

PROFESSIONAL EXAM GUIDE

FlashBlade® Architect Professional

Exam Number: FBAP_004

Last Updated: July 25, 2024



Contents

- About Pure Storage® Certified Exams..... 3**
- Section 1: Exam Registration Instructions..... 4**
 - 1.1. Exam Information.....4
 - 1.2. Creating an Online Account.....4
 - 1.3. Online Exam Computer Requirements4
 - 1.4. Day of the Exam.....5
 - 1.5. Exam Scoring.....5
 - 1.6. After the Exam.....5
 - 1.7. Your Candidate Record6
- Section 2: Pure Storage FlashBlade Architect Professional Exam Topics.....8**
 - 2.1. Domain Names & Distribution.....8
 - 2.2. Task Information.....8
- Section 3: The Pure Storage Certified FlashBlade Architect Professional Target Audience.....10**
 - 3.1. The Minimally Qualified Candidate (MQC).....10
 - 3.2. MQC Work Experience.....10
- Section 4: Determine Exam Readiness11**
 - 4.1. Exam Prerequisites11
 - 4.2. On-the-Job Experience11
 - 4.3. Self-Assessment Preparation Worksheet11
- Section 5: Pure Storage FlashBlade Architect Professional Exam Sample Questions 13**
- Section 6: Answer Key.....16**
- Support19**

About Pure Storage® Certified Exams

Achieving the Pure Storage Certified FlashBlade® Architect Professional certification demonstrates advanced expertise in integrating FlashBlade into Pure Storage's product platform. This certification validates candidates' deep understanding and specialized expertise in designing FlashBlade solutions and articulating their value across diverse IT environments, focusing exclusively on presales activities.

This guide has three purposes:

- To provide information to help you prepare for this Pure Storage exam.
- To offer recommended preparations for the Pure Storage FlashBlade Architect Professional Exam.
- to help you determine if you are ready to sit for the exam.

This guide outlines the knowledge, skills, and abilities required of a “minimally qualified candidate” for a specific job role, which will be evaluated in the exam.

Section 1: Exam Registration Instructions

1.1. Exam Information

- Exam name: Pure Storage FlashBlade® Architect Professional
- Exam number: FBAP_004
- Exam cost: \$129 (US Dollars)
- Number of questions: 60
- Question types: Multiple Choice (four or five options; one, two, or three correct answers)
- Time limit: 120 minutes

1.2. Scheduling Your Exam

To watch a three-minute video that walks you through the full registration and scheduling process, click [here](#).

1. Go to the [ExamStudio Storefront](#).
2. Select "Pure Storage FlashBlade® Architect Professional" and add it to your cart.
3. Select "View Cart" in the top right corner. Enter your exam voucher code if applicable.
4. Review the terms and check the box to accept, and then click next.
5. Log in with your current credentials if you have an existing account, or create a new account if it's your first time testing.
6. Click "Go to Dashboard" and click "Schedule" on the far right.
7. Select the appropriate time zone; then, select the date and time you want to take the exam. Please note that exams require a 48-hour lead time to schedule. The earliest date on which you can make a reservation is in two business days.

1.3. Online Exam Requirements

Your computer must meet the minimum requirements of ProctorU, including:

- A stable broadband internet service with a download speed of at least 12Mbps down and 3Mbps up
- Chrome or Firefox web browser. Download ProctorU extensions: [Chrome](#) or [Firefox](#)
- Webcam
- Microphone

ProctorU Requirements:

Ensuring our exams are secure only increases the value of a Pure certification. [Watch this video](#) to review what to expect on your exam day. **We recommend using a personal computer if possible, as some security software and remote desktop programs will conflict with the security requirements.**

1.4. Day of the Exam

Requirements:

- You must provide one form of government-issued photo ID (e.g., driver's license, passport) via webcam to the proctor. Failure to do so will result in disqualification without a refund or rescheduling.
- You must also consent to have your photo taken. This will be used for identity verification only and will not be stored.
- Ensure you are in a private, well-lit environment (e.g., conference room, home office).
- Close all third-party programs and unplug any secondary monitors.
- The proctor will ask you to show your desk and surroundings before the exam begins.
- Notes, books, documents, materials, and websites are not allowed during the exam.
- Make sure you have downloaded the ProctorU extension for either [Chrome](#) or [Firefox](#).

