



K. J. Somaiya College of Engineering, Mumbai-77

(Autonomous College Affiliated to University of Mumbai)

Batch: B1

Roll No.: 1711072

Experiment / assignment / tutorial No. 6

Grade: AA / AB / BB / BC / CC / CD / DD

Signature of the Staff In-charge with date

Title: Study of Backups and Recovery

AIM: To study and understand Backups & Recovery tools

Expected OUTCOME of Experiment:

CO 3: To learn servicing, maintenance and security of computer system

Books/ Journals/ Websites referred:

1. IBM- PC BY Govindrajalu, THM
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Pre Lab/ Prior Concepts:

Backup is the activity of copying files or databases so that they will be preserved in case of equipment failure or other catastrophe. Backup is usually a routine part of the operation of large businesses with mainframes as well as the administrators of smaller business computers. For personal computer users, backup is also necessary but often neglected. The retrieval of files you backed up is called restoring or recovering them.

In computing, data recovery is a process of salvaging (retrieving) inaccessible, lost, corrupted, damaged or formatted data from secondary storage, removable media or files, when the data stored in them cannot be accessed in a normal way. The data is most often salvaged from storage media such as internal or external hard disk drives (HDDs), solid-state drives (SSDs), USB flash drives, magnetic tapes, CDs, DVDs,



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RAID subsystems, and other electronic devices. Recovery may be required due to physical damage to the storage devices or logical damage to the file system that prevents it from being mounted by the host operating system (OS).

Set the Backup:

There are several ways to back up your PC.

1. Select the **Start** button, then select **Control Panel > System and Maintenance > Backup and Restore**.
2. Do one of the following:
 - If you've never used Windows Backup before, or recently upgraded your version of Windows, select **Set up backup**, and then follow the steps in the wizard.
 - If you've created a backup before, you can wait for your regularly scheduled backup to occur, or you can manually create a new backup by selecting **Back up now**.
 - If you've created a backup before, but want to make a new, full backup rather than updating the old one, select **Create new, full backup**, and then follow the steps in the wizard.

Note

Do not back up files to the same hard disk that Windows is installed on. For example, do not back up files to a recovery partition. Always store media used for backups (external hard disks, DVDs, or CDs) in a secure place to prevent unauthorized people from having access to your files; a fireproof location separate from your computer is recommended. You might also consider encrypting the data on your backup.

1) Create a system image

System images contain all of the info on your PC at a particular state.

1. Right-click the **Start** button, then select **Control Panel > System and Maintenance > Backup and Restore**.



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2. In the left pane, choose **Create a system image**, and then follow the steps in the wizard. 

If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

Note

To create a system image of a drive, it must be formatted to use the NTFS file system. If you save the system image on a hard drive or USB flash drive, it must be formatted to use the NTFS file system.

Keeping different versions of system images

You can keep several versions of system images. On internal and external hard drives, older system images will be deleted when the drive runs out of space. To help conserve disk space, delete older system images.

If you're saving your system images in a network location, you can only keep the most current system image for each computer. System images are saved in the format of drive\WindowsImageBackup\computer name\. If you already have a system image for a computer and are creating a new one for the same computer, the new system image will overwrite the old one.

If you want to keep the old system image, you can copy it to a different location before creating the new system image by following these steps.

1. Navigate to the location of the system image.
2. Copy the WindowsImageBackup folder to a new location.



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Recovery:

2) Create a restore point

You can use a restore point to restore your computer's system files to an earlier point in time. Restore points are automatically created each week by System Restore and when your PC detects change, like when you install an app or driver.

Here's how to create a restore point.

1. Right-click the **Start** button, then select **Control Panel > System and Maintenance > System**.
2. In the left pane, select **System protection**.
3. Select the **System Protection** tab, and then select **Create**.
4. In the **System Protection** dialog box, type a description, and then select **Create**.

Restore

1. Right-click the **Start** button, then select **Control Panel > System and Maintenance > Backup and Restore**.
2. Do one of the following:
 - To restore your files, choose **Restore my files**.
 - To restore the files of all users, choose **Restore all users' files**.
3. Do one of the following:
 - To look through the contents of the backup, select **Browse for files** or **Browse for folders**. When you're browsing for folders, you won't be able to see the individual files in a folder. To view individual files, use the **Browse for files** option.
 - To search the contents of the backup, select **Search**, type all or part of a file name, and then select **Search**.

