



**IBM System Storage N series  
Gateway Implementation Guide for HP  
EVA Storage**

# Copyright and trademark information

---

## Copyright information

Copyright ©1994 - 2010 NetApp, Inc. All rights reserved. Printed in the U.S.A.

Portions copyright © 2010 IBM Corporation. All rights reserved.

US Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

References in this documentation to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only IBM's product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of IBM's or NetApp's intellectual property rights may be used instead of the IBM or NetApp product, program, or service. Evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM and NetApp, are the user's responsibility.

No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S.A. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

## Trademark information

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. A complete and current list of other IBM trademarks is available on the Web at <http://www.ibm.com/legal/copytrade.shtml>

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

NetApp; the NetApp logo; the Network Appliance logo; Cryptainer; Cryptoshred; DataFabric; Data ONTAP; Decru; Decru DataFort; FAServer; FilerView; FlexCache; FlexClone; FlexShare; FlexVol; FPolicy; gFiler; Go further, faster; Manage ONTAP; MultiStore; NearStore; NetCache; NOW (NetApp on the Web); ONTAPI; RAID-DP; SANSscreen; SecureShare; Simulate ONTAP; SnapCopy; SnapDrive; SnapLock; SnapManager; SnapMirror; SnapMover; SnapRestore; SnapValidator; SnapVault; Spinnaker Networks; Spinnaker Networks logo; SpinAccess; SpinCluster; SpinFlex; SpinFS; SpinHA; SpinMove; SpinServer; SpinStor; StoreVault; SyncMirror; Topio; vFiler; VFM; and WAFL are registered trademarks of NetApp, Inc. in the U.S.A. and/or other countries. Network Appliance, Snapshot, and The evolution of storage are trademarks of NetApp, Inc. in the U.S.A. and/or other countries and registered trademarks in some other countries. The StoreVault logo, ApplianceWatch, ApplianceWatch PRO, ASUP, AutoSupport, ComplianceClock, DataFort, Data Motion, FlexScale, FlexSuite, Lifetime Key Management, LockVault, NOW, MetroCluster, OpenKey, ReplicatorX, SecureAdmin, Shadow Tape, SnapDirector, SnapFilter, SnapMigrator, SnapSuite, Tech OnTap, Virtual File Manager, VPolicy, and Web Filer are trademarks of NetApp, Inc. in the U.S.A. and other countries. Get Successful and Select are service marks of NetApp, Inc. in the U.S.A.

All other brands or products are trademarks or registered trademarks of their respective holders and should be treated as such.

NetApp is a licensee of the CompactFlash and CF Logo trademarks.

NetApp NetCache is certified RealSystem compatible.

## Notices

---

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe on any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, N.Y. 10504-1785  
U.S.A.

For additional information, visit the web at:  
<http://www.ibm.com/ibm/licensing/contact/>

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:**

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM web sites are provided for convenience only and do not in any manner serve as an endorsement of those web sites. The materials at those web sites are not part of the materials for this IBM product and use of those web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

If you are viewing this information in softcopy, the photographs and color illustrations may not appear.

# Table of Contents

---

	<b>Preface</b> . . . . .	iii
<b>Chapter 1</b>	<b>Implementation overview</b> . . . . .	1
	HP EVA terminology . . . . .	3
	Supported HP EVA storage arrays . . . . .	4
	Guidelines for array LUN sizing . . . . .	5
<b>Chapter 2</b>	<b>Configurations Supported with HP EVA Systems</b> . . . . .	7
	Your guide to interpreting the illustrations . . . . .	8
	HA pair with one 2-port array LUN group . . . . .	11
	Fabric-attached configurations that optimize performance. . . . .	13
<b>Chapter 3</b>	<b>Configuring HP EVA Storage for Gateways</b> . . . . .	17
	Configuration requirements for HP EVA storage arrays . . . . .	18
	Configuration overview. . . . .	19
	<b>Index</b> . . . . .	23



# Preface

---

## About this guide

This guide provides information about how to set up your storage array to work with an IBM® N series gateway running Data ONTAP® software, including configuration guidelines and sample configurations. The information in this guide pertains to all supported gateways.

---

### Note

Data ONTAP software runs on multiple hardware platforms. This documentation might describe features that are not supported on your platform.

---

---

### Attention

In this document, the term *gateway* describes IBM N series storage systems that have been ordered with gateway functionality. Gateways support various types of storage, and they are used with third-party disk storage systems—for example, disk storage systems from IBM, HP®, Hitachi Data Systems®, and EMC®. In this case, disk storage for customer data and the RAID controller functionality is provided by the back-end disk storage system. A gateway might also be used with disk storage expansion units specifically designed for the IBM N series models.