Log in to Launch the Exam

To launch the exam, log in to your [ExamStudio account](#).

1. Enter your login credentials.
2. Click "Start Exam" under the Actions tab on your dashboard.

NOTE: The timer for your exam starts only once the proctor launches the exam. You will have 120 minutes to complete it. You may start your exam once the countdown timer reaches 0:00:00. If you do not start your exam within 15 minutes of this time frame, the system will automatically mark you as a "No-Show" and you will not be able to take your exam.

Special Considerations

- If you need to reschedule your exam, visit your candidate portal. You must do so **more than 24 hours before** your scheduled session to avoid being considered a No-Show. Canceling less than 24 hours before your exam or not showing up will revoke your authorization, requiring you to repurchase the exam or request a new voucher. Multiple late cancellations or no-shows may disqualify you from receiving future exam vouchers.
- To reset a forgotten password, [visit this page](#). Once you reset your password, you can log in via your [candidate portal](#).
- For additional questions regarding ProctorU, please [visit their test taker library](#).
- If you have proctoring issues on your testing day, please [contact ProctorU support chat](#). If needed, you can escalate the issue to reach a human agent.
- For any other additional questions or concerns, please contact the Pure Storage certification team at certadmin@purestorage.com.

1.5. Exam Scoring

- One point is awarded for each correct answer to a single-response or multi-response question.
- No points are awarded for either incorrectly answered or unanswered single-response or multi-response questions.

1.6. After the Exam

Your candidate record will be updated with the results of your exam 24-48 hours following the exam. Please see Section 1.7 of this exam guide for instructions on how to review your candidate record.

If You Pass:

You will receive an email from CertMetrics and from Credly notifying you of your results. Your certification is valid for 2 years, and, upon expiration, you will need to take the exam again.

If You Fail:

You will need to wait 72 hours to re-schedule the exam.

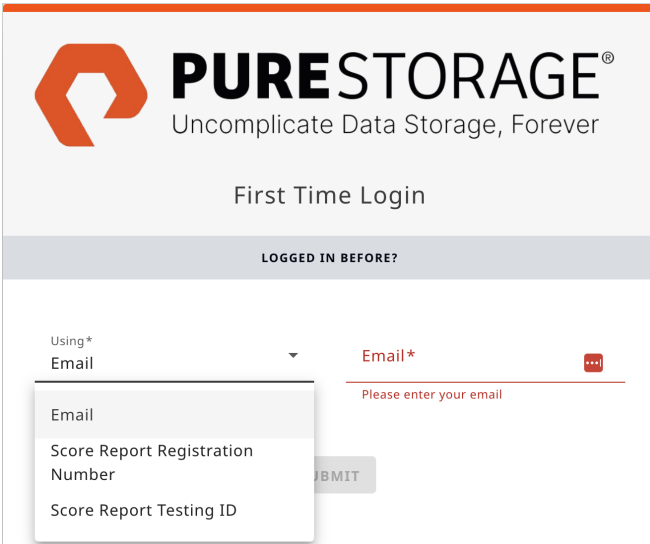
1.7. Your Candidate Record

To access your candidate record, visit [this link](#). From here, you will be able to access your score report(s).

The first time you log in, you will need to create an account.

To create an account:

1. Click "Never logged in before?" on the landing page.
2. Enter either your email address or data from your score report, as shown below.

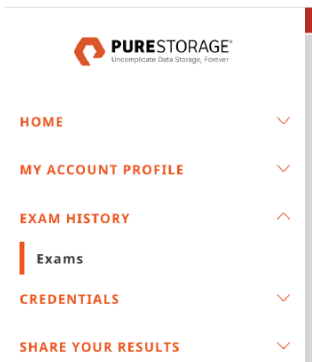


3. You will receive an email with instructions on how to access your account.

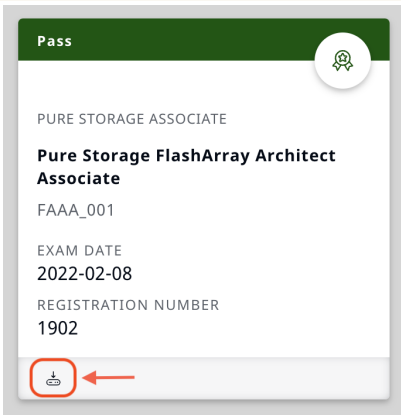
Once you create your account, you will be able to log in with your login ID and password.

