

**C9020-668**

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**C9020-668**

**IBM Storage Technical V1**

## Exam A

### QUESTION 1

An IBM mainframe client has IBM DS8886 CKD storage installed. The customer has decided to use another new IBM DS8886 and use IBM Metro Mirror to provide a synchronous redundant copy of the data.

Which additional IBM software enables non-disruptive failover in the event of a storage hardware failure?

- A. IBM Remote Pair FlashCopy
- B. IBM Global Mirror
- C. IBM High performance FICON
- D. IBM HyperSwap

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

You can create an IBM HyperSwap topology system configuration where each I/O group in the system is physically on a different site. When used with active-active relationships to create HyperSwap volumes, these configurations can be used to maintain access to data on the system when power failures or site-wide outages occur.

References: [https://www.ibm.com/support/knowledgecenter/en/STVLF4\\_7.7.1/spectrum.virtualize.771.doc/svc\\_hyperswap\\_configuration.html](https://www.ibm.com/support/knowledgecenter/en/STVLF4_7.7.1/spectrum.virtualize.771.doc/svc_hyperswap_configuration.html)

### QUESTION 2

How are key management services provided for the IBM DS8886 storage system?

- A. SKLM
- B. Blockchain
- C. Full disk encryption
- D. Non-repudiation system

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Full Disk Encryption (FDE) drive sets are used with key management services that are provided by IBM Security Key Lifecycle Manager (SKLM) software or Gemalto SafeNet KeySecure to allow encryption for data-at-rest on a DS8880.

References: IBM DS8880 Data-at-rest Encryption, December 2016, page ix

### QUESTION 3

Which offering provides scale-out parallel processing and dynamically accelerates performance of analytics clusters when integrated with the IBM FlashSystem?

- A. IBM XIV
- B. IBM Spectrum Scale
- C. Real-time Compression
- D. IBM Spectrum Copy Data Management

**Correct Answer:** B

**Section:** (none)

**Explanation**

#### **Explanation/Reference:**

Although Spectrum Scale and FlashSystem are both available by themselves, and there's no requirement to combine them, doing so can result in the IT equivalent of "1+1=3." Each solution complements the other in supporting the needs of two of today's most common, fastgrowing "application ecosystems"—private clouds and [big] data analytics. Both of those application ecosystems must deliver extreme capacity and extreme performance simultaneously and economically. If only one or two of the scale/speed/economy attributes is needed, then each of the IBM products can stand alone very well. But where all three are prerequisites, the joint IBM solution shines.

References: [http://docs.media.bitpipe.com/io\\_13x/io\\_131467/item\\_1372378/Enabling%20Private%20Clouds%20and%20Analytics.PDF](http://docs.media.bitpipe.com/io_13x/io_131467/item_1372378/Enabling%20Private%20Clouds%20and%20Analytics.PDF)

### QUESTION 4

A customer has an older IBM storage subsystem and wants to know where to find the Service Discontinued data for the product.

What should the technical specialist tell the customer?

- A. Check IBM Digital Techline Center.
- B. Check IBM SSIC webpage.
- C. Check the IBM sales manual.
- D. Check the IBM Knowledge Center.

**Correct Answer:** D

**Section:** (none)

**Explanation**

#### **Explanation/Reference:**

When service is discontinued, corrections to known problems remain available, but the development team is redirected to other work, and no new, tested corrections will be generated for general use. Known problems may be reviewed and ordered via electronic vehicles such as the internet (e.g., <http://www.ibm.com/>)

support) however support provided by the IBM Client Support representatives, will be discontinued.

References: <https://www-304.ibm.com/support/customer/sas/f/handbook/offerings.html>

#### QUESTION 5

Which OpenStack component allows management of IBM XIV and IBM DS8884 through a dashboard that gives administrators control while empowering users to provision resources through a web interface?

- A. Swift
- B. Horizon
- C. Cinder
- D. Nova

**Correct Answer:** B

**Section:** (none)

**Explanation**

#### **Explanation/Reference:**

Horizon is the canonical implementation of OpenStack's Dashboard, which provides a web based user interface to OpenStack services including Nova, Swift, Keystone, etc.

Incorrect Answers:

A: Swift functions as a distributed, API-accessible storage platform that can be integrated directly into applications or used to store VM images, backups, and archives as well as smaller files, such as photos and email messages.

C: Cinder is the project name for OpenStack Block Storage; it provides persistent block storage to guest virtual machines (VMs). Block storage is often necessary for expandable file systems, maximum performance, and integration with enterprise storage services as well as applications that require access to raw block-level storage.

D: Nova is the OpenStack project that provides a way to provision compute instances (aka virtual servers). Nova supports creating virtual machines, baremetal servers (through the use of ironic), and has limited support for system containers. Nova runs as a set of daemons on top of existing Linux servers to provide that service.

References: <https://docs.openstack.org/horizon/latest/>

#### QUESTION 6

A customer wants to improve overall workload performance and is considering adding either an IBM Storwize V7000F or an IBM FlashSystem A9000 to the environment.

Which key performance characteristic differentiates these two products?

- A. Latency
- B. Connect time
- C. Cache hit rate
- D. Queue time

**Correct Answer:** A  
**Section:** (none)  
**Explanation**

**Explanation/Reference:**

IBM FlashSystem A9000 includes the following key capability for optimal solution in a cloud environment: FlashCore technology provides extreme MicroLatency performance.

References: <http://www.redbooks.ibm.com/redpapers/pdfs/redp5325.pdf>, IBM FlashSystem A9000 Product Guide

**QUESTION 7**

A customer has floor and rack space constraints.  
Which model should be included with a single frame IBM TS4500 L25?

- A. Additional I/O station
- B. Top rack with PDU
- C. HD2 storage frame
- D. Additional cartridge magazines



**Correct Answer:** B  
**Section:** (none)  
**Explanation**

**Explanation/Reference:**

The TS4500 tape library offers high-density (HD), drive-capable and storage-only frame models that are designed to greatly increase storage capacity without increasing frame size or required floor space. The top rack, 3584 Model TR1, provides an extra 10U of rack space on any frame in a library without requiring more floor space.

References: [https://www.ibm.com/support/knowledgecenter/en/STQRQ9/com.ibm.storage.ts4500.doc/ts4500\\_library\\_structure.html](https://www.ibm.com/support/knowledgecenter/en/STQRQ9/com.ibm.storage.ts4500.doc/ts4500_library_structure.html)

**QUESTION 8**

Which IBM products should the technical specialist propose to a customer who is using disk-based backups to meet regulatory requirements for low recovery time objectives?

- A. IBM Spectrum Control Advance
- B. IBM Spectrum Archive
- C. IBM Spectrum protect
- D. IBM Spectrum Control Base

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM Spectrum Protect, formerly Tivoli Storage Manager family, provides backup, snapshot, archive, recovery, space management, bare machine recovery and disaster recovery capabilities.

Incorrect Answers:

A: IBM Spectrum Control Standard and Advanced Editions are integrated data and storage management software solutions that provides monitoring, automation and analytics for multiple storage systems.

B: IBM Spectrum Archive Single Drive Edition features IBM Linear Tape, not disk-based, File System.

