Chapter XI
Advanced Storage Technologies for Business Continuity

CHAPTER OVERVIEW

In addition to standard storage and traditional tape-based backup technologies explained in Chapter X, businesses employ advanced storage technologies in order to achieve higher levels of applications and data availability. Most widely used advanced storage technologies such as direct access storage (DAS), storage area network (SAN), network attached storage (NAS), RAID technology, mirroring and data replication, data vaulting, continuous data protection, and clustering are explained in Chapter XI.

DAS, SAN, AND NAS

Direct access storage, storage area network, and network access storage technologies are briefly explained in this section.

Contemporary business is forced to cope with demands for more efficient and effective storage solutions as part of its efforts to recover faster and more efficiently from any type of failure and/or disaster. Apart from standard backup technologies, business computing employs additional technologies in finding the ways of managing data in an efficient and effective way. With advances in data communications, networking technologies and high speed communication lines, in addition to tra-
ditional primary storage technologies, several new approaches called “advanced storage systems” have been developed.

Most widely used advanced storage technologies are: a) direct access storage, b) storage area network (SAN), and c) network attached storage (NAS).

SAN and NAS technologies are mainly based on a) Fibre Channel as a mature storage backbone technology and/or b) newly developed Internet SCSI (iSCSI) and Serial ATA technologies. SANs that use iSCSI protocol are gaining acceptance as a supplement or even complete replacement for Fibre Channel-based SANs. Today, these storage solutions and services are being integrated into server operating platforms. For instance, HP decided to integrate Smart Array serial controllers, storage enclosures, Hot-Plug Serial Attached SCSI and Serial ATA hard drivers with HP ProLiant servers (Singer, 2005). Such an operating environment does not require separate connection devices/protocols for interconnecting servers, storage, networking devices. Support for storage scalability includes support for RAID systems and scalability clustering options.

Direct access storage (DAS) is a solution that is based on a direct connection between a server and its storage system. Hard disk installed on a standard computer is also considered as a direct access storage system. This approach does not use a lot of networking devices, it is implemented onsite. Hence, it is characterized as a high performance solution with regard to data transfer rates. Several technologies are used within this model of storing data:

- SCSI (Small Computer System Interface)
- RAID systems (Redundant Array of Independent/Inexpensive Disks)
- Serial or Serial Attached SCSI—SAS
- Fibre Channel technology.

Figure 11.1. Direct attached storage (DAS)
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