Windows 11 Lenovo Image Backup

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About this time last year Uncle Sam delivered a brand-new Lenovo ThinkBook 15 G2 ITL laptop and HP printer as part of my Chapter 31 benefits. I'm pursuing my second bachelor's degree and these units are provided to allow me to complete my on-line coursework and labs.

The laptop shipped with 8 gigabytes of memory soldered to the motherboard and an 8-gigabyte memory module in an upgrade slot. For Christmas of 2022 I purchased two sixteen-gigabyte memory modules effectively upgrading to the maximum supported 40 gigabytes of memory.

The laptop shipped with a snappy 500 gigabyte NVMe Samsung hard drive, and as time marched on it didn't take long for that to feel like "not so much storage". The touch screen on the laptop also suffered a failure recently – and my premier support package brought a service tech to my home the following morning for a full replacement. This is when I discovered a second NVMe storage bay is available for upgrades.

I installed a hot new two-terabyte Western Digital "Black" SN770 NVMe drive into this bay and performed a factory wipe/reinstall of the laptop after backing up my personal data.



Partitioning

I divided the new drive into two partitions; a 502-gigabyte partition assigned drive letter "B" for "backups", with the remaining 1360 gigabytes partitioned as drive letter "D" for "Data". Both are NTFS.

Basic 476.92 GB Online	260 MB Healthy (EFI System Partition)	SYS (C:) 475.69 GB NTFS Healthy (Boot, Page File, Crash Dump, Basic Data Part	ition)	1000 MB Healthy (Recovery Partition)	
Disk 1 Basic 1863.02 GB Online	SYS-BACKUP (B:) 502.31 GB NTFS Healthy (Basic Data Partition)		Data (D:) 1360.70 GB NTFS Healthy (Basic Data Partition)		

Imaging

I'm utilizing "<u>AOMEI Backupper</u>"¹ (licensed professional version) to handle imaging duties. The software provides a broad number of backup options at the system, disk, partition and file level. I'm performing a full "Disk Backup" as part of this imaging strategy.

-	System Backup Backup Windows and create an image of system partition.		Disk Backup Backup hard disks to an image file.
¢	Partition Backup Backup partitions or dynamic volumes to an image file.	œ	File Backup Easily backup files and folders to an image file.
	Email Backup Easily backup email data of any email account.	Ø	Outlook Backup Backup Outlook App data to an image file.
•	Cloud Backup Backup data to secure and reliable AOMEI Cloud storage.		

¹ I am also a fan of <u>AOMEI Partition Assistant</u> and as a licensed user recommend it.

I edited the name to "Full Disk Backup" and browse to the B:\AOMEI_BackupImages path I've created in advance.

Ŕ	Disk Backup Task Name: Full Disk Backup	~		
			+ Add Disk	
		Backu	p the source data above to the location l	
	B:\AOMEI_BackupImages			-

I click Add Disk and select "Disk0" and click "Add". I then click "Backup Scheme" at the bottom of the screen and choose "Full Backup". <u>(The default is set to incremental.)</u>

P	Dis Task	k Backup K Name Full Disk Backup 🖌			
Se	elect Disk			×	
	Disk0 Basic GPT 476.94 GB	*: S *: 260. 16.C 75.69 GB Ntfs) *: \ 100		
	Disk1 Basic GPT 1.82 TB	B: SYS-BACKUP 502.31 GB Ntfs	D: Data 1.33 TB Ntfs		
					-
			Cancel Add		

I then click "Backup Settings".

In the General section I add comments for the image and have not enabled encryption or email notification.

Backup Settings		×
General	Comments	
Backup Mode	Write a note for the backup, e.g. "Photo 3/23/2021". Full Disk Backup of Factory Restore of Windows 11 Pro and rescue/restore partition(s). INCLUDES PERSONAL DATA!	
Command		
Advanced	Enable encryption for backups	
	Email notification	

In the Backup Mode section, I select the recommended "Intelligent Sector Backup" to save space.

For a forensic-level image I would want to select "Make an Exact Backup".

Backup Settings			
General	Intelligent Sector		
Backup Mode	Intelligent Sector Backup(Recommended) Only back up the used sectors of file systems, and this will reduce the size of image file and backup time.		
Command	Backup Service ⑦		
Advanced	Use Microsoft VSS		

In the Advanced section I set Compression to "None" and Operation Priority to "High" and click OK.

Backup Settings	
General	Compression 💿
Backup Mode	None Data will not be compressed, so this may significantly increase the size of the image file.
Command	Spliting 🔿
Advanced	Automatic(Recommended)
	Operation Priority 💿
	High * The task operation process has a higher priority than other processes and will be executed at a faster speed.
	Others Automatically create a folder with the same name as the task in the target location.
	Save to global settings Cancel OK

From here we click the "Backup" button, and the imaging process begins.

The entire imaging process from one NVMe solid-state storage device to another is incredibly fast. This backup takes less than eight minutes. The factory Samsung hard drive provides a solid read speed of 300Mbps and the new Western Digital "Black" slurps it in modest cached chunks.



Selecting "Intelligent Sector Backup" in the Backup Mode section has some interesting results.

The properties of the system drive for Microsoft Windows reveals total disk usage at 78.8 GB.

Type: File system:	Local Disk NTFS		
Used spa	ce:	84,658,819,072 bytes	78.8 GB
Free space	e:	426,111,983,616 bytes	396 GB
Capacity:		510,770,802,688 bytes	475 GB
		0	
		Drive C:	Details

Completed backup image file properties reveal the disk image is only 52.7 GB. This is because the unused or "slack" space in the drive is not included.

Full Disk Backup Properties				
General S	ecurity Details Previous Versions			
	Full Disk Backup			
Type of file:	AOMEI Backupper Backup File (.adi)			
Opens with:	AOMEI Backupper Change			
Location:	B:\AOMEI_BackupImages			
Size:	52.7 GB (56,593,915,176 bytes)			
Size on dis	k: 52.7 GB (56,593,915,904 bytes)			

Issues to consider: READ MY LIPS! An Untested Backup is a WORTHLESS BACKUP!

I.E. "Test your backups to verify they're good."

What happens if the entire laptop is lost/destroyed/stolen?

Move a copy of the most recent backup image file to alternate storage.

Why don't I use compression?

Compression can indeed save a lot of space and make multiple time-based images possible.

I, however, believe anything "extra" that can go wrong during restoring a backup is something to be avoided. Corruption during decompression, though rare, is one such thing.