D: IBM Spectrum Control Base Edition is a centralized cloud integration system that consolidates a range of IBM storage provisioning, virtualization, cloud, automation, and monitoring solutions through a unified server platform.

References: <https://www.ibm.com/us-en/marketplace/data-protection-and-recovery>

#### **QUESTION 9**

Which IBM XIV replication feature provides the ability for a remote target volume to be initialized without requiring the contents of the source volume to be re-replicated over an inter-site link?

- A. Offline Initialization
- B. Quick Initialization
- C. Synchronous Replication
- D. Asynchronous Replication

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

When an XIV mirror coupling is first activated, all actual data on the source is either copied to the destination (normal initialization) or verified to be on the destination, and only changed data is copied (offline initialization). This process is referred to as initialization.

References: <https://www.redbooks.ibm.com/redbooks/pdfs/sg247759.pdf>, page 83

#### QUESTION 10

What is the complete source of information for power, cooling, and floor space requirements for IBM tape products?

- A. Preinstall TDA checklist
- B. Product announcement letters
- C. Installation and Planning Guide
- D. IBM Storage System Interoperation Center

**Correct Answer:** A

**Section:** (none)

**Explanation**

#### **Explanation/Reference:**

The Technical Delivery Assessment (TDA) pre-installation checklist and worksheets document provides several worksheets that the customer must complete for each XIV system.

References: [https://www.ibm.com/support/knowledgecenter/en/STJTAG/com.ibm.help.xivgen3.doc/Gen3/PG/xiv\\_pln3overview.html](https://www.ibm.com/support/knowledgecenter/en/STJTAG/com.ibm.help.xivgen3.doc/Gen3/PG/xiv_pln3overview.html)

#### QUESTION 11

Which function provides a high availability feature with dual-site, active-active access to a volume in IBM Spectrum Virtualize?

- A. Hypersite
- B. Hyperledger
- C. Hyper-Scale
- D. HyperSwap

**Correct Answer:** D

**Section:** (none)

**Explanation**

#### **Explanation/Reference:**

You can create an IBM HyperSwap topology system configuration where each I/O group in the system is physically on a different site. When used with active-active relationships to create HyperSwap volumes, these configurations can be used to maintain access to data on the system when power failures or site-wide outages occur.

References: [https://www.ibm.com/support/knowledgecenter/en/STVLF4\\_7.7.1/spectrum.virtualize.771.doc/svc\\_hyperswap\\_configuration.html](https://www.ibm.com/support/knowledgecenter/en/STVLF4_7.7.1/spectrum.virtualize.771.doc/svc_hyperswap_configuration.html)

**QUESTION 12**

A customer needs to exchange encrypted data cartridges with another company. A competitor offers a solution that encrypts the data with static keys loaded the tape drives. IBM proposes IBM TS1150 tape drives using the built-in encryption feature.

Which competitive advantage does the IBM TS1150 solution provide?

- A. It achieves better throughput by encrypting and compressing data at the same time.
- B. It stores keys in the drive that can then be exported to partners in a secure format.
- C. It compresses the data before encrypting to achieve a better compression ratio.
- D. it writes a unique encrypted data key on the cartridge using public/private key pairs.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

How the encryption key server processes encryption keys

In system-managed and library-managed tape encryption, unencrypted data (clear text) is sent to the tape drive (TS1150 Tape Drive, TS1140 Tape Drive, TS1130 Tape Drive or TS1120 Tape Drive), and converted to ciphertext using a symmetric 256-bit AES Data Key (DK) generated by the encryption key server. The ciphertext is then written to tape. The encryption key server uses a single, unique Data Key for each Enterprise Tape Cartridge. This Data Key is also encrypted, or wrapped, by the encryption key server using the public key from an asymmetric Key Encrypting Key (KEK) pair. This process creates an Externally Encrypted Data Key (EEDK). The EEDK is written to the cartridge memory and to three additional places on the tape media in the cartridge. The tape cartridge now holds both the encrypted data and the means to decrypt it for anyone holding the private part of the KEK pair.

The DK may also be wrapped a second time using the public key of another party to create an additional EEDK. Both EEDKs can be stored on the tape cartridge. In this way, the tape cartridge can be shipped to a business partner holding the corresponding private key. That private key would allow the DK to be unwrapped and the tape decrypted by the business partner.

References: [https://www.ibm.com/support/knowledgecenter/en/STFS69\\_3.3.0/ts7740\\_encryption\\_keys.html](https://www.ibm.com/support/knowledgecenter/en/STFS69_3.3.0/ts7740_encryption_keys.html)

**QUESTION 13**

A customer wants to improve storage efficiency within a data center. The customer requires a low latency storage system that has a highly parallel architecture and comprehensive data reduction with pattern removal.

Which system should the technical specialist propose?

- A. IBM DS8886 HPFE
- B. IBM FlashSystem A9000R
- C. IBM FlashSystem V9000
- D. IBM XIV with compression



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM FlashSystem A9000 is a highly parallel, all-flash storage solution for cloud-scale businesses:

Harness the performance of highly parallel architecture and IBM FlashCore technology in one innovative system

Optimize storage economics with pattern removal, deduplication, and compression

Incorrect Answers:

B: IBM FlashSystem(R) A9000R is a grid-scale, all-flash storage platform.

References: [https://www-01.ibm.com/common/ssi/rep\\_ca/7/872/ENUSAG16-0087/ENUSAG16-0087.PDF](https://www-01.ibm.com/common/ssi/rep_ca/7/872/ENUSAG16-0087/ENUSAG16-0087.PDF)

#### **QUESTION 14**

Which solution provides virtualization, consolidation, and automation for a cloud deployment?

- A. IBM XIV with IBM Spectrum Protect
- B. IBM FlashSystem 900
- C. IBM Virtual Storage Center
- D. IBM Spectrum Accelerate



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM Virtual Storage Center is a storage virtualization platform and a storage management solution for cloud-based and software-defined storage. Virtual Storage Center enables organizations to monitor, automate and analyze storage.

Incorrect Answers:

B: IBM FlashSystem 900 all-flash storage arrays accelerate applications in mission-critical environments.

D: Use IBM Spectrum Accelerate to build a flexible, cost-effective cloud environment: deploy on any x86 server.

References: <http://www-03.ibm.com/software/products/en/ibm-virtual-storage-center>

#### **QUESTION 15**

A customer looking for an all-flash solution is evaluating IBM products. The primary concern for the customer is rapid growth of its database environment.

Which IBM flash solution should the specialist recommend to control capacity utilization?

- A. IBM XIV Gen3 with SSD
- B. IBM DS8886 HPFE
- C. IBM Flashsystem A9000
- D. IBM FlashSystem 900

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM FlashSystem 900 is designed to accelerate the applications that drive business – like those using an Oracle Database. IBM FlashSystem 900 can scale usable capacity from as low as 2 TB to as much as 57 TB in a single system.

FlashSystem 900 delivers Tier 0 top application performance with up to 1.1 million 100% random read IOPS and 600,000 100% random write IOPS.

References: <https://www.ibm.com/us-en/marketplace/flash-storage>

#### **QUESTION 16**

A customer is looking to take advantage of data reduction capabilities of the IBM SAN Volume Controller.