The term *filer* describes IBM N series storage systems that either contain internal disk storage or attach to disk storage expansion units specifically designed for the IBM N series storage systems. Filer storage systems do not support using third-party disk storage systems.

---

## Audience

This guide is for system administrators who are familiar with operating systems such as UNIX® and Windows® that run on the storage system's clients. This guide does not discuss basic system or network administration topics, such as IP addressing, routing, and network topology; it emphasizes the characteristics of the gateway.

## Relationship of this guide to other guides

This guide is intended to be used in conjunction with other information in the gateway and Data ONTAP libraries. The following table describes the relationships between this guide and other documentation.

Guide name	Information includes...
<i>Installation Requirements and Reference Guide</i>	<ul style="list-style-type: none"> <li>◆ General guidelines for creating and making array LUNs available to gateways</li> <li>◆ Quick start installation instructions for connecting devices together and for installing Data ONTAP on a gateway that uses only third-party storage.</li> <li>◆ Reference information.</li> <li>◆ Detailed background information including layout in aggregates and checksums.</li> </ul>
<i>Implementation Guides</i>	<ul style="list-style-type: none"> <li>◆ Vendor-specific details about how to set up a storage array to work with gateways.</li> <li>◆ More detailed configuration examples than are provided in the <i>Installation Requirements and Reference Guide</i>.</li> </ul>
<i>Implementation Guide for Native Disk Shelves</i>	Information about setting up the storage on the native disk shelves connected to the gateway.
Data ONTAP Software Setup Guide	Detailed steps for setting up the gateway, including information about installing Data ONTAP software for installations using only third-party storage. This guide is most helpful to users who are new to Data ONTAP setup and installation.
Data ONTAP guides	Detailed information about all Data ONTAP features used by all systems running Data ONTAP, for example, storage features and data protection features.

See the gateway *Interoperability Matrix* for details about Data ONTAP releases that support the gateway, supported switches, supported firmware, capacity, and maximum array LUN count.

## Supported features

IBM® System Storage™ N series products are driven by NetApp® Data ONTAP software. Some features described in the product software documentation are neither offered nor supported by IBM. Please contact your local IBM representative or reseller for further details. Information about supported features can also be found at the following Web site:

[www.ibm.com/storage/support/nas/](http://www.ibm.com/storage/support/nas/)

A listing of currently available N series products and features can be found at the following Web site:

[www.ibm.com/storage/nas/](http://www.ibm.com/storage/nas/)

## **Getting information, help, and service**

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your IBM N series product, and whom to call for service, if it is necessary.

## **Before you call**

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- ◆ Check all cables to make sure that they are connected properly.
- ◆ Check the power switches to make sure that the system is turned on.
- ◆ Use the troubleshooting information in your system documentation and use the diagnostic tools that come with your system.

## **Using the documentation**

Information about the N series hardware products is available in printed documents and a documentation CD that comes with your system. The same documentation is available as PDF files on the IBM NAS support Web site:

[www.ibm.com/storage/support/nas/](http://www.ibm.com/storage/support/nas/)

## **Web sites**

IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates.

- ◆ For NAS product information, go to the following Web site:  
[www.ibm.com/storage/nas/](http://www.ibm.com/storage/nas/)
- ◆ For NAS support information, go to the following Web site:  
[www.ibm.com/storage/support/nas/](http://www.ibm.com/storage/support/nas/)
- ◆ For AutoSupport information, go to the following Web site:  
[www.ibm.com/storage/support/nas/](http://www.ibm.com/storage/support/nas/)
- ◆ For the latest version of publications, go to the following Web site:  
[www.ibm.com/storage/support/nas/](http://www.ibm.com/storage/support/nas/)

## Accessing online technical support

For online Technical Support for your IBM N series product, visit the following Web site:

[www.ibm.com/storage/support/nas/](http://www.ibm.com/storage/support/nas/)

## Hardware service and support

You can receive hardware service through IBM Integrated Technology Services. Visit the following Web site for support telephone numbers:

[www.ibm.com/planetwide/](http://www.ibm.com/planetwide/)

## Supported servers and operating systems

IBM N series products attach to many servers and many operating systems. To determine the latest supported attachments, visit the following Web site:

[www.ibm.com/storage/support/nas/](http://www.ibm.com/storage/support/nas/)

## Firmware updates

As with all devices, it is recommended that you run the latest level of firmware. For information on firmware updates, visiting the following Web site:

[www.ibm.com/storage/support/nas/](http://www.ibm.com/storage/support/nas/)

Verify that the latest level of firmware is installed on your machine before contacting IBM for technical support. See the *Gateway Upgrade Guide* for your version of Data ONTAP for more information on updating firmware.

