

Computer Systems Servicing NC II

- *Maintaining Computer Systems and Networks*



LESSON 1: Planning and Preparing for Maintenance

Introduction

Troubleshooting is an approach to locate the cause of faults in a computer system. Not all troubleshooting experiences are the same since technicians acquire this skill based on their knowledge and personal experience.

That is why as a computer technician, you must be knowledgeable in the *fundamentals of the computer concepts* since your approach to solving a problem may rely heavily on your own knowledge.



TOPIC 1: Preventive Maintenance

Preventive maintenance is the regular and systematic inspection, cleaning, and replacement of worn parts, materials, and systems.

It is done to *prevent* failure of parts, materials, and systems by regularly checking whether all parts are in good working order.



TOPIC 1: Preventive Maintenance

Purpose of Preventive Maintenance

- Preventive maintenance reduces the probability of hardware or software problems by systematically and periodically checking hardware and software to ensure proper operation.
- Regular preventive maintenance ensures minimal system failure. When there are fewer failures, less troubleshooting will be done, thus, saving an organization time and money.
- Preventive maintenance can also be done by upgrading certain hardware or software such as a hard drive that is making a noise, upgrading insufficient memory, and installing new software updates for security and reliability.



TOPIC 2: Conducting Maintenance

First and foremost, maintenance is important in reducing hardware and software issues. With this, computer downtime and repair costs are reduced.

Preventive maintenance *depends on the needs and specifications of the equipment*. For example, a device exposed to a dusty environment such as a construction site would need more maintenance as compare to an office environment.



High traffic networks such as those used in schools would **require more extensive scanning** and removal of malicious software and unwanted files.

Do take note that it is important to create documentation for any type of preventive maintenance, so that you can also check how often do certain hardware and software issues occur.

Besides these, here are more reasons why maintenance should be conducted:

- Increased data protection
- Extended device life
- Increased equipment stability
- Reduced repair costs
- Reduced equipment failure.



TOPIC 2: Conducting Maintenance

Hardware Maintenance

Maintenance for computer hardware can be done by regularly checking cables, components, and peripherals.

Regular cleaning of components should also be done to reduce overheating. Replacement of damaged components due to excessive wear should also be conducted.

The following is a guide on conducting hardware maintenance:

- Remove dust from fans.
- Remove dust from the power supply.
- Remove dust from components inside the computer.
- Clean the mouse and the keyboard.
- Check cables.



TOPIC 2: Conducting Maintenance

Software Maintenance



Software maintenance can be done by making sure that updates are current. Follow the policies when installing programs, operating system, and security updates.

Testing is done to ensure that minimal problems will be encountered when updating the software and hardware.

Here are some simple tasks when conducting software maintenance:

- Review and check security updates.
- Review and check software updates.
- Review and check driver updates.
- Update anti-virus files.
- Scan for viruses and malware.
- Remove unused and unwanted programs.
- Scan hard drives.
- Defragment hard drives.



TOPIC 3: Troubleshooting

Although troubleshooting varies and can be modified depending on case and experience, it requires an *organized and logical approach* when handling computers and components. Doing so will ensure that the process is in systematic order.

Troubleshooting is honed over time. Every time an issue is resolved, skills on troubleshooting are also improved. Through troubleshooting experience, one would be able to know the steps needed to resolve an issue quickly.



The following is a simple process guideline which can also be modified depending on the situation:

- Explain the purpose of data protection.
- Identify the root of the problem.
- List probable causes of the issue.
- Test the theory to determine the exact cause.
- Plan the course of action to resolve the issue.
- Implement the solution.
- Check the system functionality.
- If applicable, implement preventive measures.
- Create documentation of findings, action, and outcomes.



TOPIC 4: Data Protection

Before troubleshooting, follow the necessary precautions in order to handle computer hardware and software properly.

Repairs such as hard drive replacement and operating system installation are very delicate and may put computer data at risk.

Make sure to prevent data loss when attempting repairs.



TOPIC 4: Data Protection

Practicing Caution

Data protection is one of the first steps of troubleshooting.

Computer data must first be protected before starting any work on a client or customer's computer.

A technician can be blamed or held liable if data loss occurs because of improper data handling.



TOPIC 4: Data Protection

Backing Up Data



Backup is the copy of data on a computer or hard drive that is saved to an external media such as a DVD, CD, or flash drive.

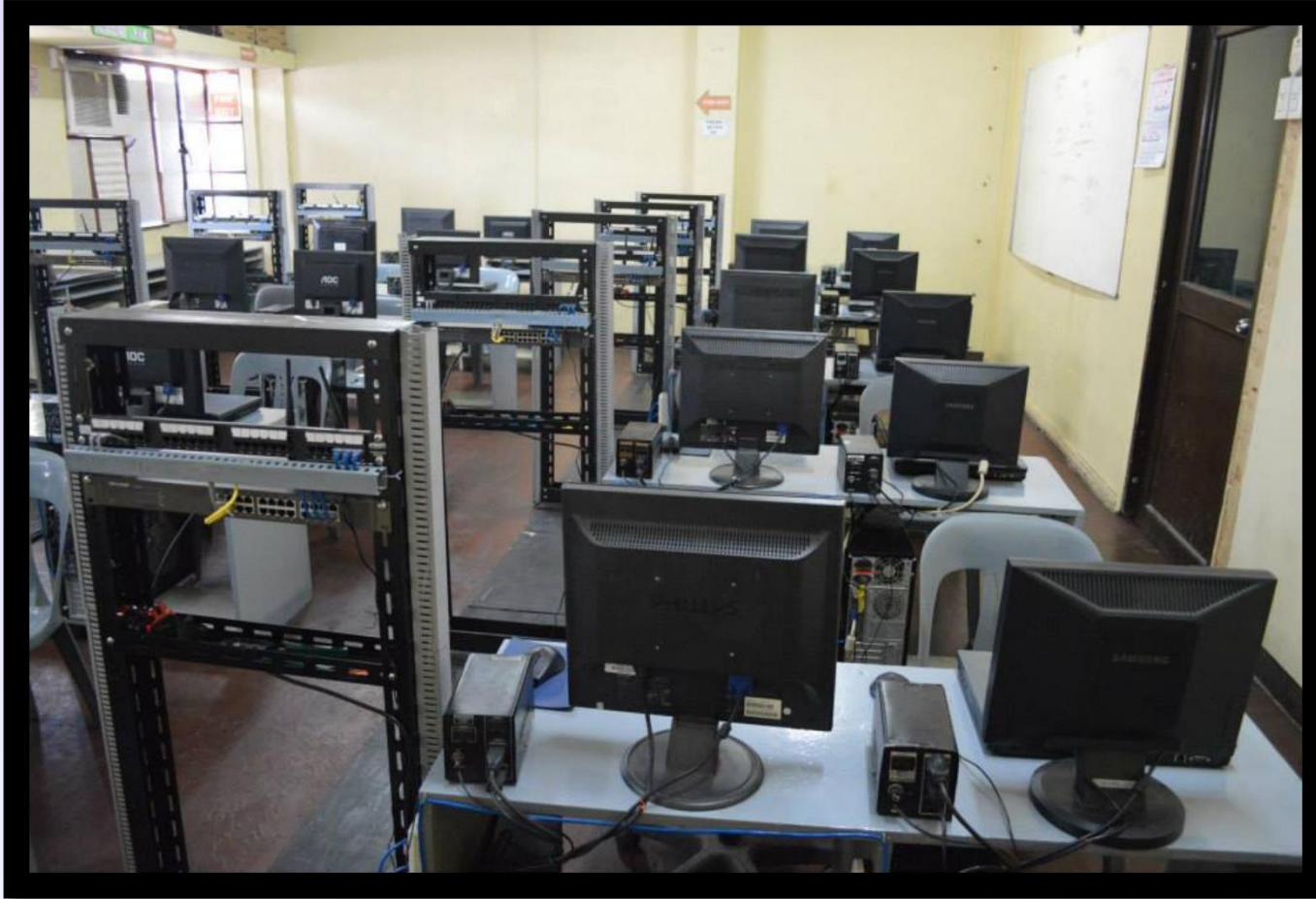
In an organization, *back-ups* are routinely done—may it be daily, weekly, or on a monthly basis. This is to ensure that the organization's data are protected and are readily

available. If unsure whether a backup has been done, do not conduct troubleshooting activities on a client's computer.

Make sure to verify the following with the customer first:

- Date of last backup
- Content of backup
- Data integrity of the backup – Data integrity is the maintenance of the accuracy and consistency of the data. It is making sure that the data can be properly retrieved or restored in its optimum quality.
- Availability of backup media for data restoration





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LESSON 2: Maintaining Computer Systems and Networks

Introduction

A properly maintained computer gives higher speeds, may it be via RAM or on the Internet, regardless of hardware set-up and configurations.

This lesson will give some tips on how to maintain computer systems and networks over time.



TOPIC 1: Routine Maintenance

Clean browsers.

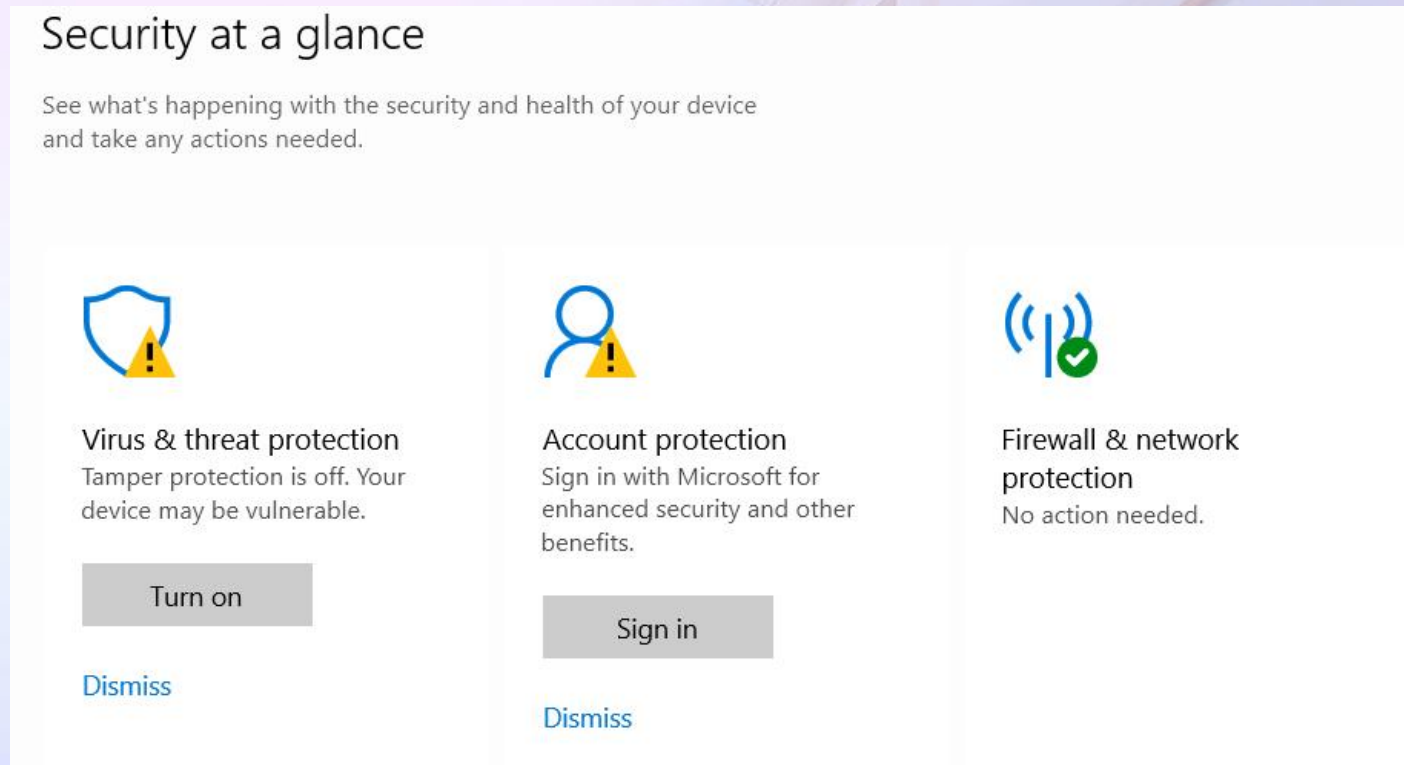
Use the computer's Disk Cleanup Utility included in the Windows System. In the same way, you can also download third party, freeware programs such as CCleaner to do the clean-up for you.



TOPIC 1: Routine Maintenance

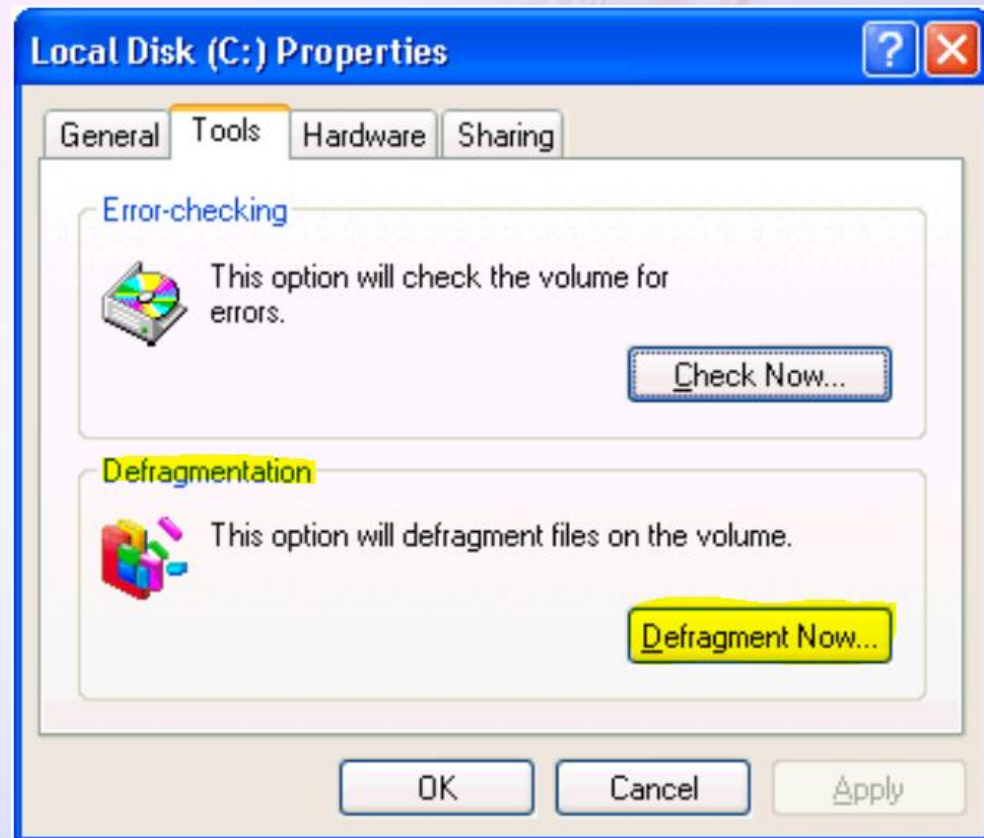
Search and delete spyware and viruses from the device.

Third party softwares like AVG Anti Virus can be used for maintenance. Or use the Windows Security built in on Windows 10 devices.



