

FlashBlade//S Site Planning Guide

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Pure Storage, Inc. 2555 Augustine Drive, Santa Clara, CA 95054 USA <http://www.purestorage.com>

Direct comments to DocumentFeedback@purestorage.com.

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Chapter 1

Conventions and Guidelines

Conventions

The following symbols appear in Pure Storage documentation.

Table 1.1 Documentation Symbols

Symbol	Meaning
	Additional information
	Supplementary instruction
	Potential for injury, physical damage, data loss, or array configuration loss
	Important information
	Indicates a need for login access to a FlashBlade or involvement from Pure Storage Technical Services.

Safety and Handling Guidelines

-  If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment might be impaired.
-  Equipment is intended for installation in a restricted access area.
-  Verify all rack electrical distribution systems meet all safety requirements of UL 62368-1, IEC 62368-1, or EN 62368-1. For AC installation provide adequate 200-240V 50-60Hz AC power, and use over-current protection devices connected to a UL certified (or equivalent 20A) circuit breaker for each

PSU. For DC installation, provide adequate -48-60V DC power, and use over-current protection devices connected to a UL certified 50A (or equivalent 50A) circuit breaker for each PSU.



Verify that all electrical connections are grounded before powering on.



Avoid contact with back-plane components and connectors.



Disconnect power cords before moving chassis and shelves.



Install replacement components within two minutes of removing a faulty component to ensure the maximum blade temperatures do not exceed temperature limits.



Use only CDRH approved Class 1 fiber optic transceiver modules.



Do not use bifurcated ("Y") power cords.



Do not open chassis, shelf enclosures, or other components unless you are a qualified service representative performing a procedure approved by Pure Storage.



Do not use component handles to lift the chassis. Use the chassis lift handles to lift a chassis.



When servicing rack-mounted equipment, remove only one chassis at a time.



Use a mechanical lift or 4 or more people to lift the FlashBlade//S chassis.



Do not replace batteries due to the risk of exploding if mishandled.



Do not insert anything into any FlashBlade//S or XFM connectors except as specified in installation or repair instructions.



Rack mounting:

A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore,

consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature specified by the Technical Specifications.

B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of the air flow required for safe operation of the equipment is not compromised.

C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment electrical ratings should be used when addressing this concern.

E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit.

 Ensure all components, including power supply modules (PSM) and blank panels, are installed before powering on or operating a FlashBlade//S or XFM modules.

 Do not remove faulty components until replacements are available.

Instructional Safeguard Symbols

The following table provides descriptions for the symbols on our safety labels.

Table 1.2 Safeguard Symbols

Symbol	Description
	Not to be serviced by users, ISO 7010, P069 (2019-07) Contact service technician when servicing is required
	Caution, ISO 7000, 0434B (2004-01)
	Warning: Laser beam, ISO 7010, W004 (2011-05)
	Electrostatic sensitive devices, IEC 60417, 5134 (2003-04)

Table 1.2 Safeguard Symbols (continued)

Symbol	Description
	Dangerous voltage, IEC 60417, 5036 (2002-10)
	Disconnection, all power plugs, IEC 60417, 6172 (2012-09) Caution, risk of electric shock.
	Protective Earthing (PE), IEC 60364 Exposed-conductive-parts shall be connected to a protective conductor. Symbol can be attached to the terminal of an exposed conductive part, where green/yellow cable is connected.
	Rack-mounted devices are not to be used as shelves or workspaces. Do not place any object on top of rack-mounted devices.
	Warning; Hot surface, ISO 7010, W017 (2011-05)

Chapter 2

Overview

This guide outlines the necessary steps to prepare a customer site for the installation of a FlashBlade//S or an upgrade to an existing FlashBlade//S system. The site planning tasks are categorized into two distinct areas:

- Physical requirements:
 - Inspect physical location for sufficient clearance and rack space before installing system.
 - Identify any obstructions or layout issues.
 - Determine the required rack space and power requirements.
- General site planning:
 - Review the shipment manifest and report any missing items.
 - Assess the available space for unpacking shipment.
 - Review the customer network.
 - Return the replaced components to the company's headquarters.

Planning and Considerations

Preparation

Pure Storage prioritizes safety for field engineers and customers when handling heavy equipment. Always adhere to the safety cautions to avoid serious injuries.

- Plan arrangements for the safe lifting of equipment. A shipping configuration (includes 7 blades) weighs approximately 80 kg (176 lb).

The in-rack weight of a fully loaded FlashBlade//S chassis (includes 10 blades and 40 DirectFlash Modules) is approximately 100 kg (220 lb).

An empty blade weighs approximately 4.6 kg (10.2 lb).

- Use a mechanical lift or 4 or more people to lift the chassis.
- Verify the rack can support the weight of all installed equipment, including cables and rails for a fully loaded chassis—approximately 100 kg (220 lb)—and the weight is within the floor loading limit.
- Each XFM module weighs approximately 14.22 kg (31.34 lb).