## Special messages

This guide contains special messages that are described as follows:

---

### Note

A note contains important information that helps you install or operate the system efficiently.

---

---

### Attention

Attention contains instructions that you must follow to avoid damage to the equipment, a system crash, or loss of data.

---

## How to send your comments

Your feedback is important in helping us provide the most accurate and high-quality information. If you have comments or suggestions for improving this document, send us your comments by e-mail to [starpubs@us.ibm.com](mailto:starpubs@us.ibm.com). Be sure to include the following:

- ◆ Exact publication title
- ◆ Form number (for example, GC26-1234-02)
- ◆ Page, table, or illustration numbers
- ◆ A detailed description of any information that should be changed



## About this chapter

This chapter provides an overview of how to integrate IBM® N series® gateways with HP StorageWorks Enterprise Virtual Array (HP EVA) storage arrays.

---

### Note

IBM gateway models and filers with gateway functionality are both referred to as gateways.

---

## Topics in this chapter

This chapter discusses the following topics:

- ◆ “[HP EVA terminology](#)” on page 3
- ◆ “[Supported HP EVA storage arrays](#)” on page 4
- ◆ “[Guidelines for array LUN sizing](#)” on page 5

## Generic storage allocation terms used in this document

**array LUN:** This guide uses the term *array LUN* (logical unit number) to describe an area on the storage array that is available for a gateway or a non-gateway host to read data from or write data to. You might be accustomed to hearing a different term to describe this area; the term varies among vendors and sometimes among platforms for the same vendor. See the gateway *Implementation Guide* for your storage array type for the specific term used for your platforms.

**HA pair:** Two storage systems (nodes) whose controllers are connected to each other either directly or through switches. In some versions of Data ONTAP, this configuration is referred to as an *active/active configuration*.

## Additional information to read

This guide is intended to be used in conjunction with the following additional documents:

- ◆ *Gateway Installation Requirements and Reference Guide*  
This guide contains general guidelines for setting up the storage array to work with the gateways. When planning your deployment, first read this guide, then read the gateway *Implementation Guide* for your storage array type. The *Implementation Guides* provide additional details that are specific to your vendor.
- ◆ *Gateway Interoperability Matrix* at <http://www.ibm.com/storage/nas/>

This document provides information about Data ONTAP releases that support the gateway, supported switches, supported firmware, capacity, and maximum array LUN count.

**Note**

---

The *Interoperability Matrix* is the final authority on the storage array models, storage array firmware, switches, and so on that the gateway supports.

---

# HP EVA terminology

---

## **array LUN**

A logical unit number of one or more disks or disk partitions into one span of disk storage space.

A LUN looks like an individual disk to the gateway. A gateway or a non gateway host reads data from or writes data to an array LUN.

## **disk group**

A set or pool of disk drives in which you can create virtual disks.

## **management appliance**

HP EVA systems are configured, managed, and monitored through a storage management appliance. The storage management appliance is a PC server that runs a software agent called Command View EVA. The software agent is accessed using a user interface that is provided by a standard Web browser.

## **Vdisk**

A simulated disk drive created in a disk group. The gateway calls this an array LUN.

# Supported HP EVA storage arrays

---

## Finding out which Data ONTAP release supports which storage arrays

This guide provides information about all vendors and storage arrays that the gateway supports at the time of publication. Not all vendors and models described in this guide are supported in all Data ONTAP releases. See the gateway *Interoperability Matrix* at <http://www.ibm.com/storage/nas/> to determine which vendors and storage array models are supported in a particular Data ONTAP release.

### Note

---

The gateway *Interoperability Matrix* is the final authority about which storage arrays that gateways support.

---

## Firmware versions

See the gateway *Interoperability Matrix* for information about supported firmware versions. The *Interoperability Matrix* is the final authority on the firmware versions that the gateway supports.

# Guidelines for array LUN sizing

---

## Relationship of Data ONTAP and storage array units of measure

The size of the array LUNs that you can create on the storage array is limited by the minimum and maximum array LUN sizes that Data ONTAP supports. The Data ONTAP definition of a gigabyte (GB) might not match the definition of a GB for your storage array. When you determine the minimum and maximum array LUN sizes for your storage array, you need to consider whether the units of measure for your storage array are different from Data ONTAP units of measure.