To retrieve your score report(s):

After you log in, click Exam History, then Exams.



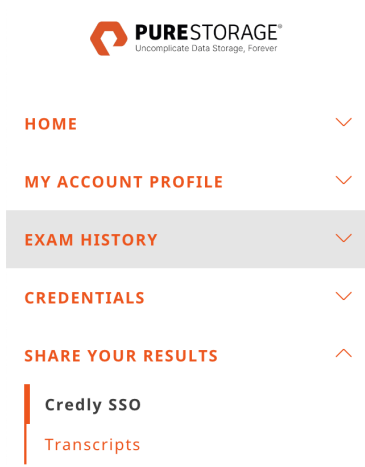
You will then see the exam card view for each of your exams. Click the icon in the lower left to download your score report.



To share your results:

Click Share Your Results. From this menu, you can connect to Credly to download your digital badge and certificate.

You can also create a custom transcript that you can download or share.



Section 2: Pure Storage FlashBlade Architect Professional Exam Topics

2.1. Domain Names and Distribution

The job tasks measured on the exam are grouped into the following domains of practice and the questions on the exam are distributed as follows.

NOTE: Each question carries the same weight, and there is no partial credit for any question.

Domain	Percent of Exam
Design and Plan	52%
Platform Architecture	22%
Advanced Storage Management and Performance	26%

2.2. Task Information

Within each domain, you will be asked about specific tasks expected of a Pure Storage Certified FlashBlade Architect Professional, including but not limited to:

Design and Plan

- Given advanced customer requirements, determine the appropriate FlashBlade configuration.
 - [FlashBlade//E Configuration Rules](#)
 - [FlashBlade//S Configuration Rules](#)
 - [FlashBlade//E FAQs](#)
 - [FlashBlade//S FAQs](#)
 - [Using Fast Remove](#)
 - [RapidFile Toolkit v2.1 for FlashBlade](#)
 - [FlashBlade//S Limits](#)
- Given a set of customer requirements, select the most appropriate data protection solution.
 - [Object Replication for Data Protection](#)
 - [Fan-in File Replication at Scale](#)
 - [FlashBlade//S™ Object Replication with Active-Active DR Configuration](#)
 - [FlashBlade 4.1: Introducing Object Lock](#)
- Given specific business requirements, determine the optimal FlashBlade storage architecture configuration.
 - [Access Control Styles on FlashBlade](#)
 - [Optimize Video Surveillance Data with Pure Storage](#)

- Explain FlashBlade networking from internal and external points of view
 - [Installing FlashBlade](#)
 - [Accessory Kits](#)
 - [Improving Object Storage Performance](#)
 - [FlashBlade Best Practices for Networking](#)
 - [NFS FAQ](#)

Platform Architecture

- Describe the lifecycle of an I/O in a FlashBlade system
 - [FlashBlade Architect Associate – Instructor-Led Course – Partner Link](#)
 - [FlashBlade Architect Associate – Instructor-Led Course – Internal Link](#)
- Explain the unique advantages of DirectFlash
 - [DirectFlash Deep Dive](#)
- Explain the FlashBlade scale-out approach with regards to storage and performance
 - [FlashBlade//E with 75TB DFM\(e\) Configurations](#)
 - [FlashStorage for All Data](#)
 - [The Purity//FB Architecture](#)

Advanced Storage Management and Performance

- Explain how PureStorage products protect data against ransomware attacks
 - [FlashBlade SafeMode](#)
 - [Eradication Mode](#)
 - [FlashBlade Data Security](#)
- Given a set of requirements, select the correct solution that utilizes FlashBlade-supported protocols and their features to meet these requirements
 - [FlashBlade//E FAQs](#)
 - [FlashBlade//S FAQs](#)
 - [Data Protocols](#)
- Given a set of requirements, design a solution utilizing replication features and functionality for Object and File
 - [FlashBlade Replication](#)
 - [Improve Fast Object Storage with Replication](#)

Section 3: The Pure Storage FlashBlade Architect Professional Target Audience

This exam is designed for individuals who are currently performing or have previous work experience with the job responsibilities of a Systems Engineer who works extensively with the FlashBlade, whether employed by Pure Storage or an affiliated partner.

