CH 2: Configuring and installing the OS

Install and Upgrade	Install and Upgrade Operating Systems
Maintain	Maintain OSs

Topic A: Installation

Windows 11 Editions/Versions

OS Installation

OS Installation Overview:

Select an installation method.

- Clean install or in-place upgrade.

Check compatibility.

- Hardware, peripherals, and applications.

If you are upgrading, back up existing data and settings.

Choose a boot method for loading the OS setup files.

Prepare the fixed disk, and copy the setup files to the target.

Configure installation options.

Verify the installation was successful.

OS Installation Types

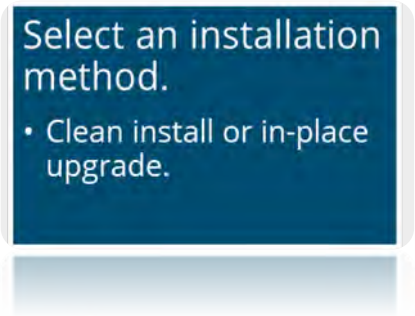
- **Attended installation:** A installation were the
- installer inputs the configuration information in response to prompts from a setup program.

- **Unattended installation:** A installation were the
- configuration information is derived from an input file.

OS Installation Types

Clean install: Installing the OS, replacing the OS software on a computer, and in the process, **deleting** existing applications, user settings, and data files.

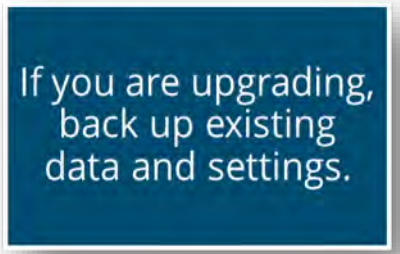
- Clean install:
  - Install OS to a new computer.
  - Replace existing OS on a computer.
  - Generally, more reliable than upgrading.
  - In mid- to large-size organizations, usually performed using images.



OS Installation Types

In-place upgrade: Installing the OS on top of an existing version of the OS, **retaining** applications, user settings, and data files.

- In-place upgrade:
  - Installs on top of existing OS.
  - Retains applications, user settings, data files.
    - Be sure to back up first!
  - Usually performed on home systems.



- **Repair upgrade** is the process of installing Windows 10 over the existing installation of Windows 10 on your hard disk, using your installation DVD or ISO file.
- Performing this can repair broken operating system files while preserving your personal files, settings and installed applications.

Compatibility Considerations

Windows Logo'd Product List (LPL) and **Hardware Compatibility List (HCL):** PC components have been tested for compatibility with Windows OSs.

- OS compatibility
- Upgrade path (11- you must be on 10 first!)
- Hardware compatibility
- Application compatibility
- Upgrade advisor software
- Linux installation and compatibility

Check compatibility.

- Hardware, peripherals, and applications.

Installation Boot Methods

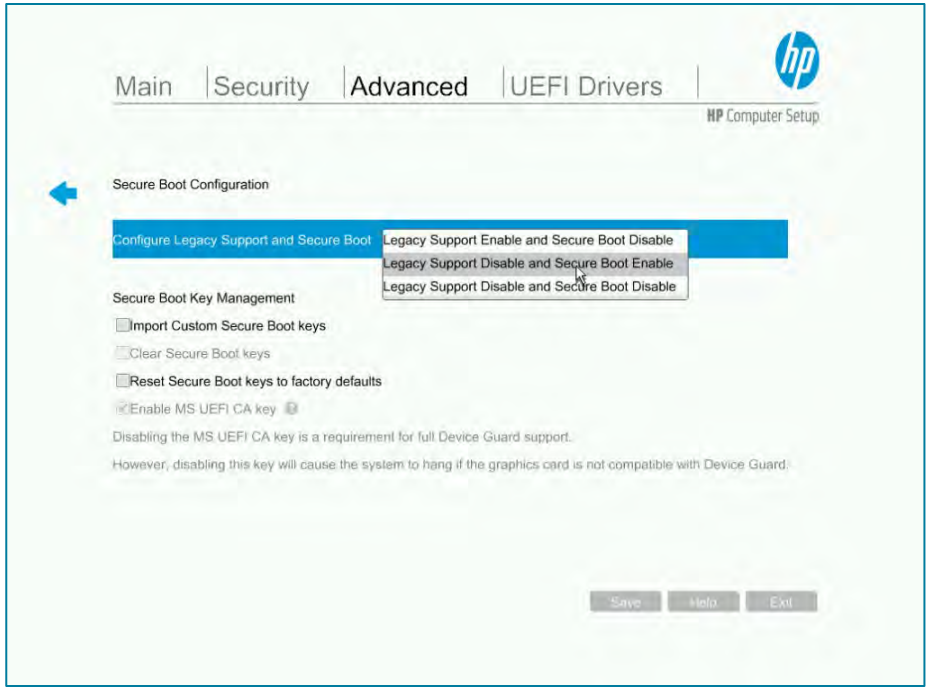
Installation boot method: How an installation program and settings are loaded onto a PC.

- Set up and prioritize boot methods in firmware setup.
  - Optical disc (ISO file)
  - External disk/Flash drive (slipstreamed media)
  - Network boot (PXE)
- Re-prioritize boot order after installation.
  - Internal fixed disk or partition

Choose a boot method for loading the OS setup files.

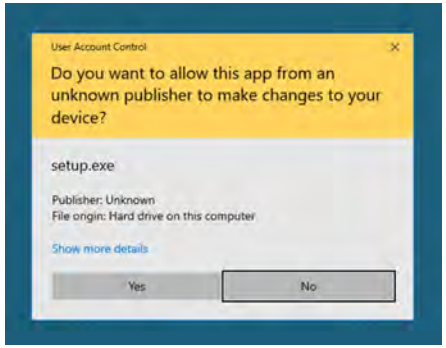
Installation Boot Methods

- Secure Boot option.
  - Available in UEFI firmware.
  - Restricts OS installation to trusted software.
  - Might need to disable to install some OSs.



