

1. Types of Virtual Hard Disks (VHD) in Hyper-V

VHD Type	Description	Use Case
Fixed Size VHD	Pre-allocates a fixed amount of disk space at creation, ensuring stable performance.	Best for production environments with consistent storage needs.
Dynamically Expanding VHD	Expands as data is added, saving initial disk space but may affect performance.	Ideal for testing or development environments.
Differencing VHD	Tracks changes made to a parent VHD without modifying the original file.	Useful for creating multiple VMs with a shared base image.
Pass-through Disk	Directly maps a physical hard disk to a virtual machine for faster performance.	Suitable for scenarios requiring high-speed data access.

2. Difference Between Server Core and Desktop Experience Installation

Feature	Server Core	Desktop Experience
User Interface	Command-line interface only (no GUI).	Full graphical interface for easy management.
Resource Usage	Consumes fewer resources and has a smaller footprint.	Consumes more resources due to GUI overhead.
Security	Smaller attack surface enhances security.	Slightly higher risk due to added GUI components.
Management	Managed through PowerShell, command line, or remote tools.	Managed using traditional GUI tools and interfaces.
Installation Size	Smaller installation size improves performance.	Larger installation size requires more disk space.
Best For	Ideal for lightweight servers, high security, and remote management.	Suitable for administrators preferring GUI-based controls.

3. Key Differences Between VHD and VHDX Formats

Aspect	VHD	VHDX
Maximum Size	Supports up to 2 TB.	Supports up to 64 TB.
Performance	Limited performance on modern hardware.	Improved performance with better data alignment.
Resilience	Less resilient to power failures.	Designed to be more resilient against corruption.

Aspect	VHD	VHDX
Compatibility	Compatible with older Windows systems.	Requires Windows Server 2012 or newer.
Data Protection	Does not include built-in data protection features.	Includes built-in protection against power failure.

4. How Does Hyper-V Handle Virtual Storage Compared to Traditional Physical Storage?

Hyper-V virtual storage differs from traditional physical storage in these key ways:

- **Flexibility:** Virtual disks can be resized dynamically, unlike physical disks.
- **Isolation:** Each VM has its own virtual storage, ensuring data separation.
- **Snapshots and Checkpoints:** Hyper-V allows capturing VM states for quick restoration.
- **Performance Management:** Hyper-V offers dynamic resource allocation for optimal disk performance.
- **Portability:** Virtual disks can be easily moved between servers for enhanced flexibility.
- **Backup Efficiency:** Hyper-V integrates with backup solutions for efficient data protection.

Overall, Hyper-V storage improves scalability, backup efficiency, and resource utilization in virtualized environments.