Which tool should the technical specialist use?

- A. Capacity Magic
- B. Comprestimator
- C. Disk Magic
- D. IBM Storage Tier Advisor Tool

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Capacity Magic calculates the effective storage capacity of your current and future IBM Disk Subsystems through an easy-to-use graphical dialog. This tool is available to IBM Business Partners.

Incorrect Answers:

B: The Comprestimator utility uses advanced mathematical and statistical algorithms to perform the sampling and analysis process in a very short and efficient way. The utility also displays its accuracy level by showing the maximum error range of the results achieved based on the formulas it uses. The utility runs on a host that has access to the devices that will be analyzed, and performs only read operations so it has no effect whatsoever on the data stored on the device.

C: Disk Magic provides you with a thorough understanding of your current Disk Subsystem performance and enables you to make better purchase and configuration decisions.

D: The IBM Storage Tier Advisor Tool predicts whether the addition of Solid State Drive (SSD), Enterprise Drive and Nearline Drive capacity in conjunction with the Easy Tier function.

References: <https://www.codeweavers.com/compatibility/crossover/ibm-capacity-magic>

#### **QUESTION 17**

A customer needs to import and export volumes between IBM Spectrum Virtualize clusters that are geographically separated.

How can this be accomplished?

- A. Create image mode volumes
- B. Snapshots with Transparent Cloud Tiering
- C. Implement IBM Spectrum Archive
- D. Utilize tiering-to-tape media

**Correct Answer:** B

**Section:** (none)

**Explanation**



#### **Explanation/Reference:**

Transparent cloud tiering is a licensed function that enables volume data to be copied and transferred to cloud storage. The system supports creating connections to cloud service providers to store copies of volume data in private or public cloud storage.

With transparent cloud tiering, administrators can move older data to cloud storage to free up capacity on the system. Point-in-time snapshots of data can be created on the system and then copied and stored on the cloud storage.

References: [https://www.ibm.com/support/knowledgecenter/en/STVLF4\\_7.8.1/spectrum.virtualize.781.doc/svc\\_icoverviewtransparentcltier.html](https://www.ibm.com/support/knowledgecenter/en/STVLF4_7.8.1/spectrum.virtualize.781.doc/svc_icoverviewtransparentcltier.html)

#### **QUESTION 18**

Which component of IBM Spectrum Scale enables data to be imported from several servers at the same time?

- A. HDFS Transparency connector
- B. IBM Spectrum Protect integration
- C. Cloud Object Storage support
- D. Multi-Cluster feature

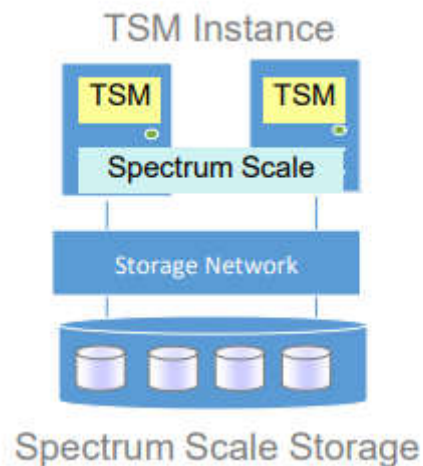
**Correct Answer:** B

**Section: (none)**

**Explanation**

**Explanation/Reference:**

With Spectrum Scale multiple Spectrum Protect instances use the same storage  
Capacity and performance management is seamless within a global name space  
Scalability is seamless and transparent  
File system replication is integrated with Spectrum Scale for different platforms  
Central administration of TSM storage



Note: Multiple Spectrum Protect (TSM) instances store DB and storage pools in a Spectrum Scale file system (GPFS)

Spectrum Scale provides global name space for all Spectrum Protect instances

Instances share all file system resources

- Spectrum Protect instances run on cluster nodes accessing the file system and disk directly
- Spectrum Scale file systems balances the workload and capacity for all TSM instances on disk
- Provides standardized, scalable and easy to use storage infrastructure for the multiple instances

Incorrect Answers:

A: IBM Spectrum Scale HDFS transparency offers a set of interfaces that allows applications to use HDFS Client to access IBM Spectrum Scale through HDFS RPC requests.

References: [https://www-03.ibm.com/support/techdocs/atsmastr.nsf/5cb5ed706d254a8186256c71006d2e0a/3264fd1e3716c13586257f460072493d/\\$FILE/SpectrumProtect on Spectrum%20Scale Intro v6.3.pdf](https://www-03.ibm.com/support/techdocs/atsmastr.nsf/5cb5ed706d254a8186256c71006d2e0a/3264fd1e3716c13586257f460072493d/$FILE/SpectrumProtect%20on%20Scale%20Intro%20v6.3.pdf)

**QUESTION 19**

A customer asks about the implication of replacing a current tape library with a single disk-only IBM TS7760.

Which key point should the technical specialist address?

- A. Validate that the new virtual library emulates the correct drive type.
- B. Confirm the compression ratio on the tapes to calculate the disk space needed.
- C. Identify the current provision for tape vaulting and disaster recovery.
- D. Check whether current tape media is encrypted.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

The TS7700 is a member of the TS line of products and builds upon previous implementations of tape storage virtualization.

For example, the TS1155 Tape drive is not compatible with IBM TS7700 or Enterprise Tape Control Unit environments.

References: <http://www.redbooks.ibm.com/redbooks/pdfs/sg245946.pdf>, IBM Tape Library Guide for Open Systems (August 2017), page 127

**QUESTION 20**

A customer wants to replace an existing HDS system connected to an IBM z/OS mainframe with a storage solution to reduce cooling requirements and potential of mechanical failure.

Which storage solution should the technical specialist recommend?

- A. IBM FlashSystem 900
- B. IBM FlashSystem V9000
- C. IBM DS8886 HPFE
- D. IBM DS8884 with SAS drives

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM invented the z Systems I/O architecture. Systems, SAN and DS8880 are jointly developed.

**QUESTION 21**

A customer has existing SAP HANA production nodes connected to an IBM Elastic Storage Server (ESS). The customer needs to scale out additional ESS nodes to maintain the high I/O throughput requirement.

Which type of nodes should be proposed?

- A. Storage nodes with SAS drives
- B. Storage nodes with SSD drives
- C. Protocol nodes with SAS drives
- D. Protocol nodes with SSD drives

**Correct Answer: B**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

A scale-out NAS system is comprised of multiple NAS storage nodes with internal or external storage. Each NAS storage node represents the same file systems to user applications. Data is stored across all NAS storage nodes, and adding capacity can be achieved by adding more storage nodes.

References: <https://www-03.ibm.com/systems/storage/spectrum/scale/scale-out-nas.html>

#### **QUESTION 22**

An IBM DS8886 customer wishes to replicate data from the primary data center to a new secondary data center 310 miles (500km) away while maintaining a low recovery point objective.

Which offering should the technical specialist recommend?

- A. SnapMirror
- B. Metro Mirror
- C. Global Mirror
- D. FlashCopy

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Global Mirror is a long-distance remote copy function across two sites using asynchronous technology. Global Mirror processing is designed to provide support for virtually unlimited distance between the local and remote sites, with the distance typically limited only by the capabilities of the network and the channel extension technology.

Incorrect Answers:

B: Metro Mirror provides real-time mirroring of logical volumes between two DS8000 storage units that can be located up to 300 km from each other.

References: [https://www.ibm.com/support/knowledgecenter/en/HW213\\_7.1.0/com.ibm.storage.ssic.help.doc/f2c\\_copysgintro\\_1xiohq.html](https://www.ibm.com/support/knowledgecenter/en/HW213_7.1.0/com.ibm.storage.ssic.help.doc/f2c_copysgintro_1xiohq.html)

### QUESTION 23

A customer has existing fiber attached storage that has reached the end of life. The customer wants a scalable solution that is easy to manage and integrates with VMware. The customer prefers an IBM A9000R based solution, but is concerned about migrating the virtual machines and ESX boot volumes.

Which explanation addresses the customer's concern?

- A. Use VMware Storage vMotion to migrate virtual machines and boot volumes.
- B. IBM A9000R has both a vCenter and VAAI plug in.
- C. Use IBM Spectrum Control to virtualize and move existing storage to the new IBM A9000R.
- D. IBM A9000R has a built in capability to copy the existing data.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

VMware VMotion: Allows the live migration of running VMs from one physical server to another, one data store to another, or both. This migration has zero downtime, continuous service availability, and complete transaction integrity.

References: <http://www.redbooks.ibm.com/redpapers/pdfs/redp5425.pdf>  
Using the IBM Spectrum Accelerate Family in VMware Environments, page 15

### QUESTION 24

A customer is purchasing an IBM 3952 Tape Frame for an IBM TS3500 Tape Library.

In which resource can you find the customer's detailed worksheets to complete the installation?

- A. IBM 3952 Tape System SAPR Guide
- B. IBM TS3500 Tape Library with System z Attachment Guide
- C. IBM 3952 Introduction and Planning Guide
- D. IBM TS3500 Introduction and Planning Guide

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:****QUESTION 25**

IBM has proposed Easy Tier as part of a storage solution to address less-active data on flash in a storage environment.

How does Easy Tier Address this problem?

- A. It moves data to the appropriate tier.
- B. It moves data to cloud storage
- C. It creates space-efficient flash copies.
- D. It archives data to tape.

**Correct Answer: A**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

The system includes IBM Easy Tier, which is a function that responds to the presence of drives in a storage pool that also contains hard disk drives (HDDs). The system automatically and nondisruptively moves frequently accessed data from HDD MDisks to flash storage MDisks, thus placing such data in a faster tier of storage.

The system supports these tiers:

Tier 0 flash

Tier 0 flash tier exists when the pool contains high-cost, high performance flash drives.

Tier 1 flash

Tier 1 flash tier exists when the pool contains tier 1 flash drives. Tier 1 flash drives are lower-cost flash drives, typically with larger capacities, but slightly lower performance and write endurance characteristics.

Enterprise tier

Enterprise tier exists when the pool contains enterprise-class MDisks, which are disk drives that are optimized for performance.

Nearline tier

Nearline tier exists when the pool contains nearline-class MDisks, which are disk drives that are optimized for capacity.

References: [https://www.ibm.com/support/knowledgecenter/STVLF4\\_7.8.0/spectrum.virtualize.780.doc/svc\\_easy\\_tier.html](https://www.ibm.com/support/knowledgecenter/STVLF4_7.8.0/spectrum.virtualize.780.doc/svc_easy_tier.html)

**QUESTION 26**

A customer is considering a storage consolidation project. The IBM technical specialist wants to show how the IBM solution will be more cost-effective than the competitors.

Which tool should the technical specialist use?



- A. IBM Compresimator
- B. IBM TCOnow!
- C. IBM Disk Magic
- D. IBM Spectrum Scale Discovery Checklist

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

TCOnow! for Disk is designed for storage architects to compare the initial costs and TCO of the most popular arrays from EMC, IBM, HPE, NetApp and Hitachi.

Incorrect Answers:

A: Comprestimator is a command line host-based utility that can be used to estimate an expected compression rate for block devices.

References: <http://cioview.com/disk.html>

#### QUESTION 27

A customer needs to bridge two Fibre Channel SANs that are 100 miles (161 km) apart.

Which device is needed at both sites?

- A. Multiprotocol router
- B. 16 Gb Fibre Channel switch
- C. PEX extender
- D. 10 Gb Ethernet Layer 2 switch

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

For example, The IBM System Storage SAN06B-R multiprotocol router entry-level multiprotocol extension router designed to connect two SANs over a wide distance using the Internet as the interconnection fabric (upgrades to enterprise-level functions are available).

References: <https://www.ibm.com/storage/san>

#### QUESTION 28

What should a technical specialist request to provide latency analysis for an Oracle DB system and help predict performance impact of IBM Flash Systems?

- A. DB Trace report
- B. nmon analyzer report
- C. Perfrep report
- D. AWR report

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM FlashSystem offers customers the ability to speed up databases to rates that may not be possible even by over provisioning the fastest spinning disk arrays. You can use native Oracle Database tools to determine the effects that flash storage can have on Oracle Database environments. Oracle utilities—Statspack and now Automatic Workload Repository (AWR) reports —provide database administrators with detailed information concerning a snapshot of database execution time. This snapshot provides statistics on wait events, latches, storage input and output volumes, and timings as well as various views of memory and SQL activities.

References: <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=ORW03038USEN>

#### QUESTION 29

A customer has a requirement to add high availability to all systems in the data center. It has an IBM TS4500 tape Library in use.

What must be added to the library to meet the high availability requirement?

- A. Additional convenience I/O stations
- B. Redundant Library Managers
- C. Dual accessors
- D. Dual grippers

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

When an optional second accessor is installed, the TS4500 tape library features high availability (HA) which enhances the library performance.

References: [https://www.ibm.com/support/knowledgecenter/en/STQRQ9/com.ibm.storage.ts4500.doc/ts4500\\_ipg\\_dual\\_accessors.html](https://www.ibm.com/support/knowledgecenter/en/STQRQ9/com.ibm.storage.ts4500.doc/ts4500_ipg_dual_accessors.html)

#### QUESTION 30

A solution architect has determined the amount of spindles needed to satisfy performance and Raid level requirements for an IBM DS8886.

Which tool provides information on the number of spare drives included in the system?

- A. STAT
- B. Capacity Magic
- C. Disk Magic
- D. e-config

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Capacity Magic is an easy-to-use tool to help with capacity planning for physical and usable capacities based on installation drive capacities and quantities in intended RAID configurations.

References: IBM DS8880 Architecture and Implementation (Release 8.2.1), page 82

#### **QUESTION 31**

A customer has multiple data types and is looking for space savings on the storage environment.

Which data type can benefit from Real-time Compression?

- A. Media files
- B. Virtual servers
- C. Compressed database files
- D. Encrypted user documents

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

References: IBM Real-time Compression in IBM SAN Volume Controller and IBM ..., Volume 7000, page 4

#### **QUESTION 32**

A customer with a block storage from a competitor desires an OpenStack ready platform for storage management.

Which solution should the technical specialist recommend?