Tips

If you're searching for files or folders associated with a specific user account, you can improve search results by typing the location of the file or folder in the **Search for** box. For example, to search for all JPG files that were backed up, type **JPG** in the **Search for** box. To only search for JPG files associated with the user Bill, type **C:\Users\Bill\JPG** in the **Search for** box. Use wildcard characters such as ***.jpg** to search for all JPG files that were backed up.



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Restore a backup made on another computer

You can restore files from a backup that was created on another computer running Windows Vista or Windows 7.

1. Select the **Start** button, then select **Control Panel > System and Maintenance > Backup and Restore**.
2. Choose **Select another backup to restore files from**, and then follow the steps in the wizard.



If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

Find files that were restored from a backup made on another computer

If you're restoring files from a backup that was made on another computer, the files will be restored in a folder under the user name that was used to create the backup. If the user names are different, you'll need to navigate to the folder where the files are restored. For example, if your user name was **Molly** on the computer that the backup was made on but your user name is **MollyC** on the computer that the backup is being restored on, the restored files will be saved in a folder labelled **Molly**.

To find restored files:

1. Select the **Start** button, then select **Computer**.
2. Double-click the icon of the drive that the files are saved on, for example **C:**.
3. Double-click the **Users** folder. You will see a folder for each user account.
4. Double-click the folder for the user name that was used to create the backup. The restored files will be in the various folders based on where they were located originally.




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Restore files from a file backup after restoring your computer from a system image backup

After you restore your computer from a system image backup, there may be newer versions of some of your files in a file backup that you want to restore.

To restore files from a file backup that was created after the system image backup was created, follow these steps.

1. Select the **Start** button, then select **Control Panel > System and Maintenance > Backup and Restore**.
2. Choose **Select another backup to restore files from.** 
If you're prompted for an administrator password or confirmation, type the password or provide confirmation.
3. In **Backup Period**, select the date range of the backup that contains the files that you want to restore, and then follow the steps in the wizard.

Data backup in WhatsApp

Creating a Google Drive backup

How to create a Google Drive backup:

1. Open WhatsApp.
2. Tap Menu > Settings > Chats > Chat backup.
3. Tap Back up to Google Drive and select a backup frequency other than Never.
4. Select a Google account that you'll back up your chat history to. If you don't have a Google account connected, tap Add account when prompted and enter your login credentials. Please remember the Google account you're using for the backup.
5. Tap Back up over to choose the network you wish to use for backup. Please note that backing up over a cellular data network might result in additional data charges.

You can also manually back up your chats to Google Drive at any time:

1. Open WhatsApp.
2. Tap Menu > Settings > Chats > Chat backup.



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3. Tap BACK UP to begin your Google Drive backup. This process might take a few minutes.

Note: Depending on the size of the chat, the first complete backup could take a while. We recommend that you connect your phone to a power source.

However, subsequent backups are incremental, thus not requiring a completely new backup of all your data every time.

Important: Media and messages you back up aren't protected by WhatsApp end-to-end encryption while in Google Drive.

Restoring from a Google Drive backup

In order to successfully restore a Google Drive backup, you need to use the same phone number and Google account used to create the backup. To restore your backup:

1. Make sure the same Google account that was used to perform the backup has been added to your phone.
2. Uninstall and reinstall WhatsApp.
3. After verifying your phone number, you'll be prompted to restore your chats and media from Google Drive. Tap RESTORE.
4. After the restoration process is complete, tap NEXT and your chats will be displayed once initialization is complete.
5. After restoring your chats, WhatsApp will begin restoring your media files.

Note: If you're installing WhatsApp without any prior backups from Google Drive, WhatsApp will automatically restore from your local backup file. Learn more from [this article](#) on restoring chat history.

Configuring your Google Drive backup settings

To change the frequency of your Google Drive backup:

1. Open WhatsApp.
2. Tap Menu > Settings > Chats > Chat backup.
3. Tap Back up to Google Drive.
4. Set the backup frequency to your liking.

To change which account you want to back up your chat history to:

1. Open WhatsApp.
2. Tap Menu > Settings > Chats > Chat backup.



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3. Tap Account and select the account you wish to back up your chat history to.

Note: If you change your Google account, you won't be able to access your backups that are linked to a different Google account.

To change the connection you wish to use for backup:

1. Open WhatsApp.
2. Tap Menu > Settings > Chats > Chat backup.
3. Tap Back up over and select the network you wish to use for backup.