TOPIC 1: Routine Maintenance

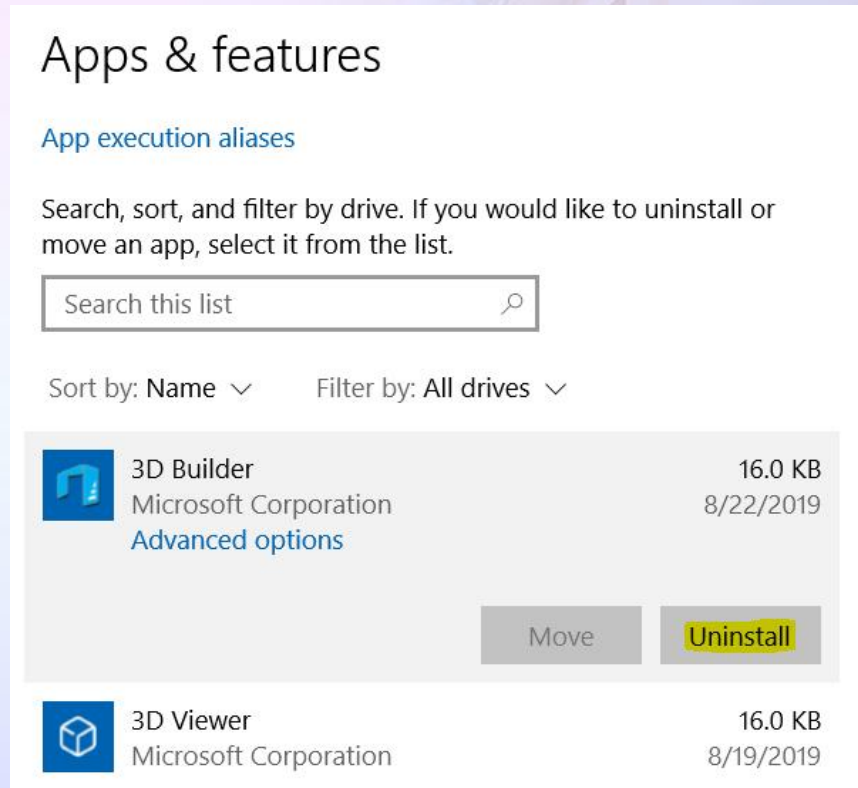
Defragment the hard drive routinely to keep the device running smoothly.



TOPIC 1: Routine Maintenance

Uninstall programs that are no longer used.

Delete files that are no longer needed. The freer space a computer has, the faster it will perform. The computer's performance will increase.

