

**NS0-509.27q**

Number: NS0-509  
Passing Score: 800  
Time Limit: 120 min

**NS0-509**



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**NetApp Certified Implementation Engineer - SAN, ONTAP**

**Exam A**

**QUESTION 1**

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You want to ensure maximum performance of iSCSI LUNs on an AFF A220.

In this scenario, which two actions will accomplish this task? (Choose two.)



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- A. Disable flow control.
- B. Configure virtual LAN (VLAN).
- C. Enable flow control.
- D. Enable jumbo frames.

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

## QUESTION 2

You are provisioning storage to an ESX host that uses iSCSI.

According to NetApp best practice, which three actions accomplish this task? (Choose three.)

- A. Enable the iSCSI service.
- B. Bind the iSCSI ports to the software iSCSI adapter.
- C. Install Virtual Storage Console (VSC) for VMware.
- D. Enable BGP on the switch.
- E. Configure MTU 1500 on the switch.

**Correct Answer:** BCE

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Section: (none)

Explanation

Explanation/Reference:

### QUESTION 3

Question

Exhibit

```
scaling::> run -node scaling-01 -command fcp topology show
```

Switches connected on adapter 0c:

```
Switch Name:      switch
Switch Vendor:    Cisco Systems, Inc.
Switch Release:   4.2(1)N1(1)
Switch Domain:    75
Switch WWN:       23:e9:00:0d:ec:b4:94:01
```

| Port | Port                    | WWPN | State   | Type   | Attached WWPN           |
|------|-------------------------|------|---------|--------|-------------------------|
| vfc1 | 20:00:00:0d:ec:b4:94:3f |      | Offline | none   |                         |
| vfc2 | 20:01:00:0d:ec:b4:94:3f |      | Offline | none   |                         |
| vfc3 | 20:02:00:0d:ec:b4:94:3f |      | Offline | none   |                         |
| vfc4 | 20:03:00:0d:ec:b4:94:3f |      | Offline | none   |                         |
| vfc5 | 20:04:00:0d:ec:b4:94:3f |      | Offline | none   |                         |
| 2/1  | 20:41:00:0d:ec:b4:94:00 |      | Offline | none   |                         |
| 2/2  | 20:42:00:0d:ec:b4:94:00 |      | Online  | F-port | 50:0a:09:80:00:05:a2:40 |
| 2/3  | 20:43:00:0d:ec:b4:94:00 |      | Online  | F-port | 50:0a:09:85:8d:9d:bf:ce |
| 2/4  | 20:44:00:0d:ec:b4:94:00 |      | Online  | F-port | 50:0a:09:85:8d:ad:c0:02 |

A customer has an AFF A700 connected to a Cisco switch and has verified connectivity but cannot see any LUNs. The customer issued the `run -node scaling-01 -command fcp topology show` command to verify the connection.

Referring to the exhibit, what needs to be enabled on the Cisco switch?

- A. Trunking needs to be enabled.
- B. VSAN needs to be enabled.
- C. NPIV needs to be enabled.
- D. VFC needs to be enabled.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 4

Question

Exhibit

FC/FCoE and NVMe Adapters

| Edit                    | Status    | Refresh |                |                         |                    |       |
|-------------------------|-----------|---------|----------------|-------------------------|--------------------|-------|
| WWNN                    | Node Name | Slot    | Data Protocols | WWPN                    | Status             | Speed |
| 50:0a:09:80:80:83:61:11 | AFF_1     | 0e      | fc             | 50:0a:09:84:80:83:61:11 | link not connected | auto  |
| 50:0a:09:80:80:83:61:11 | AFF_1     | 0f      | fc             | 50:0a:09:83:80:83:61:11 | link not connected | auto  |
| 50:0a:09:80:80:83:61:11 | AFF_1     | 0g      | fc             | 50:0a:09:86:80:83:61:11 | link not connected | auto  |
| 50:0a:09:80:80:83:61:11 | AFF_1     | 0h      | fc             | 50:0a:09:85:80:83:61:11 | link not connected | auto  |
| 50:0a:09:80:80:83:61:11 | AFF_1     | 1a      | fc,fc_nvme     | 50:0a:09:81:80:83:61:11 | online             | auto  |
| 50:0a:09:80:80:83:61:11 | AFF_1     | 1b      | fc,fc_nvme     | 50:0a:09:82:80:83:61:11 | online             | auto  |
| 50:0a:09:80:80:d3:61:00 | AFF_2     | 0e      | fc             | 50:0a:09:82:80:d3:61:00 | online             | auto  |
| 50:0a:09:80:80:d3:61:00 | AFF_2     | 0f      | fc             | 50:0a:09:81:80:d3:61:00 | link not connected | auto  |
| 50:0a:09:80:80:d3:61:00 | AFF_2     | 0g      | fc             | 50:0a:09:84:80:d3:61:00 | online             | auto  |
| 50:0a:09:80:80:d3:61:00 | AFF_2     | 0h      | fc             | 50:0a:09:83:80:d3:61:00 | link not connected | auto  |