The Data ONTAP definition of a GB is as follows:

One GB is equal to  $1000 \times 1024 \times 1024$  bytes.

See the gateway *Interoperability Matrix* for the general rule about Data ONTAP minimum and maximum array LUN sizes. This gateway *Implementation Guide* contains specific information about the equivalent minimum and maximum limits according to this vendor's calculation of units of measure.

## Minimum array LUN size for the root volume

The minimum array LUN size shown in this section does not apply to the array LUN for the root volume. It is strongly recommended that you do not set the size of a root volume below the minimum root volume size shown in the gateway *Interoperability Matrix*. The reason is that you want to ensure that there is sufficient space in the root volume for system files, log files, and core files. If a system problem occurs, you need to provide these files to technical support.

## Minimum and maximum array LUN sizes with HP EVA storage arrays

The HP EVA storage arrays support larger LUN sizes than the gateways support. The maximum usable values shown in this section are based on the assumption that the units of measurement for your storage array are calculated as follows.

Unit	Formula for calculating...
GB	$1024 \times 1024 \times 1024$ bytes

If you plan to use a large-sized array LUN that is close to the maximum capacity that Data ONTAP supports, ensure that the size you specify does not exceed the size shown in the “Maximum usable value” column in the following tables.

---

**Note**

Storage arrays vary as to how you can specify array LUN size (that is, in GB, MB, or 512-byte blocks).

---

Do not create array LUNs that are smaller than the minimum LUN size shown in the gateway *Interoperability Matrix*.

See the gateway *Installation Requirements and Reference Guide* for guidelines about the implications of different size array LUNs on Data ONTAP storage.

**Values for Data ONTAP 7.3.3 and later in the 7.3 family and 8.0 and later in the 8.x family:**

If you are specifying in...	Maximum usable value
GB	1,952 GB

**Values for Data ONTAP 7.2.4 and later in the 7.2.x family; 7.3, 7.3.1, and 7.3.2:**

If you are specifying in...	Maximum usable value
GB	976 GB

**Values for Data ONTAP 7.2.3:**

If you are specifying in...	Maximum usable value...
GB	732 GB

## About this chapter

This chapter discusses the supported configurations for all supported HP EVA storage arrays. Use the configurations in this chapter as guidelines when you connect your gateway to your storage array. You can also refer to the configurations when you determine desired capacity usage, create array LUNs initially, and add array LUNs to your gateway.

---

### Note

The gateway *Interoperability Matrix* is the final authority about which configurations that gateways support.

---

## Topics in this chapter

This chapter discusses the following topics:

- ◆ “[Your guide to interpreting the illustrations](#)” on page 8
- ◆ “[HA pair with one 2-port array LUN group](#)” on page 11
- ◆ “[Fabric-attached configurations that optimize performance](#)” on page 13

## Configuration that is not supported with HP EVA storage arrays

Data ONTAP supports only fabric-attached configurations with HP EVA storage arrays; direct-attached configurations are not supported.

## Your guide to interpreting the illustrations

---

### Variation in the maximum number of array LUNs supported

The maximum number of array LUNs supported for a configuration is limited by the maximum number of array LUNs that a particular gateway model supports or by the maximum number of array LUNs that a storage array model supports, whichever is less.

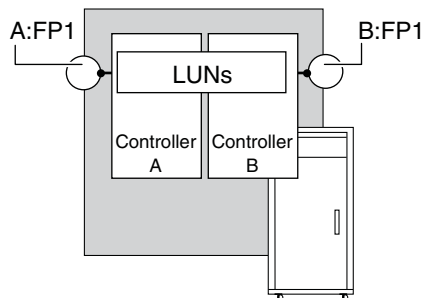
See the gateway *Interoperability Matrix* for information about the number of array LUNs supported by different gateway models.

### Number of ports shown

The illustrations show the minimum number of ports that you can use per configuration. You might choose to use more port pairs than are shown.

### Illustration of redundant paths and port pairs for storage arrays

In each illustration in this chapter, the port pairs on the storage array are shown in relation to the array LUNs on the port, with the ports on alternate controllers.



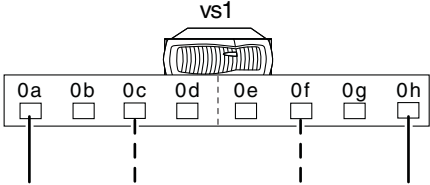
See the gateway *Installation Requirements and Reference Guide* for rules for setting up redundant ports and examples of valid and invalid configurations.