Physical Environment

Ensure the physical location adheres to the following recommendations before installing a FlashBlade//S system:

- Complies with the spatial, environmental, and electrical power requirements.
- Verify all rack electrical distribution systems meet all safety requirements of UL 62368-1, IEC 62368-1, or EN 62368-1. For AC installation, provide adequate 200-240V 50-60Hz AC power, and use over-current protection devices connected to a UL certified (or equivalent 20A) circuit breaker for each PSU. For DC installation, provide adequate -48-60V DC power, and use over-current protection devices connected to a UL certified 50A (or equivalent 50A) circuit breaker for each PSU.
- Verify power distribution units (PDU) are equipped with separate power banks and circuit breakers for redundancy when connecting FlashBlade//S storage chassis.
- Confirm the electrical outlets in the building provides protective earth connection for connecting the FlashBlade//S system and preventing electrical shock. If a protective earth connection is unavailable, arrange for one to be installed.
- Place the FlashBlade//S system in a restricted access location.
- Provide a minimum of 81.5 cm (32 in.) of clearance space for the front (cold aisle). The recommended clearance is 91.5 cm (36 in.).
- Provide a minimum of 81.5 cm (32 in.) of clearance for the rear (hot aisle). The recommended clearance is 91.5 cm (36 in.).
- Verify the front and rear of the rack mounting posts are between 61.0 cm (24 in.) and 91.5 cm (36 in.) with 5 RU of contiguous vertical space available for each FlashBlade//S chassis. Multi-chassis configurations require an additional 2 RU of contiguous vertical space for a pair of XFM modules above the first chassis.

 **Note:** Special clearance is not required for the top, bottom, or sides of the rack.

- Verify the front and rear of the rack mounting posts are between 61.0 cm (24 in.) and 91.5 cm (36 in.) with 5 RU of contiguous vertical space available for each chassis. Multi-chassis configurations require an additional 2 RU of contiguous vertical space for a pair of XFM modules above the first chassis.

 **Note:** Special clearance is not required for the top, bottom, or sides of the rack.

- Recommend installing the FlashBlade//S chassis within 3 m (9.85 ft) of the network switches or patch panels.
- Ensure the operating temperature of the physical environment is within range of 5° to 35°C when the rack is fully populated.
- Verify airflow ducts are not aiming directly at the FlashBlade//S chassis.

Network Considerations

Review all network requirements and guidelines before installing the FlashBlade//S system.

- Cross-connect the FlashBlade//S system to two network switches for maximum availability.
- Configure all the links that are part of the same LAG group in a single link aggregation group on the upstream switches connected to the XFM Ethernet ports
- Configure Multi-Chassis Link Aggregation between the upstream switches that are connected to the XFMs.
- Install FlashBlade//S chassis with ports and power supplies facing in the direction of the hot aisle.
- Install XFM modules with ETH ports facing in the direction of the hot aisle.
- Use a USB-to-serial cable for system software setup.

Chapter 3

FlashBlade//S Specifications

The following sections describe the physical specifications of a FlashBlade//S system.

FlashBlade//S Dimensions and Weight

The following illustrations and tables list the physical specifications of a FlashBlade//S chassis and associated components.

Figure 3.1 Chassis (Front View)

