in three chains

FIGURE 226  Standalone controller with five HBAs connected to four Sun Disk Shelves in four chains

FIGURE 227  Standalone controller with five HBAs connected to five Sun Disk Shelves in five chains
FIGURE 228  Standalone controller with five HBAs connected to ten Sun Disk Shelves in five chains

FIGURE 229  Standalone controller with five HBAs connected to 30 Sun Disk Shelves in five chains

7420 Standalone to Sun Disk Shelves (6 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with six HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
**FIGURE 230** Standalone controller with six HBAs connected to one Sun Disk Shelf in a single chain

**FIGURE 231** Standalone controller with six HBAs connected to two Sun Disk Shelves in two chains

**FIGURE 232** Standalone controller with six HBAs connected to three Sun Disk Shelves in three chains

**FIGURE 233** Standalone controller with six HBAs connected to four Sun Disk Shelves in four chains
FIGURE 234  Standalone controller with six HBAs connected to five Sun Disk Shelves in five chains

FIGURE 235  Standalone controller with six HBAs connected to six Sun Disk Shelves in six chains

FIGURE 236  Standalone controller with six HBAs connected to 12 Sun Disk Shelves in six chains
FIGURE 237  Standalone controller with six HBAs connected to 36 Sun Disk Shelves in six chains

7420 Clustered to Sun Disk Shelves

7420 Clustered to Sun Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 238  Clustered controllers with two HBAs connected to one Sun Disk Shelf in a single chain

FIGURE 239  Clustered controllers with two HBAs connected to two Sun Disk Shelves in two chains
FIGURE 240  Clustered controllers with two HBAs connected to four Sun Disk Shelves in two chains
FIGURE 241  Clustered controllers with two HBAs connected to 12 Sun Disk Shelves in two chains

7420 Clustered to Sun Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 242  Clustered controllers with three HBAs connected to one Sun Disk Shelf in a single chain

FIGURE 243  Clustered controllers with three HBAs connected to two Sun Disk Shelves in two chains
FIGURE 244 Clustered controllers with three HBAs connected to three Sun Disk Shelves in three chains

FIGURE 245 Clustered controllers with three HBAs connected to six Sun Disk Shelves in three chains
7420 Clustered to Sun Disk Shelves (4 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 247  Clustered controllers with four HBAs connected to one Sun Disk Shelf in a single chain

FIGURE 248  Clustered controllers with four HBAs connected to two Sun Disk Shelves in two chains

FIGURE 249  Clustered controllers with four HBAs connected to three Sun Disk Shelves in three chains
FIGURE 250  Clustered controllers with four HBAs connected to four Sun Disk Shelves in four chains

FIGURE 251  Clustered controllers with four HBAs connected to eight Sun Disk Shelves in four chains
FIGURE 252  Clustered controllers with four HBAs connected to 24 Sun Disk Shelves in four chains

7420 Clustered to Sun Disk Shelves (5 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with five HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.
FIGURE 253  Clustered controllers with five HBAs connected to one Sun Disk Shelf in a single chain

FIGURE 254  Clustered controllers with five HBAs connected to two Sun Disk Shelves in two chains

FIGURE 255  Clustered controllers with five HBAs connected to three Sun Disk Shelves in three chains
FIGURE 256  Clustered controllers with five HBAs connected to four Sun Disk Shelves in four chains

FIGURE 257  Clustered controllers with five HBAs connected to five Sun Disk Shelves in five chains

FIGURE 258  Clustered controllers with five HBAs connected to ten Sun Disk Shelves in five chains
FIGURE 259  Clustered controllers with five HBAs connected to 30 Sun Disk Shelves in five chains

7420 Clustered to Sun Disk Shelves (6 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with six HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 260  Clustered controllers with six HBAs connected to one Sun Disk Shelf in a single chain

FIGURE 261  Clustered controllers with six HBAs connected to two Sun Disk Shelves in two chains

FIGURE 262  Clustered controllers with six HBAs connected to three Sun Disk Shelves in three chains
FIGURE 263  Clustered controllers with six HBAs connected to four Sun Disk Shelves in four chains

FIGURE 264  Clustered controllers with six HBAs connected to five Sun Disk Shelves in five chains

FIGURE 265  Clustered controllers with six HBAs connected to six Sun Disk Shelves in six chains
FIGURE 266  Clustered controllers with six HBAs connected to 12 Sun Disk Shelves in six chains

FIGURE 267  Clustered controllers with six HBAs connected to 36 Sun Disk Shelves in six chains

Sun Disk Shelf to 7320

7320 Standalone to Sun Disk Shelves

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7320 standalone controllers with one HBA. To cable the controller to the disk shelves, use
“Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.

