Soroban Support Guide

Back up your computer

Aomei Backupper- full disk backup

You are strongly advised to make a regular backup of your computer just in case the worst happens and it suddenly stops working, or through some mistake you accidentally delete an important file. This backup can be to a local networked drive, a USB disk, a cloud service etc.

There are two cases to consider:

1. A full system backup in case your disk dies or an update goes catastrophically wrong - occasionally
2. File backup for documents etc. you have created - FREQUENTLY

These two cases are NOT either/or. They are BOTH required to fully protect your data.

Aomei Backupper is a backup program that addresses the first case very well and while it can backup files there are better tools for this frequent task. Another free program, Cobian, which is more convenient for regular datafile backup, is described in a separate guide (under preparation).

This document describes how to install the free version of Aomei Backupper and how to configure and run a full system backup and to prepare bootable media in case you do need to restore your system. There is a non free version with greater functionality.

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Version:	**Draft-3**
Date:	**1 Dec 2023**

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Revisions

Version	Date	Changed by	Summary of change
Draft-3	1 Dec 23	John Steele	Draft

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1 OVERVIEW

1.1 Why is backup necessary

When you are using a computer you depend on it working and over time you typically accumulate important and possibly irreplaceable data on your computers storage. Historically this has been on your Hard Disk Drive (HDD) but are increasingly now on Solid State Drives (SSD.

Computers are very reliable **most of the time** but when they go wrong it is often sudden and in some cases can lead to a total loss of your possibly irreplaceable data.

Sometimes the computer's Operating System can possibly be repaired or you may need to buy a new computer depending what has failed. Such a sudden failure might be due to a software problem or a Malware attack. This is always inconvenient! What can be even more devastating is the loss of irreplaceable data that you have stored and is now inaccessible.

Unless you never store any personal data on your computer you SHOULD consider having a backup strategy so you have your important data stored elsewhere before that unwanted event happens – your computer develops a fault, gets attacked by malware or you make a mistake.

It is frequently too late to recover any personal data if your computer dies, is lost or is damaged or stolen. This data MUST be copied to a separate backup device for it to be safe. This especially includes documents you have created but may also include important documents you have received from other parties.

Once you have installed the software and created the recovery bootable media it only takes a few minuites every few moths the backup your computer. It is far easier to restore a broken computer back to a working state if you have taken the time to prepare a backup of the whole computer and to keep this sufficiently up to date and have separately backed up your data..

There are actually two different cases to consider:

1. Documents you have created or received, email archives you have acquired etc.:
   - Such documents are often created or change frequently so you need to backup your personal data files relatively frequently e.g. daily or weekly
   - The backup data volume is typically relatively small
   - Recovery from backup should be easy and ideally will be just a simple file copy
   - This backup requires a different backup program and needs to be run regularly and a solution si described in a separate document.
2. Your Operating System and programs you have installed – EXCLUDING your personal documents:
   - The data here can usually be regenerated from other sources but that would be very time consuming and may be beyond your skill set and need professional help
   - The data to be copied is typically very large and can take a long time

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- If you use a Document backup regularly (which is typically relatively fast) then you do not need to take a full system backup very often. Typically after a major update or you have installed a significant new software package.
- Recovery requires overwriting or at lease checking the entire disk drive and can take a considerable time and requires a copy of the software that created the backup – probably on a bootable media.

To be safe you need to address BOTH of these cases.

The free program AOMEI Backupper can, and should, be configured to support BOTH cases unless you use an alternative file backup program such as Cobian Reflector.

1.2 Some terminology used in this document

1. Disk terms
   a) HDD = Hard Disk Drive
      i A traditional disk drive with one or more rotating platters and moving heads to select one of a number tracks.
      ii The read/write heads “fly” just above the surface of the disk platter
      iii These spin at speeds from 5,400 rpm to 15,000 rpm
      iv The record/read heads move in and out to select a track
      v Being mechanical they can fail
      vi If disturbed e.g. by being knocked or a laptop dropped while the disks are rotting rotating the heads can “crash” into the surface which will usually make the whole disk unusable
      vii In managed properly they can last for many years
      viii They are readily available as plug-in USB drives and hence very suitable for providing a backup device. Such drives need ideally to be only connected when they are backing up a system
   b) SSD = Solid State Drive
      i The rotating patters are replaced by silicon devices using similar technology to the computers using themselves for their internal memory hence they are dramatically faster
      ii Storage of data is retained when power is removed but this process can cause molecular level changes and SSDs have complex error checking and correction to make them work with sufficient reliability
      iii Perhaps surprisingly the storage process used can “wear out”. SSDs contain clever “wear levelling” to ensure that the data does not get lost due to degradation of the storage media too soon.
      iv They are mechanically more robust than HDDs but are not able to provide the same capacity as HDDs
      v Costs of SSDs ae falling relative to HDDs but are still more expensive
      vi I would currently recommend to avoid using SSD devices for backup yet.

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2 CONFIGURING DISK BACKUP

2.1 Full image backup with incremental backup

In this section we will look at configuring Aomei Backupper

- To take an initial full backup to an external USB disk drive
- Subsequent backups will be Incremental
- Backups will be initiated manually
- Changing the next backup from Incremental to Full will be a manual decision

Backupper can also take backups to Network Attached Storage but that will not usually be available for many users. The configuration however is almost the same.

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3 AOMEI BACKUPPER INSTALLATION

3.1 Where to download it from

The website can be found at https://www.aomeitech.com/aomei-backupper.html

This links to their front page. Part of this is shown in Figure 1. The menu item ***For Home*** has been selected.

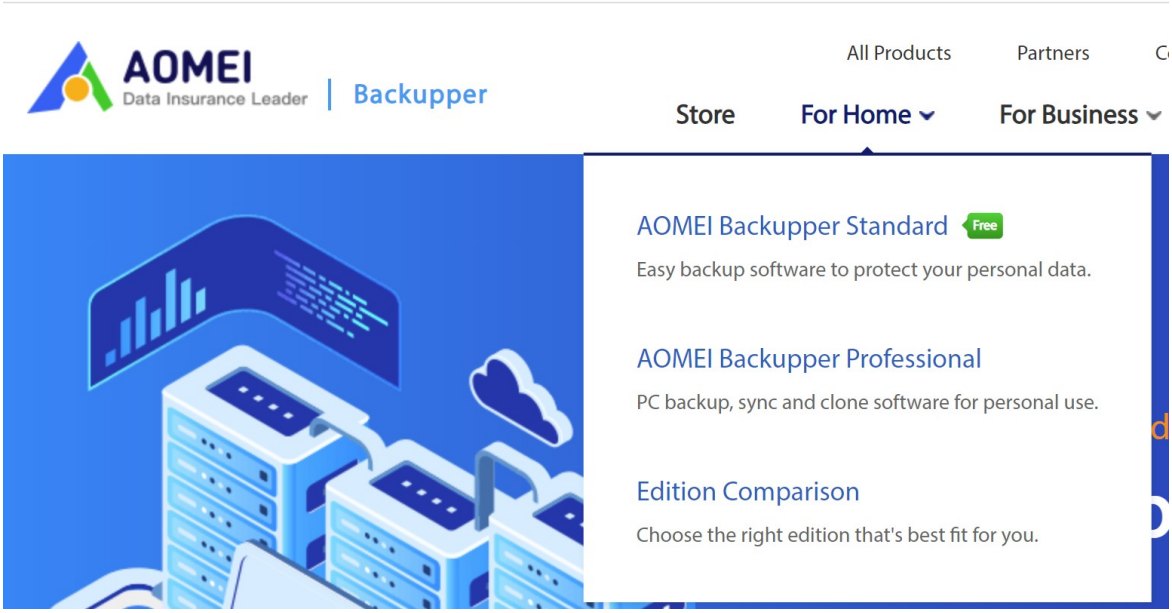

Figure 1: Aomei front page

This takes you to the download page as shown in Figure 2 below.

Figure 2: AOMEI Backupper Standard Download

The ***Download Freeware*** button will download the installation file for the free versin which can be installed just like any other program.

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3.2 Installation

It will need to be installed using the Admin account credentials but will prompt for these if installation is attempted using a Standard User account.

It will first prompt for a Language – ***English*** has been chosen for this document.

It will offer to switch to the Professional version but for most home users the free version is sufficient so click ***Skip***.

This then goes to the install page – note there is a checkbox, pre-selected, to **"accept the agreement"**. Clicking on these words reveals a typical End User Licencing Agreement which of course you will read every word very carefuly!

Assuming you do accept the Licencing terms then click on ***Install Now*** to continue the installation.

When this completes Backupper is installed it will display a page tempting you to upgrade you should find icons in your start menu that will enable you to:

- Start Backupper
- Uninstall Backupper
- Read a PDF version of their very comprehensive manual
- Visit their website

You can go on to configure your backup strategies as described in the following sections! What follows are some suggestions as to how to configure your strategy:

- File backup
  - It is recommended that you do configure this feature **and use it regularly** if you do not use any other file backup solution
- Full disk backup
  - It is recommended that you use this occasionally e.g. whenever there has been a major Windows update. **Do not rely on this for backing up your own data files. It will backup the data BUT**
    - Data backups should be taken frequently but should only require a small amount of data to be backed up each time
    - A full disk backup will backup all changes to your Operating System as well as your personal files. Most of these changes are NOT needed on a day to day basis.
      - If you do need to recover a disk drive then an old version of the Operating System is sufficient – It will update itself as needed.
      - If you have installed other programs, or they have been updated, since your last full disk backup then these would need to be updated again or reinstalled. **Installing new programs would be a good time to refresh your full backup!**
      - Your personal files will obviously be out of data but can easily be recovered back from your file backup

These only cover a fraction of what the program is capable of. Read the Manual!

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4 BACKUP STRATEGIES

4.1 Image versus file backup

An Image backup will take a copy of your entire disk drive. It will initially only backup the used areas and subsequent backups will only backup changes from the previous backups using either Differential or Incremental backup strategies – see below.

The purpose of an Image backup is to be able to restore your entire computer disk drive or a partition on that drive, back to EXACTLY the same state is was in when the backup was taken.

Most of the time you will only be changing a few data files on a day to day basis and the changes that the Operating System makes to its files are not relevant. You can roll back the software and related system/program files for many months and a reloaded system will still work and typically especially Operating Systems that are out of date will automatically update themselves. Some programs may need to be manually updated.

Separating data files from System files dramatically reduces the volume of data that needs to be backed up on a regular basis.

The recommendation therefore is take an Image backup occasionally e.g. after a major OS update or after installation or update of an application but take a MUCH SMALLER file update on a regular basis on a daily or weekly cycle.

4.2 Full backups vs Differential or Incremental backups

This section explains some terminology used in describing backups. It can be applied to both full image backup or file backups.

A full backup is fairly obvious. The entire data set, whether this is an entire disk drive or a set of folders/files within the computer filing system are all copied to the backup storage device. This will be a large amount of data so a backup strategy will typically take a full backup for the first backup in a cycle and then for subsequent backups to only copy data area that have changed since the last backup.

These intermediate backups can again take two approaches. They both assume that a full backup is taken from tie to time. The options for intermediate backups can follow one of two patterns:

- **Differential Backup:**
  - Backup all the files that have changed since the last full backup
  - The size of the backup set will grow over time as more files are changed
  - Restoration is quick as you only need to use the newest set of files
- **Incremental Backup:**
  - Backup all the files that have changed since the last backup whether this was a full backup or a previous Incremental backup
  - The size of the backup set includes only the files that have changed since the last full backup or the previous incremental backup
  - Restoration needs to scan trough the incremental backups to find the newest version of a file as it may have changed several times since the previous full backup

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The choice between Incremental and Differential strategies is usually a personal one. Incremental backups store less data but restoration may need to scan through all of the intermediate backups to find the appropriate version of a file. The author's preference is to always use Incremental backups but these options do typically exist in any backup solution.

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5 START BACKUPPER

This section of this guide is only intended to give a quick start to using the basic features. Note that all screenshots are taken using W10.

Start AOMEI Backupper from the Start menu – See Figure 3 below.

Note that this has also installed an AOMEI User manual which is very comprehensive.

Figure 3: Start menu

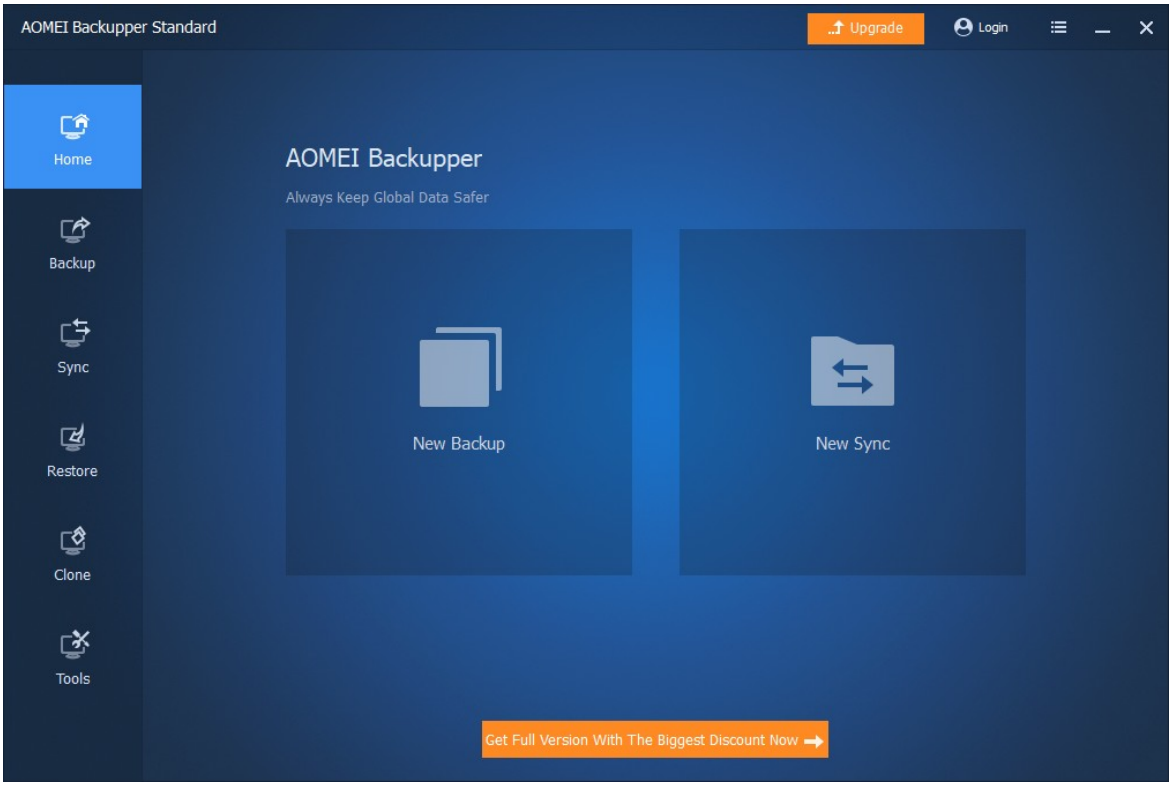

Figure 4: Initial screen before any configuration

For the purposes of this document we will create an image backup and a file backup strategy. Both are recommended as described above.

5.1 Image backup

5.1.1 Choose type of backup – typically System

Click the New Backup button, this will show the actions that are possible – see Figure 5 below.

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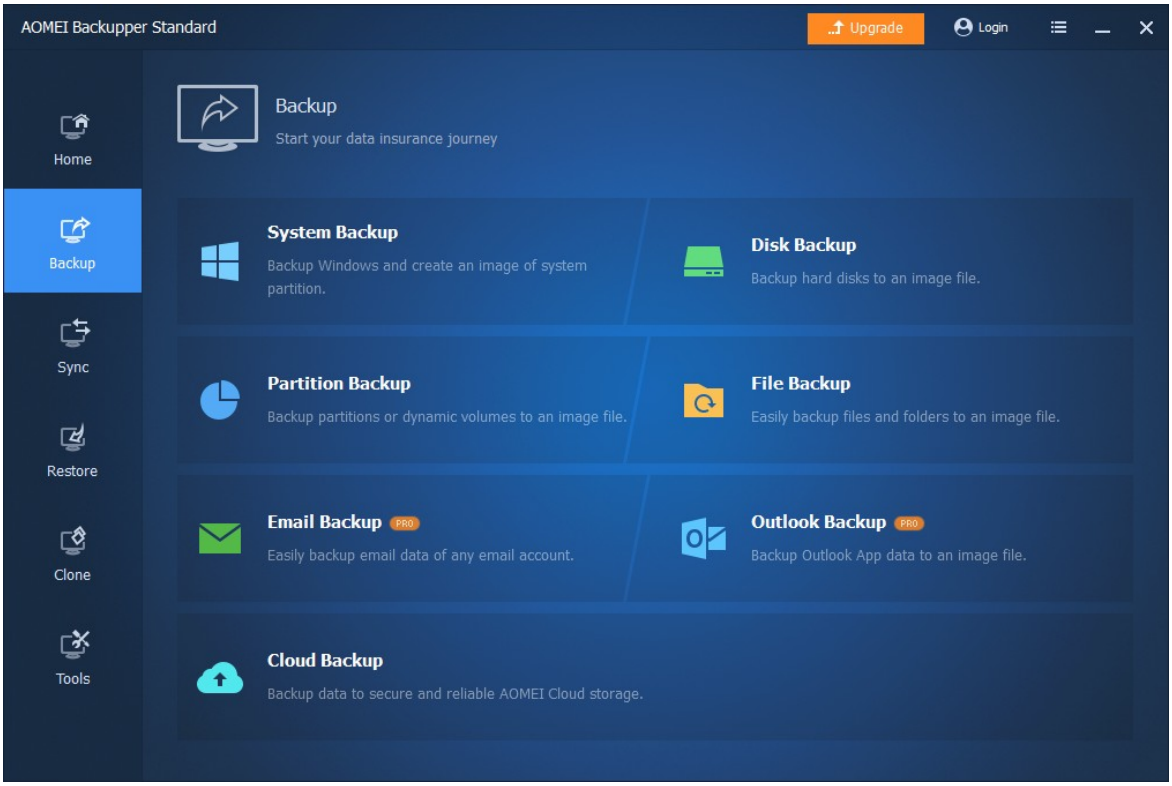

Figure 5: New backup selected – Options are shown

For the purposes of this document and in general what you are most likely to require is a ***System Backup***. This will create backup of your system so it can be restored if your system is damaged by malware, hardware failure (after the hardware has ben repaired) or an operator error.

We will also look at File Backup in Section xxxx.

Selecting System Backup brings up the next screen

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5.1.2 System Backup

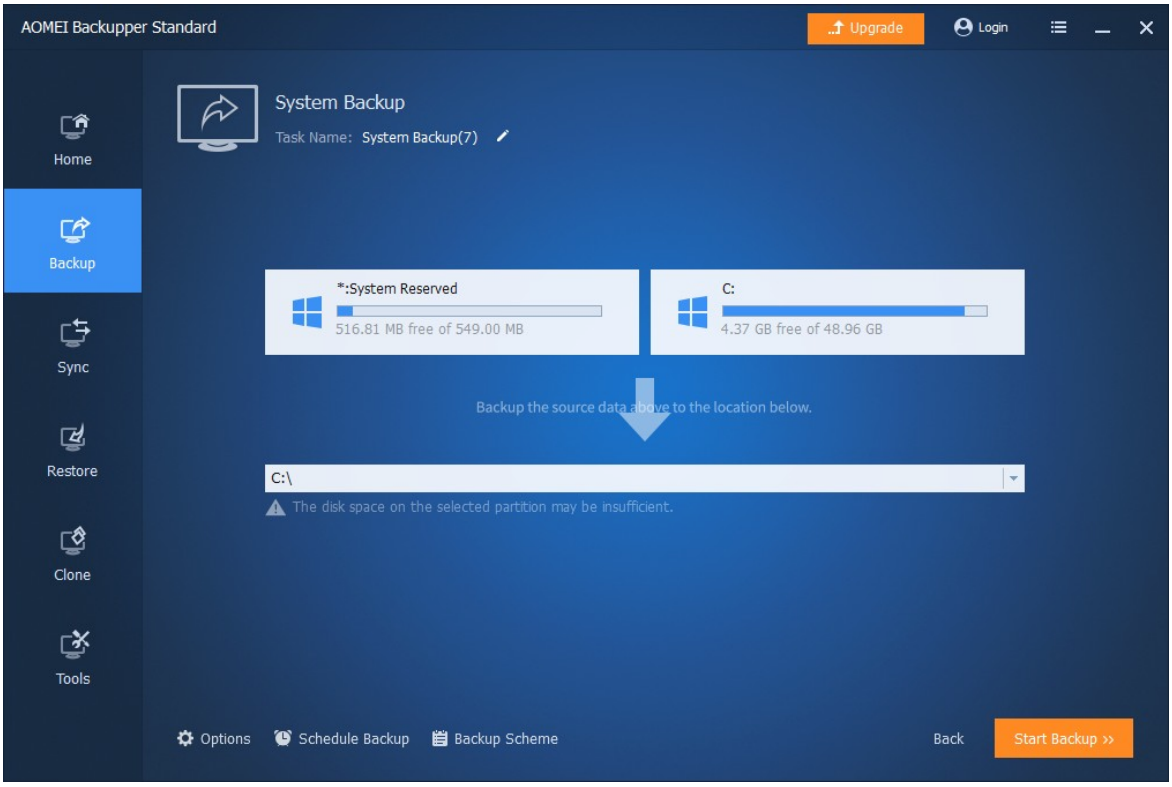

Figure 6: System backup selected

This shows what will be backed up. It is unlikely that you will want to change this. And where to bach it up to. **The default shown, C:\, needs to be changed!**

Note that the screen shows that this is "System backup 7"! This is because a number of attempts have been made to prepare this document and it has remembered previous attempts! The small mark next to this (a pencil1) indicates that this name can be changed and it is changed to Demo backup as will be seen in the later screen shots.

You now need to select a destination for the backup. The root of the C: drive is definitely not appropriate!

Using the small arrow at the right brings up a list of available options – see Figure 7 below.

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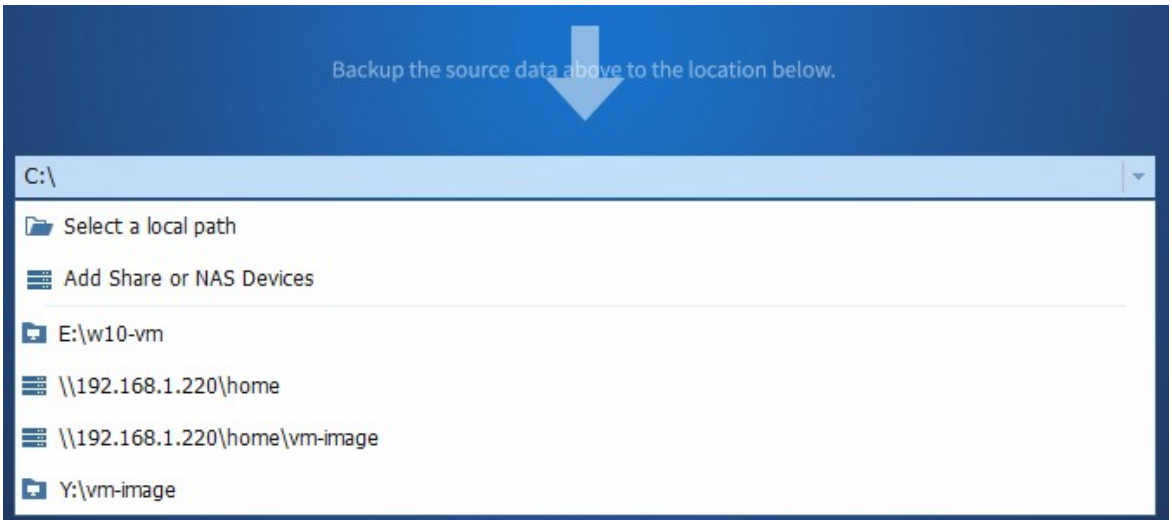

Figure 7: Potential backup destinations

In this case, and your options will depend on your environment, allows you to select a target destination.

1. Select a local path
   a) This is a folder on your local computer which must NOT be in the area that has already been selected. It would need to be in a different partition.
      i Do NOT select this option unless you have created a partition for this purpose or do not understand this paragraph!
2. Add a share or NAS device
   a) This only applies if you have an external storage device on you network. I do which is why the option appears and is a good choice if you have one
3. A USB device which has a drive letter assigned
   a) An example is is the E:/w10-vm shown in the list
   b) This folder however does NOT exist as it was created on an earlier attempt to text this program- see below for the action t take!
4. The remaining options shown are other network accessible drives or local drives and should be ignored.

An external USB drive is the most likely choice you want to make and it is quite possible, as in this case, that the folder you want does not exist or an invalid one is shown.

All you need do is to select the first option “Select a local path” which will allow you to browse to the required location and to select or create a new folder to receive the backup. In this case a folder Aomei has been created to receive the backup.

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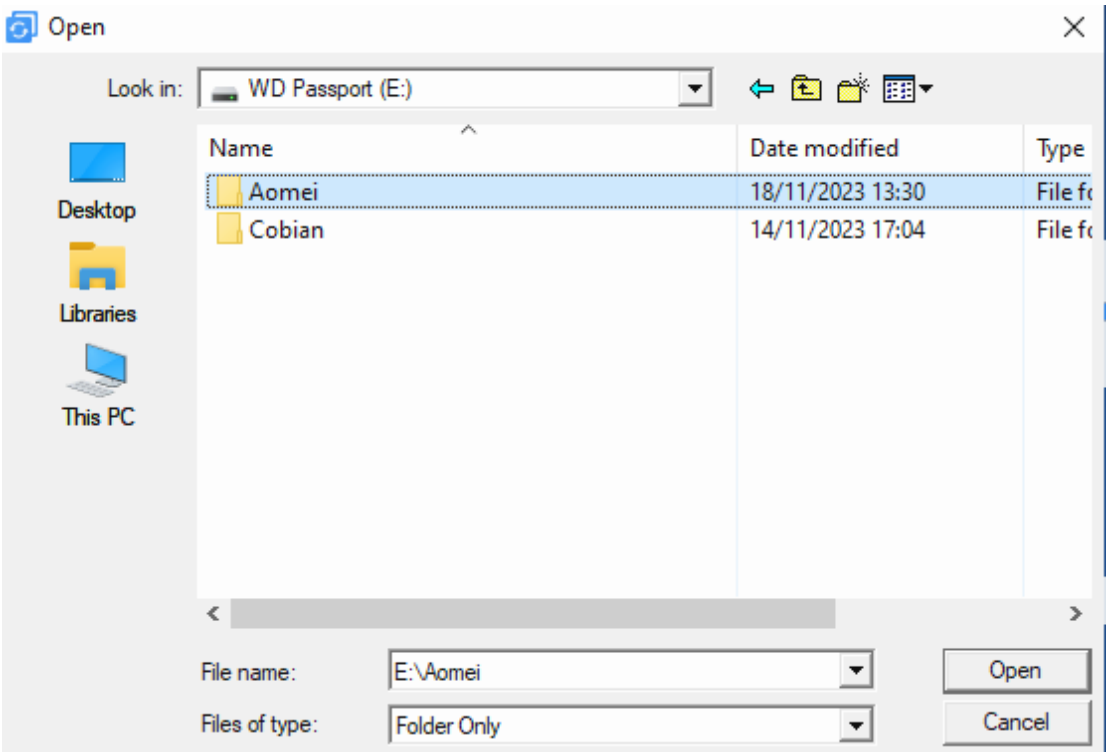

Figure 8: Select image backup folder

5.1.3 Further options

There are further possibilities to to consider especially when creating the first system backup

These are at the bottom of the screen shown in Figure 6 above. These are described under the following headings.

5.1.3.1 Options

This displays four further options of which the only one you might like to consider is the first which will add a free text note to the backup

The other options are unlikely to be needed for a basic backup and for details refer to the Aomei manual.

5.1.3.2 Schedule backup

This option allows the style of backup to be changed

1. It can be scheduled but for a system backup, particularly to a USB drive this is most unlikely to be required
2. Default is no schedule

5.1.3.3 Backup Scheme

The Backup scheme can be selected. The default (and recommended) is ***Incremental backup***.

1. This can be changed to use any of the following:
   a) a ***Full backup***

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b) ***Incremental*** which is the default
c) or ***Differential*** backup if you wish

For Incremental and Differential backups you can optionally choose to make a full backup after a configured number of Incremental/Differential backups.

- By default this will not happen
- By selecting the checkbox you can specify the number of Incremental/Differential backups before a new full backup is made.

5.1.3.4 Start backup

This will start the backup you have already configured. You will not normally change the options.

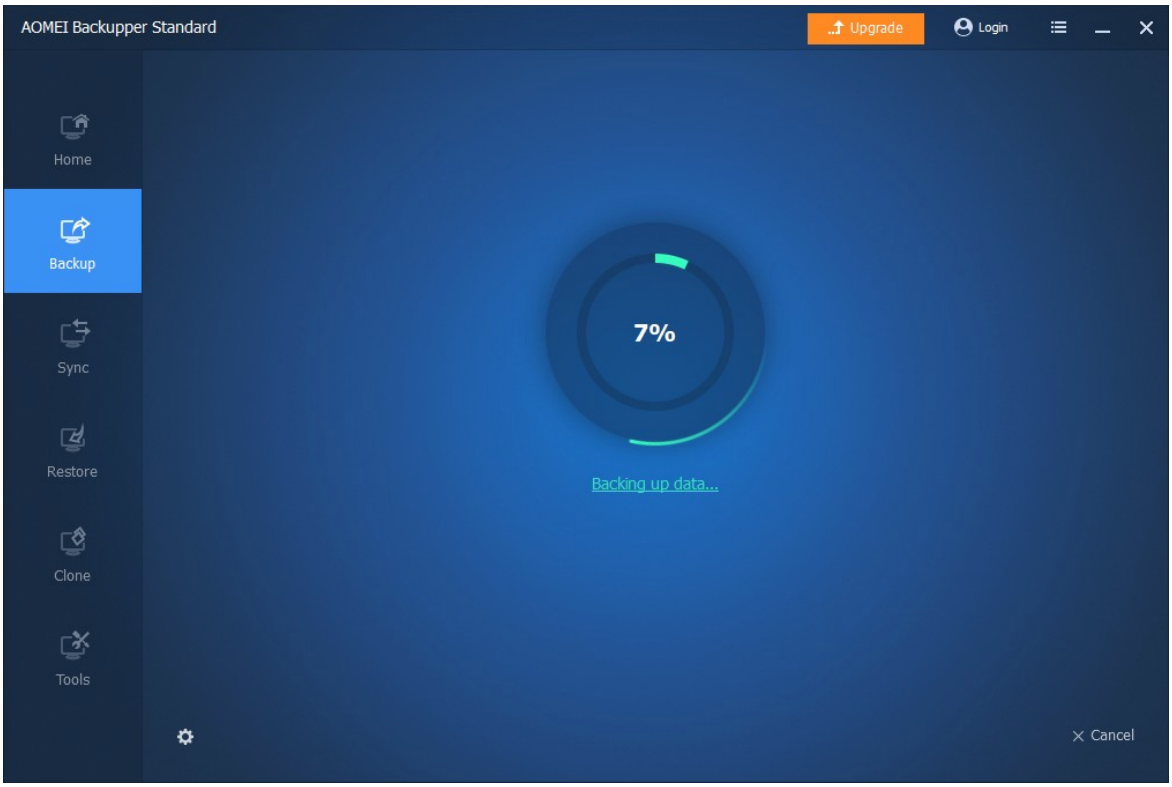

Figure 9: System backup in progress

A spinning progress wheel is displayed which show the progress of the backup. This can take many minutes depending on the size of the system disk drive. For a large disk backing up to a USB HDD perhaps 30 minutes or more for a full backup. Incremental backups will be faster.

