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QUESTION 1

Which values are required to enter a generic workload into the XtremIO Sizing Tool?

A. Capacity, IOPs, R/W ratio

B. IOPs, I/O size, bandwidth

C. IOPs, bandwidth, latency

D. Bandwidth, I/O size, latency

Correct Answer: C

IDC outlines a criteria some criteria for selecting a testing tool:

*

Generate workloads

*

Capture results for analysis: Throughput IOPS Latency

References: http://emc.co/collateral/technical-documentation/h15280-euc-xendesktop-vsphere-xtremiosg.pdf, page 87
http://info.xtremio.com/rs/xtremio/images/IDC_Flash_Array_Test_Guide.pdf, page 7

QUESTION 2

Table 1. Sustained remote replication throughput per RPA (MB/s)			
Configuration	**IP**		**Over FC**
	Without compression	**With compression**	
Between XtremIO arrays	80	240	300
XtremIO to non-XtremIO	80	90	90
Continuous replication from non-XtremIO to XtremIO	110	300	300
Snap-based replication from VNX to XtremIO	110	150	150

Refer to the Exhibit.

A customer has the following XtremIO environment: Read/write ratio is 3:1 I/O size is 8K Write pattern is random Data is compressible

If an application generates 100,000 IOPS of traffic, how many RPAs are needed to replicate the traffic from one XtremIO array to another XtremIO array over IP?

A. 1

B. 2

C. 3

D. 4

Correct Answer: C

Required bandwidth= 100,000 * 8 * 1024 bytes Provided bandwidth between XtremIO arrays with compression over Fiber Channel: 300 * 1024 * 1024 bytes

Required number of RPAs: 100,000 * 8 * 1024 / (300 * 1024 * 1024) = 800,000 / (300 * 1024) = 2.6. Three RPAs would be enough.

QUESTION 3

You need to design an Oracle solution for a customer. Which XtremIO best practices should be used in Oracle environments?

A. Use a 512 byte LUN sector size for databases. Use Eager Zeroed Thick formatting for ESXi

B. Use a 4 kB LUN sector size for databases. Use Lazy Zeroed Thick formatting for ESXi

C. Align data on 4 kB boundaries. Use Thin formatting on ESXi

D. Align data on 4 kB boundaries. Use Lazy Zeroed Thick formatting on ESXi

Correct Answer: A

The default setting for XtremIO volumes is 512e. It is recommended not to alter this in order to use 4K Advanced Format for Oracle Database deployments. There are no performance ramifications when using 512e volumes in conjunction with an Oracle database. On the contrary, 4K Advanced Format is rejected by many elements of the Oracle and Linux operating system stack.

References: https://www.emc.com/collateral/white-papers/h13497-oracle-best-practices-xtremio-wp.pdf, page 20

QUESTION 4

What is considered typical performance for an XtremIO single X-Brick cluster?

A. Small block writes: 200k-250k IOPs. Large block reads: up to 2.5 GB/s

B. Small block writes: 200k-250k IOPs. Large block writes: up to 2.5 GB/s

C. Small block reads: 200k-250k IOPs. Large block writes: up to 2.5 GB/s

D. Small block reads: 200k-250k IOPs. Large block reads: up to 2.5 GB/s

Correct Answer: C

Choose an EMC XtremIO system and scale out linearly by adding more XtremIO X-Bricks.

System	Raw Capacity	Read/Write IOPS	Read IOPS
Starter X-Brick	5 TB	150K	250K
1 X-Brick	10, 20, or 40 TB	150K	250K
2 X-Brick Cluster	20, 40, or 80 TB	300K	500K
4 X-Brick Cluster	40, 80, or 160 TB	600K	1M
6 X-Brick Cluster	120 or 240 TB	900K	1.5M
8 X-Brick Cluster	160 or 320 TB	1.2M	2M

References: https://store.emc.com/en-us/Product-Family/EMC-XtremIO-Products/EMC-XtremIO-All-FlashScale-Out-Array/p/EMC-XtremIO-Flash-Scale-Out

QUESTION 5

How many management IP addresses are required on a single XtremIO storage controller?