A customer is using both FC and NVMe in a cluster. The customer needs to do some work on AFF\_1. Referring to the exhibit, what will happen?

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- A. The NVMe namespaces on AFF\_2 will be available after takeover of AFF\_1.
- B. The FC LUNs that use cluster interconnect to access the LUNs on AFF\_1 will be unavailable after failover.
- C. The FC LUNs on node AFF\_2 will be unavailable after failover of AFF\_1.
- D. The NVMe namespaces on AFF\_1 will be unavailable after takeover by AFF\_2.

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 5

Which two features does Assymmetric Namespace Access (ANA) support? (Choose two.)

- A. multipathing
- B. LUN masking
- C. LUN hosting
- D. path management

**Correct Answer:** AD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: <https://www.netapp.com/us/media/tr-4684.pdf> (16)

#### QUESTION 6

A customer that is using an AFF A220 has a problem with a host for a new FC LUN. Other LUNs on the same SVM are working properly. This LUN is not visible on the host.

Which configuration does the customer need to verify in their solution?

- A. LUN mapping with igroup
- B. host HBA speed settings
- C. FC target port setting on NetApp node
- D. FC switch zoning

**Correct Answer:** C



**Section: (none)**

**Explanation**

**Explanation/Reference:**

#### **QUESTION 7**

A customer has an existing 8-node cluster that consists of six FAS2650 nodes and two FAS2554 nodes. The customer wants to expand the cluster by adding two AFF A220 nodes.

Which resource would be used to determine whether this configuration is supported?

- A. Interoperability Matrix Tool (IMT)
- B. Config Advisor
- C. OneCollect
- D. Hardware Universe (HWU)

**Correct Answer: B**

**Section: (none)**

**Explanation**

**Explanation/Reference:**



#### **QUESTION 8**

You deployed a new SVM for FC access, and you used the `vserver fcr, create -vserver svm1 - status-admin up` command to enable FC service on the SVM. You then created the LIFs for the FC protocol. When you review the status of the LIFs, they show that the admin status is up, but the operational status is down. You have already verified that the ports are physically connected.

In this scenario, what is the next step to bring the LIFs up?

- A. Use the `network interface modify` command to change the operational status of the LIFs.
- B. Create at least one zone that contains your SVM LIF WWPNs and an initiator.
- C. Verify that an FC license is applied on your system.
- D. Disable the SAN switch port where your NetApp storage is connected.

**Correct Answer: B**

**Section: (none)**

**Explanation**

Explanation/Reference:

## QUESTION 9

Question






Exhibit

Supported Adapter Cards - AFF A700 9.5 ONTAP

Platform Configuration:

Single Chassis HA Pair

V

| Priority | Category        | Bus Type  | Mktg Part No           | Images  | LED                  | Mig Part No | Description                  | Optical Module | Cables               | Supported Speed (s)              | Min ONTAP  | M |
|----------|-----------------|-----------|------------------------|---|----------------------|-------------|------------------------------|----------------|----------------------|----------------------------------|--|---|
| 1        | NVRAM           | IO Module | X93140A                |    | <a href="#">View</a> | 111-03190   | NVRAM10<br>32GB              | Not Supported  | <a href="#">View</a> |                                  | 9,1RC2,<br>9,2RC1,<br>9,3RC1,<br>9,4RC1,<br>9,5RC1 | 1 |
| 2        | Networking      | IO Module | X91440A <sup>[2]</sup> |    | <a href="#">View</a> | 111-02590   | 2p 40GbE NIC<br>Cu/Op        | QSFP Optional  | <a href="#">View</a> | ETH: 10/40 Gbps                  | 9,1RC2,<br>9,2RC1,<br>9,3RC1,<br>9,4RC1,<br>9,5RC1 | 6 |
| 3        | Block<br>Access | IO Module | X91135A                |   | <a href="#">View</a> | 111-03789   | 4p 32Gb FC SFP<br>- Op       | SFP + Included | <a href="#">View</a> | FC:8/16/32 Gbps<br>FC:16/32 Gbps | 9,3RC1,<br>9,4RC1,<br>9,5RC1                       | 6 |
| 4        | Block<br>Access | IO Module | X91134A                |  | <a href="#">View</a> | 111-03431   | 2p 32Gb FC Op                | SFP + Included | <a href="#">View</a> | FC:8/16/32 Gbps<br>FC:16/32 Gbps | 9,1RC2,<br>9,2RC1,<br>9,3RC1,<br>9,4RC1,<br>9,5RC1 | 6 |
| 5        | Block<br>Access | IO Module | X91143A                |  | <a href="#">View</a> | 111-02397   | 4p 16Gb   10Gb<br>UTA2 Cu/Op | SFP + Optional | <a href="#">View</a> | ETH: 1/10 Gbps<br>FC:4/8/16 Gbps | 9,1RC2,<br>9,2RC1,<br>9,3RC1,<br>9,4RC1,<br>9,5RC1 | 6 |

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A customer wants to add a 2-port, 32 Gb FC card to support NVMe in an AFF A700 2-node cluster. Currently, there are cards in slots 1, 2, 4, 6, 8, and 9.

Referring to the exhibit, what is the number of the slot that should be used?

- A. 10
- B. 3
- C. 5
- D. 7

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 10**

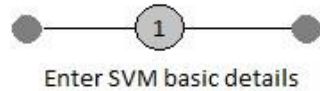




Question

Exhibit

### Storage Virtual Machine (SVM) Setup



### SVM Details

? Specify a unique name and the data protocols for the SVM

SVM Name:

? IPspace:  ▼

? Data Protocols: ☐ CIFS ☐ NFS ☐ iSCSI ☐ FC/FCoE

? Default language:  ▼

The language of the SVM specifies the default language encoding setting for the SVM and its volumes. Using a setting that incorporates UTF-8 character encoding is recommended.

? Security Style:  ▼

Root Aggregate:  ▼

### DNS Configuration

Specify the DNS domain and name servers. DNS details are required to configure the CIFS protocol.

? Search Domains:

? Name Servers:

Referring to the exhibit, which two elements are required for NVMe host access with ONTAP 9.5 and using supported AFF nodes? (Choose two.)

- A. You need 16 Gb FC HBAs installed in the AFF nodes.
- B. You must have the license installed for NVMe support in the cluster.
- C. You must have the license installed for FC support in the cluster.
- D. You need 32 Gb FC HBAs installed in the AFF nodes.

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### QUESTION 11

A customer is required to encrypt iSCSI traffic across their public network.

In this scenario, which method will accomplish this task?