Deleting your backup file from your Google account

You can remove WhatsApp data from your Google Drive. To do so:

1. Go to the Google Drive website and log in to your Google account.
 - If you're accessing the Google Drive website from your phone, you'll have to tap the Menu icon in the top left corner and then tap Desktop Version.
2. Click the Gear icon in the top right corner > Settings > Manage Apps.
3. Scroll until you find WhatsApp in the list. Please note it might take several minutes for WhatsApp to appear.
4. After you find WhatsApp in the list, wait until "Hidden app data" size comes up. This might also take several minutes.
5. Click OPTIONS > Delete hidden app data > DELETE.

Google Drive backup troubleshooting

If you're unable to create a Google Drive backup, please try the following:

- Verify you have a Google account added to your phone.
- Verify you have Google Play services installed on your phone.
 - Note: Google Play services are only available on Android 2.3.4 and higher.
- If you're attempting to back up on a cellular data network, make sure you have data for both WhatsApp and Google Play services. Contact your provider if you're unsure.
- Attempt to do a backup on a different network.

Example: Try connecting to Wi-Fi if you're unable to back up on a cellular data network.

If you're unable to restore a Google Drive backup, please try the following:



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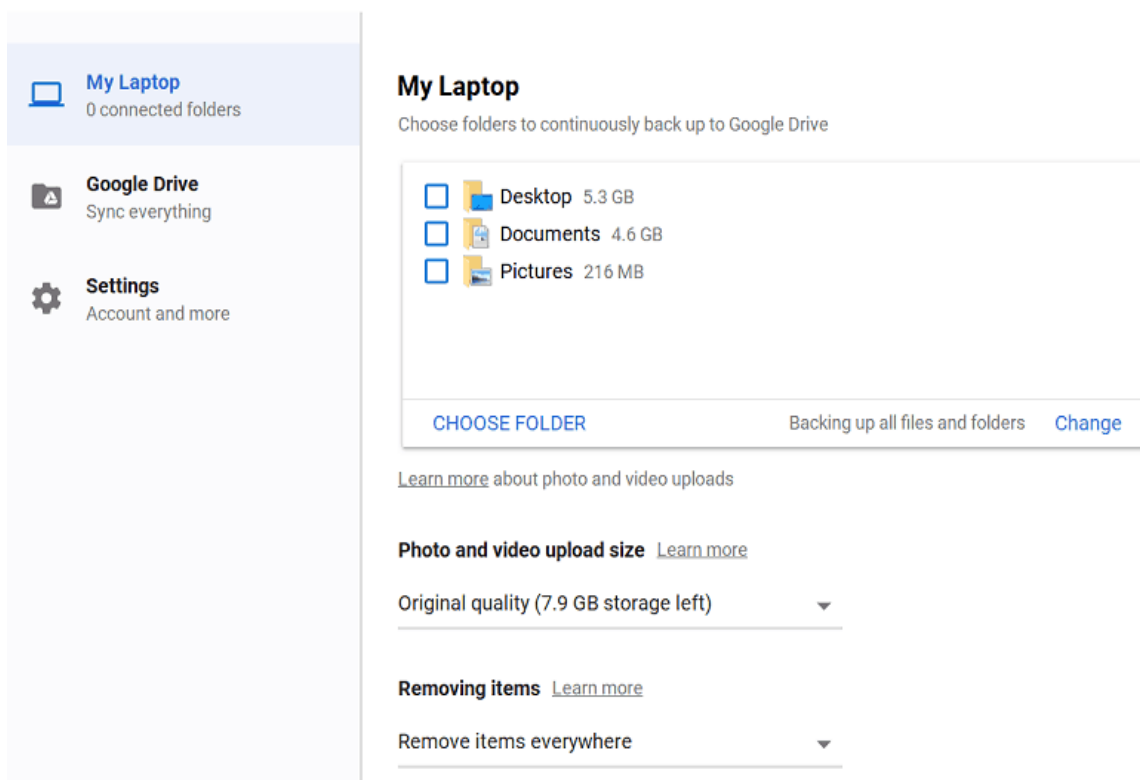
- Verify you're attempting to restore data from the same phone number and Google account that the backup was created on.
- Verify there's enough room on your phone to restore the backup.
- Verify you have Google Play services installed on your phone.

Note: Google Play services are only available on Android 2.3.4 and higher.