- A. IBM Spectrum Control
- B. IBM Spectrum Scale
- C. IBM Spectrum protect Suite
- D. IBM PowerVM NovaLink

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Using IBM Spectrum Scale in an OpenStack cloud environment offers many benefits, including the enterprise features of IBM Spectrum Scale and consolidated storage options.

OpenStack include the Cinder component, which Provides virtualized block storage for virtual machines.

Incorrect Answers:

A: IBM Spectrum Control is a comprehensive solution that can significantly improve monitoring, automation and analytics capabilities in multi-vendor storage environments.

References: [https://www.ibm.com/support/knowledgecenter/en/STXKQY\\_4.2.3/com.ibm.spectrum.scale.v4r23.doc/bl1ins\\_openstackusecase.htm](https://www.ibm.com/support/knowledgecenter/en/STXKQY_4.2.3/com.ibm.spectrum.scale.v4r23.doc/bl1ins_openstackusecase.htm)

### QUESTION 33

Which IBM FlashSystem A9000 function enables the division of storage system administration tasks into logical domains?

- A. Storage-based permissions
- B. Access-based permissions
- C. Role-based permissions
- D. interface-based permissions

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM FlashSystem A9000 enables a secure isolation of logical domains of storage resources among numerous tenants, with the ability to set different QoS levels for each domain. Multi-tenancy enables the division of storage system administration tasks into logical domains by using role-based permissions.

References: IBM FlashSystem A9000 Product Guide, page 2  
<http://www.redbooks.ibm.com/redpapers/pdfs/redp5325.pdf>

### QUESTION 34

A customer has a fully licensed single frame IBM TS4500 with four 3592 drives installed, using about 200 storage slots, and a small IBM TS3310 library with two LTO-6 drives and 60 LTO-6 cartridges. The customer wants to consolidate the two libraries and move the LTO cartridges into the IBM TS4500.

Which upgrade to the IBM TS4500 achieves this goal?

- A. Upgrade the LTO-6 drive models and move them into the existing frame.
- B. Use the existing frame, and add two new LTO-6 drives.
- C. Add a new drive frame, with two new LTO-7 drives.
- D. Move the two LTO-6 drives into a new IBM TS4500 drive frame.

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

TS4500 tape library frame models: Frame Position 1 capacity: Up to 12 tape drives and 550 storage slots

References: [https://www.ibm.com/support/knowledgecenter/en/STQRQ9/com.ibm.storage.ts4500.doc/ts4500\\_library\\_structure.html](https://www.ibm.com/support/knowledgecenter/en/STQRQ9/com.ibm.storage.ts4500.doc/ts4500_library_structure.html)

### QUESTION 35

Which non-concurrent capacity upgrade is possible for a customer with an IBM FlashSystem 900?

- A. Systems purchased with eight 2.9 TB flash modules can be expanded to twelve 2.9 TB flash modules.
- B. Systems purchased with eight 5.7 TB flash modules can be expanded to twelve 2.9 TB flash modules.
- C. Systems purchased with eight 1.2 TB flash modules can be expanded to twelve 2.9 TB flash modules.
- D. Systems purchased with eight 1.2 TB flash modules can be expanded to twelve 5.7 TB flash modules.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

FlashSystem 900 can be populated with up to 12 x 1.2 TB IBM MicroLatency modules in increments of 4, 6, 8, 10, or 12; or up to 12 x 2.9 TB or 5.7 TB IBM MicroLatency modules in increments of 6, 8, 10, or 12.

These modules of either 1.2 TB, 2.9 TB, or 5.7 TB cannot be intermixed. Capacity can be upgraded by purchasing the AF23 (1.2 TB), AF24 (2.9 TB) or AF25 (5.7 TB) IBM MicroLatency module feature codes as MES upgrades. Here are the upgrade paths:

Using AF23 (1.2 TB)

Start with 2.4 TB and grow to 4.8 TB 7.2 TB 9.6 TB, or 12 TB

Using AF24 (2.9 TB)

Start with 5.8 TB and grow to 11.6 TB, 17.4 TB, 23.2 TB, or 29 TB

Using AF25 (5.7 TB)  
Start with 11.4 TB and grow to 22.8 TB, 34.2 TB, 45.6 TB, or 57 TB

References: <http://www.redbooks.ibm.com/technotes/tips1261.pdf>

### QUESTION 36

A customer issued an RFP to replace EMC Disks. Vendors are being asked to provide the best competitive advantage in their proposals.

What should the IBM proposal on an IBM FlashSystem A9000 include in the bid?

- A. All software features included in base price
- B. Flash cache
- C. HyperSwap migration
- D. Fully-automated software tiering

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**



### QUESTION 37

IBM has proposed IBM Spectrum Control for a customer who is currently using multiple vendor tools to manage a complex heterogenous storage environment.

How does IBM Spectrum Control do this?

- A. Simplifies single-pane of glass management
- B. Large-scale single name space
- C. Enables cloud-based management
- D. Heterogeneous data migration

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM Spectrum Control offers a single pane of glass to monitor the performance of all your IBM Spectrum Scale clusters.

References: <https://www.ibm.com/developerworks/community/blogs/869bac74-5fc2-4b94-81a2-6153890e029a/entry/test?lang=en>

**QUESTION 38**

A customer has released a RFP for a cloud solution to monitor and analyze storage usage on IBM Spectrum Virtualize and EMC disk. The proposed solution will replace on-site monitoring software.

Which product should the technical specialist recommend?

- A. IBM Spectrum Control Storage Insights
- B. IBM Electronic Service Agent
- C. IBM Storage Alert Manager
- D. IBM Spectrum Scale

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM Spectrum Control Storage Insights optimizes your on-premises storage infrastructure and data placement using predictive analytics in this cloud-based solution.

Incorrect Answers:

B: IBM Electronic Service Agent is a no-charge software tool that resides on your system to automatically and continuously monitor, collect, and submit hardware problem information to the IBM Electronic Support website. IBM Electronic Service Agent can also routinely collect and submit hardware, software, performance, and system configuration information, which might help IBM Support in diagnosing problems.

D: IBM Spectrum Scale, based on IBM General Parallel File System (GPFS™), is a proven, scalable, high-performance file management system that is being used extensively across multiple industries worldwide. IBM Spectrum Scale provides simplified data management and integrated information lifecycle tools capable of managing petabytes of data and billions of files, in order to address the growing cost of managing ever growing amounts of data.

References: <https://www.ibm.com/ms-en/marketplace/analytics-driven-data-management>

**QUESTION 39**

Which tool can be used to model the service time of the storage workload for a customer considering a storage consolidation to a new IBM storage platform?

- A. Disk Magic
- B. IBM Spectrum Control
- C. Arxscan
- D. Batch Magic

**Correct Answer:** A

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Disk Magic is a tool for sizing and modelling disk systems for various servers.

Using Disk Magic will provide you with more knowledge about how performance for your specific workloads will change under various growth and/or hardware configuration scenarios.

Incorrect Answers:

C: Arxscan delivers fast and meaningful reporting and analysis for any size and type of storage environment, providing capacity, utilization, performance and dozens of other important metrics for all types of physical and virtual storage platforms and supports all major vendors in one, light weight, affordable solution.

D: Batch Magic is a powerful application for tape and batch window tuning and capacity planning.