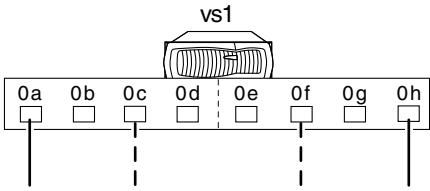
### Illustration of redundant paths and port pairs for the gateways

The FC initiator ports are onboard ports and are labeled 0a, 0b, and so on. Redundancy is achieved on the gateway because each port in a pair is on a different bus. (For more information about selecting redundant ports on the different gateway models with onboard FC initiator ports, see the gateway *Installation Requirements and Reference Guide*.)

**Relationship between gateway port pairs and array LUN groups**

The illustrations in the following table show an N7000 series gateway that has both onboard FC initiator ports and cards. These examples show the use of two different redundant port pairs. Redundancy is achieved on the gateway because each port in a pair is on a different bus.

Release	Supported configurations
7.3 and later	<p>For HP EVA 8000, HP EVA 8100, and HP EVA 8400 storage arrays only, you can use multiple port pairs on a gateway system to access array LUNs on the same storage array, if the following requirements are met:</p> <ul style="list-style-type: none"> <li>◆ Each gateway port pair must access a different group of array LUNs</li> <li>◆ Each gateway port pair must access a different fabric.</li> </ul> <p>See <a href="#">“Fabric-attached configurations that optimize performance”</a> on page 13 for examples of configurations with multiple port pairs and multiple array LUN groups.</p> <div style="text-align: center;">  </div> <p>— FC initiator port pair to a LUN group over two independent fabrics      - - - FC initiator port pair to a different LUN group over two independent fabrics</p>

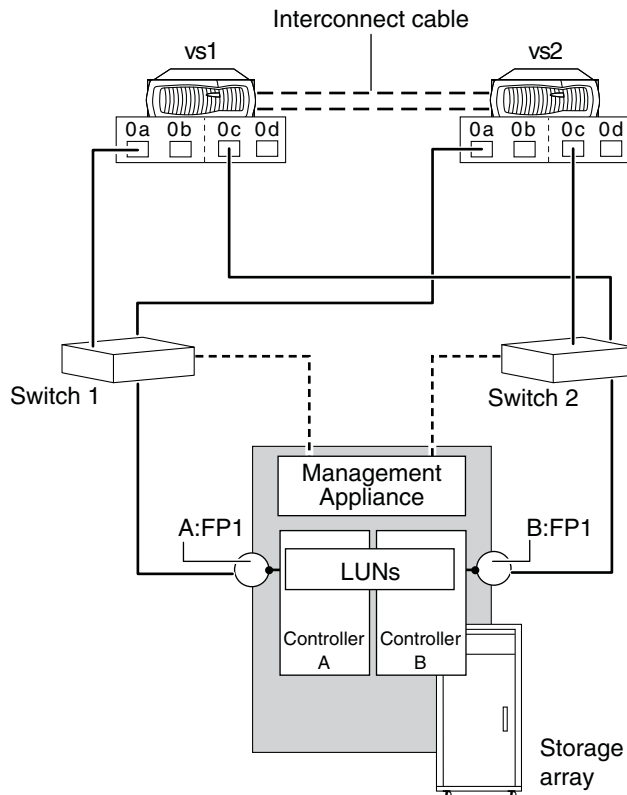
Release	Supported configurations
Earlier than 7.3	<p>To use multiple gateway port pairs with an HP EVA storage array, you must follow these rules:</p> <ul style="list-style-type: none"> <li>◆ Each port in a gateway port pair must access a different fabric.</li> <li>◆ You must have one port pair for each gateway for each array.</li> <li>◆ No more than one port pair on a specific gateway can access array LUNs on that storage array.</li> <li>◆ For an HA pair, one port pair from each gateway must be able to see the same array LUNs.</li> </ul> <div style="text-align: center;">  <p>— FC initiator pair to one storage array over two independent fabrics</p> <p>- - - FC initiator pair to a different storage array over two independent fabrics</p> </div>

### About switch zoning

Use single initiator zoning for a gateway because the gateway FC initiator ports do not need to and should not see each other.

## HA pair with one 2-port array LUN group

The following illustration shows an example in which an HA pair is attached through switches to a single HP EVA storage array. The HP EVA Management Appliance should have a separate zone carved out for the EVA Management initiators and the target ports. This reduces the likelihood of interoperability problems on the shared ports.