- A. dot1q
- B. IPsec
- C. NVMe
- D. CHAP



**Correct Answer:** B

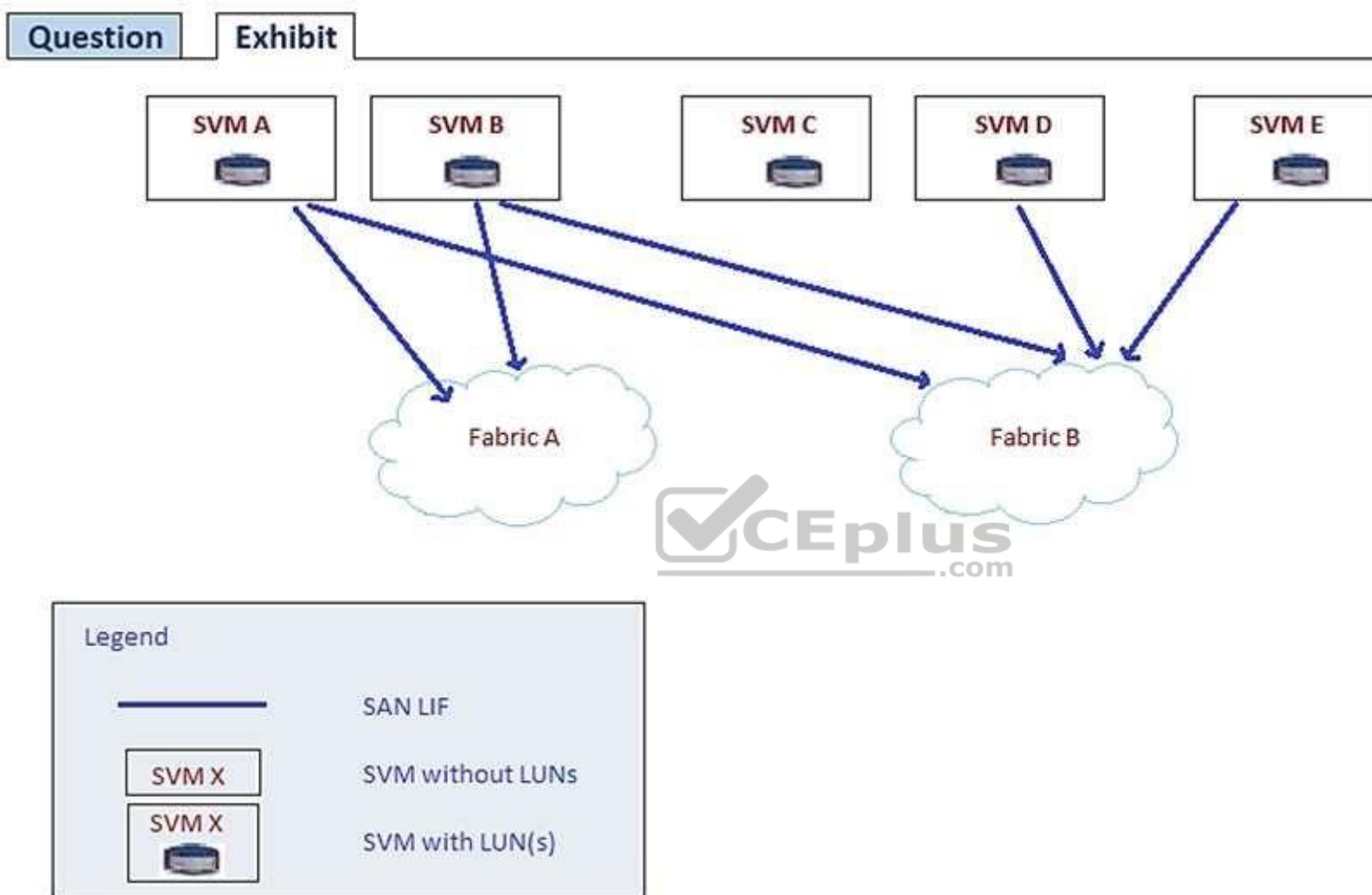
**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: <https://www.computerweekly.com/feature/iSCSI-security-Networking-and-security-options-available>

#### QUESTION 12



An administrator has an ONTAP cluster with SVMs and LUNs as shown in the exhibit. Hosts attempting to connect to LUNs mapped from SVM "C" are unable to see their LUNs. The hosts are not configured to connect to any other SVM.

Which action should be performed to restore multi-path connectivity to the LUNs in this scenario?

A. Create LIFs on SVM "C" for host connectivity.

- B. Move the LUN to a different volume within SVM "C".
- C. Move the LUN to SVM "E" to restore connectivity.
- D. Move the LUN to SVM "A" to restore connectivity.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

### QUESTION 13

Automatic host-side space management with SCSI T10 thin-provisioned LUNs is achieved by which feature of ONTAP?