Installation Boot Methods

- Installers for desktop applications
  - Windows EXE and MSI installers
  - macOS DMG and PGK installers
  - Linux APT (DEB) and YUM (RPM) package managers & formats
  - ISO mountable (downloadable)
  - Physical media versus



Disk Formatting and Partitioning

System partition: The bootable partition on the hard disk Fat32.

Boot partition: The partition that contains the operating system.

Determine how the computer will be used:

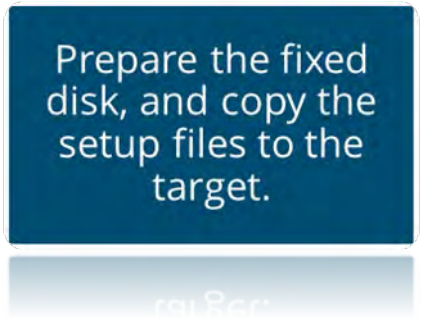
- Multiboot?
- Does the boot partition have room for growth?
- Will RAID be implemented?
- Is an SSD or hybrid SSD being used?

Prepare the fixed disk, and copy the setup files to the target.

Multiboot Partitioning

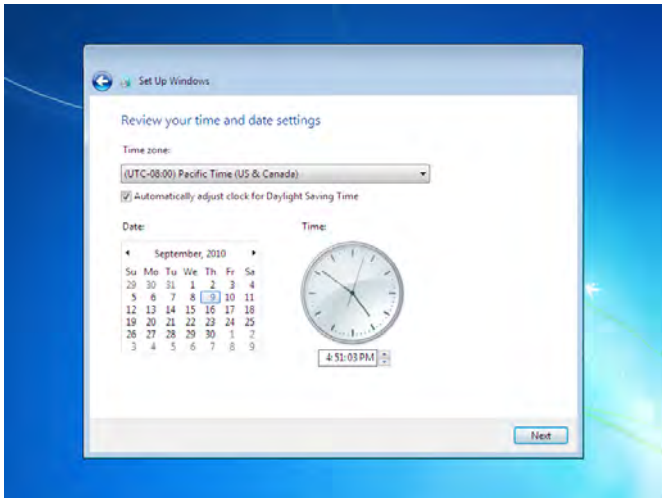
Multiboot: A computer with multiple operating systems installed on a single computer, each installed in a separate partition.

- Each OS installed to separate boot partitions.
- System partition accessible to each OS.
- Don’t overwrite the boot manager.
- Consider using virtualization instead.

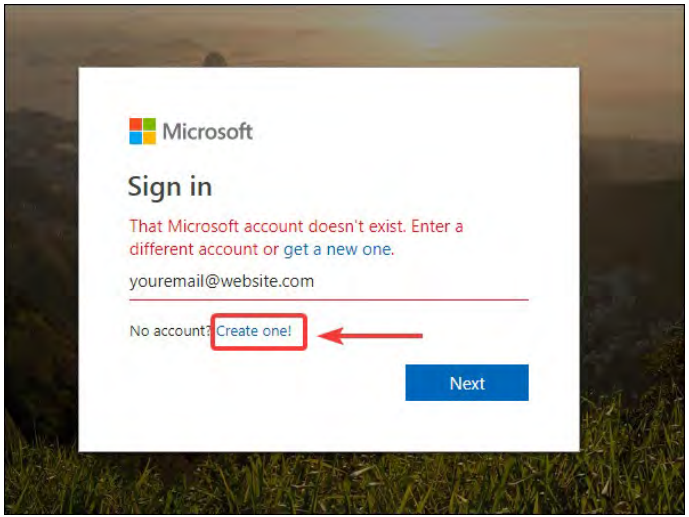


Locale Settings and Software Selection

- Attended Windows installations:
  - Select language and other locale settings.
  - Verify time and date display correctly.
  - Enter product key.
  - Accept EULA.
  - Select install type.



Networking Considerations



Workgroup: A small group of computers on a network that share resources in a peer-to-peer fashion.

Domain: A group of computers that share a common accounts database, referred to as the directory.

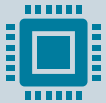
Microsoft account: The type of account required to get apps from the Microsoft Store, to sync data between devices, access OneDrive, and work with parental controls for a Child account.

Local account: An account that is only associated with the computer on which it was created.

Networking Considerations

- Workgroup installed by default.
- WORKGROUP should not be renamed.
- Join a domain by reconfiguring System properties.
- If not connected to the Internet, local account will be created.
- Convert to a Microsoft account through Windows **Settings.**

Post-Installation Tasks

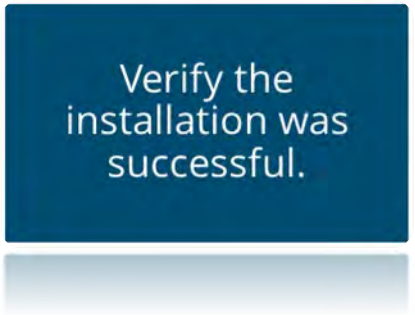


Hardware detection and driver installation is automated.

Check log files and Device Manager to ensure all hardware was identified.

Programs and Features Control Panel.

Post-Installation Tasks



- Microsoft product/volume activation.
  - Anti-piracy technology.
  - Individual installations activated over the Internet.
  - Grace period users cannot access the system until they activate Windows
  - Large organizations can use a volume license product key for bulk activation.
  - Automated installations can activate Windows, too.

