This is the ninth in a series of short articles reviewing the theory and practice of making backups.

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Systems with different characteristics and purposes can require different backup strategies. This section looks at large production systems (mainframes), smaller computers used for distributed processing (servers), individual computers used primarily by one user (workstations) and portable or handheld computers (_laptops_ and _personal digital assistants_, often called _PDAs_).

**Mainframes**

Large production systems using mainframes or networks of servers routinely do full system backups every day because of the importance of rapid recovery in case of data loss. Using high-capacity tape libraries with multiple drives and immediate access to tape cartridges, these systems are capable of data throughput of up to 2 TB/hour (see section 41.2.6.4). Typically, all backups are performed automatically during the period of lowest system utilization. Because of the problems caused by concurrent access, mainframe operations usually reserve a time every day during which users are not permitted to access production applications. A typical approach sends a series of real-time messages to all open sessions announcing, “Full Backup in xx minutes; please log off now.” Operations staff have been known to phone offending users who are still logged on to the network when backups are supposed to start. To prevent unattended sessions from interfering with backups (as well as to reduce risks from unauthorized use of open sessions), most systems configure a timeout after a certain period of inactivity (typically 10 minutes). If users have left their sessions online despite the automatic logoff, mechanisms such as forced logoffs can be implemented to prevent user processes from continuing to hold production files open.

In addition to system backups, mainframe operations may be instructed to take more frequent backups of high-utilization application systems. Mission-critical transaction-processing systems, for example, may have several incremental or delta backups performed throughout the day. Transaction log files may be considered so important that they are also copied to backup media as soon as the files are closed (i.e., when a log file reaches its maximum size and a new log file is initiated for the application programs).

**Servers**

Managers of networks with many servers have the same options as mainframe operations staff, but in addition they have increased flexibility because of the decentralized, distributed nature of the computing environment. Many network architectures segregate specific application systems or groups of users to specific servers; therefore, it is easy to schedule system backups at times convenient for different groups of users. In addition to flexible system backups, the distributed
aspect of such networks facilitates application backups.

In the next article, we'll look at backup strategies for workstations, laptop computers and handheld computers.

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