

In a RAID 5 array, parity is calculated for every bit of data written to the array, and the resulting parity values are distributed evenly across all the disks in the array such that if any one disk is lost, the missing data can be reconstructed from the data on the surviving drives.

The effective capacity of a RAID 5 array is equal to the total capacity of all the drives less one. So, if a RAID 5 array is built from five 2TB drives, the effective capacity is 8TB ($4 \times 2\text{TB}$).

- » **RAID 6** is almost the same as RAID 5 except that two parity values are calculated and distributed across the disks. This allows you to lose two drives in the array and still be able to recover your data. The effective capacity of a RAID 6 array is equal to the total capacity of all the drives less two. So, a RAID 6 array built from five 2TB arrays will have an effective capacity of 6TB ($3 \times 2\text{TB}$).

Three ways to attach disks to your servers

I also mention in Chapter 10 that there are three primary ways to connect disks to a server computer. This is true whether your servers are virtual or physical servers. To recap:

- » **Local disk storage:** All server computers have at least one disk drive that is directly attached to the server, mounted in the same case as the server. Most servers can accommodate additional disk drives, which can be consolidated into RAID arrays to create disk storage that is available to that server and that server only.
- » **Storage Area Network (SAN):** A SAN is essentially a network of disk controllers that manage arrays of disk drives. The controllers themselves are connected to server computers and to each other via a special network designed specifically for this purpose. The most common network technology used in SANs is called *Fibre Channel*; it runs at speeds considerably higher than most Ethernet networks — at the time I wrote this book, the fastest available Fibre Channel speed was 256 Gbps.

A SAN allows you to separate your disk storage from your server computers so that you can manage storage and servers independently. If you need more servers, you can add more and connect them to the SAN. If you need more disk space, you can add additional disks to the SAN and your servers will be able to use it.