OS Installation Types

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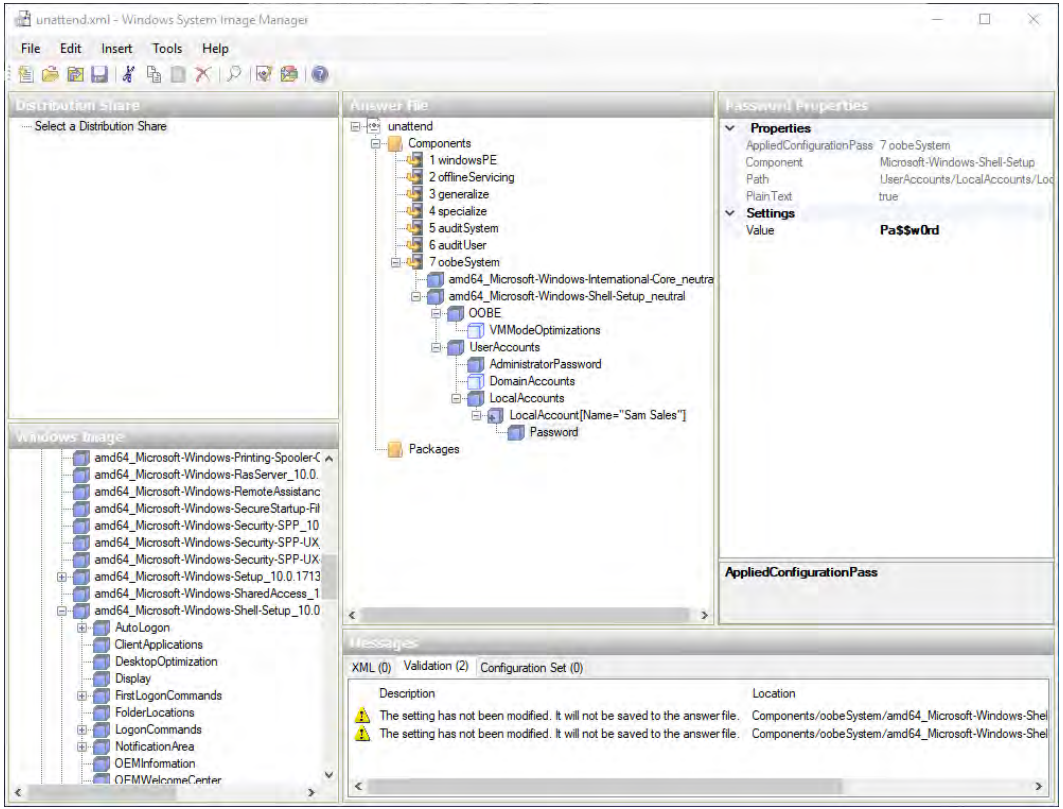
Verify the installation was successful.

Installing & Upgrading Windows

Vmware & Win 10 install!!

Unattended Installations

- Answer file
- Image deployment



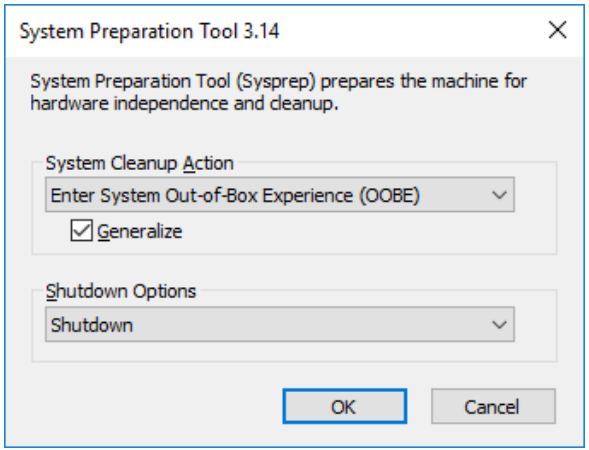
Unattended Installations

Unattended installation: uses a script or config file to input the choices and settings needed during setup. Windows ANSWER file

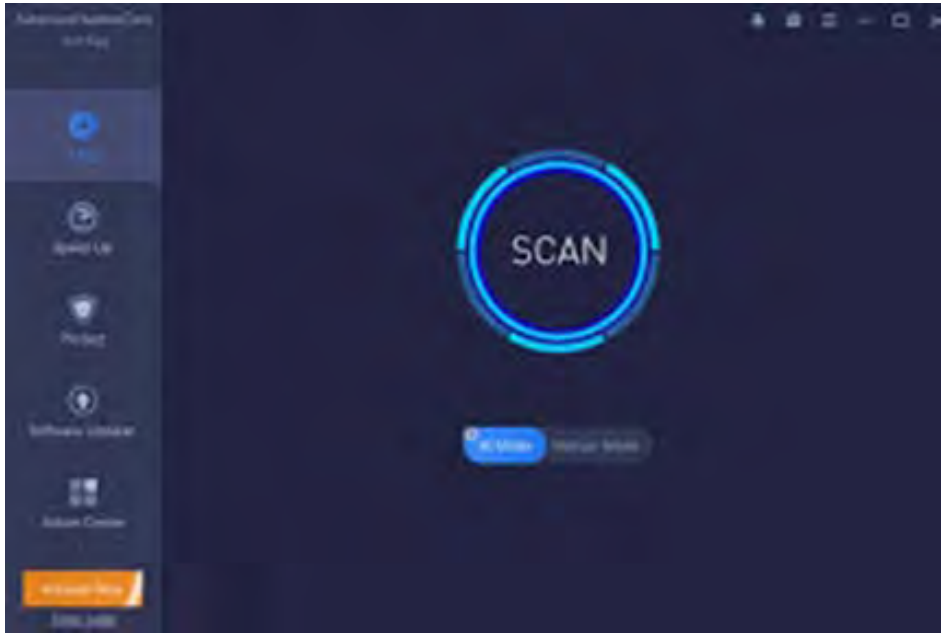
- Image deployment
  - An answer file is an eXtensible Markup Language (**XML**) text file that contains all the instructions that the Windows Setup program will need to install and configure the OS without any administrator intervention
- Windows System Image Manager
  - Configures the answer files
  - Such as product key, disk partitions, computer name, language, and network settings (join a domain)

Unattended Installations

- Drive cloning and sysprep
  - Dism tool reads the contents of a drive and writes the output to a **.WIM** (Windows Image File) format file.
  - Run sysprep before imaging to make the image unique
- Windows Deployment Services
  - **.WIM** images and answer files



Topic B: Maintain OSs



Disk Maintenance

Fragmentation: Occurs when a data file is not saved to contiguous sectors on a disk. This decreases performance by making the disk read/write heads move between fragments.