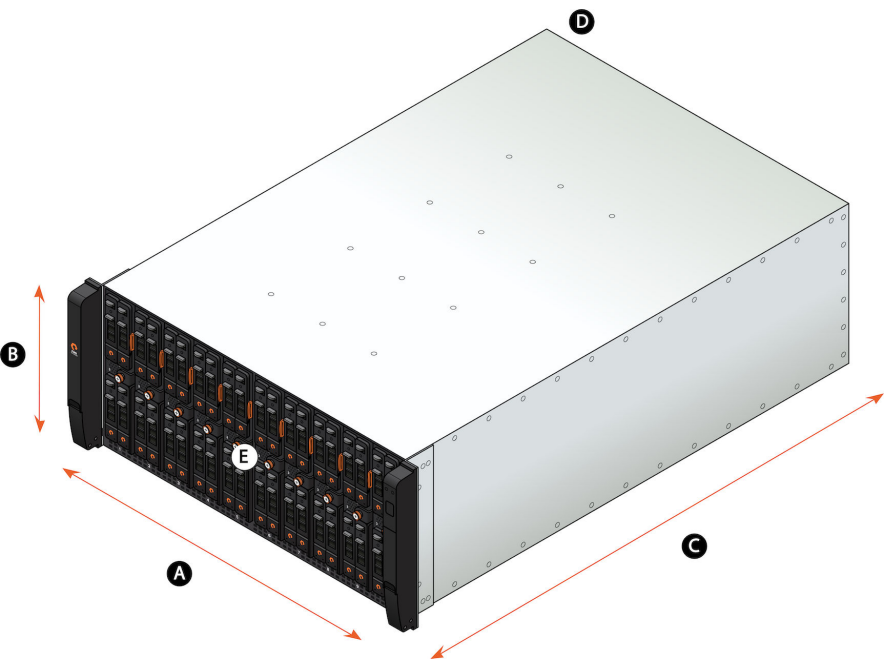


Table 3.1 Chassis Dimensions

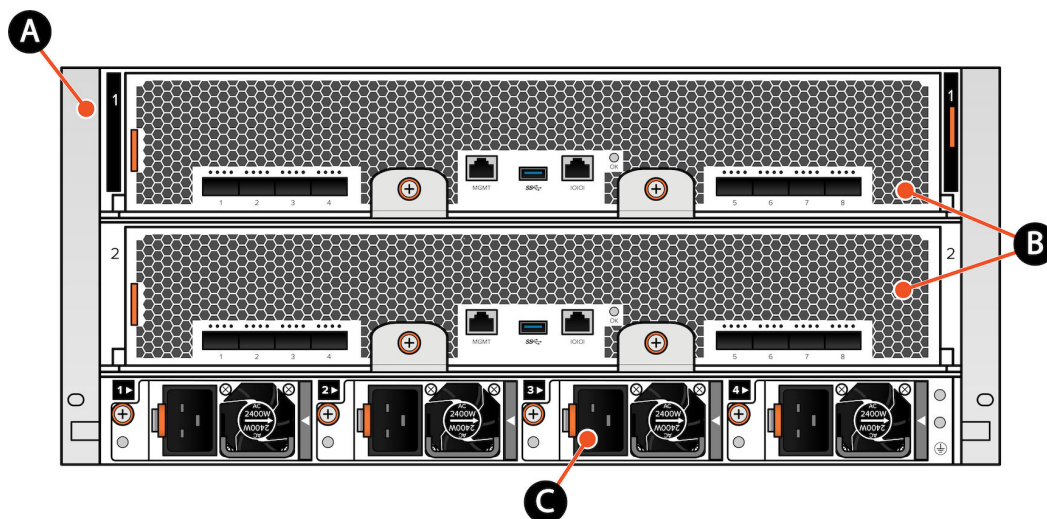
Callout	Specification	Dimensions	Notes
A	Chassis width	44.3 cm (17.44 in.)	Not including rack ears.
	Overall width	48.2 cm (19.00 in.)	Including rack ears and bezel.
B	Height	21.9 cm (8.62 in.)	5 RU of contiguous vertical space is required.

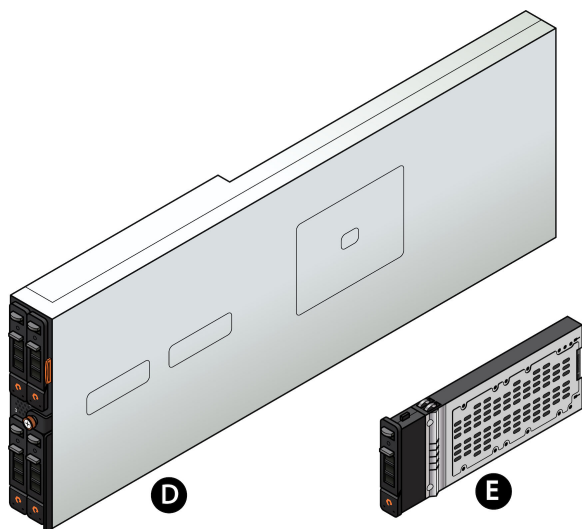
Table 3.1 Chassis Dimensions (continued)

Callout	Specification	Dimensions	Notes
C	Chassis length	81.3 cm (32.0 in.)	From rack mount surface.
	Overall length	86.0 cm (34.0 in.)	Includes rack ears and bezel.
D	Rear depth allowance	3.2 cm (1.3 in.)	Clearance for PSU handle not including power cord.
E	Individual blade (without DFMs)	Length: 57.5 cm (22.7 in.) Width: 4.2 cm (1.65 in.) Height: 19.8 cm (7.80 in.)	Width value does not include EMC gaskets. Height value does not include EMC gaskets or ejector.
Not shown	Front bezel allowance	5 cm (2.0 in.)	Rack mount surface to the front bezel.

Note: The direction of the airflow enters from the front and exits through the rear of the chassis.

Figure 3.2 Chassis Components (Rear View)