In this configuration, each of the two target ports is accessed by two gateway FC initiator ports, one from each node in the HA pair. (Two gateway initiator ports “share” the same target port.) To ensure availability, use a redundant port pair on each node in the HA pair. Then, if one path from a node fails, the other path from the node is used; gateway controller takeover does not occur.

**Note**

The maximum number of FC initiator ports on a gateway is determined by model.

**Zoning**

The following table shows single-initiator zoning for this example. Single-initiator zoning is the recommended zoning strategy.

<b>Zone</b>	<b>Gateway and port</b>	<b>Storage array controller</b>	<b>Storage array port</b>
<b>Switch 1</b>			
z1	vs1 0a	A	FP1
z2	vs2 0a	A	FP1
<b>Switch 2</b>			
z3	vs1 0c	B	FP1
z4	vs2 0c	B	FP1

## Fabric-attached configurations that optimize performance

---

### How performance is optimized

The examples in this section show configurations that enable you to optimize performance by spreading the I/O across the disk groups on the storage array. You set up your configuration so that different port pairs on a gateway access different groups of array LUNs on the storage array. The gateway sees any given array LUN over only two paths because a given logical device is mapped to only two alternate ports on the storage array.

On the storage array, different array LUN groups are accessed through different ports. Each number used to identify a logical device must be unique on the same storage array, but numbers presented to hosts to identify array LUNs (external numbers) can be duplicated on different ports.

---

### Attention

For releases prior to Data ONTAP 7.3, using multiple the gateway port pairs to access different array LUN groups on the same storage array results in more than two paths to an array LUN, which causes the system to function improperly. Starting with Data ONTAP 7.3, Data ONTAP supports this configuration for HP EVA 8000, HP EVA 8100, and HP EVA 8400 storage arrays. Check the gateway *Interoperability Matrix* to determine which Data ONTAP release supports which of these storage array models.

---

### Rules for implementing this type of configuration

To implement this type of configuration, you need to do the following:

- ◆ On the storage array, use as many ports as possible to provide access to the array LUNs you allocated for the gateway.
- ◆ On the gateway, use multiple port pairs. Each port pair accesses a different group of array LUNs on the storage array through redundant paths.
- ◆ Create one big aggregate (in the Data ONTAP configuration), assigning array LUNs from multiple disk groups to the aggregate. By doing so, the I/O is spread across more disks.

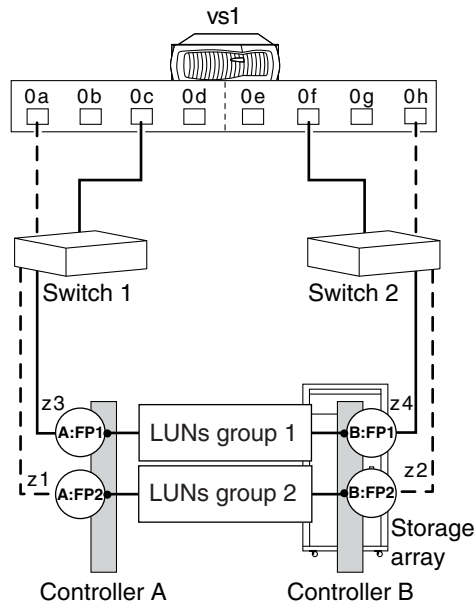
The combination of spreading I/O across the disk groups and creating one large aggregate results in a significant performance boost.

## Stand-alone with two 2-port array LUN groups

The following illustration shows a configuration with a stand-alone N7600 or N7800 gateway. One gateway port pair accesses array LUNs in one LUN group on the storage array and a different gateway port pair accesses array LUNs in a different LUN group on the storage array.

### Note

The HP EVA Management Appliance is not shown in the following illustration.



**Zoning for this configuration:** The following table summarizes the zoning for this example. Single-initiator zoning is the recommended zoning strategy.