**FIGURE 268** Standalone controller with one HBA connected to one Sun Disk Shelf in a single chain

**FIGURE 269** Standalone controller with one HBA connected to two Sun Disk Shelves in a single chain
7320 Clustered to Sun Disk Shelves

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7320 clustered controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 271  Clustered controllers with one HBA connected to one Sun Disk Shelf in a single chain

FIGURE 272  Clustered controllers with one HBA connected to two Sun Disk Shelves in a single chain
FIGURE 273  Clustered controllers with one HBA connected to six Sun Disk Shelves in a single chain

Sun Disk Shelf to 7120

7120 Standalone to Sun Disk Shelves

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7120 standalone controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model.
FIGURE 274  Standalone controller with one HBA connected to one Sun Disk Shelf in a single chain

FIGURE 275  Standalone controller with one HBA connected to two Sun Disk Shelves in a single chain
Mixed DE2-24 and Sun Disk Shelves

DE2-24 and Sun Disk Shelves to ZS3-4

ZS3-4 Standalone to Mixed Disk Shelves

ZS3-4 Standalone to Mixed Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-4 standalone controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

FIGURE 276  Standalone controllers with two HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)
FIGURE 277  Standalone controllers with two HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)

FIGURE 278  Standalone controllers with two HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 279  Standalone controllers with two HBAs connected to multiple mixed disk shelves in four chains (DE2-24 shown on the left)
ZS3-4 Standalone to Mixed Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-4 standalone controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:
- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain
Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 282** Standalone controllers with three HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 283** Standalone controllers with three HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)

**FIGURE 284** Standalone controllers with three HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)
FIGURE 285  Standalone controllers with three HBAs connected to five mixed disk shelves in five chains (DE2-24 shown on the left)

FIGURE 286  Standalone controllers with three HBAs connected to six mixed disk shelves in six chains (DE2-24 shown on the left)

FIGURE 287  Standalone controllers with three HBAs connected to multiple mixed disk shelves in six chains (DE2-24 shown on the left)
The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-4 standalone controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain
Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

FIGURE 290  Standalone controllers with four HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

FIGURE 291  Standalone controllers with four HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)

FIGURE 292  Standalone controllers with four HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)
FIGURE 293  Standalone controllers with four HBAs connected to five mixed disk shelves in five chains (DE2-24 shown on the left)

FIGURE 294  Standalone controllers with four HBAs connected to six mixed disk shelves in six chains (DE2-24 shown on the left)

FIGURE 295  Standalone controllers with four HBAs connected to seven mixed disk shelves in seven chains (DE2-24 shown on the top)
FIGURE 296  Standalone controllers with four HBAs connected to eight mixed disk shelves in eight chains (DE2-24 shown on the top)

FIGURE 297  Standalone controllers with four HBAs connected to multiple mixed disk shelves in eight chains (DE2-24 shown on the top)
The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-4 clustered controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:
- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 300** Clustered controllers with two HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 301** Clustered controllers with two HBAs connected to three mixed disk shelves in two chains (DE2-24 shown on the left)
FIGURE 302  Clustered controllers with two HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 303  Clustered controllers with two HBAs connected to multiple mixed disk shelves in four chains (DE2-24 shown on the left)
ZS3-4 Clustered to Mixed Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-4 clustered controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:
- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain
**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 306** Clustered controllers with three HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 307** Clustered controllers with three HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)
FIGURE 308  Clustered controllers with three HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 309  Clustered controllers with three HBAs connected to five mixed disk shelves in five chains (DE2-24 shown on the left)
FIGURE 310  Clustered controllers with three HBAs connected to six mixed disk shelves in six chains (DE2-24 shown on the left)