3.1. The Minimally Qualified Candidate (MQC)

To pass the exam, you must possess at least the minimum level of knowledge, skills, and abilities required of a Systems Engineer at the Professional level. The MQC will have a deep understanding of the Pure Storage product portfolio and its unique advantages in the market. Additionally, they have advanced knowledge and practical experience in effectively positioning these products for appropriate use cases, demonstrating their ability to align Pure Storage solutions with specific customer needs and scenarios.

The Pure Storage Certified FlashBlade Architect Professional should be able to perform the following tasks without any assistance:

- Identify appropriate workloads
- Explain capacity siting and performance
- Understand NFS, SMB, and S3 protocols
- Design environments that support FlashBlade (e.g., support functionality, connectivity, routing, and security)
- Explain when and how to utilize all major FlashBlade components, as well as their functions
- Understand FlashBlade networking and architecture
- Understand parallel workflows
- Advanced understanding of solution design
- Compare and contrast scale out vs. scale up

3.2. MQC Work Experience

A minimally qualified Pure Storage FlashBlade Architect Professional candidate typically has the following work experience:

- Intermediate level roll
- Minimum of 3-5 years of storage industry experience
- Minimum of 1-2 years of Pure Storage experience

Section 4: Determine Exam Readiness

Nothing can guarantee that you will pass your test; however, the more practical work experience you have, the better your chances are to pass the test. Use the self-assessment preparation worksheet (below) to evaluate your level of readiness.

4.1. Exam Prerequisites

There are no prerequisites for the Pure Storage FlashBlade Architect Professional Examination, however, successful completion of the FlashArray Architect Associate exam is recommended.

4.2. On-the-Job Experience

Since Pure Storage exams measure knowledge, skills, and abilities for a specific job role, one of the best ways to prepare for the exam is to make sure you have the minimum work experience, as described in this guide.

4.3. Self-Assessment Preparation Worksheet

Use the following worksheet to review the exam topics and assess your own readiness. If you need additional preparation on a certain topic, there are additional links to information in the prior "Task Information" section as well as a "Recommended Learning" section, where you will find recommendations and links to those learning opportunities.

I can:

Topic	Yes	No
Design and Plan		
Analyze provided data utilizing an estimated data reduction rate, growth projections, capacity needs, and data protection demands.		
Calculate and explain the differences between raw, usable, and effective capacities and how they impact the customer		
Articulate the usable capacity and potential performance impact with respect to DFM configuration		
Based on a scenario, determine appropriate data protection methods		
Given a customer's existing FlashBlade environment, explain how the modular expansion and elastic performance scaling would meet that customer's future requirements		
Based on a customer's scenario, design the appropriate FlashBlade networking requirements		
Discuss the path of I/O in regards to LACP, MLAG, and ECMP		
Platform Architecture		
Identify I/O operation path from host through FlashBlade architecture, including Protocol Endpoint Processing and DirectFlash module interactions, Storage managers, and Authorities		
Describe how FlashBlade's I/O path enhances data integrity and performance		
Contrast the benefits of FlashBlade DirectFlash Modules as compared to SSDs		
Summarize the innovation cycle of DirectFlash, focusing on continuous improvements through software upgrades and Evergreen capabilities		
Determine use cases for architectures (e.g., scale out, parallel, scale up)		
Determine use cases for parallel stream setup to maximize FlashBlade performance		
Advanced Storage Management and Performance		
Explain the impact of implementing Safemode on FlashBlade		
Explain the differences of Safemode with both Filesystems and Object Buckets and how they are applied		
Determine the range of data storage protocols (e.g., NFS, SMB, S3) supported by FlashBlade configurations, parallelism)		
Explain features and configuration options for each protocol supported by FlashBlade to optimize storage solutions for diverse workload requirements		
Design remote replication with an understanding of underlying features and limitations for replicating Filesystems		
Design remote replication with an understanding of underlying features and limitations for replicating S3 objects		
Explain how FlashBlade provides ransomware protection using immutability in Snapshots and Object Lock		

Section 5: Pure Storage FlashBlade Architect Professional Exam Sample Questions

Review and practice taking exam questions to get a sense for the types of questions on the exam. Please note that **your performance here does not indicate how you will do on the actual exam**. To fully prepare for the exam, closely review the topic areas and objectives in this Exam Guide.