- Make sure your battery is fully charged or your phone is plugged into a power source.
- Make sure your phone is connected to a strong and stable network. If restoring using a cellular data network doesn't work, please try Wi-Fi.

Data backup in cloud:

Google replaced its desktop client with what it calls "backup and sync" in 2017. Available for PC and Mac, the new tool can be used to backup specific folders in your file system without moving them to your sync folder. Launch the tool by right-clicking the "backup and sync" icon in your taskbar. Click the three dots menu in the top right and select "preferences." That will open a bigger window with three tabs down the left side: "my laptop," "Google Drive" and "settings."



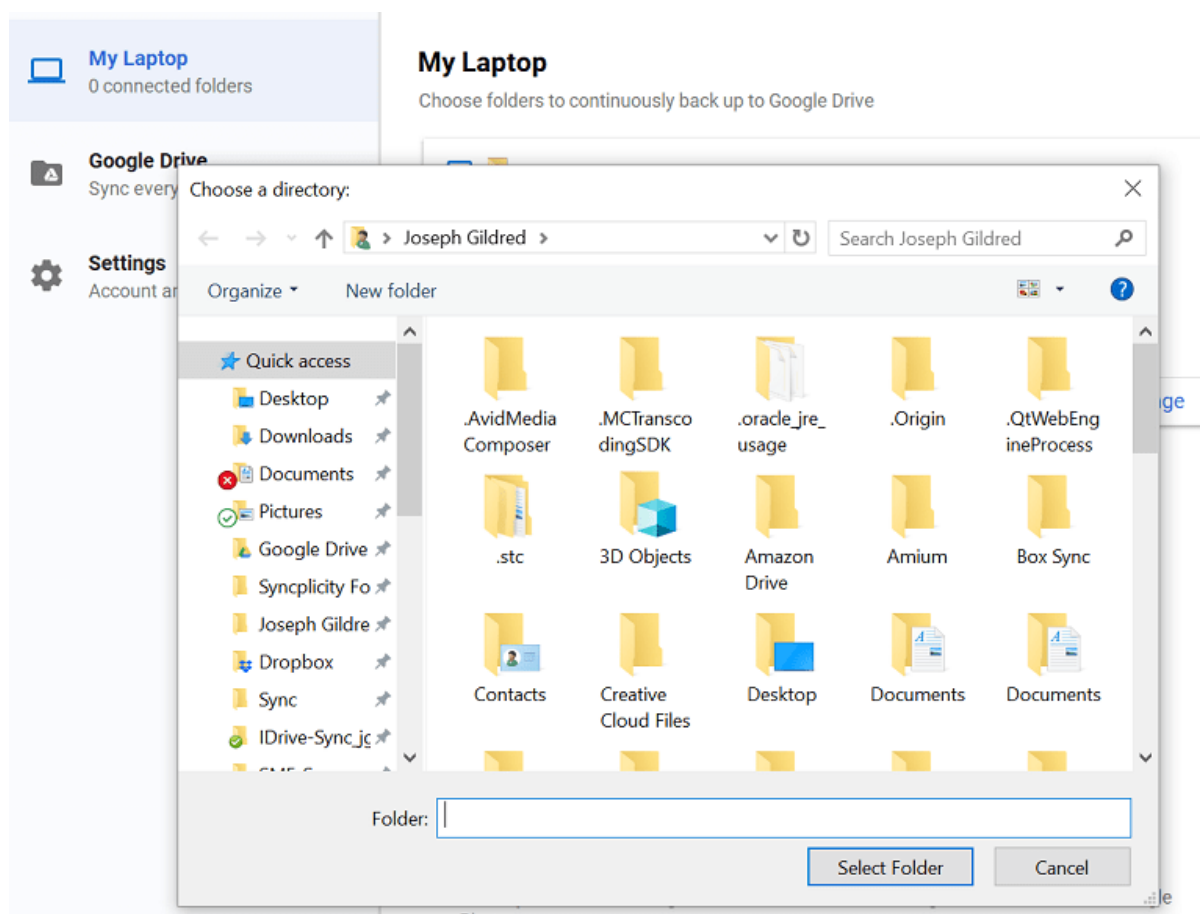


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The first tab, “my laptop,” can be used to tag folders for backup to Google Drive. You may see folders already listed, such as documents and pictures. Those are just suggestions. As long as the checkboxes beside them aren’t clicked, no data is being sent to the cloud.

To add folders, click “choose folders.” A file system browser window that you can use to add folders to your backup plan will open.