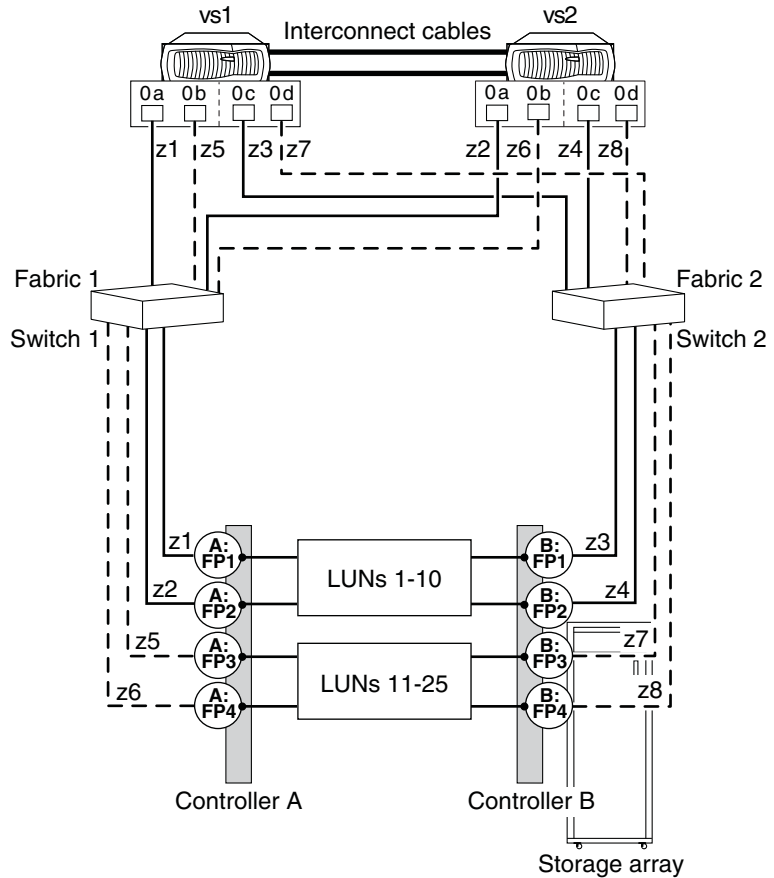
Zone	Gateway FC initiator port	Storage array controller	Storage array port
<b>Switch 1</b>			
z1	Port 0a	A	FP2
z3	Port 0c	A	FP1
<b>Switch 2</b>			
z2	Port 0h	B	FP2
z4	Port 0f	B	FP1

## Two 4-port array LUN groups configuration

The following illustration shows a gateway HA pair with two 4-port array LUN groups on HP EVA 8000, HP EVA 8100, or HP EVA 8400 storage arrays.

### Note

The HP EVA Management Appliance is not shown in the following illustration.



The following table summarizes the zoning for this configuration.

<b>Zone</b>	<b>Gateway and port</b>	<b>Storage array</b>	<b>Storage port</b>	<b>Array LUN group</b>
<b>Switch 1</b>				
z1	vs1-0a	Controller A	A:FP1	LUNs 1 - 10
z2	vs2-0a	Controller A	A:FP2	LUNs 1 - 10
z5	vs1-0b	Controller A	A:FP3	LUNs 11 - 25
z6	vs2-0b	Controller A	A:FP4	LUNs 11 - 25
<b>Switch 2</b>				
z3	vs1-0c	Controller B	B:FP1	LUNs 1 - 10
z4	vs2-0c	Controller B	B:FP2	LUNs 1 - 10
z7	vs1-0d	Controller B	B:FP3	LUNs 11 - 25
z8	vs2-0d	Controller B	B:FP4	LUNs 11 - 25

- About this chapter** This chapter contains an overview of the steps required to configure an HP EVA storage array to work with a gateway. For details about how to set up and configure HP EVA storage arrays, see your HP EVA documentation.
- Topics in this chapter** This chapter contains the following topics:
- ◆ [“Configuration requirements for HP EVA storage arrays”](#) on page 18
  - ◆ [“Configuration overview”](#) on page 19
- HP EVA user interfaces** You use the HP StorageWorks Command View EVA graphical user interface to configure the HP EVA Storage Server system.
- Prerequisites** You must connect the HP EVA Management Appliance to the same switches that connect the gateways to the HP EVA storage array. The Management appliance must also have a network connection to run the HP StorageWorks Command View EVA graphic user interface.

# Configuration requirements for HP EVA storage arrays

---

## Required system parameters for the HP EVA

The following table shows the required system parameters for implementing the HP EVA with the gateways.

Parameter	Value required for gateways
Redundancy	Vraid1, Vraid5, or Vraid6
Preferred path/mode	No preference (default)
Host Type	SUN Solaris

## Host limits

The HP EVA storage arrays support up to 255 array LUNs for a host.

## Requirements for multiple array LUN groups

The following are requirements to configure multiple array LUN groups on HP EVA 8000, HP EVA 8100, and HP EVA 8400 storage arrays:

- ◆ Switch zoning must define which target ports the gateway initiator ports use to access each array LUN group.
- ◆ You use Hosts to define which array LUN groups are presented to each gateway initiator port.
- ◆ One initiator port pair for each gateway system is required for each array LUN group.