Disk drives and file systems require the most attention.

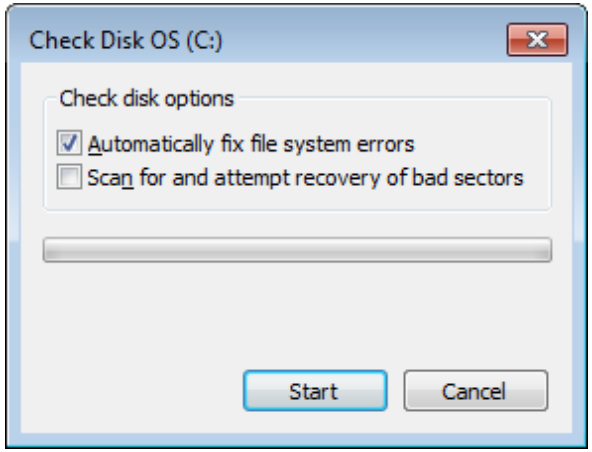
When used regularly, disk performance tools can help address these problems.

- Fragmentation
- Capacity
- Damage

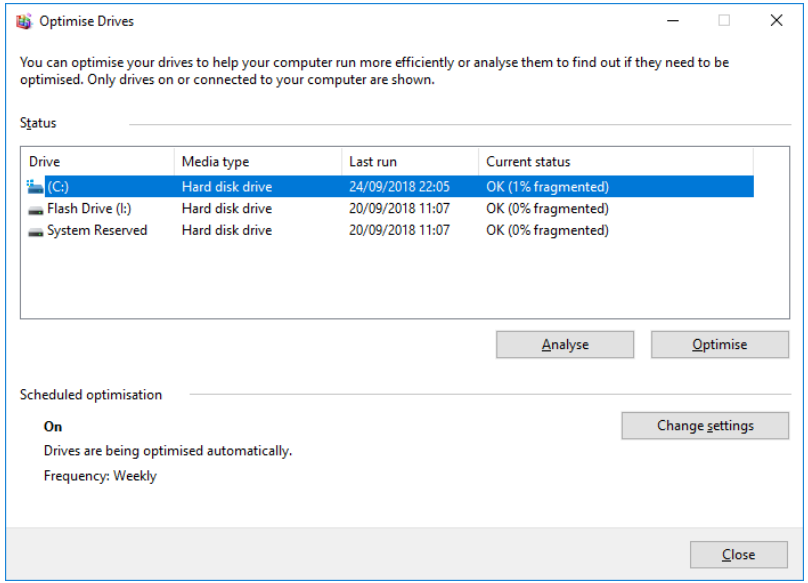
Windows Disk Maintenance Tools

Check Disk

Error Checking tool is simply a GUI for the chkdsk command line tool.



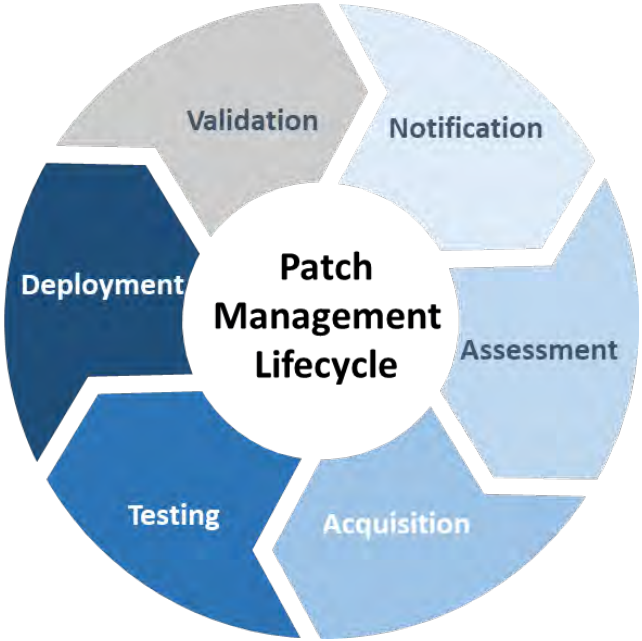
Disk Defragmenter



Linux and macOS Disk Maintenance Tools

- Linux disk management tools:
  - df
  - du
  - Fsck
- macOS Disk Utility app

Patch Management



Patch management: Identifying, testing, and deploying OS and application updates.

Patch: A fix for software, designed to eliminate known bugs or vulnerabilities and improve performance.

Update: Made freely available by the software manufacturer to fix problems in a particular software version, including any security vulnerabilities.

A patch management program might include:

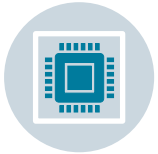
Someone to review security patches and update newsletters.

Categories updates into urgent, important, & non-critical categories.

An offline patch test group.

Immediate delivery of urgent patches!

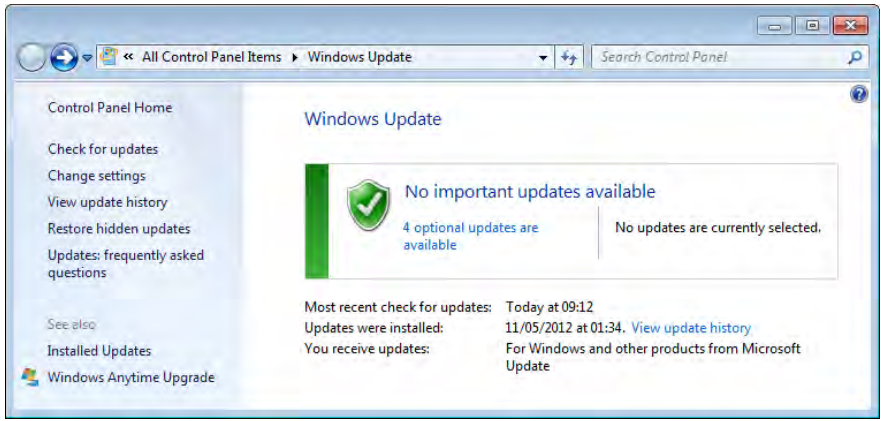
Weekly push of approved important patches.