Figure 10 below shows the display showing that the backup has been successfully competed.

On the USB disk drive it has created a single file of 28.8 Gbytes from my test system.

It then shows a screen on how to create recovery media. This must be to a bootable USB memory stick or to a bootable DVD. This can always be done later.

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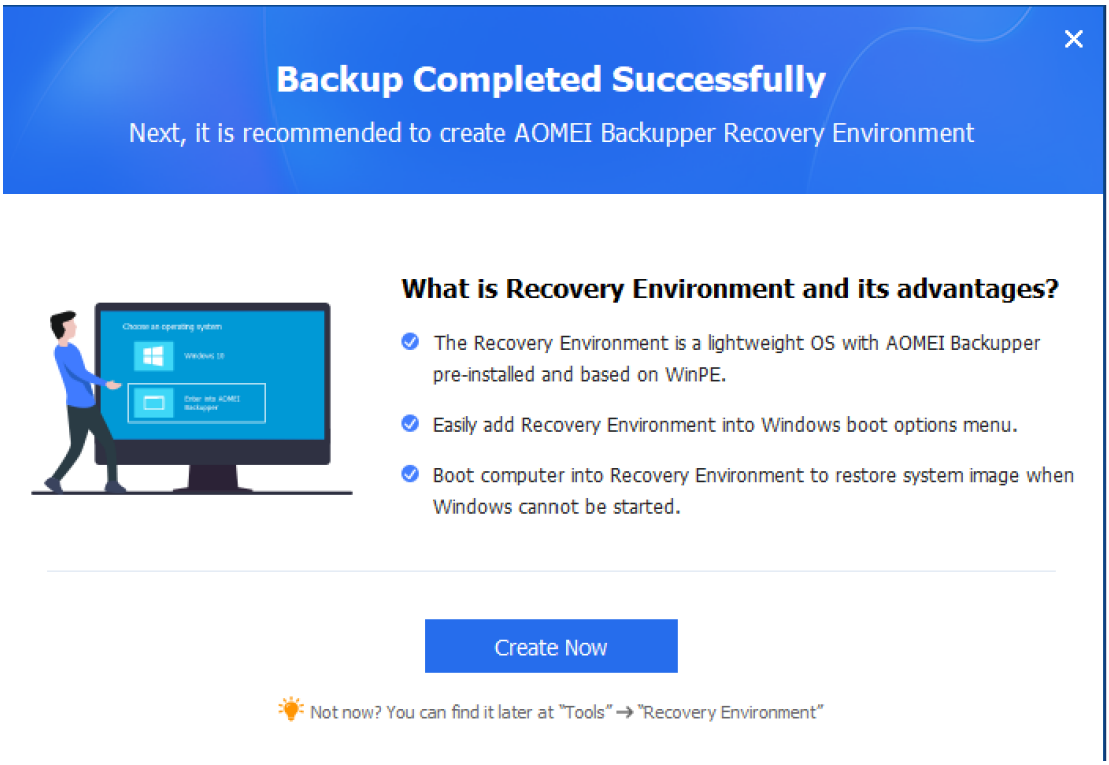

Figure 10: Success message

For future backups you can start the next backup cycle directly from the main screen.

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6 DOCUMENT/FILE BACKUP

6.1 Objective

With file backup you will be backing up your normal day to day work. This can include

- Documents you have written or received
- Emails you have created of received
- etc.

Your exact requirements will depend on how you use your computer and other services.

The characteristics of this data is that it is your personal data, and not the computer operating system, You will have received this data from other sources or created it yourself. Unlike the Operating system on your computer it is unique to you, and unless steps are taken in advance, can be irretrievable lost should the computer crash due to it developing a fault or receive damage or be stolen.

Such data differs from the computer Operating System in that it is typically regularly added to or altered so any method of backing up the data must be performed comparatively frequently. It may also be necessary to retrieve individual files from the backup without having to recover all your data. This will be there to protect you if you accidentally delete an important file. A not uncommon occurrence.

There are many choices for a document/file backup. In general these are typical types of personal data which can be dealt with in various ways.

6.2 Types of data

6.2.1 Email transfer to/from your provider

Email is often very important. Some emails mist be kept while others are purely transient.

An email client usually has its own method of archiving emails so that these can be removed from your Inbox or Sent Items. The comments here are relevant if you have an email client on your computer that stores emails locally. If you use Webmail no data is transferred to your computer unless you explicitly copy it. The rest of this section assumes you use an email client on your computer to read and send emails.

To understand email data you need to be aware there are two ways of accessing email from a mail server. Both methods are typically supported by your email provider.

The original way of receiving email is called POP3 (Post Office Protocol – version 3). With this method of transfer your computer email program connects to you mail server at fixed intervals and collects any messages waiting there. By default the messages in the server are then deleted although there is usually an option for them to be retained for a fixed period of say two weeks. **You can store emails for as long as you like in your local Inbox on your own computer but that is your only copy.**

A later option was created called IMAP (Internet Message Access Protocol) which works differently. In this case you email client is notified that an email has ben received and it will be copied immediately to your computer. It is NOT deleted from the server until YOU remove it from your inbox. You can create subfolders in your mail client which wil be replicated on the mail server. Depending on your mail client you can also create local archive email folders which are NOT replicated on the server.

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Emails are sent in both cases using SMTP which will transfer the message to the server. Whether it s retained on the server while it is in your Sent Items folder may depend on the mail server.

It should therefore be apparent that if you use IMAP your email provider is automatically providing an off-site copy of your inbox minimising your need to take a local backup

The email situation is further complimented by how email clients store emails locally and will impact on any email backup.