FIGURE 311  Clustered controllers with three HBAs connected to multiple mixed disk shelves in six chains (DE2-24 shown on the left)
The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-4 clustered controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain
Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 314** Clustered controllers with four HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 315** Clustered controllers with four HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)
FIGURE 316  Clustered controllers with four HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 317  Clustered controllers with four HBAs connected to five mixed disk shelves in five chains (DE2-24 shown on the left)
FIGURE 318  Clustered controllers with four HBAs connected to six mixed disk shelves in six chains (DE2-24 shown on the left)

FIGURE 319  Clustered controllers with four HBAs connected to seven mixed disk shelves in seven chains (DE2-24 shown on the top)
FIGURE 320  Clustered controllers with four HBAs connected to eight mixed disk shelves in eight chains (DE2-24 shown on the top)
**FIGURE 321** Clustered controllers with four HBAs connected to multiple mixed disk shelves in eight chains (DE2-24 shown on the top)

**FIGURE 322** Multiple DE2-24 disk shelves in a single chain
DE2-24 and Sun Disk Shelves to ZS3-2

ZS3-2 Standalone to Mixed Disk Shelves

ZS3-2 Standalone to Mixed Disk Shelves (1 HBA)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-2 standalone controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller requires the following:
- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.
FIGURE 324  Standalone controller with one HBA connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

FIGURE 325  Standalone controller with one HBA connected to multiple mixed disk shelves in two chains (DE2-24 shown on the left)

FIGURE 326  Multiple DE2-24 disk shelves in a single chain
The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-2 standalone controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller requires the following:
- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.
FIGURE 329  Standalone controller with two HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)

FIGURE 330  Standalone controller with two HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 331  Standalone controller with two HBAs connected to eight mixed disk shelves in four chains (DE2-24 shown on the left)
Using mixed disk shelves on a controller, requires the following:
- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 334** Clustered controllers with one HBA connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 335** Clustered controllers with one HBA connected to multiple mixed disk shelves in two chains (DE2-24 shown on the left)
ZS3-2 Clustered to Mixed Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage ZS3-2 clustered controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain
Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

FIGURE 338 Clustered controller with two HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

FIGURE 339 Clustered controller with two HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)
FIGURE 340  Clustered controller with two HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 341  Clustered controller with two HBAs connected to eight mixed disk shelves in four chains (DE2-24 shown on the left)
FIGURE 342  Multiple DE2-24 disk shelves in a single chain

FIGURE 343  Multiple Sun disk shelves in a single chain

DE2-24 and Sun Disk Shelves to 7420

7420 Standalone to Mixed Disk Shelves

7420 Standalone to Mixed Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with two HBAs. To cable the controller to the disk shelves, use
“Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 344** Standalone controllers with two HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 345** Standalone controllers with two HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)
FIGURE 346  Standalone controllers with two HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 347  Standalone controllers with two HBAs connected to multiple mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 348  Multiple DE2-24 disk shelves in a single chain
Mixed DE2-24 and Sun Disk Shelves to 7420

FIGURE 349  Multiple Sun disk shelves in a single chain

7420 Standalone to Mixed Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

FIGURE 350  Standalone controllers with three HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)
FIGURE 351  Standalone controllers with three HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)

FIGURE 352  Standalone controllers with three HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 353  Standalone controllers with three HBAs connected to five mixed disk shelves in five chains (DE2-24 shown on the left)
FIGURE 354  Standalone controllers with three HBAs connected to six mixed disk shelves in six chains (DE2-24 shown on the left)

FIGURE 355  Standalone controllers with three HBAs connected to multiple mixed disk shelves in six chains (DE2-24 shown on the left)

FIGURE 356  Multiple DE2-24 disk shelves in a single chain
Multiple Sun disk shelves in a single chain

7420 Standalone to Mixed Disk Shelves (4 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 standalone controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

Standalone controllers with four HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)
FIGURE 359  Standalone controllers with four HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)

FIGURE 360  Standalone controllers with four HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 361  Standalone controllers with four HBAs connected to five mixed disk shelves in five chains (DE2-24 shown on the left)
FIGURE 362  Standalone controllers with four HBAs connected to six mixed disk shelves in six chains (DE2-24 shown on the left)

FIGURE 363  Standalone controllers with four HBAs connected to seven mixed disk shelves in seven chains (DE2-24 shown on the top)
FIGURE 364  Standalone controllers with four HBAs connected to eight mixed disk shelves in eight chains (DE2-24 shown on the top)