- A. fractional reserve
- B. space allocation
- C. space reservation
- D. volume auto-grow

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: [https://library.netapp.com/ecm/ecm\\_download\\_file/ECMLP2492716](https://library.netapp.com/ecm/ecm_download_file/ECMLP2492716) (13)

### QUESTION 14

You are planning to expand a SAN-only ONTAP 9.5 cluster that consists of eight AFF A700 nodes.



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In this scenario, what is the maximum number of additional AFF A700 nodes that would be added?

- A. 2
- B. 4
- C. 8
- D. 0

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: [http://web.stanford.edu/group/storage/dot9/ONTAP\\_9\\_Release\\_Notes.pdf](http://web.stanford.edu/group/storage/dot9/ONTAP_9_Release_Notes.pdf)

#### QUESTION 15

You have a 4 node cluster with an AFF A300 HA pair and a FAS8200 HA pair. You plan on using the default storage efficiency settings. With inline data compaction, you estimate that you can save 6% of storage space. AFF A300 LUNs that use under 5000 IOPS are moved to a FAS8200 using the `lun move` command.

In this scenario, what happens to the data after the LUN is moved? (Choose two.)

- A. The new written data is not compacted.
- B. The new written data is compacted.
- C. The existing data is compacted.
- D. The existing data is not compacted.

**Correct Answer:** BD

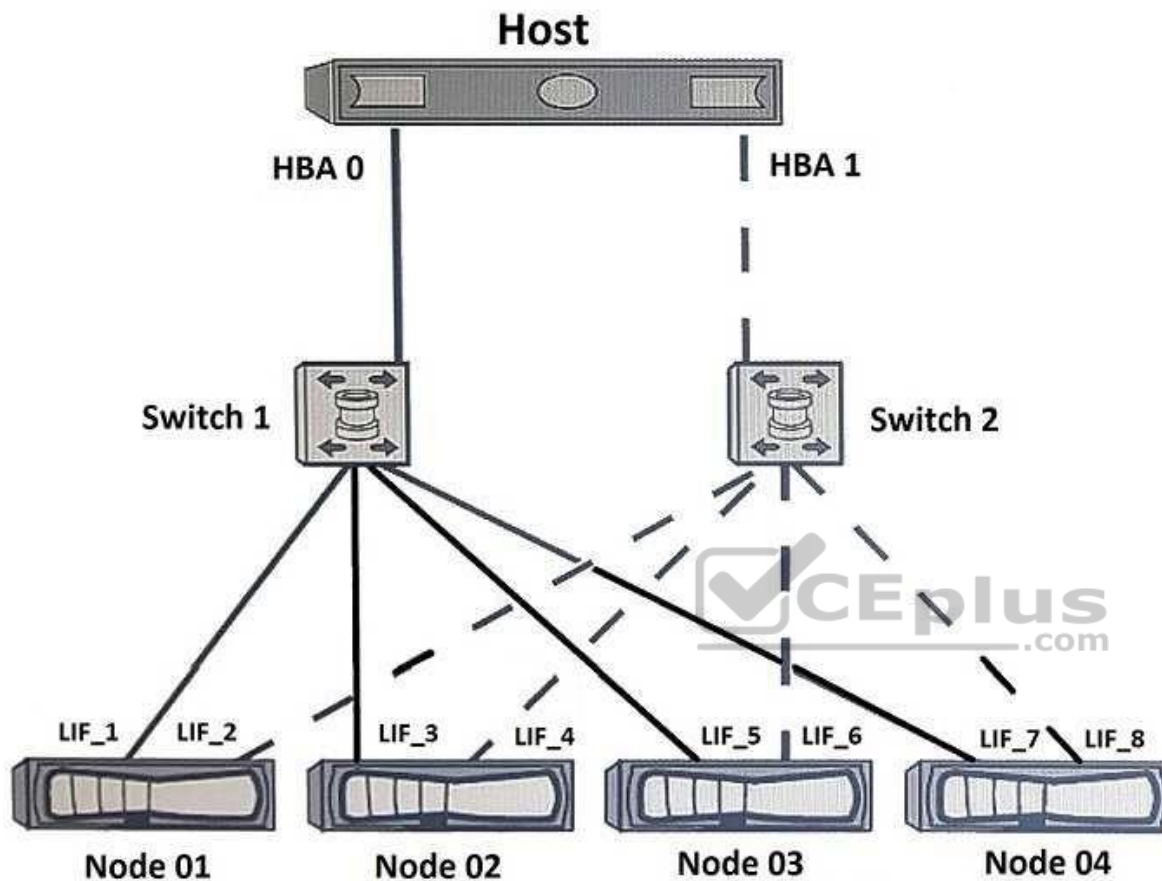
**Section:** (none)