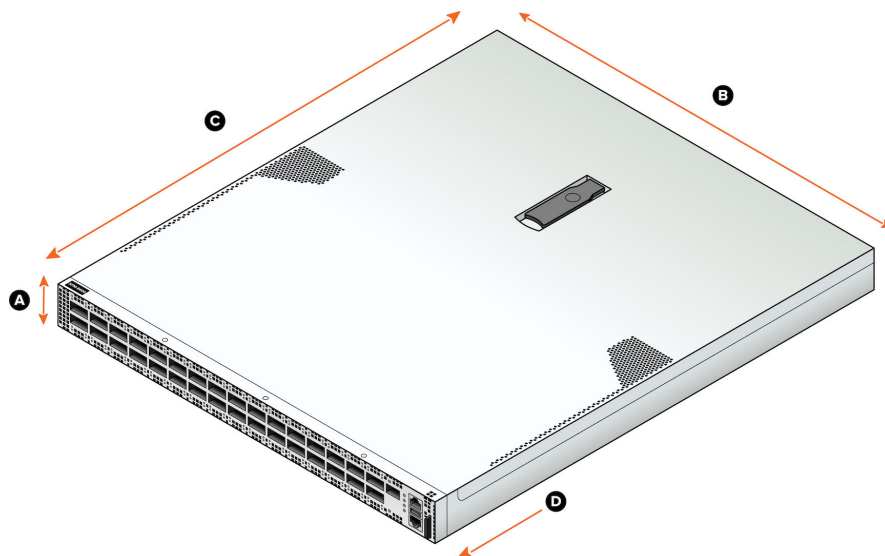



Table 3.2 Component Weight

Callout	Component	Quantity (per system)	Weight (per component)
A	Chassis	1	28.0 kg (61.8 lb)
B	Fabric I/O Module	2 per chassis	5.8 kg (12.8 lb)
C	AC/DC Power supply unit (PSU)	4 per chassis	1.0 kg (2.3 lb)
	Power supply module (Housing unit for PSU)	4 per chassis	0.6 kg (1.4 lb)
D	Blade (without DFMs)	7-10 per chassis	4.6 kg (10.2 lb)
E	DirectFlash Module	1-4 per blade 7-40 per chassis	0.2 kg (0.4 lb)

XFM-8400/XFM-8400R2 Dimensions and Weight

The XFM-8400 (Part No. 86-0001-xx)/ XFM-8400R2 (Part No. 86-0003-xx) modules are only available with multi-chassis system configurations and the physical specifications are listed in the following tables.

Figure 3.3 XFM-8400/ XFM-8400R2 Module

Table 3.3 Physical Dimensions

Callout	Specification	Dimension	Notes
A	Height	4.3 cm (1.70 in.)	
B	Width	43.9 cm (17.26 in.)	
C	Length	65.8 cm (25.89 in.) (Not including fan/PSU latches)	
D			Direction of airflow

Table 3.4 Weight

Component	Quantity	Weight
Chassis (module)	1	14.22 kg (31.34 lb)
Power supply unit (hot-swappable)	2	1.16 kg (2.56 lb)

Packaging Dimensions and Weight

The XFM-8400/ XFM-8400R2 modules are shipped separately from the FlashBlade//S shipping container. Each package includes power cords, network cables, adapters, and labels.

Table 3.5 Packaging Dimensions and Weight

Length	Width	Height	Gross Weight
91.4 cm (35.98 in.)	57.15 cm (22.50 in.)	44.5 cm (17.52 in.)	31 kg (69 lb)

Chapter 4

Network Requirements

The following network requirements for FlashBlade//S system includes:

- Active/active port channel.
- Single LAG (data and management) or double LAG (single for data and an optional one only for management).
- Access mode (untagged) or Trunk mode (tagged packets) to support VIPs on different subnets.
- Double LAG configuration allows for only one port channel to be untagged.

 **Note:** A minimum configuration requires at least a single active/active port channel. Multi-port channel configurations allow for only one port channel to be untagged. All additional port channels require packets to be tagged.

- Access mode (untagged) or Trunk mode (tagged packets) to support VIPs on different subnets.
- Spanning Tree Protocol (STP) is not required.
- 5-meter distance (maximum) to uplink switches if the customer is using copper connections.
- 8 x 10 Gb SFP+ links or 4 x 40-Gb QSFP+ links MTP/MPO fiber.
- 8 x 100 GbE QSFP28 ports per FIOM.

 **Attention:** Only ports 1 through 4 are currently supported.

 **Note:** FlashBlade//S system only supports QSFP connectors. For information about other types of supported connectors, contact Pure Storage Technical Services or visit the [transceiver and cable support page](#).

Supported Cables and Optical Transceivers

FlashBlade//S system supports a variety of network cables and optical transceivers. For more information, visit FlashBlade//S [Transceiver and Cable Support](#).

Network Architecture Considerations

Network Environment

Ensure all network planning is complete and adheres to the listed guidelines before installing a FlashBlade system:

- Do not connect the system to network switches with insufficient upstream bandwidth.
- Do not install the system away from the majority of clients on the network that are many hops away.
- Make switches redundant without single points of failure to connect to the system.
- If possible, connect system directly to the aggregate (or core) or spine switches to maximize connectivity distribution and bandwidth.
- Do not use the IP ranges 172.16.0.0/28 and 198.18.0.0/15 because they overlap with internal ranges. These ranges are used for internal communication and can cause the fabric modules to experience connectivity issues with other components.
- Cross-connect the system to two network switches for maximum availability.
- Configure Multi-Chassis Link Aggregation between the top of rack switches.
- Install the chassis with ports and power supplies facing in the direction of the hot aisle.
- Use C19/C20 type power cords (x4) for the chassis.
- Configure all the links that are part of the same LAG group in a single link aggregation group on the switches to the chassis Ethernet ports.

Client-Side Considerations

There are several performance and resiliency considerations to account when configuring a host.

Mount a FlashBlade NFSv3 file system and set up a client mount with the default options and without explicit flags.

For example:

```
mount FlashBlade:/test /mnt
```

Under normal circumstances you do not need to specify the *rsize* or *wsiz*e in the mount options. By default, FlashBlade negotiates these options to 512K. If the client does not support 512K, it will negotiate to the supported size of the client.

General and Management Network Information Requirements

Management Network Information

See the following table for required general and management network information. For additional details about network management requirements, contact Pure Storage Technical Services.

Table 4.1 General Settings

General Setting	Example
Hostname	test_hostname
Full Domain Name	mydomain.com
FlashBlade//S sender domain  Note: The <i>sender domain</i> is the domain name that you are going to use to send mails.	mydomain.com
Time Zone	Americas/Chicago
DNS Nameserver	192.0.2.10, 192.0.2.11
DNS Search Suffix	mydomain.com
NTP Servers	MyNTPServer1.com, MyNTPServer2.com

Table 4.1 General Settings (continued)

General Setting	Example
Watcher Email	aartiealert@example.com
Proxy (If required)	http://proxy.example.com:8080

Table 4.2 Management Network Settings

Management Network Setting	Example
Admin VIP	10.1.1.103
Admin IP 1 (FM1)	10.1.1.104
Admin IP 2 (FM2)	10.1.1.105

Table 4.3 Subnet for Management Network Settings

Subnet for Management Network Setting	Example
Subnet VLAN ID	111
Subnet Netmask	255.255.255.0 (or 24)
Gateway	10.1.1.1
Subnet Name ¹	Sub01
¹ Used in the UI to identify subnets.	

Data Network Requirements

See the following tables for the example of data network configuration and use the customer worksheet on the following page to record the customer's network information.

You can create data virtual IP addresses (data VIPs) after the initial setup of the FlashBlade. You can add data VIPs to existing (management) or a new subnet. If data VIPs are in a different subnet than the ones already configured, you must add a new subnet first.

Table 4.4 Data VIP Settings

Data VIP Setting	Example
IP	10.2.2.203
Service	NFS
Interface name	DataVip01

Table 4.5 Data Subnet Settings

Data Subnet Setting	Example
Subnet VLAN ID	222
Subnet Netmask	255.255.255.0 (or 24)
Gateway	10.2.2.1
Subnet name	Sub02

Network Settings Worksheet

Use this worksheet to enter your network information and use as reference during the setup process.

Table 4.6 General Settings

General Setting	Value
Hostname	
Full Domain Name	
Pure1 sender domain	
Time Zone	

Table 4.6 General Settings (continued)

General Setting	Value
DNS Nameserver	
DNS Search Suffix	
NTP Servers	
Watcher email	
Proxy (if required)	

Table 4.7 Management Network Settings

Management Network Setting	Value
Admin VIP	
Admin IP 1 (FM1)	
Admin IP 2 (FM2)	

Table 4.8 Subnet for Management Network Settings

Subnet for Management Network Setting	Value
Subnet Subnet VLAN ID	
Subnet Netmask	
Gateway	
Subnet Name	

Table 4.9 Data VIP Settings

Data VIP Setting	Value
IP	
Service	

Table 4.9 Data VIP Settings (continued)

Data VIP Setting	Value
Interface Name	

Table 4.10 Data Subnet Settings

Data Subnet Setting	Value
Subnet VLAN ID	
Subnet Netmask	
Gateway	
Subnet Name	

Linux Network Bonding

When an NFS client is using dual NIC ports with network bonding for bandwidth aggregation and/or resiliency, Pure Storage recommends the following:

- Active-active LACP bonding, supported by the networking environment, to two different network switches.
- L3+L4 hashing on the LACP bond to achieve the highest level of randomization on the network connections and multi-plexing of traffic.
- Do not use round robin (non-LACP bonding). This causes TCP disconnections and a high degree of latency and low throughput because it is not compatible with Pure Storage network virtualization. The Flashblade allows for both LACP rate fast and LACP rate slow and will automatically adapt to the chosen setting on the switch.
- Use the default MTU size of 1500 on Ethernet interfaces.

Using LACP does not guarantee full usage of all network ports on your server. LACP L3+L4 bonding hashes each TCP connection through a single physical network path. With NFS, a single mountpoint produces a single TCP connection and does not use the second link in a dual-NIC server. The actual throughput limitation is the single NIC. There are a few ways to bypass this limitation:

- Virtualization—Run separate VMs on the hardware.
- Containers—Run Docker 1.9+, which allows for independent TCP connections if you are configuring the NFS mount within the container.
- Oracle dNFS—The Oracle user space dNFS client spawns multiple threads for each mount point and is extremely efficient to connect to FlashBlade//S for a high level of concurrency.
- NFS Nconnect—Available in Linux kernel version 5.3. Nconnect mount provides the ability to open multiple transport connections between an NFS client and a maximum of 16 endpoints.

Network Configuration Examples

The following examples show different configurations on a customer switch for the port-channel and other required configuration parameters.