A. 1

B. 2

C. 3

D. 4

Correct Answer: A

References: https://docs.openstack.org/juno/config-reference/content/XtremIO-cinder-driver.html#xtremiomanagement-ip

QUESTION 6

How can REST API commands be run to manage and monitor an XtremIO cluster?

A. From the REST API CLI built into each X-Brick

B. From the REST API GUI built into each X-Brick

C. From a third-party GUI

D. From the REST API tab in the XMS GUI

Correct Answer: C

The XtremIO\\'s RESTful API allows HTTPS-based interface for automation, orchestration, query and provisioning of the system. With the API, third party applications can be used to control and fully administer the array.

Normally you would access the API using some form of programming/scripting language, such as Python or Perl.

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However for the purposes of learning or testing concepts there are a number of tools that work better, such as HTTPRrequester and curl.

*

Curl is a command-line tool that exists in all Linux distributions, and is available for most other Unix OSes as well as Windows. To use curl to access XtremIO you\'ll need to pass it a few options, such as the username/password to access the array (any valid account on the XtremIO XMS will work), the URL of the API, and potentially a few options such as -k to tell curl not to validate the SSL certificate (presuming you don\'t have a valid certificate installed), and -s (silent) to stop curl displaying it\'s progress as it downloads the response.

*

HTTPRequester is a browser extension that is available for both Chrome and Firefox. As with for curl, you\'ll need to provide a username/password, which is done by clicking on the

"Authentication..." box, which adds two boxes below the URL for the username and the password.

References: https://blog.docbert.org/using-the-xtremio-rest-api-part-1/
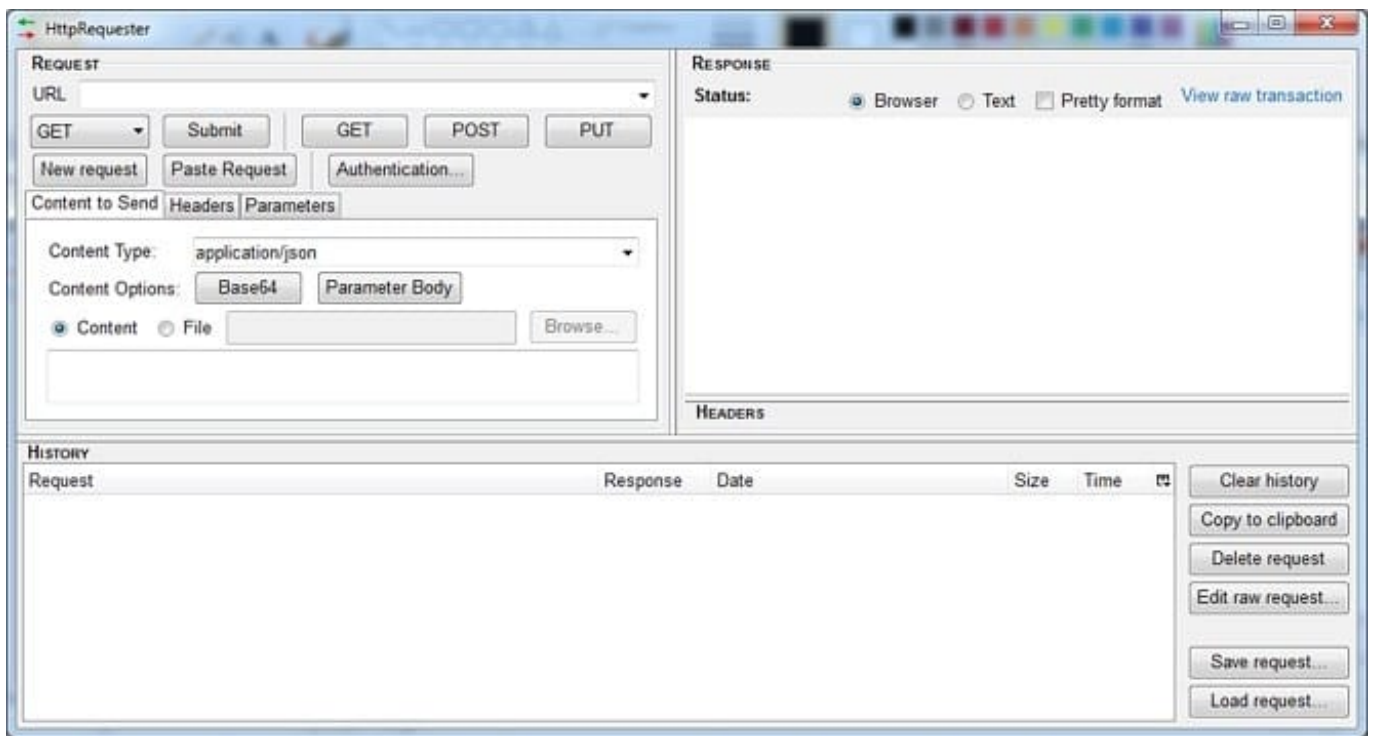
QUESTION 7