References: <http://www-304.ibm.com/partnerworld/gsd/showimage.do?id=25691>

#### **QUESTION 40**

A security policy for a customer specifies a need for similar methods to manage encryption keys for disk and tape storage. A recent proposal includes the IBM TS4500 and IBM Storwize V5030.

What should the technical specialist highlight?

- A. IBM Spectrum Control will manage encryption for both products.
- B. IBM Security Key Lifecycle Manager will manage keys for both products.
- C. The same USB key can contain the encryption keys for both products.
- D. IBM Spectrum Protect will provide encryption keys for both products.

**Correct Answer: B**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

IBM Security Key Lifecycle Manager for Dell Migration Customers centralizes, simplifies and automates the encryption key management process to help minimize risk and reduce operational costs. It offers robust key storage, serving and lifecycle management for IBM and non-IBM storage devices.

References: <http://www-03.ibm.com/software/products/en/key-lifecycle-manager-dell>

#### **QUESTION 41**

A customer wants to migrate from IBM DS5300 to an IBM FlashSystem V9000 and wants to determine reductions in physical storage requirements.



Which tool should the customer use?

- A. IBM Comprestimator Utility
- B. Capacity Magic
- C. IBM Storage Tier Advisor Tool
- D. Storage Consolidation Evaluation Tool hosted by Alinean

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Capacity Magic calculates the effective storage capacity of your current and future IBM Disk Subsystems through an easy-to-use graphical dialog. This tool is available to IBM Business Partners.

The IBM tool Capacity Magic can be used to verify capacity and space utilization plans.

Incorrect Answers:

A: The Comprestimator utility uses advanced mathematical and statistical algorithms to perform the sampling and analysis process in a very short and efficient way. The utility also displays its accuracy level by showing the maximum error range of the results achieved based on the formulas it uses. The utility runs on a host that has access to the devices that will be analyzed, and performs only read operations so it has no effect whatsoever on the data stored on the device.

C: The IBM Storage Tier Advisor Tool predicts whether the addition of Solid State Drive (SSD), Enterprise Drive and Nearline Drive capacity in conjunction with the Easy Tier function.

D: The IBM Systems Consolidation Evaluation Tool, from Alinean, Inc., can help you obtain an independent view of potential savings. In a matter of minutes you can see high level, quantifiable results for potential total cost of ownership and critical financial savings.

References: <https://www-01.ibm.com/support/docview.wss?uid=tss1wp102305&aid=1>

**QUESTION 42**

What does IBM require to verify a customer's environment before installation of an enterprise tape library?

- A. Butterfly study
- B. Submit a SCORE request
- C. Technical and delivery Assessment
- D. Product Installation and Planning guide

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

When you buy an IBM hardware product, the business partner or IBM will generally perform a Technical Delivery Assessment (TDA) meeting with you to insure that the solution you're going to buy is appropriate for your environment and meets your needs.

Incorrect Answers:

A: How do you easily move historic backup data from legacy environments and consolidate it with your current data? The answer is Migration Engine from Butterfly Software, an innovative and totally automated application. This extremely powerful software solution is specifically designed to migrate data quickly, safely, cost effectively and without disruption.

References: <http://joehertvik.com/an-ibm-technical-delivery-assessment-primer/>

**QUESTION 43**

A customer is refreshing a 300 TB multi-vendor storage environment with an IBM Storwize V7000 and needs all the storage advanced functionality features such as remote mirroring, thin provisioning and Easy Tier. The customer also requires capability for storage provisioning, VMware vCenter APIs, and performance monitoring.

Which product should the technical specialist recommend?

- A. IBM Virtual Storage Center
- B. IBM Spectrum Protect Suite
- C. IBM Spectrum Control Advanced Edition
- D. IBM Storwize V7000 full bundle



**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM Storwize V7000 provides the following benefits:

- Configurations up to 360 TB physical storage
- Built-in solid-state drive optimization
- Thin provisioning and nondisruptive migration of data
- IBM System Storage Easy Tier for automatically migrating data between storage tiers
- Metro Mirror and Global Mirror for replicating data synchronously or asynchronously between systems for backup efficiency
- Real-time compression for efficiently reducing disk capacity by up to 80%
- Easy to use graphical user interface
- Supports block workloads for simplicity and greater efficiency
- Resilience with IBM FlashCopy technology

Note: The IBM Storage Management Console for VMware vCenter is a software plug-in that integrates into the VMware vCenter server platform. It enables VMware

administrators to independently and centrally manage their storage resources on IBM storage systems. These resources include SVC, Storwize V7000, Storwize V3700, among other IBM storage systems.

References: IBM SAN Solution Design Best Practices for VMware vSphere ESXi, page 4  
<http://www.redbooks.ibm.com/redbooks/pdfs/sg248158.pdf>

#### QUESTION 44

A customer wants to storage system solution with proactive system health management. The customer has asked about advantages that the IBM FlashSystem A9000R offers.

Which feature should the technical specialist discuss?

- A. Grid architecture redundancy with hot standby
- B. Deduplication of data
- C. System call home feature
- D. Proactive phase out and self-healing mechanisms

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM FlashSystem A9000R also incorporates autonomic and proactive monitoring and self-healing features. These features enable preventive measures to preserve data redundancy before a component malfunction occurs.

References: IBM FlashSystem A9000R Product Guide, page 14  
<http://www.redbooks.ibm.com/redpapers/pdfs/redp5326.pdf>

#### QUESTION 45

A customer has experienced a high rate of drive failure and loss of data in its environment and is considering IBM XIV to replace the existing storage.

Which IBM XIV benefit should the technical specialist highlight to the customer?

- A. Distributed cache
- B. Fast rebuild speed
- C. Distributed RAID
- D. IBM Hyper-Scale

**Correct Answer:** B

**Section:** (none)

## Explanation

### Explanation/Reference:

When an IBM XIV disk fails, all disks in the system participate in the rebuild. The outcome? It takes less time for the XIV system to restore full redundancy. For example, if a disk on a fully used 1 TB drive system fails, XIV restores full redundancy in an average of 30 minutes or less, and without a significant performance penalty. Traditional RAID systems might take up to a day to restore data reliability, with performance compromised during rebuild. The fast XIV rebuild time means that your data spends less time that is exposed to risk. In this way, the XIV system actually protects your data more than traditional enterprise storage systems can.

Incorrect Answers:

D: IBM Hyper-Scale Mobility is a no-cost feature introduced in XIV Storage System software. The feature allows users to move volumes from one XIV System Gen3 to another XIV System Gen3 with no interruption before, during, and after the migration.

### QUESTION 46

Which feature of a base IBM XIV system is a technical advantage over competitive storage arrays?

- A. Always-on Compression
- B. SSD adaptive read caching
- C. Hot encryption
- D. IBM Spectrum Control Software

**Correct Answer: C**

**Section: (none)**

**Explanation**

### Explanation/Reference:

Uniquely among IBM products, the XIV Storage System offers hot encryption. When encryption is enabled on the XIV system, all data that resides on it is encrypted within minutes, with no performance impact.