FIGURE 365  Standalone controllers with four HBAs connected to multiple mixed disk shelves in eight chains (DE2-24 shown on the top)
7420 Clustered to Mixed Disk Shelves

7420 Clustered to Mixed Disk Shelves (2 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with two HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:
- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 368** Clustered controllers with two HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 369** Clustered controllers with two HBAs connected to three mixed disk shelves in two chains (DE2-24 shown on the left)
FIGURE 370  Clustered controllers with two HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 371  Clustered controllers with two HBAs connected to multiple mixed disk shelves in four chains (DE2-24 shown on the left)
7420 Clustered to Mixed Disk Shelves (3 HBAs)

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with three HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:
- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain
**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 374** Clustered controllers with three HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 375** Clustered controllers with three HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)
FIGURE 376  Clustered controllers with three HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 377  Clustered controllers with three HBAs connected to five mixed disk shelves in five chains (DE2-24 shown on the left)
**FIGURE 378** Clustered controllers with three HBAs connected to six mixed disk shelves in six chains (DE2-24 shown on the left)

![Diagram of clustered controllers with three HBAs connected to six mixed disk shelves in six chains (DE2-24 shown on the left)](image)

**FIGURE 379** Clustered controllers with three HBAs connected to multiple mixed disk shelves in six chains (DE2-24 shown on the left)

![Diagram of clustered controllers with three HBAs connected to multiple mixed disk shelves in six chains (DE2-24 shown on the left)](image)
The following figures show a subset of the supported configurations for Oracle ZFS Storage 7420 clustered controllers with four HBAs. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain
Note - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 382** Clustered controllers with four HBAs connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 383** Clustered controllers with four HBAs connected to three mixed disk shelves in three chains (DE2-24 shown on the left)
FIGURE 384 Clustered controllers with four HBAs connected to four mixed disk shelves in four chains (DE2-24 shown on the left)

FIGURE 385 Clustered controllers with four HBAs connected to five mixed disk shelves in five chains (DE2-24 shown on the left)
FIGURE 386  Clustered controllers with four HBAs connected to six mixed disk shelves in six chains (DE2-24 shown on the left)

FIGURE 387  Clustered controllers with four HBAs connected to seven mixed disk shelves in seven chains (DE2-24 shown on the top)
FIGURE 388  Clustered controllers with four HBAs connected to eight mixed disk shelves in eight chains (DE2-24 shown on the top)
FIGURE 389  Clustered controllers with four HBAs connected to multiple mixed disk shelves in eight chains (DE2-24 shown on the top)

FIGURE 390  Multiple DE2-24 disk shelves in a single chain
DE2-24 and Sun Disk Shelves to 7320

7320 Standalone to Mixed Disk Shelves

The following figures show a subset of the supported configurations for Oracle ZFS Storage 7320 standalone controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.
FIGURE 392  Standalone controller with one HBA connected to two mixed disk shelves in two chains (DE2-24 shown on the left)

FIGURE 393  Standalone controller with one HBA connected to multiple mixed disk shelves in two chains (DE2-24 shown on the left)

FIGURE 394  Multiple DE2-24 disk shelves in a single chain
The following figures show a subset of the supported configurations for Oracle ZFS Storage 7320 clustered controllers with one HBA. To cable the controller to the disk shelves, use “Getting Started with Cabling”, which include the “Maximum Number of Disk Shelves per Controller Configuration” on page 6.

Using mixed disk shelves on a controller, requires the following:

- The controller must use only 4X4 port SAS-2 HBAs
- Do not use mixed disk shelves in the same chain

**Note** - For hardware port locations, see the PCIe Options section in the Hardware Maintenance Overview for your controller model. 4X4 port SAS-2 HBAs are only supported with release AK 2013.1.0 and later.

**FIGURE 395** Multiple Sun disk shelves in a single chain

**FIGURE 396** Clustered controllers with one HBA connected to two mixed disk shelves in two chains (DE2-24 shown on the left)
**FIGURE 397** Clustered controllers with one HBA connected to multiple mixed disk shelves in two chains (DE2-24 shown on the left)

**FIGURE 398** Multiple DE2-24 disk shelves in a single chain
FIGURE 399  Multiple Sun disk shelves in a single chain