

## 📖 EASY (10 Questions)

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**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:**

- 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:**

- 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)

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**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

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**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)**

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**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