Once you’ve made your selections, you can alter the backup behavior of Google Drive by clicking “change.” That will give you an option to only backup photos and videos, as well as selection boxes to backup RAW data and screenshots.

There’s an “advanced” section to add file type exclusions. For example, you might want to exclude temporary files from your backup to conserve space.

Backup and Sync Photo Size

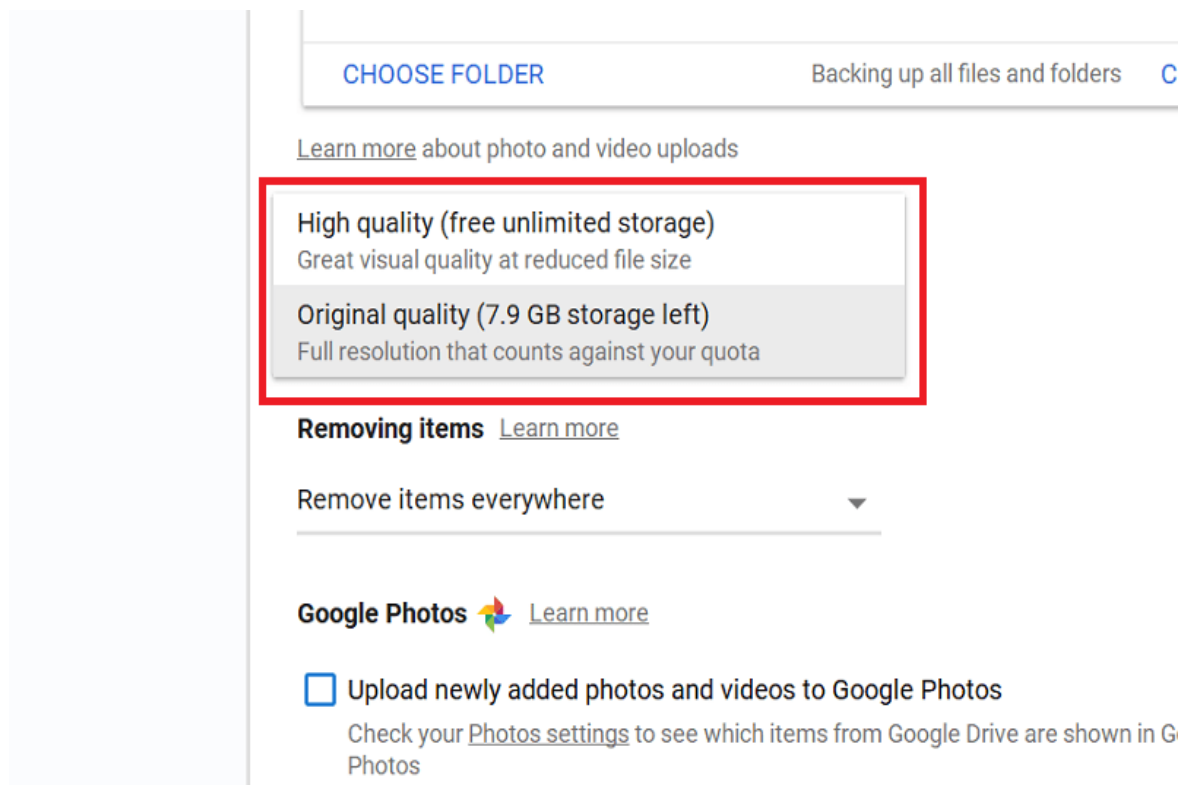
There are two options for uploading photos to Google Drive: “high quality” and “original size.” High quality uploads don’t affect your storage space. You can



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upload as many images as you want with no penalty. The downside is that there's a 16MB cap. Photos larger than that are reduced in size, losing resolution in the process.



The second option, "original size," maintains file size and resolution but consumes Google Drive space.

Backup and Sync Removing Files

This next part is critical to using Google Drive to backup your files. In the backup and sync preferences window, there's a header that reads, "removing items." Below it, there are three options.



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Photo and video upload size [Learn more](#)

Original quality (7.9 GB storage left) ▼

Removing items [Learn more](#)

- Remove items everywhere
- Don't remove items everywhere
- Ask me before removing items everywhere

☐ Upload newly added photos and videos to Google Photos

Check your [Photos settings](#) to see which items from Google Drive are shown in Google Photos

USB Devices & SD Cards CANCEL OK

By selecting "remove items everywhere," if you delete a file on your computer that's backed up to Google Drive, it will be deleted in Google Drive, too. Instead, you should select the second option: "don't remove items everywhere." That way, files stay in Google Drive even if they're deleted on your computer.