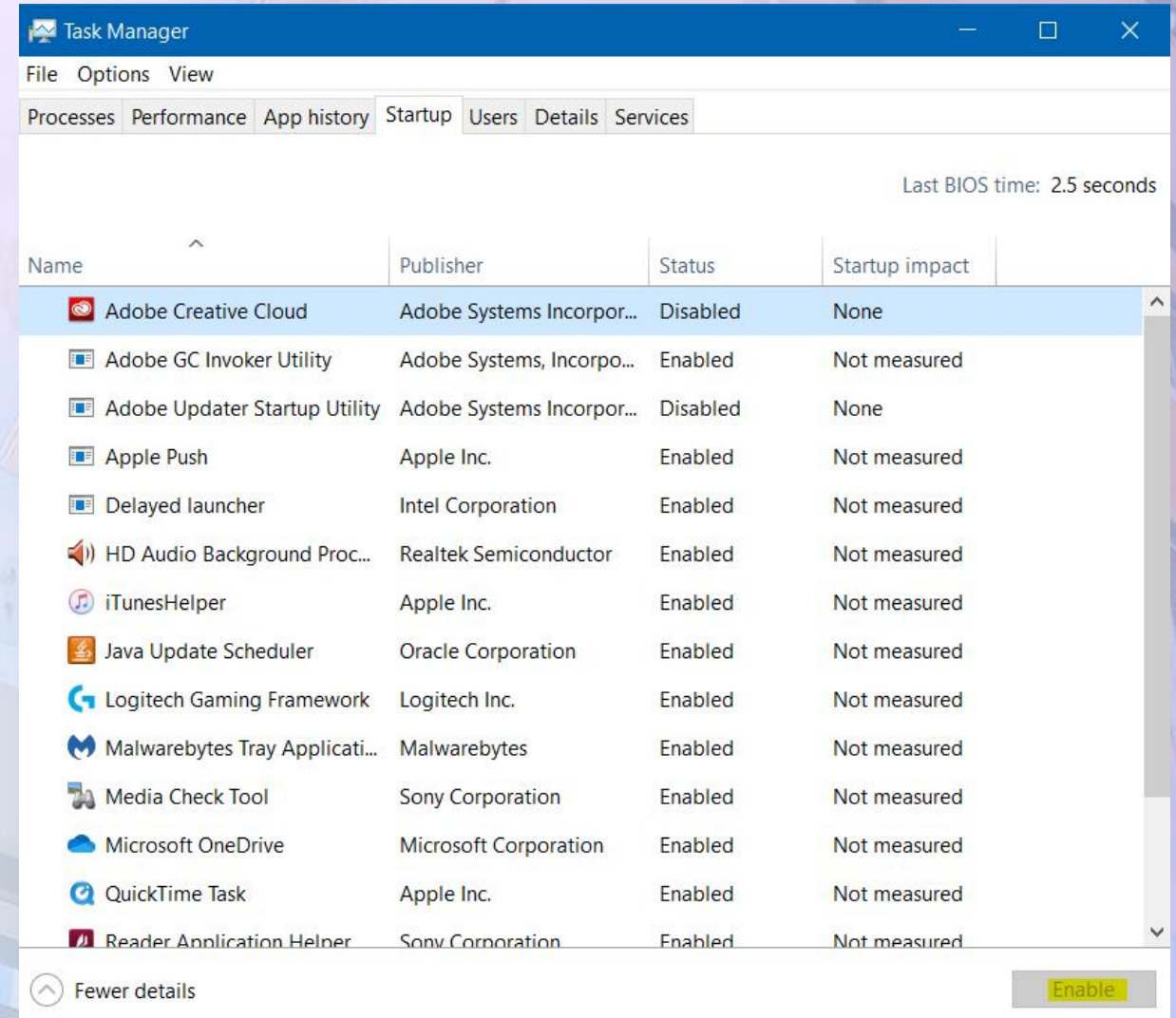


TOPIC 1: Routine Maintenance

Remove startup programs.

Use the msconfig command in the RUN command prompt to open up a window that will allow you to uncheck startup programs that are no longer used.

Doing this will improve start up and boot down times a lot. Third party softwares such as CCleaner can also be used for this purpose.

A screenshot of the Windows Task Manager application, specifically the 'Startup' tab. The window title is 'Task Manager'. The menu bar includes 'File', 'Options', and 'View'. The tab bar shows 'Processes', 'Performance', 'App history', 'Startup' (selected), 'Users', 'Details', and 'Services'. The main area displays a list of startup programs with columns for Name, Publisher, Status, and Startup impact. The list includes programs like Adobe Creative Cloud, Adobe GC Invoker Utility, Adobe Updater Startup Utility, Apple Push, Delayed launcher, HD Audio Background Proc..., iTunesHelper, Java Update Scheduler, Logitech Gaming Framework, Malwarebytes Tray Applicati..., Media Check Tool, Microsoft OneDrive, QuickTime Task, and Reader Application Helper. The 'Status' column shows 'Disabled' or 'Enabled'. The 'Startup impact' column shows 'None' or 'Not measured'. At the bottom left, there is a 'Fewer details' link. At the bottom right, there is an 'Enable' button. The text 'Last BIOS time: 2.5 seconds' is visible in the top right corner of the main area.

