9.13.3 Backup Management Facts

Be aware of the following when managing backups:

- Backups must be current to be useful. The space between the current time and the time of the last backup identifies the amount of data that could potentially be lost.
- Do not combine incremental and differential backups.
- Image backups provide a fast way to restore an entire system in the event of a disk failure or malware infection.
- Backup media should be stored offsite to prevent the same disaster from affecting the network and the backup media. Store backup media in fire and waterproof cabinets to prevent destruction.
- Backup media should be stored in a secure location. Someone with access to your backup media might be able to restore sensitive data or even restore entire systems.
- Electronic vaulting provides an automatic way of sending backups to an alternate site through an electronic bulk transfer. Electronic vaulting is performed in the following ways:
  - *Online tape vaulting* is the transmission of tape backups to an offsite location by the primary data processing center.
  - *Hierarchical storage* management keeps the most current, necessary items on the fastest media devices.
  - *Remote journaling* is the transmission of data journals and logs to an offsite location.
  - *Database shadowing* is the transmission of a production database to an offsite location.
- Backup media is often rotated using a predescribed method that minimizes the number of tapes or disks required, but provides the necessary levels of protection to adequately restore data in a variety of scenarios. Backup media rotation systems include:

Method	Description
Grandfather Father Son	The Grandfather Father Son (GFS) rotation scheme identifies three categories of backup media: ▪ Son (daily). Son backups are rotated daily. ▪ Father (weekly). Father backups are rotated weekly. One daily backup each week becomes a Father backup. ▪ Grandfather (monthly). One weekly backup each week becomes a Grandfather backup. For best results, keep track of how often each media gets used to prevent Son backup media from being reused constantly.
Tower of Hanoi	Just like the game for which this rotation system was named, multiple tapes are rotated through a daily and weekly rotation schedule involving full and incremental/differential backups. ▪ Tower of Hanoi requires more tapes than GFS. ▪ This is a very complicated rotation scheme that requires a schedule for selecting the correct tapes and backup types to rotate through.
Round Robin	Round robin uses a full backup on one day with incremental/differential backups on subsequent days. When all the tapes have been used for backup, you start over with the tape with the oldest data. Round robin is the simplest of the backup rotation schemes.

- Many backup programs allow you to choose the type of data to back up.
  - System state data includes the operating system and some application configuration files. To back up the Active Directory, back up the system state data on a domain controller.
  - Application data includes any configuration information used by specific applications that is not included within system state data.
  - User data is all the files and data created and saved by users and applications.
- Users who are delegated the responsibility to back up data typically do not need permissions to read the files that are backed up.
- Following the principle of separation of duties, separate backup and restore privileges by assigning each role to a different user.
- Be sure to test your backup and restore strategy. It does no good to back up your data if you can't restore it (for example, if a system problem has prevented successful backups from completing).
- Reverting a system to a known state means you have put it back to a known working condition.
- Rolling a system back to a known configuration means changing settings back to an older version of the same machine.