The correct answers are at the end of the exam guide.

1. A customer is experiencing issues with servers that access data on the FlashBlade.

The customer reports the following:

- Servers assigned to the research network (192.168.1.0/24) are able to read and write data to the NFS filesystem.
- Servers assigned to the accounting network (192.168.2.0/24) are unable to write data to the NFS filesystem.
- Servers assigned to the sales network (192.168.3.0/24) are unable to access the NFS filesystem completely.
- The customer verifies that all network and client-side settings are correct across all subnets.
- There is a data VIP in each network.

What is causing this issue?

- a. AD directory services are NOT configured for those subnets.
 - b. Jumbo frames are NOT properly configured across the 3 networks.
 - c. The corporate edge firewall is blocking NFS traffic.
 - d. The filesystem export options are NOT properly configured.
2. A customer outlines their top three priorities for the year: ransomware mitigation, disaster recovery, and vendor consolidation. An SE is helping a customer size a FlashBlade for multiple use cases:

Application	Read Performance	Write Performance	Application Window	Number of Hosts
Backup	40Gb/s	120Gb/s	19:00-05:00	4
AI	200Gb/s	40Gb/s	00:00-23:59	200
Streaming Analytics	180Gb/s	120Gb/s	07:00-18:00	18
Log Server	40Gb/s	80Gb/s	00:00-23:59	5

Application	Read Performance	Write Performance	Application Window	Number of Hosts
Virtualization	120Gb/s	80Gb/s	00:00-23:59	12

What is the minimum number of 100Gb/s External Fabric Module uplinks that the architect needs to size for?

- a. 4
- b. 6
- c. 8
- d. 10

3. A customer is having trouble accessing their data VIPs on a new 7 x S200 Blade system.

1. The customer has 10 data VIPs
2. The customer has a single LAG to their switches
3. The 'purelag list' command shows that it is healthy

What is causing this issue?

- a. The customer improperly configured the data VIPs.
- b. The customer is using the wrong type of cables between the FlashBlade and their switches.
- c. The customer has NO data protocol enabled for the data VIP.
- d. The customer needs to create the VLANs on the switch to support the data VIPs.

4. A customer reports that they are only able to get 100Mb/s of throughput per NFS mount point.

The customer provides the following information:

1. The FlashBlades are connected by a 10Gb/s network link end to end. They are able to get 8Gb/s throughput with an iperf test.
2. The customer has done multiple ping tests between the FlashBlade and the client, which all have between 2 and 3 milliseconds of latency.
3. The customer has 2 NFS mounts, all with the following options: vers=3,rsize=16384,wsize=16384,hard,proto=tcp

What should the architect do to resolve this issue?

- a. Increase the network link to 40Gb/s
- b. Set the rsize and wsize to 524288
- c. Increase NFS mounts to 5
- d. Add additional data VIPs

5. During a discovery workshop, a prospective customer details their requirements for an archive data repository: The customer provides the following information:

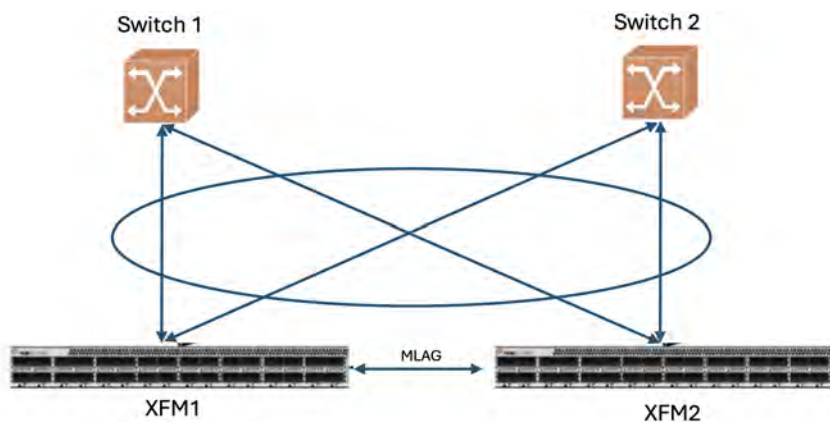
Workload profiles:

- Log Analytics cold store: 3PB usable, 8GB read
- Content Repository: 1.5PB usable, 5GB read
- Backup Repository: 2PB usable, 2GB read

Which FlashBlade//E system should the SE recommend?