There are basically two methods used to store emails locally on your computer:

- Store each email separately as a file in a folder
  - The folder name matches the name displaying in your email client
  - This is very efficient for backup purposes
- Store all emails for one mailbox in a single file – a PST file
  - This is how Microsoft store emails in their Outlook email client
  - This is extremely inefficient for backup purposes as a PST file can easily grow to several hundred megabytes or even larger (it used to have a limit of 2 Gbytes!).
    - To backup a single email therefore requires the whole PST file to be stored!
    - Local archive folders are stored in a single OST file.
    - You may find back up programs that specifically optimise PST storage/backup!

In general

- if you use IMAP/SNMP protocols you are fairly safe relying on your mail server to maintain a copy of your email.
- If you use a mail client (such as the free Thunderbird) that stores emails as separate files then any file backup solution will work.

If you choose to use the Microsoft Outlook client in your computer then there are special email backup solutions available or just rely on using IMAP and leave backup to the server.

Aomei Backupper requires the non free option to be able to backup Microsoft Outlook mailboxes efficiently.

6.2.2 Other documents

These are simple documents of any type other than emails and a simple file backup solution is all that is needed. This is fully supported by Backupper

6.3 File/Folder backup using AOMEI Backupper

6.3.1 Outline

Backupper will consolidate all your folders and files into a single specially formatted archive file. A browse function is however provided to browse this archive. This

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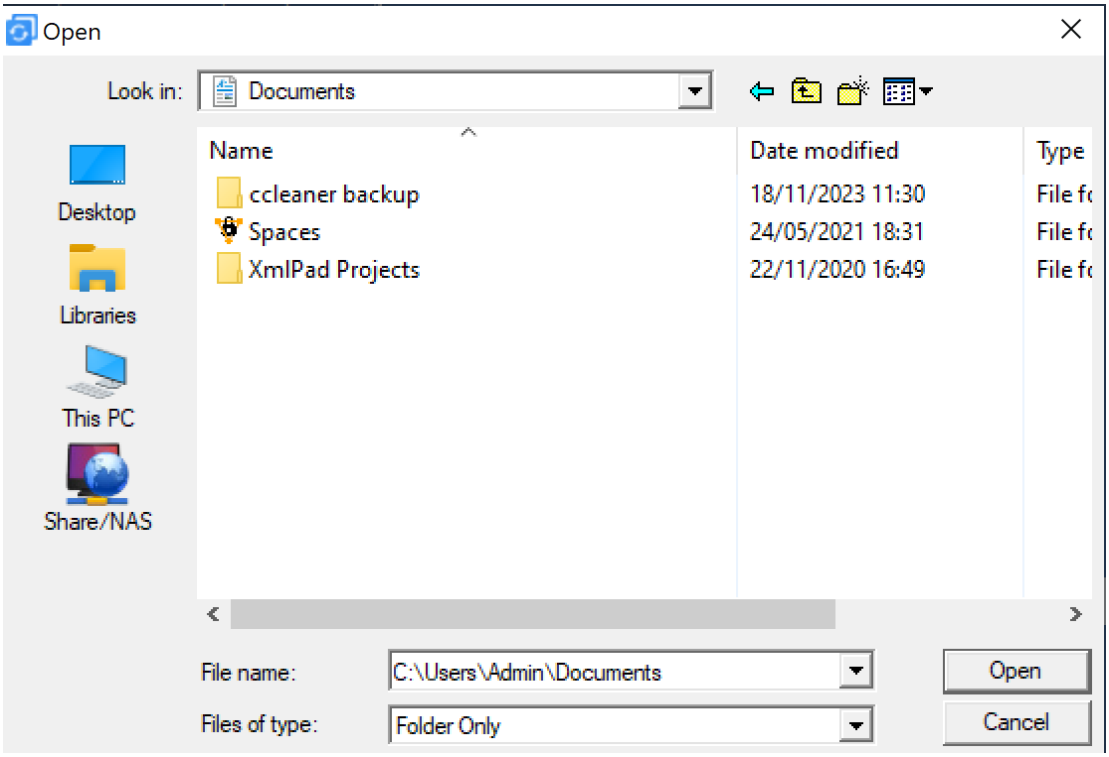

