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

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Backups can include different amounts and kinds of data, as described in the following list:

* _Full_ backups store a copy of everything that resides on the mass storage of a specific system. To restore a group of files from a full backup, the operator mounts the appropriate volume of the backup set and restores the file in a single operation.

* _Differential_ backups store all the data that have changed since a specific date or event; typically, a differential backup stores everything that has changed since the last full backup. The number of volumes of differential backups can increase with each additional backup. To restore a group of files from a differential backup, the operator needs to locate the latest differential set and also the full backup upon which it is based to ensure that all files are restored.

* _Incremental_ backups are a more limited type of differential backup that typically stores everything that has changed since the previous full or incremental backup. As long as multiple backup sets can be put on a single volume, the incremental backup requires fewer volumes than a normal differential backup for a given period. To restore a set of files from incremental backups, the operator may have to mount volumes from all the incremental sets plus the full backup upon which they are based.

* _Delta_ backups store only the portions of files that have been modified since the last full or delta backup; delta backups are a rarely-used type more akin to logging than to normal backups. Delta backups use the fewest backup volumes of all the methods listed; however, to restore data using delta backups, the operator must use special-purpose application programs and mount volumes from all the delta sets plus the full backup upon which they are based.

Another aspect of backups is whether they include all the data on a system or only the data particular to specific application programs or groups of users:

* _System_ backups copy everything on a system;

* _Application_ backups copy the data needed to restore operations for particular software systems.

In addition to these terms, one often hears operators and users refer to _daily_ and _partial_ backups. These terms are ambiguous and should be defined in writing when setting up procedures.

In the next article, we'll look at backup strategies for mainframes and servers.
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