**Explanation**

**Explanation/Reference:**

Reference: <https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.dot-cm-vsmg%2FGUID-9C88C1A6-990A-4826-83F8-0C8EAD6C3613.html>

#### QUESTION 16



You configured a SAN host with a 4-node ONTAP 9.5 cluster that uses default settings. All paths are available from the host to the four nodes. You have a requirement to see only two paths to each LUN. One path is optimized and the other is non-optimized.

In this scenario, which NetApp SAN feature supports this requirement?

A. portsets

- B. SLM
- C. VLANs
- D. igroups

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 17**

You are planning to implement a 32 Gb FC SAN on a 2-node AFF A700 ONTAP 9.5 cluster. You need to create 112 FC LIFs across the HA pair with a limit of 20 FC LIFs per physical HBA port.

In this scenario, how many 2-port 32 Gb HBA cards do you need per storage controller?

- A. 2
- B. 1
- C. 4
- D. 3



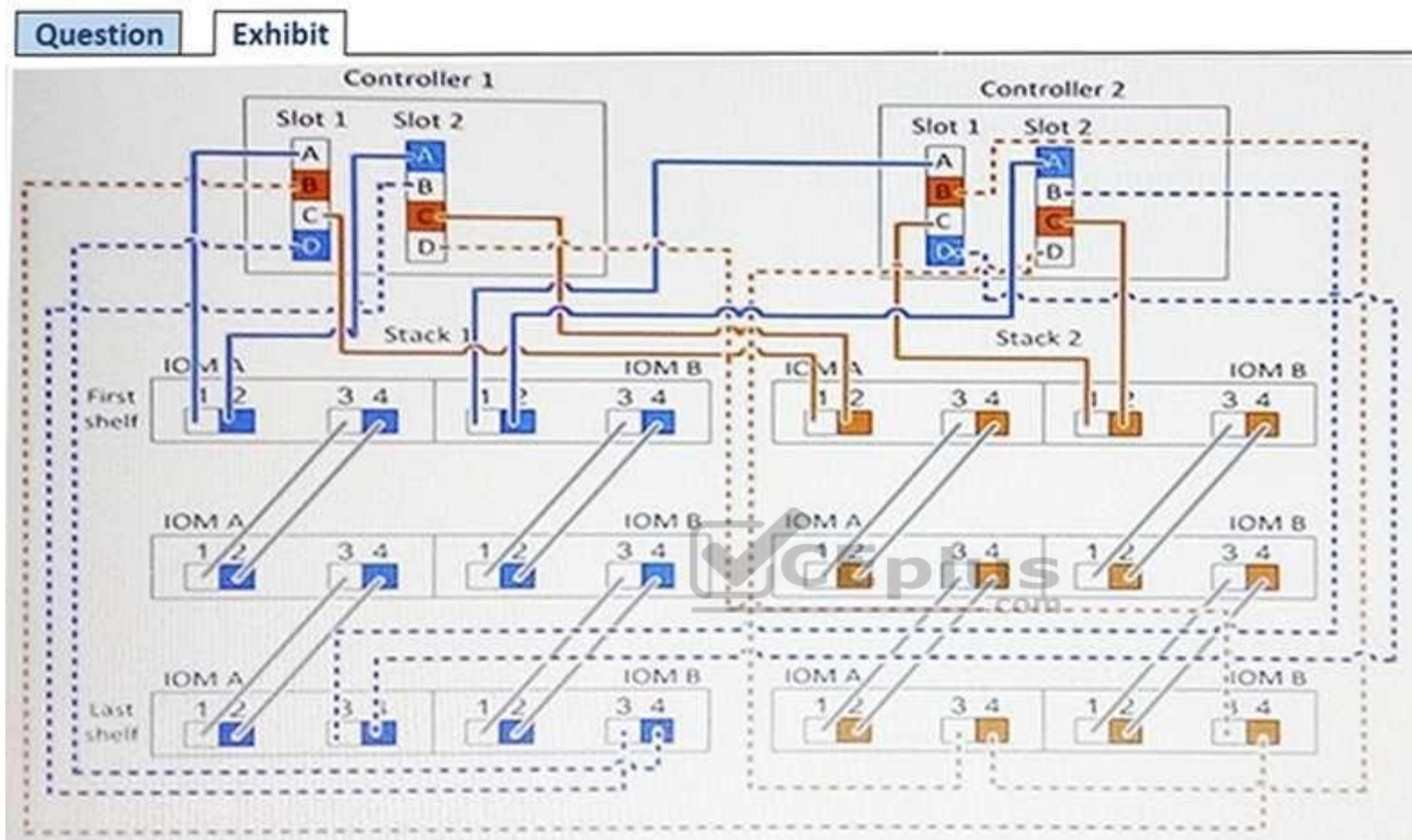
**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