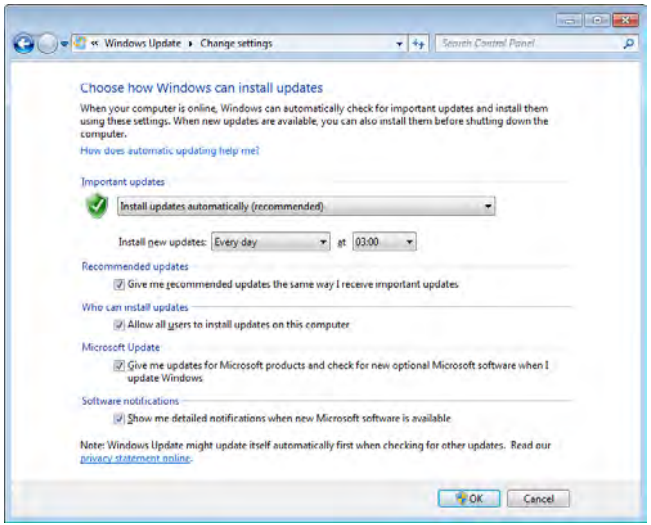
A periodic evaluation phase and full rollout for non-critical patches.

OS Updates

Windows Update



Changing Update Settings



OS Updates

Windows Update.

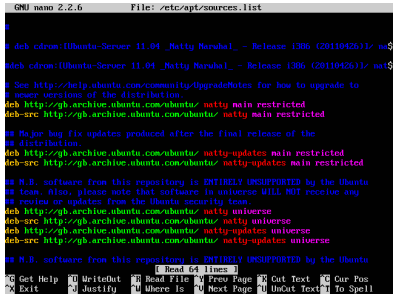
- Website hosts maintenance updates for many Windows versions.
- “Patch Tuesday.” No Longer!
- Critical updates, security patches, and optional updates.
- Configure automatic check for updates:
  - During installation.
  - Windows Update app in Control Panel.
  - For Windows 11, & 10 Windows Settings, **Update & Security**.
  - Locate: %SystemRoot%/WindowsUpdate.txt records update activity.

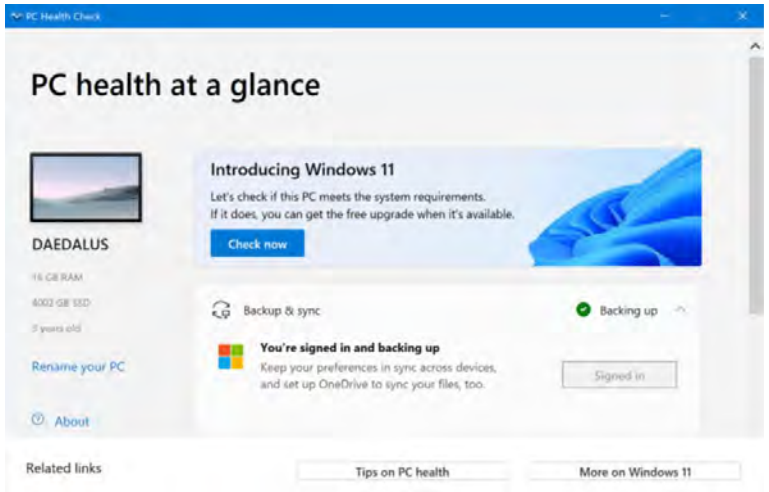
Uninstall updates that cause problems.

- Use **Programs and Features** applet.

OS Updates

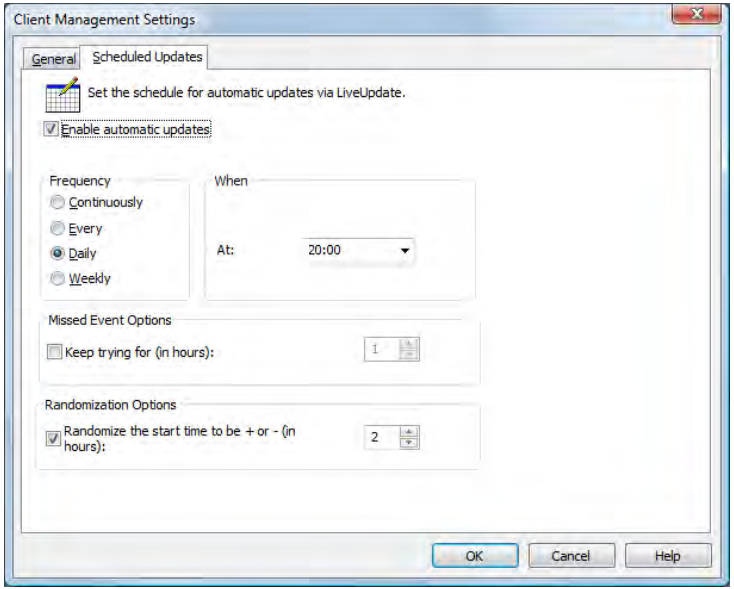
- Application updates:
  - Browsers and plug-ins
  - Each vendor provides autoupdate software (task manager)
- Linux package management
  - yum
  - apt-get