References: [https://www.ibm.com/support/knowledgecenter/en/STJTAG/com.ibm.help.xiv.doc/xiv\\_elearning\\_reinventingstoragewithxivscript.html](https://www.ibm.com/support/knowledgecenter/en/STJTAG/com.ibm.help.xiv.doc/xiv_elearning_reinventingstoragewithxivscript.html) IBM XIV Security with Data-at-Rest Encryption, page 2

### QUESTION 47

Which statement correctly applies to PRO and Copy Data Services?

- A. RPO is the minimum time interval that a mirrored volume or consistency group lag behind the source volume
- B. Volumes backed up from clones do not affect RPO.
- C. RPO is a pre-defined parameter based on the type of replication selected.
- D. Multiple consistency groups can be supported with asynchronous mirroring for different RPOs.

**Correct Answer: D**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

Consistency groups creates a consistent point-in-time copy of multiple volumes, with negligible host impact. You can enable FlashCopy consistency groups from the DS CLI.

Note: Recovery Point Objective (RPO) describes the interval of time that might pass during a disruption before the quantity of data lost during that period exceeds the Business Continuity Plan's maximum allowable threshold or "tolerance."

References: <https://www.druva.com/blog/understanding-rpo-and-rto/>

**QUESTION 48**

A customer is interested in purchasing an IBM TS7650G ProtecTIER Gateway for its production site and one for replication at its DR site. The DR site is a target only site.

How is the cost of the solution affected by the replication?

- A. ProtecTIER replication is included with base license.
- B. ProtecTIER replication is included with hardware and no license is required.
- C. ProtecTIER replication licensing is required at both sites.
- D. ProtecTIER replication licensing is required at the primary site only.

**Correct Answer: C**

**Section: (none)**

**Explanation**

**Explanation/Reference:**

You must have a license for the replication feature for each ProtecTIER server in the replication grid.

References: [https://www.ibm.com/support/knowledgecenter/en/STVRB7\\_3.2.0/ts7650jpg\\_replication.html](https://www.ibm.com/support/knowledgecenter/en/STVRB7_3.2.0/ts7650jpg_replication.html)

**QUESTION 49**

A mainframe customer is considering moving from a native tape environment to a virtualized environment across two sites. A study has shown that it needs more than one IBM TS7700 at each site for performance and capacity reasons.

What is the benefit of using IBM TS7700 hybrid grid?

- A. It allows the customer to write data to the optimal storage hardware for each workload type.
- B. It allows clusters to connect using both FC and IP networks.

- C. It provides double the number of logical volumes.
- D. It permits a combination of IBM TS1130 and IBM TS1140 drives in one cluster.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

All TS7700 models can coexist in a grid. If only a disk and a tape-attached model are combined, that configuration is called a hybrid grid.

#### **QUESTION 50**

A cloud service provider is looking to provide a scalable solution that provides quality of service capabilities, ease of management, deduplication, and integration with OpenStack and VMware while providing sub-millisecond response time.

Which solution should the technical specialist recommend?

- A. IBM Storwize V5010
- B. IBM FlashSystem 900
- C. IBM FlashSystem A9000R
- D. IBM Spectrum Scale

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM FlashSystem A9000 can use the well-established IBM code base for OpenStack and REST API support.

IBM Spectrum Control Base V3.0 allows a simplified deployment and efficient integration of IBM FlashSystem A9000 with the VMware vCloud suite.

The FlashSystem A9000R data reduction node implements data deduplication and compression functions.

A9000 provides consistent and predictable microsecond response times and simplicity that you need.

References: <http://www.redbooks.ibm.com/redpapers/pdfs/redp5325.pdf>

IBM FlashSystem A9000 Product Guide

#### **QUESTION 51**

A customer's compliance department requires that data is kept for ten years. The data must be available as needed, and the customer must ensure that the data cannot be modified.

Which technology should the specialist recommend?

- A. NVMe flash
- B. SED drives
- C. NL-SAS drives
- D. WORM tape cartridges

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Write-once, read-many (WORM) tape cartridge characteristic. WORM format pervades the entirety of every WORM cartridge. The WORM tape media is formatted to give every block on a WORM cartridge write-once, read-many protection. Additionally, the cartridge memory (CM) has a WORM indicator byte in the cartridge type field.

Incorrect Answers:

A: NVM Express (NVMe) or Non-Volatile Memory Host Controller Interface Specification (NVMHCI) is a logical device interface specification for accessing non-volatile storage media attached via a PCI Express (PCIe) bus. The acronym NVM stands for non-volatile memory, which is commonly flash memory that comes in the form of solid-state drives (SSDs).

B: An SED is a self-encrypting hard drive with a circuit built into the disk drive controller chip that encrypts all data to the magnetic media and decrypts all the data from the media automatically. All SEDs encrypt all the time from the factory onwards, performing like any other hard drive, with the encryption being completely transparent or invisible to the user.

References: [https://www.ibm.com/support/knowledgecenter/en/STPRH6/com.ibm.storage.drives.doc/con\\_3592ipg\\_worm\\_characteristics.html](https://www.ibm.com/support/knowledgecenter/en/STPRH6/com.ibm.storage.drives.doc/con_3592ipg_worm_characteristics.html)

**QUESTION 52**

A customer has an existing IBM XIV Gen3 solution with 3 TB drives and nine modules. While performance is acceptable, the customer wants to increase the performance of small-block reads. The current nine modules are running at 60% of capacity.

Which solution should the technical specialist recommend?

- A. Add the SSD caching option on five modules.
- B. Add the SSD caching option on all nine modules.
- C. Add IBM Spectrum Control Software with an IBM FlashSystem 900.
- D. Add three more data modules to improve performance.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

SSD Caching improves small-block random read performance. SSD Caching in the XIV system can improve performance of any workload that is suffering from high latency due to a high amount of small-block random read misses.

Consider a situation where you do not have an XIV system yet, but you want to know whether you might benefit from by extending the XIV with SSD Caching. On most storage systems, you can inspect I/O statistics and determine whether a workload can benefit from SSD Caching. If the storage system has granular reporting, you can take the following steps:

Sort your workload by read and write percentages.

The read portion of the workload can potentially benefit from the SSD Caching. A typical candidate workload for SSD Caching consists of 80% reads and 20% writes.

Etc.

References: <http://www.redbooks.ibm.com/redpapers/pdfs/redp4842.pdf>  
Solid-State Drive Caching in the IBM XIV Storage System (May 2012), page 20

**QUESTION 53**

When implementing disk encryption on an existing IBM TS7700, which action does a client need to take for the existing virtual volumes to be encrypted after the encryption feature is enabled?

- A. No additional customer action is required once encryption is enabled.
- B. The copy refresh command must be issued for each of the existing volumes.
- C. Any existing volumes will have to expire and be reused before being encrypted.
- D. The customer must assign existing virtual volumes with a new encryption policy.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

An encryption policy configuration is the set of rules, or policies, that specify which volumes are to be encrypted.

References: <https://www-01.ibm.com/support/docview.wss?uid=ssg1S7005315&aid=1>  
IBM TS7700 Version 4 Release 1, Introduction and Planning Guide, page 123

**QUESTION 54**

How does an IBM XIV System provide a guarantee of consistent performance even under the most dynamically changing elastic cloud workload environments?

