Chapter VII
Advanced Server Technologies for Business Continuity

CHAPTER OVERVIEW

Server operating systems described in Chapter VI usually come preinstalled. Additional components can be installed “on-demand” in the form of ServerWare components and modules, as explained in previous chapter. However, there exist more advanced technologies, both hardware and software, aimed at further enhancing the levels of continuous computing and business continuity. These technologies are introduced and briefly explained in this chapter.

FAULT TOLERANCE AND DISASTER TOLERANCE TECHNOLOGIES

Fault tolerance and disaster tolerance technologies are presented, including fault-tolerant servers. In addition, server virtualization technology is briefly explained. Server management software and its components are presented as to business continuity perspective.

Servers may include several types of additional hardware and software features that support so-called “high-availability” technologies such as: SMP/Clustering, support for 64-bit computing, support for Storage Scalability, RAID Technology, Fault Tolerance, Online Reconfiguration, N1 Grid Containers, Dynamic System
Domains, Virtual Machine Managers, and so forth. In addition, server platforms-based ServerWare suites include: bundled servers, reloadable kernel and online upgrade features, crash-handling technologies, workload management, Windows/UNIX integration, and so forth.

Further details on these continuous computing technologies are presented in the section that follows.

**Fault tolerance** is a term describing the ability of a server to continue operating despite the hardware and/or software failures. Fault tolerance typically refers to hardware failures and hardware fault tolerance, even though, software failures such as operating system crashes or network protocols’ crashes are considered as parts of an integrated fault tolerance solution as well. Technologies include redundant hardware devices and components and special hardware with error-checking and hot-swap support. By default, fault tolerance solutions are onsite solutions, the solutions that are installed within the datacenter. They provide the highest level of availability on onsite basis. Fault-tolerant technologies in broader sense contain redundant units-based features as well (e.g., power supply, fan, disks-RAID, network cards, routers and other communication devices, UPS, etc.).

In addition to fault-tolerant technologies, contemporary business is forced to cope with demands for more efficient and effective computing and storage solutions as part of its efforts to recover from any type of failure and/or disaster.

**Disaster tolerance** is the ability of a server to continue with performing operations despite a disaster.

**Disaster Recovery** refers to an ability of computer system/operating system to resume operations after some sort of disaster that occurred in data processing unit. In most cases, disaster recovery operation takes some time and almost always there is a delay before data processing can continue. Disaster Recovery methods include: standard tape backups and advanced methods such as: hot sites, data vaulting, disaster recovery sites, and so forth.

There exist several levels (layers) of fault tolerance:

a. Hardware fault tolerance—including redundant components, replicated processors, additional—redundant memory, redundant networking devices (routers, switches, modems, network cards, etc.), redundant power supplies, and so forth.

b. System software fault tolerance. This is the second level of fault tolerance that operates on the system software (operating system) level.

c. Application fault tolerance relates to the application software and ability of the software to be tolerant to a specific code–related problem.