The main drawbacks of local disk storage is that it's limited to the physical capacity of the host computers and is available only to the host computer that it's installed in.

» **Storage Area Network (SAN):** In a SAN, disk drives are contained in a separate device that is connected to the host via a high-speed controller. The difference between a SAN and local storage is that the SAN is a separate device. Its high-speed connection to the host is often just as fast as the internal connection of local disk storage, but the SAN includes a separate storage controller that is responsible for managing the disk drives.

A typical SAN can hold a dozen or more disk drives and can allow high-speed connections to more than one host. A SAN can often be expanded by adding one or more expansion chassis, which can contain a dozen or more disk drives each. Thus, a single SAN can manage hundreds of terabytes of disk data.

» **Network attached storage (NAS):** This type of storage is similar to a SAN, but instead of connecting to the hosts via a high-speed controller, a NAS connects to the host computers via standard Ethernet connections and TCP/IP. NAS is the least expensive of all forms of disk storage, but it's also the slowest.

Regardless of the way the storage is attached to the host, the hypervisor consolidates its storage and creates virtual pools of disk storage typically called *data stores.* For example, a hypervisor that has access to three 2TB RAID-5 disk arrays might consolidate them to create a single 6TB data store.

From this data store, you can create *volumes,* which are essentially virtual disk drives that can be allocated to a particular virtual machine. Then, when an operating system is installed in a virtual machine, the operating system can mount the virtual machine's volumes to create drives that the operating system can access.

For example, let's consider a virtual machine that runs Windows Server. If you were to connect to the virtual machine, log in, and use Windows Explorer to look at the disk storage that's available to the machine, you might see a `C:` drive with a capacity of 100GB. That `C:` drive is actually a 100GB volume that is created by the hypervisor and attached to the virtual machine. The 100GB volume, in turn, is allocated from a data store, which might be 4TB in size. The data store is created from disk storage contained in a SAN attached to the host, which might be made up of a RAID-10 array consisting of four 2TB physical disk drives.

So, you can see that there are at least four layers of virtualization required to make the raw storage available on the physical disk drives available to the guest operating system: