STORAGE-CENTRIC IT ARCHITECTURE AND ITS ADVANTAGES

Storage networks can solve the problems of server-centric IT architecture that we have just discussed. Furthermore, storage networks open up new possibilities for data management. The idea behind storage networks is that the SCSI cable is replaced by a network that is installed in addition to the existing LAN and is primarily used for data exchange between computers and storage devices (Figure 1.3).

In contrast to server-centric IT architecture, in storage networks storage devices exist completely independently of any computer. Several servers can access the same storage device directly over the storage network without another server having to be involved. Storage devices are thus placed at the centre of the IT architecture; servers, on the other hand, become an appendage of the storage devices that 'just process data'. IT architectures with storage networks are therefore known as storage-centric IT architectures.

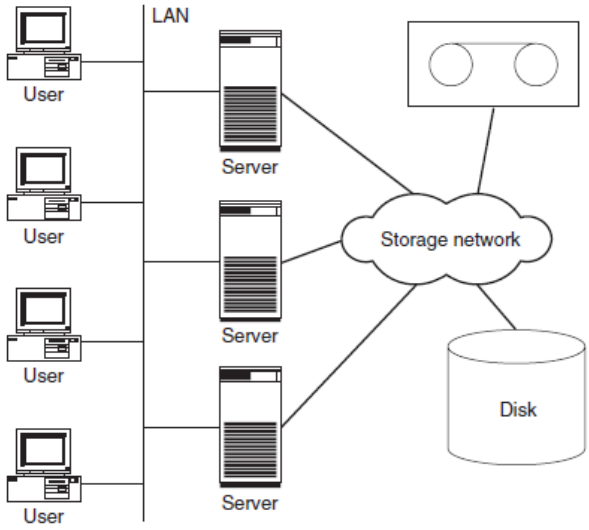

Figure 1.3 In storage-centric IT architecture the SCSI cables are replaced by a network Storage devices now exist independently of a server.

When a storage network is introduced, the storage devices are usually also consolidated. This involves replacing the many small hard disks attached to the computers with a large disk subsystem. Disk subsystems currently (in the year 2009) have a maximum storage capacity of up to a petabyte. The storage network permits all computers to access the disk subsystem and share it. Free storage capacity can thus be flexibly assigned to the computer that needs it at the time. In the same manner, many small tape libraries can be replaced by one big one.

More and more companies are converting their IT systems to a storage-centric IT architecture. It has now become a permanent component of large data centres and the IT systems of large companies. In our experience, more and more medium-sized companies and public institutions are now considering storage networks. Even today, most storage capacity is no longer fitted into the case of a server (internal storage device), but has its own case (external storage device).

1.3 CASE STUDY: REPLACING A SERVER WITH STORAGE NETWORKS

In the following we will illustrate some advantages of storage-centric IT architecture using a case study: in a production environment an application server is no longer powerful enough. The ageing computer must be replaced by a higher-performance device. Whereas such a measure can be very complicated in a conventional, server-centric IT architecture, it can be carried out very elegantly in a storage network.

1. Before the exchange, the old computer is connected to a storage device via the storage network, which it uses partially (Figure 1.4 shows stages 1, 2 and 3).

2. First, the necessary application software is installed on the new computer. The new computer is then set up at the location at which it will ultimately stand. With storage networks it is possible to set up the computer and storage device several kilometers apart.

3. Next, the production data for generating test data within the disk subsystem is copied. Modern storage systems can (practically) copy even terabyte-sized data files within seconds. This function is called instant copy. To copy data it is often necessary to shut down the applications, so that the copied data is in a consistent state. Consistency is necessary to permit the application to resume operation with the data. Some applications are also capable of keeping a consistent state on the disk during operation (online backup mode of database systems, snapshots of file systems).

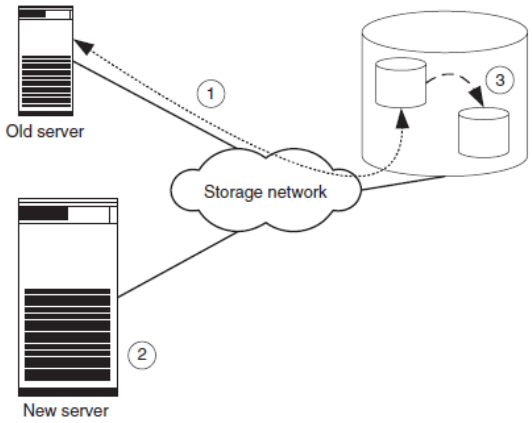

Figure 1.4 The old server is connected to a storage device via a storage network (1). The new server is assembled and connected to the storage network (2). To generate test data the production data is copied within the storage device (3).

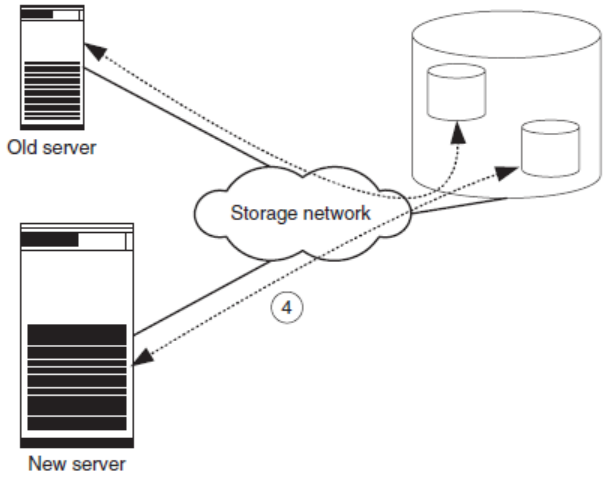

Figure 1.5 Old server and new server share the storage system. The new server is intensively tested using the copied production data (4).

4. Then the copied data is assigned to the new computer and the new computer is tested intensively (Figure 1.5). If the storage system is placed under such an extreme load by the tests that its performance is no longer sufficient for the actual application, the data must first be transferred to a second storage system by means of remote mirroring.

5. After successful testing, both computers are shut down and the production data assigned to the new server. The assignment of the production data to the new server also takes just a few seconds (Figure 1.6 shows steps 5 and 6).

6. Finally, the new server is restarted with the production data.

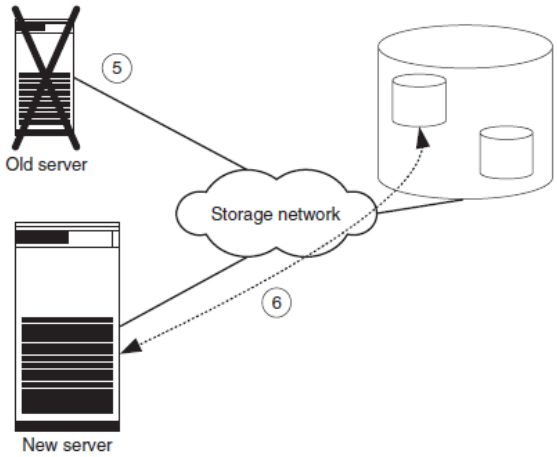

Figure 1.6 Finally, the old server is powered down (5) and the new server is started up with the production data (6).

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