Arista

- Configure multi-chassis link aggregation group (MLAG) across both switches
- Enable trunk mode on the port-channel
- Activate port-channel on both switches

Example Customer Arista Switch 1:

```
interface Ethernet10/1
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet10/2
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet10/3
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet10/4
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet11/1
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet11/2
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet11/3
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet11/4
switchport mode trunk
channel-group 10 mode active
!
interface Port-Channel10
description FlashBlade
switchport mode trunk
mlag 10
```

Example Customer Arista Switch 2:

```
interface Ethernet10/1
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet10/2
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet10/3
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet10/4
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet11/1
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet11/2
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet11/3
switchport mode trunk
channel-group 10 mode active
!
interface Ethernet11/4
switchport mode trunk
channel-group 10 mode active
!
interface Port-Channel10
description FlashBlade
switchport mode trunk
mlag 10
```

Brocade VDX

- Use the same port-channel numbers on both VDX switches to make them participate in a Virtual Link Aggregation (VLAG).
- Enable Trunk mode on the port-channel.

Example Customer VDX Switch 1 (only 4 links per switch shown):

```
connector 1/8/10
sfp breakout
!
interface TenGigabitEthernet 1/8/10:1
description PureStorage
no fabric isl enable
no fabric trunk enable
channel-group 10 mode active type standard
no shutdown
!
interface TenGigabitEthernet 1/8/11:2
description PureStorage
no fabric isl enable
no fabric trunk enable
channel-group 10 mode active type standard
no shutdown
!
interface TenGigabitEthernet 1/8/11:3
description PureStorage
no fabric isl enable
no fabric trunk enable
channel-group 10 mode active type standard
no shutdown
!
interface TenGigabitEthernet 1/8/11:4
description PureStorage
no fabric isl enable
no fabric trunk enable
channel-group 10 mode active type standard
no shutdown
!
interface Port-channel 10
vlag ignore-split
description FlashBlade
switchport mode trunk
switchport switchport mode trunk
switchport trunk allowed vlan all
switchport trunk tag native-vlan
!
```

Example Customer VDX Switch 2 (only 4 links per switch shown):

```
connector 1/8/10
sfp breakout
!
interface TenGigabitEthernet 1/8/10:1
description PureStorage
no fabric isl enable
no fabric trunk enable
channel-group 10 mode active type standard
no shutdown
!
interface TenGigabitEthernet 1/8/11:2
description PureStorage
no fabric isl enable
no fabric trunk enable
channel-group 10 mode active type standard
no shutdown
!
interface TenGigabitEthernet 1/8/11:3
description PureStorage
no fabric isl enable
no fabric trunk enable
channel-group 10 mode active type standard
no shutdown
!
interface TenGigabitEthernet 1/8/11:4
description PureStorage
no fabric isl enable
no fabric trunk enable
channel-group 10 mode active type standard
no shutdown
!
interface Port-channel 10 vlag ignore-split
description FlashBlade
switchport mode trunk
switchport
switchport mode trunk
switchport trunk allowed vlan all
switchport trunk tag native-vlan
!
```

Cisco Nexus Switch

The management and NFS networks are configured on a single subnet 10.10.116.0/24 with VLAN ID 504.

 **Note:** Examples of commands are for illustration purposes only. Substitute the values shown for appropriate names and addresses where they are applicable.

 **Note:** A single port channel should be configured on the switches for a single lag configured on the FlashBlade.

```
example@corporate-system:~$ puresubnet list
Name      Enabled Prefix      VLAN Gateway      MTU  Services  Interfaces
net01-mgmt True      10.10.116.0/24 504  10.10.116.1 1500 data      fm1.admin0

management fm2.admin0

support     net02-data                                vir0
```

Setting the speed when the direct attach cable is already plugged in may fail and require a port bounce. For more information about troubleshooting Ethernet connectivity and ports, visit the Cisco Support [link](#).

 **Note:** The FlashBlade can be configured in access mode or trunk mode. For environments that are using access mode, the VLAN on the FlashBlade is set to 0. For trunk mode, one or more VLANs can be configured.

When setting the speed on the switch ports:

- 1 Remove the cable or transceiver from the port.
- 2 Set the speed.
- 3 Disable auto negotiation.
- 4 Reconnect the cable.

```
interface Ethernet1/19
switchportswitchport mode trunk
switchport trunk allowed vlan 504
speed 40000 (note: can be 10000, 40000, or 100000)
no negotiate auto
channel-group 19
mode active
no shutdown
```

The following is a configuration example for two Cisco Nexus 9000 switches and Ethernet ports 19 and 20. If other settings are not specified on separate switches, apply the same configuration settings to both switches.