Conclusion: The various methods of data backup and recovery in PC, WhatsApp and cloud were studied.

Date: 08/03/2019

Signature of faculty in-charge

Department of Computer Engineering



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Post Lab Questions:

1. Explain the different types of Data Backup.

- **Ans.**

Full Backup

Full backup is a method of backup where all the files and folders selected for the backup will be backed up. When subsequent backups are run, the entire list of files and will be backed up again. The advantage of this backup is restores are fast and easy as the complete list of files are stored each time. The disadvantage is that each backup run is time consuming as the entire list of files is copied again. Also, full backups take up a lot more storage space when compared to incremental or differential backups.

Incremental backup

Incremental backup is a backup of all changes made since the **last backup**. With incremental backups, one full backup is done first and subsequent backup runs are just the changes made since the **last backup**. The result is a much faster backup then a full backup for each backup run. Storage space used is much less than a full backup and less then with differential backups. Restores are slower than with a full backup and a differential backup.

Differential backup

Differential backup is a backup of all changes made since the **last full backup**. With differential backups, one full backup is done first and subsequent backup runs are the changes made since the **last full backup**. The result is a much faster backup then a full backup for each backup run. Storage space used is much less than a full backup but more then with Incremental backups. Restores are slower than with a full backup but usually faster then with Incremental backups.

Mirror Backup

Mirror backups are as the name suggests a mirror of the source being backed up. With mirror backups, when a file in the source is deleted, that file is eventually also deleted in the mirror backup. Because of this, mirror backups should be used with caution as a file that is deleted by accident or through a virus may also cause the mirror backups to be deleted as well.



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Full PC Backup or Full Computer Backup

In this backup, it is not the individual files that are backed up but entire images of the hard drives of the computer that is backed up. With the full PC backup, you can restore the computer hard drives to its exact state when the backup was done. With the Full PC backup, not only can the work documents, picture, videos and audio files be restored but the operating system, hard ware drivers, system files, registry, programs, emails etc can also be restored.

Local Backup

Local backups are any kind of backup where the storage medium is kept close at hand or in the same building as the source. It could be a backup done on a second internal hard drive, an attached external hard drive, CD/ DVD –ROM or Network Attached Storage (NAS). Local backups protect digital content from hard drive failures and virus attacks. They also provide protection from accidental mistakes or deletes. Since the backups are always close at hand they are fast and convenient to restore.

Offsite Backup

When the backup storage media is kept at a different geographic location from the source, this is known as an offsite backup. The backup may be done locally at first but once the storage medium is brought to another location, it becomes an offsite backup. Examples of offsite backup include taking the backup media or hard drive home, to another office building or to a bank safe deposit box.

Beside the same protection offered by local backups, offsite backups provide additional protection from theft, fire, floods and other natural disasters. Putting the backup media in the next room as the source would not be considered an offsite backup as the backup does not offer protection from theft, fire, floods and other natural disasters.

Online Backup

These are backups that are ongoing or done continuously or frequently to a storage medium that is always connected to the source being backed up. Typically the storage medium is located offsite and connected to the backup source by a network or Internet connection. It does not involve human intervention to plug in drives and storage media for backups to run. Many commercial data centres now offer this as a subscription service to consumers. The storage data centres are located away from the source being backed up and the data is sent from the source to the storage data centre securely over the Internet.

Remote Backup

Remote backups are a form of offsite backup with a difference being that you can access, restore or administer the backups while located at your source location or other location. You do not need to be physically present at the backup storage



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facility to access the backups. For example, putting your backup hard drive at your bank safe deposit box would not be considered a remote backup. You cannot administer it without making a trip to the bank. Online backups are usually considered remote backups as well.

Cloud Backup

This term is often used interchangeably with Online Backup and Remote Backup.

It is where data is backed up to a service or storage facility connected over the Internet. With the proper login credentials, that backup can then be accessed or restored from any other computer with Internet Access.

FTP Backup

This is a kind of backup where the backup is done via FTP (File Transfer Protocol) over the Internet to an FTP Server. Typically the FTP Server is located in a commercial data centre away from the source data being backed up. When the FTP server is located at a different location, this is another form of offsite backup.