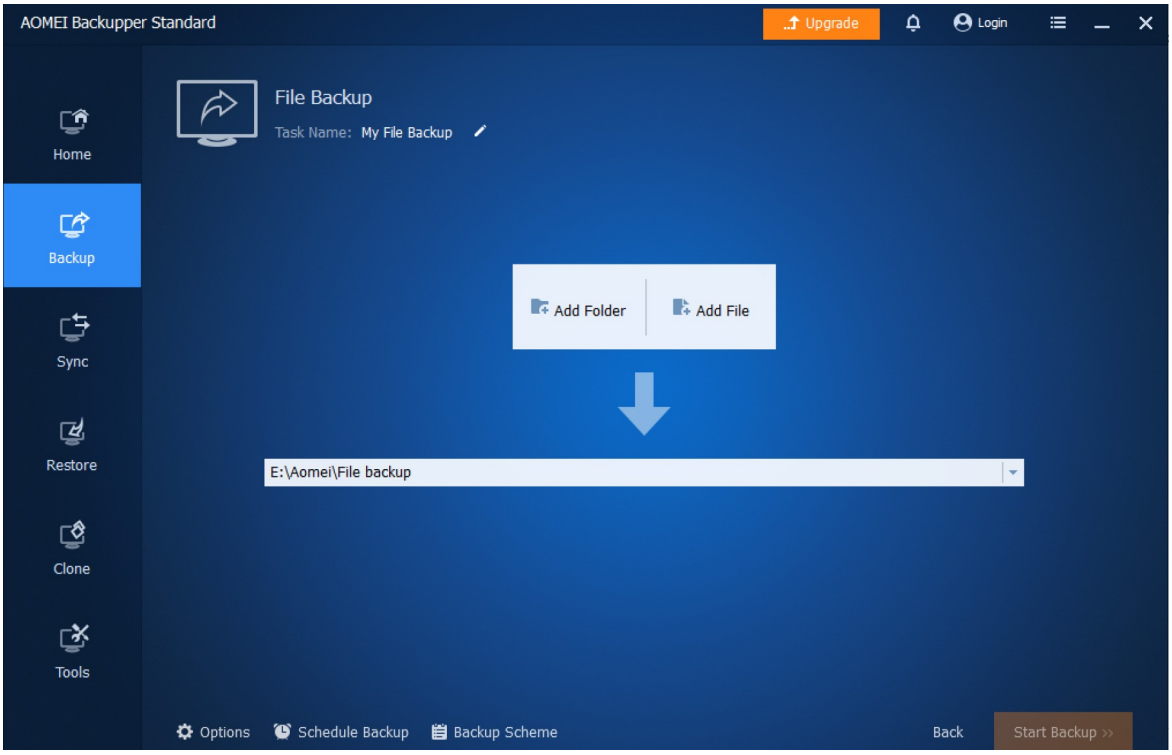

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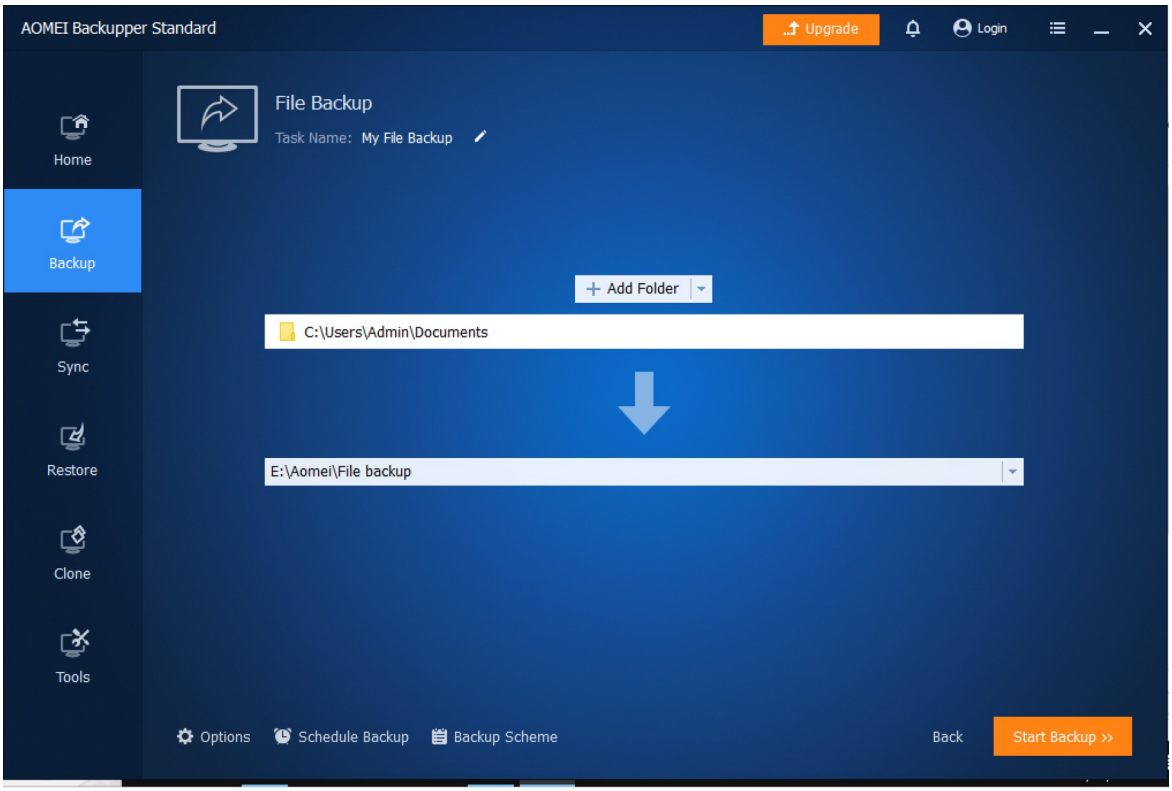

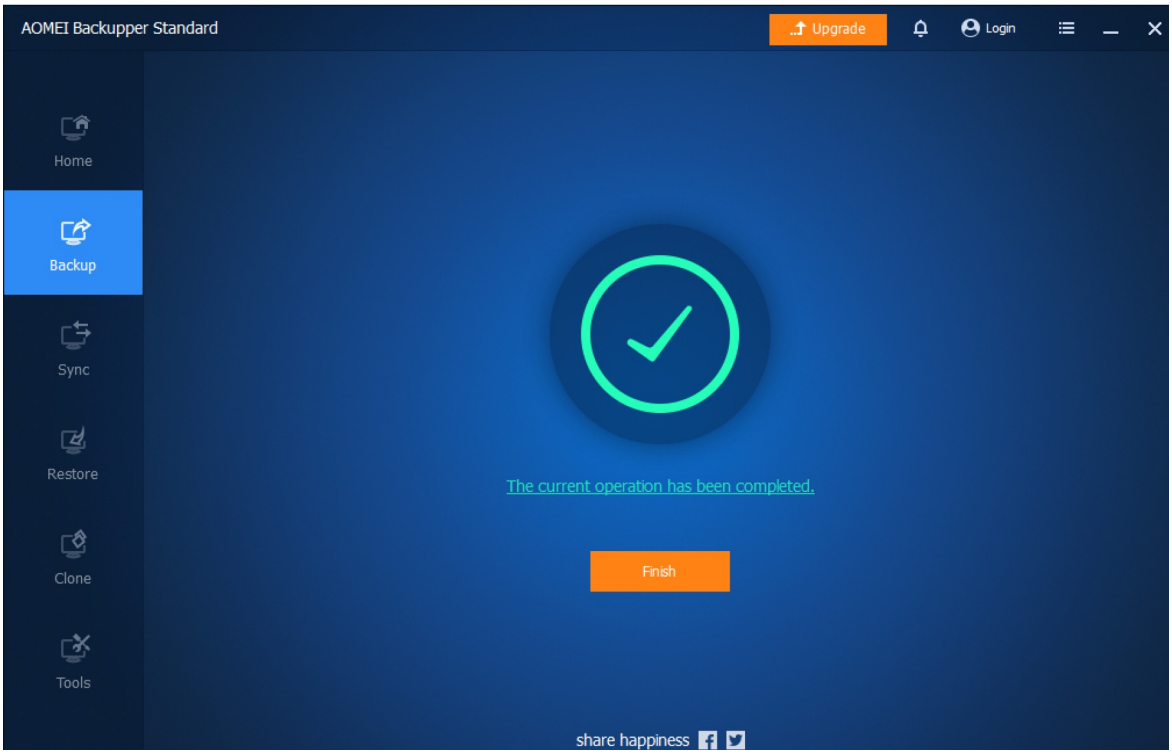

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