A customer is considering XtremIO storage for their current Virtual Desktop Infrastructure (VDI) deployment. The customer wants information on the benefits of an XtremIO solution.

What are the benefits of an XtremIO solution for this environment?

A. Latency is less than 1 ms for all large I/O sizes, deduplication with compression, and scales linearly

B. Latency is less than 1 ms for large I/O sizes, deduplication and compression, and no reduction in power and cooling costs

C. Latency is less than 1 ms for small I/O sizes, scales linearly, and slightly higher cost/IOP/GB than hybrid arrays

D. Latency is less than 1 ms for small I/O sizes, deduplication and compression, and scales linearly

Correct Answer: A

Storage capacity and performance scale linearly, such that two X-Bricks supply twice the IOPS, four X-Bricks supply four times the IOPS, six X-Bricks supply six times the IOPS and eight X-Bricks supply eight times the IOPS of the single X- Brick configuration. However, the latency remains consistently low (less than 1ms) as the system scales out. The sub-millisecond latency is validated by actual test results, and is determined according to the worst-case scenario.

References: Introduction to the EMC XtremIO STORAGE ARRAY (April 2015), page 37

QUESTION 8

When using XtremIO storage with Solaris (SPARC), what is the EMC recommended I/O size that will deliver sequential I/O more efficiently to XtremIO?

A. 1 MB

B. 2 MB

C. 4 MB

D. 8 MB

Correct Answer: C

EMC recommended setting for Solaris include that the /etc/system file be modified to include the following parameter:

* Set maximum IO size

set maxphys = 0x400000

This also requires increase of the maximum I/O size for the disk driver. The corresponding entry and file for

this change are different for different Solaris versions, as follows:

For Solaris 10 (SPARC):

File: /kernel/drv/ssd.conf

Setting: ssd_max_xfer_size=0x400000;

For Solaris 10 (x86):

File: /kernel/drv/sd.conf

Setting: sd_max_xfer_size=0x400000;

Etc.

References: EMC Host Connectivity Guide for Oracle Solaris, page 167

https://www.emc.com/collateral/TechnicalDocument/docu5132.pdf

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QUESTION 9

A customer has recently deployed an XtremIO 20 TB two X-Brick cluster to run an existing instance of Oracle RAC previously leveraging VNX for back-end storage. The application environment uses a block size of 1 MB. Multiple tables are in use with the PARALLEL_DEGREE_POLICY variable set to AUTO.

The customer wants your help with tuning the DB_FILE_MULTIBLOCK_READ_COUNT parameter for best performance with XtremIO. Which values should be recommended for tuning the DB_FILE_MULTIBLOCK_READ_COUNT parameter in the Oracle RAC environment?

