

❑ EASY (10 Questions)

Q1. What is virtualization primarily used for?

- A. Increasing hardware size
 - B. Running multiple operating systems on a single physical machine
 - C. Improving network bandwidth
 - D. Reducing software licensing cost
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Q2. Which component is responsible for managing virtual machines?

- A. Guest OS
 - B. Application Server
 - C. Hypervisor
 - D. BIOS
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Q3. Type-1 hypervisor is also known as:

- A. Hosted hypervisor
 - B. Bare-metal hypervisor
 - C. Application hypervisor
 - D. Desktop hypervisor
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Q4. Which virtualization technique allows multiple OS instances to share the same kernel?

- A. Hardware virtualization
 - B. Full virtualization
 - C. Operating System virtualization
 - D. Para-virtualization
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Q5. A snapshot of a virtual machine is best described as:

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- A. A copy of the physical disk
 - B. A live migration
 - C. A point-in-time state of a VM
 - D. A VM template
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Q6. Which of the following is a common open-source SAN solution?

- A. VMware ESXi
 - B. FreeNAS
 - C. Hyper-V
 - D. Docker
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Q7. ZFS primarily combines which two functions?

- A. File system and hypervisor
 - B. RAID controller and OS
 - C. File system and volume manager
 - D. SAN and NAS
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Q8. Object storage primarily stores data as:

- A. Blocks
 - B. Files
 - C. Objects
 - D. Volumes
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Q9. Which protocol is commonly used for IP-based storage?

- A. FTP
 - B. iSCSI
 - C. SMTP
 - D. SNMP
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Q10. In cluster computing, a node refers to:

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- A. A network switch
 - B. A single server in the cluster
 - C. A storage device
 - D. A virtual disk
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MEDIUM (15 Questions)

Q11. Which key feature differentiates Type-1 from Type-2 hypervisors?

- A. Type-1 runs on top of an OS
 - B. Type-2 has direct hardware access
 - C. Type-1 runs directly on hardware
 - D. Type-2 does not support virtualization
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Q12. Para-virtualization improves performance by:

- A. Eliminating the need for a hypervisor
 - B. Allowing guest OS to be aware of virtualization
 - C. Using physical hardware only
 - D. Disabling CPU virtualization extensions
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Q13. Which VM management feature is MOST suitable for rapid deployment of identical VMs?

- A. Snapshot
 - B. Cloning
 - C. Template
 - D. Live migration
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Q14. In operating system virtualization, isolation is achieved using:

- A. Hypervisors
- B. Virtual BIOS
- C. Kernel namespaces and cgroups
- D. Hardware emulation

Q15. Which cluster architecture is designed for high availability?

- A. Load-balancing cluster
 - B. Compute cluster
 - C. Storage cluster
 - D. Failover cluster
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Q16. A cluster heartbeat is primarily used to:

- A. Synchronize storage
 - B. Monitor node health
 - C. Balance network load
 - D. Manage snapshots
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Q17. In FreeNAS, ZFS datasets are mainly used to:

- A. Configure network interfaces
 - B. Organize and manage storage
 - C. Manage users
 - D. Enable virtualization
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Q18. Which ZFS feature ensures data integrity?

- A. Thin provisioning
 - B. Deduplication
 - C. Copy-on-Write
 - D. Compression
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Q19. For SAN-based high availability, which component is MOST critical?

- A. RAID controller
 - B. Shared storage
 - C. Backup server
 - D. Snapshot scheduler
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Q20. Which IP-based storage protocol operates at the block level?

- A. NFS
 - B. SMB
 - C. iSCSI
 - D. HTTP
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Q21. Object storage is MOST suitable for:

- A. Transactional databases
 - B. Operating system disks
 - C. Unstructured data and backups
 - D. Swap partitions
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Q22. Which cluster requirement ensures minimal service downtime?

- A. Scalability
 - B. High availability
 - C. Throughput
 - D. Latency
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Q23. In a ZFS pool, vdevs are used to:

- A. Manage network traffic
 - B. Group physical disks
 - C. Assign IP addresses
 - D. Create snapshots
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Q24. Which SAN feature allows multiple hosts to access the same storage?

- A. Local disk caching
 - B. Shared block access
 - C. Object replication
 - D. File locking
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Q25. A VM clone differs from a snapshot because a clone:

- A. Is temporary
 - B. Cannot be powered on
 - C. Creates an independent VM
 - D. Stores only metadata
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HARD (15 Questions)

Q26. Which scenario BEST justifies the use of Type-1 hypervisors?

- A. Desktop application testing
 - B. Enterprise data center virtualization
 - C. Single-user workstation
 - D. Development laptops
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Q27. Hardware virtualization relies on which CPU feature?

- A. RAID
 - B. NUMA
 - C. Intel VT-x / AMD-V
 - D. BIOS shadowing
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Q28. A major limitation of OS-level virtualization is:

- A. High overhead
 - B. Poor performance
 - C. Inability to run different kernels
 - D. Limited scalability
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Q29. In cluster architecture, split-brain conditions occur when:

- A. Storage runs out of space
 - B. Nodes lose synchronization and act independently
 - C. Snapshots fail
 - D. Network bandwidth increases
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Q30. Which FreeNAS component manages ZFS pools?

- A. Middleware
 - B. Web UI
 - C. ZFS Volume Manager
 - D. Hypervisor
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Q31. In SAN-based HA, fencing is used to:

- A. Isolate failed nodes
 - B. Expand storage
 - C. Enable replication
 - D. Create snapshots
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Q32. ZFS snapshots differ from traditional backups because they:

- A. Are stored offsite
 - B. Consume full disk space
 - C. Are instantaneous and space-efficient
 - D. Require downtime
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Q33. Which IP-based storage communication challenge affects performance MOST?

- A. Disk fragmentation
 - B. Network latency
 - C. File permissions
 - D. Snapshot scheduling
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Q34. Object storage systems achieve scalability primarily through:

- A. Centralized metadata
 - B. Fixed disk layouts
 - C. Flat namespace and distributed metadata
 - D. Hardware RAID
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Q35. In a clustered SAN environment, multipathing is used to:

- A. Increase storage capacity
 - B. Improve fault tolerance and performance
 - C. Enable compression
 - D. Manage snapshots
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Q36. Which ZFS configuration provides the BEST balance of performance and redundancy?

- A. RAID-0
 - B. RAID-1
 - C. RAID-Z2
 - D. JBOD
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Q37. In virtualization, VM templates help primarily with:

- A. Backup recovery
 - B. Patch management
 - C. Standardization and rapid provisioning
 - D. Load balancing
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Q38. Which cluster requirement addresses data consistency across nodes?

- A. Scalability
- B. Synchronization

- C. Redundancy
 - D. Throughput
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Q39. Compared to block storage, object storage lacks:

- A. Scalability
 - B. Metadata
 - C. POSIX-style file system semantics
 - D. Durability
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Q40. A SAN combined with clustering mainly enhances:

- A. Application portability
- B. High availability and fault tolerance
- C. Desktop virtualization
- D. Network security