Anti-Malware Updates

- Update all Windows systems:
  - Virus definitions/patterns
  - Scan engine/components
- macOS:
  - Not affected by conventional viruses.
  - Other malware can affect
  - Windows partitions still susceptible
  - Protection steps:
    - Only download trusted apps
    - Use anti-virus software
    - If Boot Camp or another Windows partition app is in use, treat the machine as if it was a Windows computer



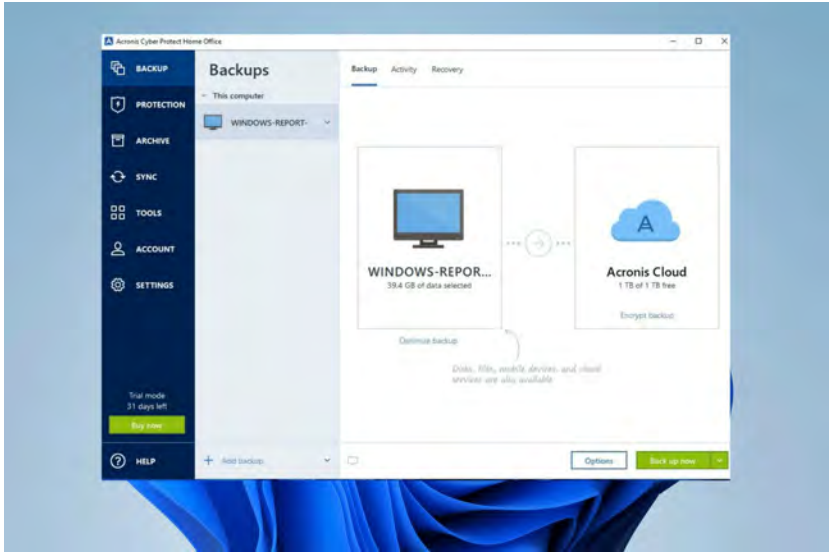
Driver and Firmware Updates

- For Windows systems, get driver updates from:
  - Windows Update
    - Listed as optional updates
    - Might not be automatically installed
    - Vendor website

- Firmware upgrades
  - Motherboard firmware updates to address
    - Bugs
    - Incompatibilities with Oss
    - New features

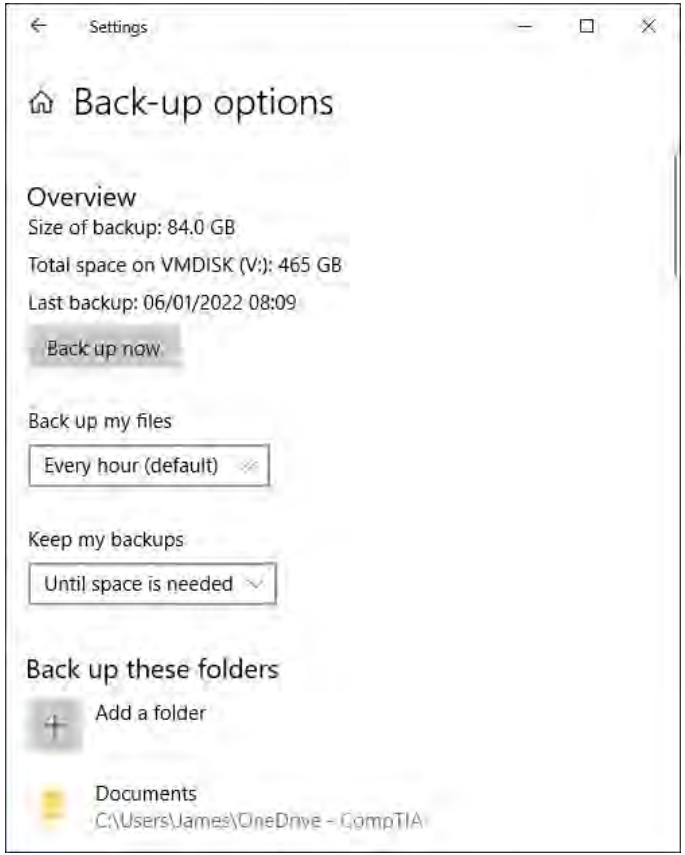
Scheduled Backups

- Essential to back up data.
- On networks, tape systems and complex third-party utilities are common.
- Personal backups commonly made to external hard drive or media, or the cloud.