## Configuration overview

---

The following table provides the high-level steps for setting up an HP EVA storage array, switches, and gateways to communicate with each other.

Step	Action
1	Determine the storage capacity you need for the gateways.
2	Plan the number and size of the array LUNs for the gateways. See “ <a href="#">Guidelines for array LUN sizing</a> ” on page 5 and the gateway <i>Installation Requirements and Reference Guide</i> for recommendations about array LUN size.
3	Confirm that the firmware on the HP EVA storage array meets the version level required by the gateway. See the gateway <i>Interoperability Matrix</i> for information about supported firmware versions.
4	Install each gateway. <ul style="list-style-type: none"><li>a. Rack mount the gateway.</li><li>b. Make sure the power is connected to the gateway and that the console is set up.  See the gateway <i>Installation Requirements and Reference Guide</i> for detailed instructions.</li><li>c. Power on the gateway.</li><li>d. Interrupt the boot process by pressing Ctrl-C when you see the following message on the console:  Starting Press CTRL-C for special boot menu</li><li>e. Select the “Maintenance mode boot” option.  Do not proceed any further with gateway installation and setup at this time.</li></ul>
5	Connect the cables between the storage arrays and switches and between the switches and the gateways.

Step	Action
6	<p>Zone the switches. Then verify that the communications between the storage array and the switch and the switch and the gateways are working.</p> <p>If you are setting up zoning using Worldwide Port Names (WWPNs), the gateways and storage array must be powered on and running Data ONTAP (either in maintenance mode or in normal mode) for the WWPNs to be automatically discovered by the switch.</p>
7	<p>From the HP EVA Management Appliance on the StorageWorks Command View EVA, discover the storage array.</p>
8	<p>If necessary, change the name of the storage array.</p>
9	<p>Create a disk group(s).</p>
10	<p>Add disks to the disk group(s).</p>
11	<p>Create Vdisks (array LUNs) for the gateway on the HP EVA.</p> <p>To make a Vdisk available to a host, you must present it to a host. You can present a Vdisk to a host during or after Vdisk creation.</p> <p><b>Attention</b> _____  The redundancy must be set to <b>vraid1, vraid5, or vraid6</b>.  The preferred path/mode must be set to <b>No preference</b> (the default).  _____</p>
<p><b>If you are creating a single LUN group:</b></p>	
12	<p>Create a host for the gateway on the HP EVA storage array.</p> <p><b>Attention</b> _____  The Host Type must be set to <b>SUN Solaris</b>.  The maximum number of array LUNs you can assign to a host is 255.  _____</p>
13	<p>Map Vdisks to the gatewayhost.</p>

Step	Action
<b>If you are creating multiple LUN groups (HP EVA 8000, HP EVA 8100, and HP EVA 8400 models only):</b>	
14	<p>Create the first host with the 0a, 0c adapter ports from both gateways.</p> <p><b>Attention</b> _____  The Host Type must be set to <b>SUN Solaris</b>.  The maximum number of array LUNs you can assign to a host is 255.</p>
15	<p>Create the second host with 0b, 0d adapter ports from both gateways.</p> <p><b>Attention</b> _____  The Host Type must be set to <b>SUN Solaris</b>.  The maximum number of array LUNs you can assign to a host is 255.</p>
16	Create Virtual Disks from the Disk Group.
17	Map (present) the Vdisks (array LUNS) to their respective gatewayhosts.
<b>Verification:</b>	
18	<p>On the gateway, verify that the HP EVA array LUNs allocated for the gateways are visible to the gateway.</p> <ul style="list-style-type: none"> <li>a. Enter the following command:  <pre>disk show -v</pre></li> <li>b. Verify that all the array LUNs that were allocated for the gateways are displayed.</li> </ul> <p>If you do not see all the array LUNs you expect, wait a short time then enter the command again. There can be a short delay before the array LUNs are visible over the network.</p>



# Index

## C

configuration overview 17

## F

firmware versions supported 4, 19

## G

gigabyte, defined 5

## H

HA pairs, definition 1

HP EVA Management Appliance  
described 3

HP EVA storage arrays  
configuration overview 17

## L

logical unit number, defined 1

LUNs (array)  
sizing guidelines 5

LUNs (array), defined 1, 3

## M

Management Appliance  
described 3

## O

optimizing performance  
configuration example 13

## P

performance optimization  
configuration example 13

## T

terminology  
Data ONTAP 1  
HP EVA 3

## Z

zoning recommendation 10





NA 210-04957\_A0, Printed in USA

GC27-2192-04