 **Note:** For a regular inter-switch trunk, trunking must be turned on for the VLANs to which the vPC member port belongs.

```
feature lacp
feature vpc
```

```
vlan 1,1000,1002-1015,3000
spanning-tree port type edge default
vrf context management
  ip route 0.0.0.0/0 1.1.1.254
vrf context pkal
vpc domain 1
  peer-keepalive destination 192.168.20.2 source 192.168.20.1 vrf pkal
interface port-channel20
  description For VPC PeerLink
  switchport mode trunk
  switchport trunk allowed vlan 1-4000
  spanning-tree port type network
  vpc peer-link
interface port-channel51
  description PorChannel to FB XFM ETH24
  switchport mode trunk
  switchport trunk allowed vlan 1,1000-1015,3000
  spanning-tree port type edge trunk
  spanning-tree bpduguard disable
  spanning-tree guard none
  speed 100000
  duplex full
  no negotiate auto
  vpc 51
interface Ethernet1/3
  description Connection to XFM ETH23 uplink
  shutdown
  switchport mode trunk
  switchport trunk allowed vlan 1,1000-1015,3000
  spanning-tree port type edge trunk
  spanning-tree guard none
  speed 100000
  duplex full
  fec rs-fec
  no negotiate auto
  channel-group 51 mode active
interface Ethernet1/4
  description Connection to XFM ETH24 uplink2
  switchport mode trunk
  switchport trunk allowed vlan 1,1000-1015,3000
  spanning-tree port type edge trunk
  spanning-tree guard none
  speed 100000
  duplex full
  fec rs-fec
  no negotiate auto
  channel-group 51 mode active
interface Ethernet1/31
  description VPC PeerLink
  switchport mode trunk
  switchport trunk allowed vlan 1-4000
  channel-group 20 mode active
interface Ethernet1/32
  description VPC Peer KA L3 Int
  no switchport
  vrf member pkal
```

```
ip address 192.168.20.1/24
no shutdown
```

```
# Reference Link: https://www.cisco.com/c/en/us/products/collateral/switches/nexus-5000-series/switches/configuration\_guide\_c07-543563.html
```

```
# Hardware used: 2x cisco Nexus9000 C93180LC-EX Chassis
# NXOS: version 7.0(3)I6(1)
```

```
# Now we will configure VPC peer
```

```
# Switch 1
```

```
feature vpc
vpc domain 1
peer-keepalive destination 10.10.255.205
role priority 1
auto-recovery
```

```
# Switch 2
```

```
feature vpc
vpc domain 1
peer-keepalive destination 10.10.255.204
role priority 2
auto-recovery
```

```
# Configure VLANs
```

```
vlan 504
name DL-MGMT
```

```
# Configure VPC peer link. I chose 2x 40G/100G links
```

```
interface Ethernet1/31-32
switchport
channel-group 31 mode active
```

```
interface port-channel31
description VPC-PEER
switchport
switchport mode trunk
switchport trunk allowed vlan 504
vpc peer-link
```

```
# Setup SVI with HSRP
```

```
# Switch 1
```

```
interface Vlan504
description DL-MGMT
no shutdown
no ip redirects
ip address 10.10.116.2/24
no ipv6 redirects
hsrp version 2
hsrp 54
preempt
```

```
priority 1
ip 10.10.116.1

# Switch 2

interface Vlan504
description DL-MGMT
no shutdown
no ip redirects
ip address 10.10.116.3/24
no ipv6 redirects
hsrp version 2
hsrp 54
preempt
priority 2
ip 10.10.116.1

# Sample FlashBlade VPC link
interface Ethernet1/19
switchport
switchport mode trunk
switchport trunk allowed vlan 504
speed 40000/100000
no negotiate auto
channel-group 19 mode active
no shutdown

interface Ethernet1/20
switchport
switchport mode trunk
switchport trunk allowed vlan 504
speed 40000/100000
no negotiate auto
channel-group 19 mode active
no shutdown

interface port-channel19
description VPC link to FB
switchport
switchport mode trunk
switchport trunk allowed vlan 504
speed 40000/100000
no negotiate auto
vpc 19
```

Cisco port show commands Edit section

The following example output shows how to check a transceiver type. Output is using a Cisco direct attach cable (DAC).

```
nexus-9k# show int eth1/49 transceiver
Ethernet1/49
  transceiver is present
  type is QSFP-40G-CR4
  name is CISCO
  part number is 2231254-3
  revision is C
  serial number is TED2024E312-B
  nominal bitrate is 10300 MBit/sec per channel
  Link length supported for copper is 5 m
  cisco id is 13
  cisco extended id number is 16
  cisco product id is QSFP-H40G-CUXM
```

The interface capability shows multiple speeds.

```
nexus-9k# show int eth 1/49 capabilities
Ethernet1/49
  Model: N9K-C93180YC-EX
  Type (SFP capable): QSFP-40G-CR4
  Speed: 1000,10000,25000,40000,50000,100000
  Duplex: full
  Trunk encap. type: 802.1Q
  Channel: yes
  Broadcast suppression: percentage(0-100)
  Flowcontrol: rx-(off/on),tx-(off/on)
  Rate mode: dedicated
  Port mode: Routed,Switched
  QOS scheduling: rx-(8q2t),tx-(7q)
  oS rewrite: yes
  ToS rewrite: yes
  SPAN: yes
  UDLD: yes
  MDIX: no
  TDR capable: no
  Link Debounce: yes
  Link Debounce Time: yes
  FEX Fabric: no
  dot1Q-tunnel mode: yes
  Pvlan Trunk capable: no
  Port Group Members: 193
  EEE (efficient-eth): no
  PFC capable: yes
  Buffer Boost capable: no
  Breakout capable: yes
```