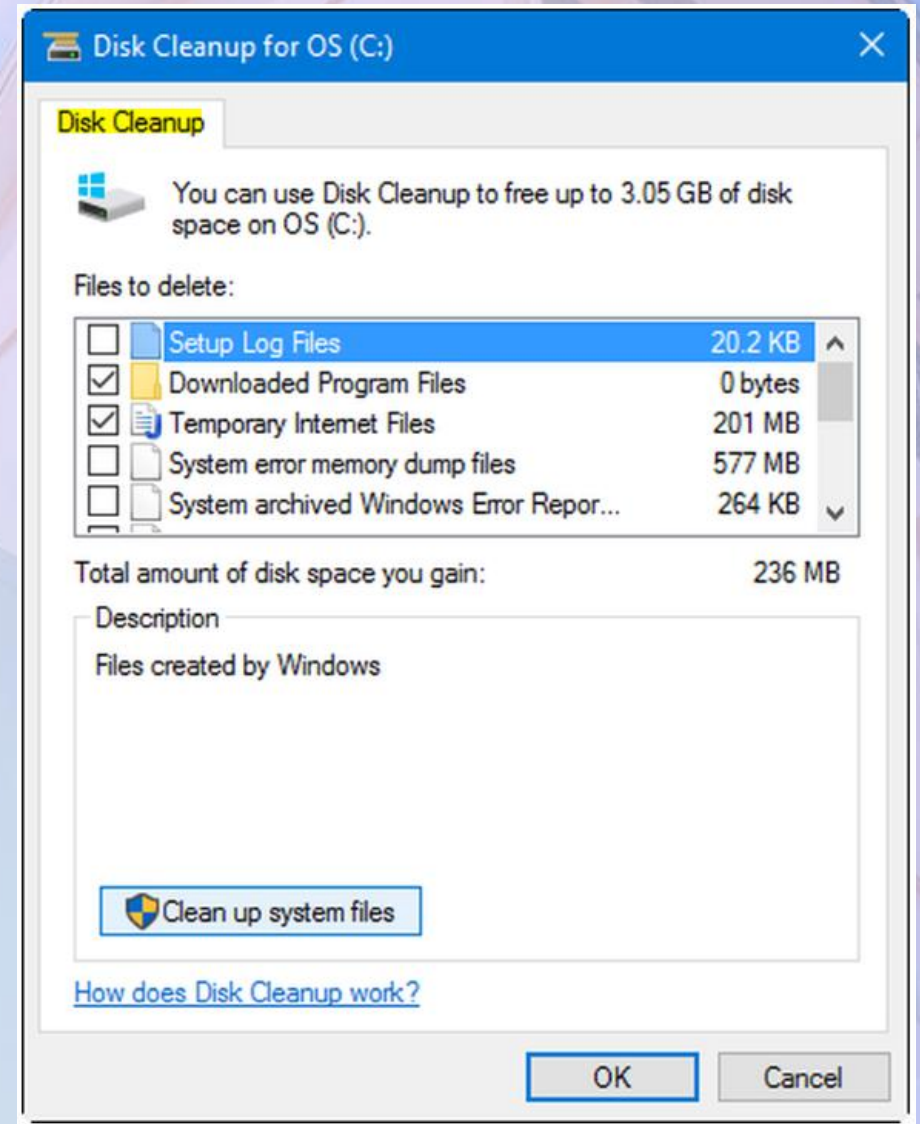
Name	Publisher	Status	Startup impact
Adobe Creative Cloud	Adobe Systems Incorpor...	Disabled	None
Adobe GC Invoker Utility	Adobe Systems, Incorpo...	Enabled	Not measured
Adobe Updater Startup Utility	Adobe Systems Incorpor...	Disabled	None
Apple Push	Apple Inc.	Enabled	Not measured
Delayed launcher	Intel Corporation	Enabled	Not measured
HD Audio Background Proc...	Realtek Semiconductor	Enabled	Not measured
iTunesHelper	Apple Inc.	Enabled	Not measured
Java Update Scheduler	Oracle Corporation	Enabled	Not measured
Logitech Gaming Framework	Logitech Inc.	Enabled	Not measured
Malwarebytes Tray Applicati...	Malwarebytes	Enabled	Not measured
Media Check Tool	Sony Corporation	Enabled	Not measured
Microsoft OneDrive	Microsoft Corporation	Enabled	Not measured
QuickTime Task	Apple Inc.	Enabled	Not measured
Reader Application Helper	Sony Corporation	Enabled	Not measured