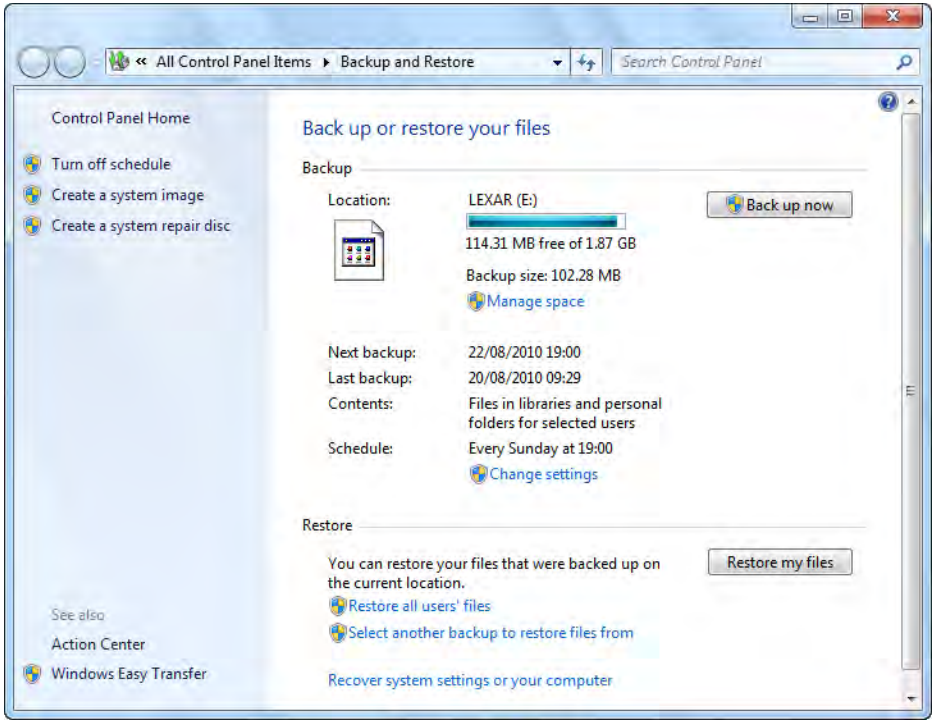
Backup Operations

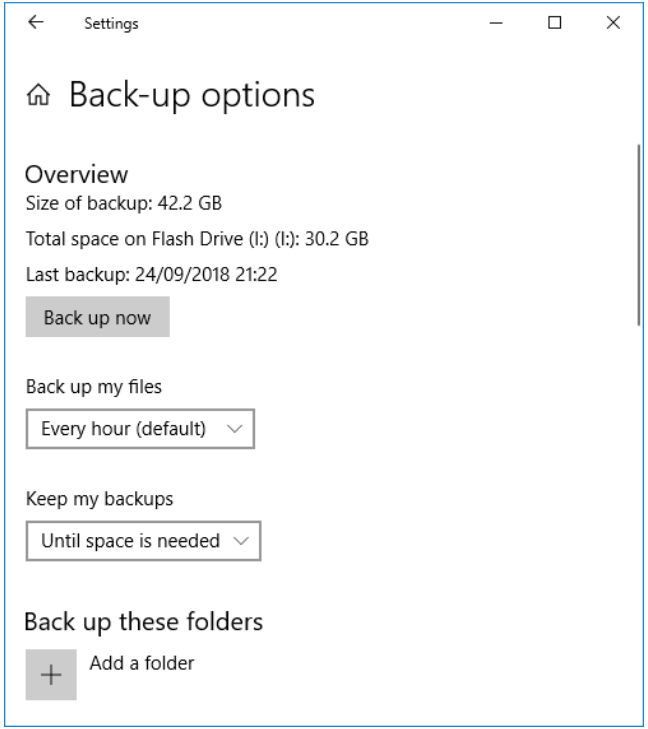
- Data backup and recovery operations
  - What to back up
  - How to store backups
  - Testing and validating recovery procedures
- Windows backup tools for home backups
  - File History
  - Windows Backup and Restore Center



Scheduled Backups

- Backup and Restore Center in control panel



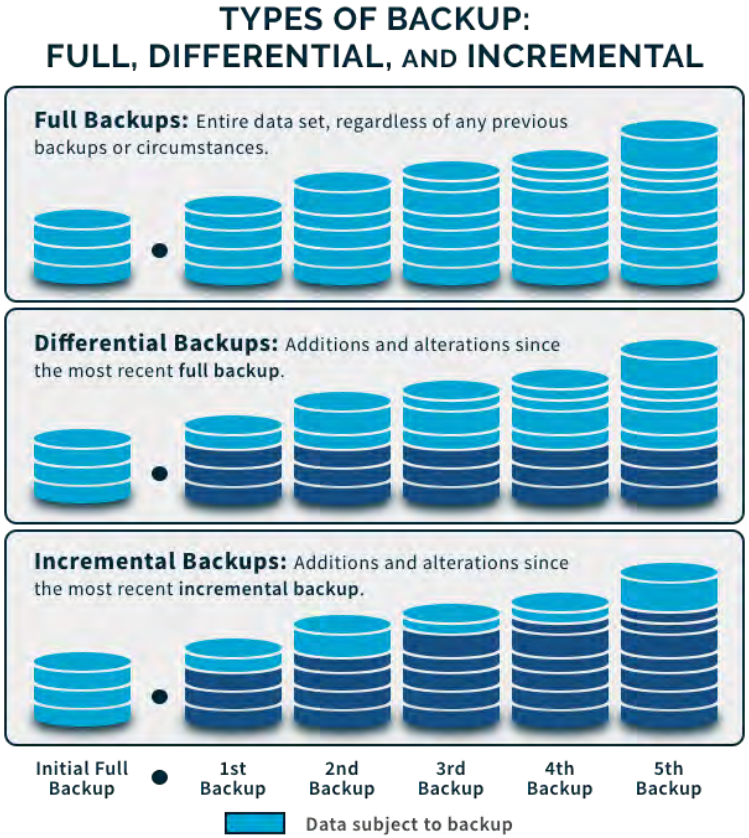


Backup Methods

- Frequency reflects how much lost work can be tolerated
- Retention is the period that any given backup job is kept
- Backup chains
  - Full with incremental or differential

Type	Data Selection	Backup Job Time and Storage Requirement	Recovery Complexity	Archive Attribute
Full	All selected data regardless of when it was previously backed up	High	Low (single job)	Cleared
Incremental	New files and files modified since last backup job	Low	High (multiple jobs)	Cleared
Differential	New files and files modified since last full backup job	Moderate	Moderate (two jobs)	Not Cleared

Backup Methods: Full with incremental or differential



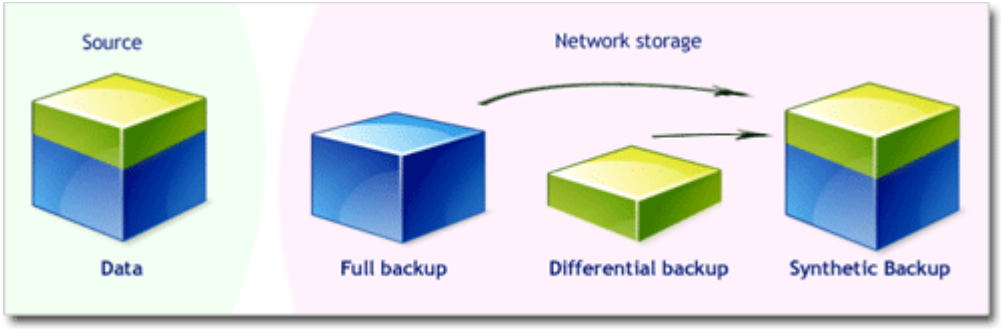
Synthetic Backup Methods

- Synthetic backup
  - Reduces transfer by synthesizing a next full backup from incremental jobs
  - Not generated directly from the original data but instead assembled from other backup jobs

How it works:

- 1. The chain starts with a full backup as normal and subsequently makes a series of incremental backups.