HP Switch

Configuration Configure via terminal Interface:

- Bits per second—9,600

- Data bits—8
- Parity—None
- Stop bits—1
- Flow control—None
- Emulation—VT100

Set switch name `#sysname NAME (sysname switch1/2)`:

- `system-view`
- `sysname switch2`
- (undo `sysname` sets the name to HP Default)
- `system-working-mode advanced`

Set up SNMP:

- `system-view`
- `SNMP-agent community read simple public`
- `SNMP-agent sys-info version v2c`

IRF Setup:

- `system-view`
- `irf member1 renumber 2` (Or 3 or whatever the number of switch you need)
- `irf member2 priority 30` (Master switch needs to be a higher number such as 32)
- `save`
- `quit`
- `reboot`
- Switch 1:
 - `interface range Ten-GigabitEthernet 1/0/21 to Ten-GigabitEthernet 1/0/24`
 - `shut`
 - `quit`

- irfport 1/1
- port group int ten 1/0/21
- port group int ten 1/0/22
- quit
- irfport 1/2
- port group int ten 1/0/23
- port group int ten 1/0/24
- quit
- interface range Ten-GigabitEthernet 1/0/21 to Ten-GigabitEthernet 1/0/24
- undo shut
- quit
- irf-port-configuration active
- save
- Switch 2:
 - interface range Ten-GigabitEthernet 2/0/21 to Ten-GigabitEthernet 2/0/24
 - shut
 - quit
 - irf-port 2/1
 - port group int ten 2/0/21
 - port group int ten 2/0/22
 - quit
 - irf-port 2/2
 - port group int ten 2/0/23
 - port group int ten 2/0/24
 - quit
 - interface range Ten-GigabitEthernet 2/0/21 to Ten-GigabitEthernet 2/0/24
 - undo shut

- quit
- irf-port-configuration active
- save

Setting management Interface IP:

- system-view
- interface M-GigabitEthernet 0/0/0
- ip address 192.168.1.184 255.255.254.0
- quit
- save

Create local user:

- system-view
- local-user USERNAME class manage
- password simple PASSWORD
- authorization-attribute user-role network-admin
- service-type telnet
 - By default, the system has 18 predefined user roles: network-admin, network-operator, and level-n (where n equals an integer in the range 0 to 15)

Setting up Telnet Access:

- system-view
- telnet server enable
- user-interface vty 0 10
- authentication-mode password
- set authentication password simple PASSWORD
- user-role network-admin

- quit
- save

Create LACP:

- system view
- Display link-aggregation summary (to help you find the next available number)
- interface Bridge-Aggregation (NUMBER)
- quit
- interface ten 1/0/18 (second switch 2/0/18)
- description SF2
- port link-aggregation group (number)
- quit
- (Repeat C through H with the second switch)
- interface Bridge-Aggregation (NUMBER)
- link-aggregation mode dynamic
- lacp edge-port
- quit
- save
- display link-aggregation summary

Firmware Upgrade: [\(Link\)](#) (This link shows how to perform an upgrade W/O ISSU):

- display irf
 - verify switches are up
- tftp 192.168.0.x get5900_5920-CMW710-R2310.ipe
- display issu state
 - Check software versions

- display version comp-matrix file ipe flash:/5900_5920-CMW710-R2310.ipe
- (Verify upgrade will work)
- display issu rollback-timer
 - Rollback timer: Working
 - Rollback interval: 45 minutes
 - Rollback time remaining: 10 minutes (Not good)
- issu load file ipe flash:/5900_5920-CMW710-R2310.ipe slot 2
 - Answer yes to the operation.
- Display version
 - Should show you the version just loaded
- issu run switchover
- issu run accept
- issu commit slot2
- display irf
- boot-loader update slot 2

Juniper

The following is an example of a switch setting for MLAG/LAG configuration.

 **Note:** The two management interfaces are regular access ports.

```
interfaces {
xe-0/0/28 {
description "array name? maybe interface?";
ether-options
{ 802.3ad ae10; }
}
xe-0/0/29 {
description "array name? maybe interface?";
ether-options { 802.3ad ae10; }

}
xe-1/0/28 {
description "array name? maybe interface?";
ether-options
{ 802.3ad ae10; }
}
xe-1/0/29 {
description "array name? maybe interface?";
ether-options { 802.3ad ae10; }

}
ae10 {
description "array name?";
aggregated-ether-options {
lacp
{ active; periodic fast; }

}
unit 0 {
family ethernet-switching {
interface-mode trunk;
vlan
{ members [ vlan1 vlan2 ]; }

}
}
}
}
```



Pure Storage, Inc.

X: @purestorage

2555 Augustine Drive, 1st Floor

Santa Clara, CA 95054

800-379-7873

Sales: sales@purestorage.com

Support: support@purestorage.com

Media: pr@purestorage.com

General: info@purestorage.com