#### **QUESTION 18**



Referring to the exhibit, you have SAN LUNs on an AFF A700s and are asked to test an SSD shelf stack failure.

What is the maximum allowed number of failed paths per controller to shelf stack before a storage failover occurs?

- A. 1
- B. 3
- C. 2
- D. 4

**Correct Answer: C**



**Section: (none)**

**Explanation**

**Explanation/Reference:**

#### QUESTION 19

You have an SVM that serves LUNs to your hosts in an FC SAN environment. This SVM runs on a 4-node cluster and has two data LIFs on each node, according to best practices. You just created a LUN and mapped it to your initiators group. The LUN is owned by `node01`.

In this scenario, what would be an appropriate test for LUN mobility?

- A. Move the LUN to `node02`.
- B. Mirror the LUN to another node in your cluster.
- C. Physically disconnect the SAN ports, and verify if the SAN data LIFs automatically move to other hosts.
- D. Copy the LUN to another node and create a new LUN map.

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**



#### QUESTION 20

While expanding a 200 GB LUN in an ONTAP 9.4 system, the following error is observed:

```
cluster1::*> lun resize -path /vol/lun_vol/lun -size +3T
```

```
Error: command failed: New size exceeds this LUN's initial geometry
```

What is the cause of this error?

- A. The volume auto-grow is disabled.
- B. The LUN reached maximum capacity.
- C. The LUN can be expanded up to 10 times its original size.
- D. Space reservation is enabled.

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

**QUESTION 21**

You currently have a FAS8200 with ONTAP 9.5. You want to expand the front end FC I/O capabilities. However, you are unsure which target adapters are supported.

What would you use to confirm which adapters are supported with your current configuration?

- A. Hardware Universe (HWU)
- B. Upgrade Advisor
- C. OneCollect
- D. Interoperability Matrix Tool (IMT)

**Correct Answer: A**

**Section: (none)**

**Explanation**



**Explanation/Reference:**

Reference: [https://library.netapp.com/ecm/ecm\\_download\\_file/ECMLP2495115](https://library.netapp.com/ecm/ecm_download_file/ECMLP2495115)

**QUESTION 22**

Which two storage efficiencies have been enabled on the NVMe namespace that is shown in the exhibit? (Choose two.)

