

Tech Advisory Council
Feb 8, 2006

Attendees: Rawdon Cheng (UHLS, notes), Rob Carle (UHLS), Mike Sweeney (GUIL), Laurie Louis (APLM), Marcia Middleton (APLM), Jonathan Koppel (UHLS), Mike Whitney (EGRN), Judie Harren(VOOR), Jason (GUIL)

Topic: Disaster Recovery – Backup

“Choosing a Backup Strategy” (presented by Rawdon Cheng)

Backup Media (demonstrated by Mike Sweeney)

USB external USB hard drive – cost \$120, storage size 80GB. It is a molded enclosure made by Lacie. It is ready to use but the downside is the hard drive cannot be replaced.

Adaptec USB hard drive enclosure – the case costs \$63. You need an IDE drive to put in (not included). The enclosure has built-in circuitry to convert IDE drive to USB drive. You may put in any size of hard drive. Although some assembly is needed, it is very easy to put the hard drive in. You can also swap different hard drive into the enclosure for testing or for backup purpose.

USB Keys (aka Flash drives and Thumb Drives) – cost \$20+ depending on the size. It is a compact unit that holds at least 128MB of storage space. New flash drives size has increased substantially. The largest available at of this time is 160GB with a huge price tag at \$1200! You can find 1GB at less than \$100. This is great for copying files or setup files. On the plus side, the unit is very portable; but because of this, it may be exposed to harsh environment. Most people put it in their pocket for transport. If the cap is missing, the connectors will be exposed and may reduce its reliability. Reasonable care should be exercised.

Iomega Rev Drive – cost \$400 for the drive, \$50 for the cartridge, very portable. It is an external storage unit that accepts removable cartridges. Similar to tape drive, it uses cartridges as medium for storage. Cartridges can be ejected with a push of the button. Read/Write speed is much faster than that of tapes. Iomega claims the cartridge the mean time of failure is 2000 times with a storage life at 30 years. The downside is it is proprietary. If you don't have the same drive, you cannot read the cartridge.

HP DAT SCSI external tape drive – tape drive cost \$600, tape \$4-20(dependent on size), SCSI card \$150. It is portable. HP claims its tapes life expectancy is 10 years, and have been tested multiple times to ensure its quality. The downside of tape is slow read/write speed. Due to its sequential access method, the tape will

be read entirely to retrieve a file. Also, it is suggested that it can be write up to 99 times.

General discussion on this topic

Regardless what media to use, reasonable care should be exercise. All media will have wear and tear so regular checking on the media should be performed. All devices have two heads: Read head and Write head. Both heads are independent to each other. So it is possible to have a working Read head but a bad Write head. It is suggested that a test restore should be performed at a regular basis.

It is recommended to read the backup logs or reports. Any errors occurred during backup will be recorded in the report. It is better to discover errors early than regret later.

APL raised a question about backing up via wide-area network since it has remote facilities that the support staff cannot be onsite all the time. Some of its servers play more role as application server which full backup is more critical. Also discussed was roaming profile in a domain environment.

UHLS backup Horizon server to hard drive first and then copy the backup set to tape. Also, some servers are backup to another server which then the backup set is copied to tape.

Recommendations for small libraries

There is no one and for all solution for backup. Libraries should decide what to backup and estimate the size of storage needed. CD/DVD medium cost <\$1 each. DVD burner is getting more popular and is become standard complement of new PCs. DVD comes in various formats: DVD+, DVD-, DVD+/-, DVD/RW+, DVD/RW-. For maximum compatibility, choose DVD- since it is an older format and is readable by more DVD players. USB thumb drive has limited capacity but very convenient. It can be re-recorded over many times but if it is lost, the cost of replacement is higher.

Small libraries may not have a server that requires daily backup. Most new PC comes with CD burner or DVD burner. CD and DVD are inexpensive and are widely available. Backup to CD/DVD is a two step processes: backup to a file and then burn that file to optical medium.

The Advisory Council recommends to backup at least the login user profile in C:\Documents and Settings. For novice users, they can select a portion of the user profiles to be backup. Some important folders are: My Documents, Desktop, Favorite (Bookmarks), Application Data or Local Settings\Application Data(for

email). Outlook Express email is stored in Local Settings\Application Data\Identities folder.

UHLS will create a training video to show how to do backup using Windows Backup program.

Next meeting date and place: TBD

Choosing a backup strategy

What will be backup?

In selecting what to be backup, you can consider the following:

- ❖ Impact to the organization operation when the data is not presence
- ❖ Can it be re-created,
- ❖ Cost of re-creating it,

How often should the data be backed up?

- ❖ How often the data is changed,
- ❖ How much information we can afford to loose in between backup.

At UHLS, we backup Horizon transactions once an hour. Some servers are backup only once a week.

How long should the backup data be kept?

It is possible to restore your information back from an older copy. It may be due to virus attack or files deleted a while ago. Having older copies of backup will be handy when such a situation occurs. You will need more than one set of media to perform this

Media Rotation Methods

- Son – all media have the same retention period, e.g. Daily tapes
- Father/Son – 2 retention periods are used for rotating media, e.g. Daily/Weekly
- Grandfather/Father/Son – more than 2 retention periods are used for rotating media, e.g. Daily/Weekly/Monthly

What media will be used?

- Removable medium: CD/DVDs, Iomega REV/ZIP drives, tapes
- Hard drive: internal/external
- Another server

Storage of backup media

A sound backup strategy should also consider facility problem. Should a facility is damaged or destroyed; it may destroy the backup media. Should it be the only copy, restoring information will be impossible. It is always wise to have a copy of the media stored offsite.

Applications to perform backup

Most O/S comes with backup application. All versions of Windows come with Backup program. There are other backup solutions on the market that will satisfy additional demand of the enterprises.

Backup Methods

- Copy – files copied to another medium, no change to the archive bit
- Full –files copied to another medium, reset archive bit
- Incremental –files copied to another medium that has changed since the last backup (either Full or Incremental), reset archive bit
- Differential – files copied to another medium that has changed since the last Full backup, does not change the archive bit
- Archive – files copied to another medium and removed from the original location.

Choosing between backup methods

- Copy is usually for making additional backup set for specific purpose such as sending it to another location. It may be used for selected data. In general, it is not deployed as part of backup strategy.
- Full backup includes all files on a volume and stored on one media set. Should restore is needed, all files are present on that media set; therefore, there is no need to look for additional backup media. The downside is redundancy - files that never changed are always backup; hence, it uses the most number of media, and takes the longest time to perform the process.
- Incremental requires the least time to perform backup. It is more efficient to use media storage space since this method selects the least number of files. Though it requires all backup sets to be present to do a full restore. If a set is missing or corrupted, full restore will not be achieved.
- Differential is a balance between Full backup and Incremental
- **Full backup must be done on a regular basis.**