A. 8 or 16

B. 24 or 32

C. 64 or 128

D. 256 or 512

Correct Answer: C

Oracle Database performs I/O on data files in multiples of the database block size (db_block_size), which is 8KB by default. The default Oracle Database block size is optimal on XtremIO. XtremIO supports larger block sizes as well. In the case of multiblock I/O (e.g., table/index scans with access method full), one should tune the Oracle Database initialization parameter db_file_multiblock_read_count to limit the requests to 128KB. Therefore, the formula for db_file_multiblock_read_count is: db_file_multiblock_read_count = 128KB / db_block_size

In our case the block size is 1 MB, so the formula db_file_multiblock_read_count is 1 MB/ 8KB = 1024/8 = 128

References: https://www.emc.com/collateral/white-papers/h13497-oracle-best-practices-xtremio-wp.pdf, page 21

QUESTION 10

A storage administrator is configuring SAN switches and zoning to connect an eight X-Brick XtremIO array. A VMware ESXi server is hosted on a blade chassis with 16 HBA ports. In addition, the SAN is composed of two separate SAN switches.

What is the recommended XtremIO best practice for zoning?

A. Two HBA connections per host connected to a single switch Multiple initiators/multiple targets per zone Maximum of 4 paths for each LUN per zone

B. Connect a single storage controller to the first switch Connect a second storage controller to the second switch Single initiator/multiple targets per zone Maximum of 6 paths for each LUN per zone

C. Connect all N1 storage controllers to the first switch Connect N2 storage controllers to the second switch Multipath all host ports to single LUNs per zone Maximum of 4 paths for each LUN per zone

D. Multiple HBA connections per host Single initiator/single target per zone Maximum of 2 paths to each X-Brick for each initiator Each host connected to each SAN switch

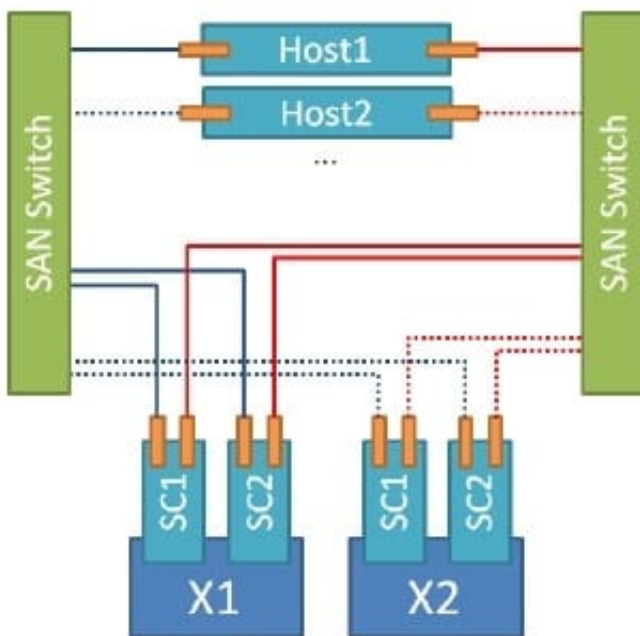Correct Answer: B

In an environment where a host with two HBAs (VMware Best Practice) is connected to two fabrics and storage array

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with two Storage Controllers (EMC VNX, for example) the host will have four paths to a LUN: 2 Controllers x 2 HBAs = 4 paths

If you go to the extreme and configure your XtremIO with eight X-Brick, you have 16 controllers. Again, two HBAs per host and the max number of LUNs you can attach to an ESXi host will be 32... I understand, different OS\\'es may have different limits than VMware and this logic will not be applicable.

If you have hit the limit of 1024 paths per host (1024 / 4 controllers / 2 HBAs = 128 LUNs) and need to provision more LUNs, the best way will be to re-zone the host to limit the number of X-Bricks / Controllers the host HBA can connect to.

The following diagram displays the logical connection topology for 4 paths.

Incorrect Answers:

D: Eliminate single-initiator to single-target zones.

References: http://vstrong.info/2015/11/18/vmware-host-zoning-for-multi-x-brick-emc-xtremio-storagearray/

QUESTION 11

Which part of the XtremIO architecture do host ports use to access an XtremIO volume?

A. FA

B. Initiator

C. Target

D. Zone

Correct Answer: D

All XtremIO\\'s enterprise features (including Inline Data Reduction, snapshots, XDP, HA, etc.) have been developed as

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part of the scale-out architecture. All data and metadata are evenly distributed across the entire cluster. I/Os are admitted to the array via all the host ports, utilizing SAN zones and multi-pathing.