TOPIC 1: Routine Maintenance

Use your computer's disk management systems.

For Windows, select Performance and Maintenance. Choose "Rearrange items on your hard disk..." and "Free up space on your hard disk." Or simply run Disk Cleanup.



TOPIC 1: Routine Maintenance

Maintenance Basics

How to Perform Disk Clean Up:

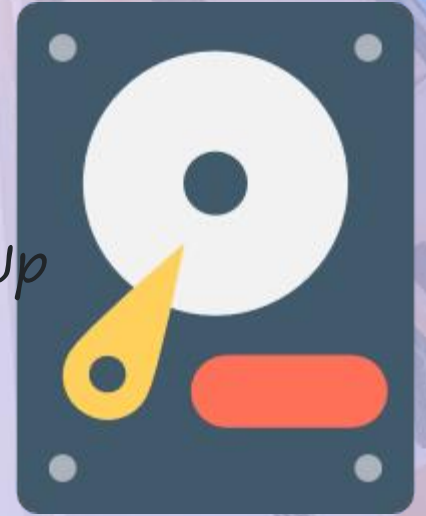
1. Start Menu > Programs > Accessories > System Tools > Disk Clean Up
2. Select Drive to Clean Up > Click Ok
3. Check all items that need to be removed > Click Ok

How to Clear Internet History

1. Start Menu > Settings > Control Panel > Click Internet Options
2. Click "Clear History"
3. Click Ok

How to Run Scan disk and Disk Defragmenter without Interruption:

1. Start Menu > Run > In Run, type "MSCONFIG", then click Ok MSCONFIG will appear.
2. Select "Selective Startup"
3. Uncheck "Load Startup Group Items". Click Ok.
4. Click Yes to Restart Computer Upon Restart.
5. Start Menu > Settings > Control Panel > Click Display
6. Select the "Screen Saver" tab.
7. Change the Screen Saver Drop menu to "None". Click Ok.



TOPIC 1: Routine Maintenance

Then Perform Scan Disk,

Start Menu > Programs > Accessories > System Tools > Scan Disk

After Scan Disk, Perform Disk Defragmenter

Start Menu > Programs > Accessories > System Tools > Disk Defragmenter > Select which disk to Defragment. Click Ok.

After Disk Defragmenter

Start Menu > Run > In Run, type "MSCONFIG", click Ok. MSCONFIG will appear. Select "Normal Start Up", click Ok. Click Yes to Restart Computer Upon Restart

Start Menu > Settings > Control Panel > Click Display
Select the "Screen Saver" tab.

Change the Screen Saver Drop menu to "None". Click Ok.



TOPIC 2: Tips on Maintaining Hardware

(1) Always run your computer on an Uninterruptible Power Supply (UPS).

It is an electrical apparatus that gives emergency power when a computer's main power fails. This will help *protect the device from electric surges*. Phone lines for modems and cat 5 or cat 6 network lines also need surge suppression as they can and will take out your network card or modem in an electric storm.



TOPIC 2: Tips on Maintaining Hardware

(2) Open up your computer.

Dust can accumulate in your computer in less than a year, depending on how dusty your house. Check every few months. Make sure to follow proper computer assembly and disassembly.



TOPIC 2: Tips on Maintaining Hardware

(3) Be careful when plugging peripherals to the computer.

Ports can be easily damaged when mishandled. These repairs can be quite costly.