- 2. The next full backup is scheduled; backup software makes one more incremental backup. It then synthesizes a new full backup from the previous full and incremental backups.



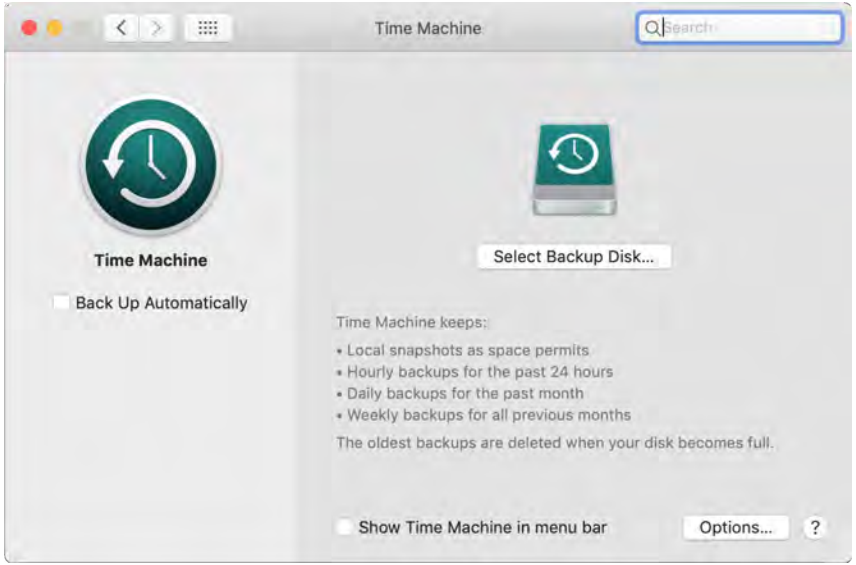
GFS Backup

- Grandfather-father-son (GFS) media rotation: (most widely used)
  - The GFS label scheme is in generations
  - Son - most recent data has the shortest retention period (one week)
  - Grandfather tapes are the oldest with the longest retention period (one year)
  - Label tapes for monthly, weekly, and daily backup jobs

Other considerations:

- On site versus off site & Online versus offline
- (3-2-1) backup rule - States you should have:
- 3 copies of your data
- across 2 media types
- 1 copy held offline and off site

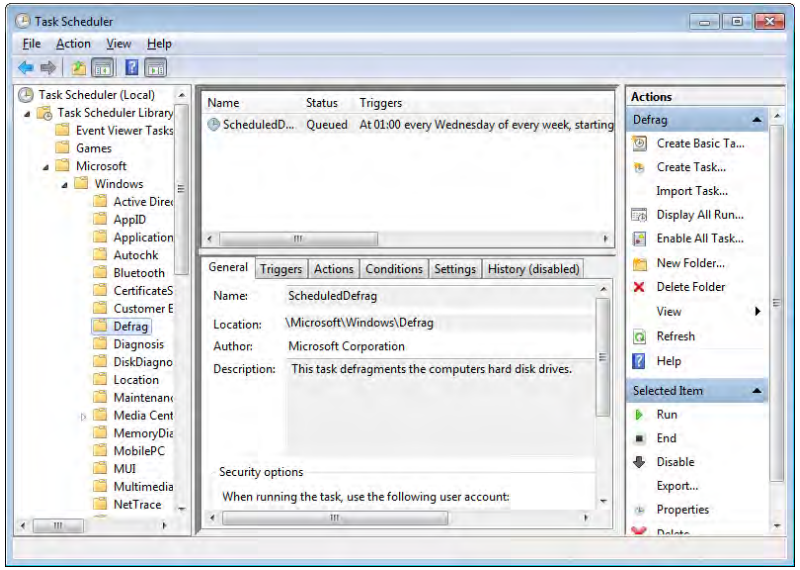
Scheduled Backups



- macOS Time Machine
- Linux backups:
  - No official OS tools.
  - Custom solution using cron and scripts.
  - Third-party software.

Task Schedulers

- Windows Task Scheduler
  - One-time or recurring schedule.
  - Some processes already have schedules.
  - You can define triggers other than a simple schedule.
  - You can add multiple actions under a single task.
  - You can view log files for events connected to a task.
  - You can organize tasks in folders.



Discussing OS Maintenance

- **What Windows utility would you use to back up data files in Windows 10?**

- **ANSWER:**
  - File History. You could also consider OneDrive as a type of backup solution.

Discussing OS Maintenance

- **What backup issue does the synthetic job type address?**

- **ANSWER:**
  - Reduces data transfer requirements
  - Reduces job time by synthesizing a full backup from previous incremental backups rather than drives directly.

Discussing OS Maintenance

- **You are documenting workstation backup and recovery methods and want to include the 3-2-1 backup rule. What is this rule?**

- **ANSWER:**
  - Have 3 copies of your data - across 2 media types - with 1 copy held offline and off site.

Discussing OS Maintenance

- **For which backup/restore issue is a cloud-based backup service an effective solution?**

ANSWER:

- The issue of provisioning an off-site copy of a backup. Cloud storage can also provide extra capacity.

Discussing OS Maintenance

- **What principal restriction would you face if using the backup tool included with Windows 7 Home Premium?**

- **ANSWER:**
  - It only supports backing up to local drives or removable media, not to network shares.

Discussing OS Maintenance

- **What is the name of Apple's backup software for macOS?**

- **ANSWER:**
  - Time Machine.