References: Introduction to the EMC XtremIO STORAGE ARRAY (April 2015), page 39

QUESTION 12

A customer wants to purchase an XtremIO array. After the array is installed, the customer wants to initially disable encryption. What is the result of enabling encryption on an array that is already being used?

A. Data will remain in place but the XtremIO cluster services will need to be temporarily shutdown.

B. Data will remain in place and there will be no interruption to the XtremIO cluster services.

C. Data will be erased but there will be no interruption to the XtremIO cluster services.

D. Data will be erased and the XtremIO cluster services will be temporarily shutdown.

Correct Answer: A

Disable Encryption and Non-Encrypted Models This version [Ver. 4.0.2-65] allows disabling the Data at Rest Encryption (DARE), if desired. Disabling and Enabling is done when the cluster is stopped.

References: https://samshouseblog.com/2015/12/29/new-features-and-changes-in-xtremio-ver-4-0-2-65/

QUESTION 13

A customer has purchased a two X-Brick XtremIO array with a physical XtremIO Management Server (XMS). The customer plans to use all Fibre Channel connectivity in the environment.

What are the physical connectivity requirements for the cluster?

A. 1 Copper Ethernet connection, 4 Fibre Channel Optical connections

B. 3 Copper Ethernet connections, 8 Fibre Channel Optical connections

C. 4 Copper Ethernet connections, 16 Fibre Channel Optical connections

D. 5 Copper Ethernet connections, 8 Fibre Channel Optical connections

Correct Answer: B

EMC XTREMIO 4.0 SYSTEM SPECIFICATIONS

Host Connectivity (Based on number of X-Bricks in the array)	Starter X-Brick	1 X-Brick	2 X-Brick Cluster	4 X-Brick Cluster	6 X-Brick Cluster	8 X-Brick Cluster
Fibre Channel Ports (8Gbps)	4	4	8	16	24	32
iSCSI Ethernet Ports (10Gbps)	4	4	8	16	24	32

Management	Starter X-Brick	1 X-Brick	2 X-Brick Cluster	4 X-Brick Cluster	6 X-Brick Cluster	8 X-Brick Cluster
Ethernet Ports (1Gbps)	2	2	4	8	12	16

References: http://www.aecl.com/AECWeb/media/Assets/PDF/h12451-xtremio-4-system-specificationsss.pdf

QUESTION 14

A customer has a large ESX server environment they are considering deploying to XtremIO for a VDI implementation. To determine a baseline of the environment, you are proceeding with documenting each server\\'s CPU, NIC, and disk utilization statistics. The customer has provided you with direct CLI access to the servers to conduct this assessment.

Which utility should be used to monitor these performance parameters?

A. esxtop

B. resxtop

C. top

D. iostat

Correct Answer: B

resxtop is a command to retrieve performance statistics. This command is included in vSphere command line interface (CLI) and is part of the vSphere Management Assistant (vMA), which is an equivalent to esxtop that runs only inside an ESX service console.

Incorrect Answers:

A: esxtop runs only inside an ESX service console.

D: Use the iostat command to report statistics about disk input and output, and to produce measures of throughput, utilization, queue lengths, transaction rates, and service time.

References: www.emc.com/collateral/TechnicalDocument/docu5265.pdf, page 22

QUESTION 15

What are common storage array mechanisms?

A. Log structuring and RAID

B. Post-processing and metadata logging

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C. RAID and metadata log structuring

D. Metadata logging and RAID

Correct Answer: B

XtremIO\\'s snapshot technology is implemented by leveraging the content-aware capabilities of the system (Inline Data Reduction), optimized for SSD media, with a unique metadata tree structure.

XtremIO leverages a proprietary flash-optimized data protection algorithm (XtremIO Data Protection or XDP), which provides performance that is superior to any existing RAID algorithm.

References: Introduction to the EMC XtremIO STORAGE ARRAY (April 2015), page 33

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