- A. deduplication
- B. compaction
- C. compression

Question

Exhibit

Volume: ESX2\_NVMe\_volume\_944

[Back to all volumes](#)

[Edit](#)

[Delete](#)

[More actions](#)

[Refresh](#)

Overview

Snapshots Copies

Data Protection

Storage efficiency

Performance

Before



153.93 Gb of 166.25 G  
available space

After



156.71 Gb of 166.25 G  
available space

Last Details

Last Run Aug/24/2018 23:56:57

Total Savings 2.77 GB (22%)

1.14 GB (9%) - Deduplication Savings

1.63 GB (13%) - Compression Savings

Start Time Aug/24/2018 23:56:57

End Time Aug/24/2018 23:56:57

Details

|                    |                  |
|--------------------|------------------|
| Deduplication      | Enabled (inline) |
| Deduplication Mode | none             |
| Status             | idle             |
| Type               | regular          |
| Compression        | Enabled (inline) |

D. thin provisioning

Correct Answer: B

Section: (none)

Explanation

Explanation/Reference:

QUESTION 23

Question
Exhibit

Edit Volume
×

General
Storage Efficiency
Advanced

☒ **Background Deduplication**  
 Recommended for volumes used for server on desktop virtualization, file system shares, or backups.
 

☒ Policy based - Deduplication happens based on the selected policy.  
 Storage Efficiency Policy:                      default    Choose

☐ On-demand - Deduplication must be run manually.

☒ **Background Compression** ⓘ  

Compression runs along with deduplication. Not recommended for performance-critical applications.

☐ Inline compression

[Tell me more about storage efficiency.](#)

You have a performance critical database application that is running on a FAS9000 controller that uses FC. As shown in the exhibit, volume efficiency is enabled.

If you follow the performance recommendation, what are two results to the data in the volume? (Choose two.)

- A. The new written data is compressed.
- B. The new written data is uncompressed.
- C. The existing data is uncompressed.
- D. The existing data is compressed.

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 24**

You are configuring both NVMe and FC on the same AFF A800 2-node ONTAP 9.5 cluster. You are configuring both protocols on the same Cisco FC network switches.

In this scenario, which configuration on the cluster is supported?

- A. a volume with both LUNs and namespaces
- B. an SVM with both `nvme` and `fcp` allowed protocols
- C. an AFF A800 node HBA with both NVMe/FC and FC on the same port
- D. a LIF with both `fc-nvme` and `fcp` data protocols

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 25**

**Question****Exhibit**

slot 0: Fibre Channel Target Host Adapter 0e

```
OLogic CNA 8324 (8362) rev. 2, <LINK NOT CONNECTED>
Firmware rev:      8.5.1
Flash rev:         4.1.0
Host Port Addr:    000000
FC Nodename:       50:0a:09:80:80:c1:72:4b (500a098080c1724b)
FC Portname:       50:0a:09:84:80:c1:72:4b (500a098480c1724b)
Connection:        No link
Switch Port:       Unknown
SFP Vendor Name:   AVAGO
SFP Vendor P/N:    ArBR-7038mz-NA3
SFP Vendor Rev:    G2.3
SFP Serial No.:    AD1405A0628
SFP Connector:     LC
SFP Capabilities:  10 Gbit/Sec
```

You connected your FAS8200 to a Brocade SAN switch. As shown in the exhibit, port 0e is not available.

In this scenario, which statement is correct?

- A. The incorrect SFP+ module is installed.
- B. The switch zoning is using the FC nodename.
- C. The incorrect firmware revision is installed.
- D. The switch port is configured for mode E\_Port.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 26**

On your ONTAP 9.5 cluster, you need to set up the onboard key manager with hardware-based security and volume encryption.

Which two licenses are required in this situation? (Choose two.)

- A. FDE
- B. TPM
- C. VE
- D. RSA

**Correct Answer:** CD

**Section:** (none)

**Explanation**

**Explanation/Reference:**

**QUESTION 27**

A customer is planning to connect a Linux server to a FAS8200 using Brocade FC switches. During the initial configuration, the SVM does not log in to the fabric.

Which two statements are correct in this scenario? (Choose two.)

- A. NPIV has not been enabled on the switches.
- B. The switch port topology is set incorrectly to the E\_Port.
- C. ALUA has not been set up on the FAS8200.
- D. Zoning is incorrectly configured between the Linux server and the ONTAP cluster.

**Correct Answer:** AC

**Section:** (none)

**Explanation**

**Explanation/Reference:**



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