- a. FB-E-7500TB (5965TB usable)
- b. FB-E-9000TB (7304TB usable)
- c. FB-E-12000 (9739TB usable)

6. How is the NAND flash and NVRAM allocated in a FlashBlade?
- a. Each DFM is divided into 128 partitions regardless of the number of DFMs that are installed in each chassis.
 - b. Each blade is divided into 128 partitions, and the partitions are equally distributed across the DFMs on each blade.
 - c. Each DFM in the system is divided so that the number of partitions is equal to 128 divided by the number of DFMs.
7. What role does the Eradication timer play in the prevention of unauthorized deletion of snapshots within Safemode?
- a. The Eradication timer allows administrators to recover data immediately after deletion requests, before being permanently removed.
 - b. Safemode prevents the permanent deletion of snapshots until the expiration of the Eradication timer.
 - c. The Eradication timer sends alerts to administrators whenever a snapshot deletion is attempted.
8. Refer to the exhibit.



During a FlashBlade design session with a prospective customer, this network design is provided by the network team.

Why is this network design invalid?

- a. MLAG is misconfigured on the XFMs.
- b. MLAG is misconfigured on the switches.
- c. LACP is misconfigured on the XFMs.
- d. LACP is misconfigured on the switches.

Section 6: Answer Key

Correct answers are shown below in *bold italics*.

1. A customer is experiencing issues with servers that access data on the FlashBlade.

The customer reports the following:

- Servers assigned to the research network (192.168.1.0/24) are able to read and write data to the NFS filesystem.
- Servers assigned to the accounting network (192.168.2.0/24) are unable to write data to the NFS filesystem.
- Servers assigned to the sales network (192.168.3.0/24) are unable to access the NFS filesystem completely.
- The customer verifies that all network and client-side settings are correct across all subnets.
- There is a data VIP in each network.

What is causing this issue?

- a. AD directory services are NOT configured for those subnets.
 - b. Jumbo frames are NOT properly configured across the 3 networks.
 - c. The corporate edge firewall is blocking NFS traffic.
 - d. ***The filesystem export options are NOT properly configured.***
2. A customer outlines their top three priorities for the year: ransomware mitigation, disaster recovery, and vendor consolidation. An SE is helping a customer size a FlashBlade for multiple use cases:

Application	Read Performance	Write Performance	Application Window	Number of Hosts
Backup	40Gb/s	120Gb/s	19:00-05:00	4
AI	200Gb/s	40Gb/s	00:00-23:59	200
Streaming Analytics	180Gb/s	120Gb/s	07:00-18:00	18
Log Server	40Gb/s	80Gb/s	00:00-23:59	5

Application	Read Performance	Write Performance	Application Window	Number of Hosts
Virtualization	120Gb/s	80Gb/s	00:00-23:59	12

What is the minimum number of 100Gb/s External Fabric Module uplinks that the architect needs to size for?

- a. 4
- b. **6**
- c. 8
- d. 10

3. A customer is having trouble accessing their data VIPs on a new 7 x S200 Blade system.

1. The customer has 10 data VIPs
2. The customer has a single LAG to their switches
3. The 'purelag list' command shows that it is healthy

What is causing this issue?

- a. The customer improperly configured the data VIPs.
- b. The customer is using the wrong type of cables between the FlashBlade and their switches.
- c. The customer has NO data protocol enabled for the data VIP.
- d. **The customer needs to create the VLANs on the switch to support the data VIPs.**

4. A customer reports that they are only able to get 100Mb/s of throughput per NFS mount point.

The customer provides the following information:

1. The FlashBlades are connected by a 10Gb/s network link end to end. They are able to get 8Gb/s throughput with an iperf test.
2. The customer has done multiple ping tests between the FlashBlade and the client, which all have between 2 and 3 milliseconds of latency.
3. The customer has 2 NFS mounts, all with the following options: vers=3,rsize=16384,wsz=16384,hard,proto=tcp

What should the architect do to resolve this issue?