- A. Built in performance monitoring of key resources
- B. Support for multiple versions of OpenStack software



- C. Use of a distributed grid architecture
- D. Capacity on Demand addition of useable storage

**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM XIV Cloud Storage for Service Providers, or client hosted cloud solutions require elastic, rapid response, and dynamic demand that is captured within XIV's 485 TB linear scalability, and the immediate and automatic redistribution, without interruption, of added capacity. The grid design stripes data across all modules and disks, incorporating data redundancy for consistent and predictable I/O performance that is always load balanced.

Incorrect Answers:

D: With Capacity on Demand (CoD) you effectively buy a certain amount of capacity up front but also get up to 3 more modules shipped with the machine. You can start using this extra capacity when your business requirements demand it, at which point you will be asked by IBM to purchase it. The advantage here is that you physically get a bigger machine up front with all the performance benefits that bestows, plus you don't have to contact IBM to start using that extra capacity.

References: <http://www.redbooks.ibm.com/abstracts/tips1238.html?Open>

#### **QUESTION 55**

A customer with a minimum IBM XIV configuration is upgrading to a full rack and plans to add SSDs for performance.

How many SSDs would be added during this upgrade?

- A. 12
- B. 9
- C. 6
- D. 15

**Correct Answer:** B

**Section:** (none)

**Explanation**

**Explanation/Reference:**

A minimally populated rack for models 281x-114 and 281x-214 contains three data modules and three interface modules, for a total of six modules. A fully populated rack contains nine data modules and six interface modules, for a total of 15 modules.

References: [https://www.ibm.com/support/knowledgecenter/en/STJTAG/com.ibm.help.xivgen3.doc/Gen3/PG/xiv\\_pln3rackconfigurations.html](https://www.ibm.com/support/knowledgecenter/en/STJTAG/com.ibm.help.xivgen3.doc/Gen3/PG/xiv_pln3rackconfigurations.html)

#### **QUESTION 56**

A customer has locations in Singapore, London, and Denver and is considering IBM Spectrum Scale for its unstructured data.

How does IBM Spectrum Scale benefit this customer?

- A. It provides enterprise grade encryption.
- B. It is a cloud-only offering.
- C. It is a product with native CIFS support.
- D. It offers a global namespace.

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM Spectrum Scale provides a global namespace.

References: [https://www.ibm.com/support/knowledgecenter/en/STXKQY\\_4.2.1/com.ibm.spectrum.scale.v4r21.doc/bl1ins\\_intro.htm](https://www.ibm.com/support/knowledgecenter/en/STXKQY_4.2.1/com.ibm.spectrum.scale.v4r21.doc/bl1ins_intro.htm)

#### **QUESTION 57**

Which solution meets a customer's requirements for 100,000 IOPS, lowest latency, and maximum of 30 TB of raw capacity for an Oracle database?

- A. IBM FlashSystem A9000
- B. IBM Storwize V7000F
- C. IBM FlashSystem V9000
- D. IBM FlashSystem 900

**Correct Answer:** D

**Section:** (none)

**Explanation**

**Explanation/Reference:**

IBM FlashSystem 900 is designed to accelerate the applications that drive business – like those using an Oracle Database.

IBM FlashSystem 900 can scale usable capacity from as low as 2 TB to as much as 57 TB in a single system.

FlashSystem 900 delivers Tier 0 top application performance with up to 1.1 million 100% random read IOPS and 600,000 100% random write IOPS.

Incorrect Answers:

C: IBM FlashSystem V9000 is designed to accelerate all types of applications and infrastructures, but it is most often deployed to support high-performance database applications such as those based on Oracle Database

Up to 32 PB of external storage can be managed by a single IBM FlashSystem V9000 array.

References: <https://www.ibm.com/us-en/marketplace/flash-storage>

#### QUESTION 58

What should the technical specialist explain when describing the addition of grid elements to an IBM FlashSystem A9000R?

- A. Up to 12 MicroLatency modules can be attached to a grid element.
- B. Six elements must be grown to nine elements initially.
- C. Element interface options must be the same type.
- D. MicroLatency module size can be intermixed.

**Correct Answer: C**

**Section: (none)**

**Explanation**

#### Explanation/Reference:

Grid elements installed must all be the same type (interface options and MicroLatency module size). An intermix of interface options or MicroLatency module capacities is not supported.

Note: Two grid controllers and one flash enclosure are combined to make one grid element.

Capacity, caching, and processing power are added at the same time by adding in one or more grid elements to scale up.

IBM Flash System A9000R consists of 2 - 6 grid elements, where a partially populated rack (2 - 5 grid elements) is expanded by adding grid elements to the maximum number of six-grid elements.

Incorrect Answers:

A: Each flash enclosure includes 12 flash modules (MicroLatency modules), battery modules, power supplies, and two fully redundant canisters,

B: IBM Flash System A9000R consists of 2 - 6 grid elements.

D: The capacity of all MicroLatency modules across all grid elements in IBM FlashSystem A9000R must be the same.

References: <http://www.redbooks.ibm.com/redpapers/pdfs/redp5326.pdf>

IBM FlashSystem A9000R Product Guide, page 10

#### QUESTION 59

A customer has a two-frame IBM TS4500 Tape Library with 24 IBM TS1150 drives. The L frame is the left-most frame and the customer wants to add slots for 1100 cartridges. The available physical space in the data center is limited, so high density (HD) frames are needed. The customer has some existing IBM TS3500 storage frames that could be repurposed.

What does the customer need to understand about the upgrade?

- A. The IBM TS3500 storage frames must be installed to the right of the L frame.
- B. A redeployed IBM TS3500 storage frame must be the last (right-most) frame.
- C. An IBM TS3500 storage frame must be upgraded to HD2 before it can be redeployed.
- D. One IBM TS3500 storage frame may be installed and must be frame position one.

**Correct Answer:** A

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Leverage flexibility that enables the library to grow from both the right and the left side of the first L frame since models can be placed in any active position.

References: <https://www.ibm.com/us-en/marketplace/ts4500>

#### **QUESTION 60**

A customer wants to replace its legacy block storage environment with a new IBM FlashSystem A9000R solution and is concerned about properly estimating consolidated storage capacity after deduplication and compression savings.

Which tool should be used?

- A. IBM Comprestimator
- B. IBM Storage Tier Advisor Tool
- C. IBM Data Reduction Estimator Tool
- D. Capacity Magic



**Correct Answer:** C

**Section:** (none)

**Explanation**

**Explanation/Reference:**

Data Reduction Estimator tool is a command-line host-based utility for estimating the data reduction saving on block devices.

In order to help with the profiling and analysis of existing user workloads that need to be migrated to a new system, IBM provides a highly accurate data reduction estimation tool which supports both deduplication and compression. The tool operates by scanning target workloads on any legacy storage array (IBM or 3rd party) and then merging all scan results to provide an integrated system level data reduction estimate.

References: [https://delivery04.dhe.ibm.com/sar/CMA/SSA/06hb9/3/Data\\_Reduction\\_Estimation\\_Tool-1.02.htm](https://delivery04.dhe.ibm.com/sar/CMA/SSA/06hb9/3/Data_Reduction_Estimation_Tool-1.02.htm)