- a. Increase the network link to 40Gb/s
- b. **Set the rsize and wsz to 524288**
- c. Increase NFS mounts to 5
- d. Add additional data VIPs

5. During a discovery workshop, a prospective customer details details their requirements for an archive data repository:

The customer provides the following information:

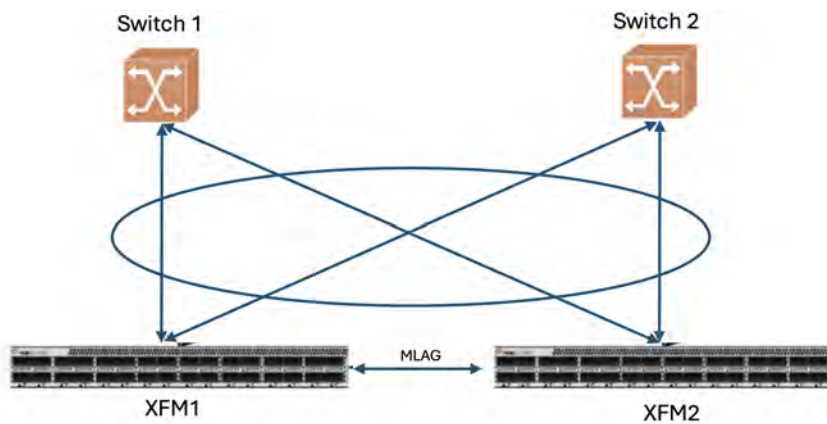
Workload profiles:

- Log Analytics cold store: 3PB usable, 8GB read
- Content Repository: 1.5PB usable, 5GB read
- Backup Repository: 2PB usable, 2GB read

Which FlashBlade//E system should the SE recommend?

- a. FB-E-7500TB (5965TB usable)
- b. FB-E-9000TB (7304TB usable)
- c. **FB-E-12000 (9739TB usable)**

6. How is the NAND flash and NVRAM allocated in a FlashBlade?
- Each DFM is divided into 128 partitions regardless of the number of DFMs that are installed in each chassis.**
 - Each blade is divided into 128 partitions, and the partitions are equally distributed across the DFMs on each blade.
 - Each DFM in the system is divided so that the number of partitions is equal to 128 divided by the number of DFMs.
7. What role does the Eradication timer play in the prevention of unauthorized deletion of snapshots within Safemode?
- The Eradication timer allows administrators to recover data immediately after deletion requests, before being permanently removed.
 - Safemode prevents the permanent deletion of snapshots until the expiration of the Eradication timer.**
 - The Eradication timer sends alerts to administrators whenever a snapshot deletion is attempted.
8. Refer to the exhibit.



During a FlashBlade design session with a prospective customer, this network design is provided by the network team.

Why is this network design invalid?

- MLAG is misconfigured on the XFMs.
- MLAG is misconfigured on the switches.**
- LACP is misconfigured on the XFMs.
- LACP is misconfigured on the switches.

Support

For information on Pure Storage's certification programs, visit [this link](#). To contact us, please send an email to certadmin@purestorage.com.

©2020 Pure Storage, the Pure P Logo, and the marks on the Pure Trademark List at <https://www.purestorage.com/legal/productenduserinfo.html> are trademarks of Pure Storage, Inc. Other names are trademarks of their respective owners. Use of Pure Storage Products and Programs are covered by End User Agreements, IP, and other terms, available at: <https://www.purestorage.com/legal/productenduserinfo.html> and <https://www.purestorage.com/patents>

The Pure Storage products and programs described in this documentation are distributed under a license agreement restricting the use, copying, distribution, and decompilation/reverse engineering of the products. No part of this documentation may be reproduced in any form by any means without prior written authorization from Pure Storage, Inc. and its licensors, if any. Pure Storage may make improvements and/or changes in the Pure Storage products and/or the programs described in this documentation at any time without notice.

THIS DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID. PURE STORAGE SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS DOCUMENTATION. THE INFORMATION CONTAINED IN THIS DOCUMENTATION IS SUBJECT TO CHANGE WITHOUT NOTICE.

Pure Storage, Inc.
650 Castro Street, #400
Mountain View, CA 94041

[purestorage.com](https://www.purestorage.com)

800.379.PURE

