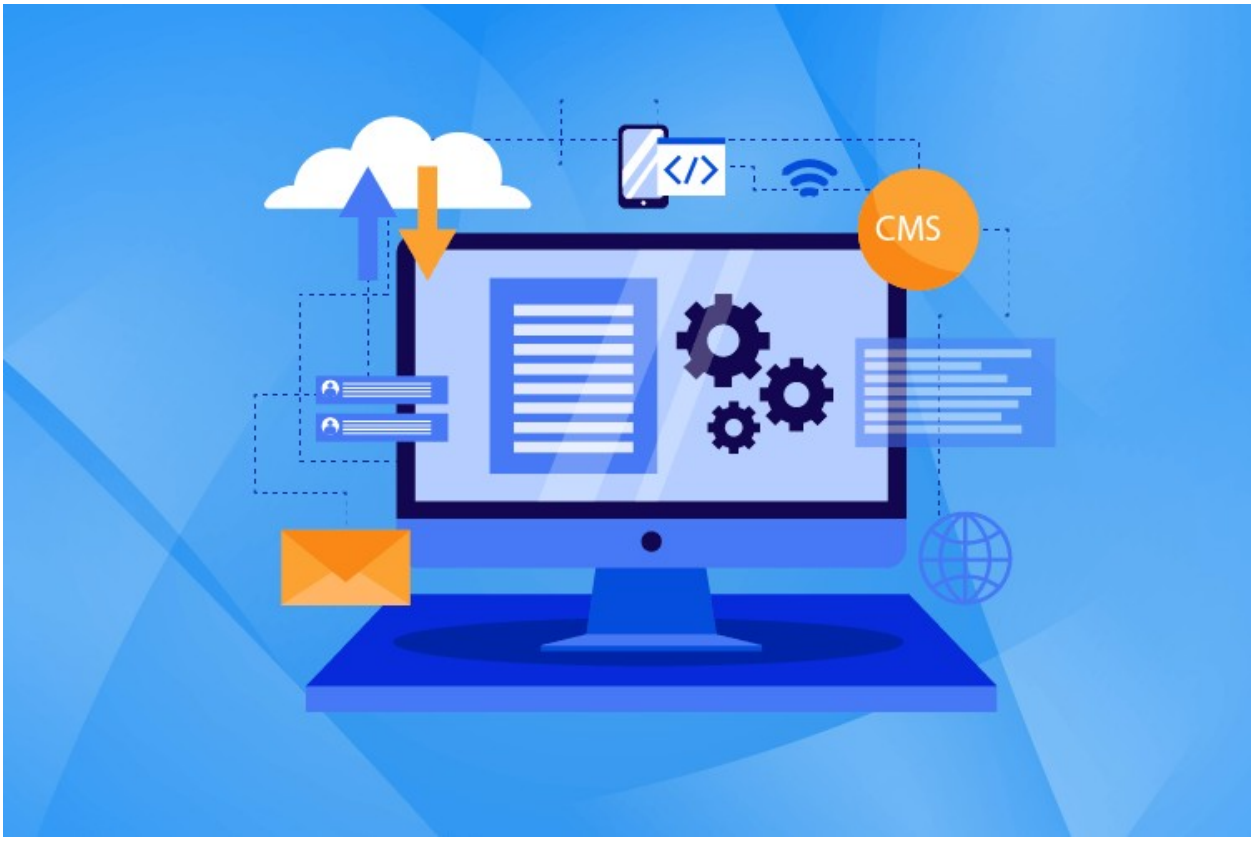
Top 10 Solutions to Fix Hardware Reserved Memory of Windows

Is your computer working slowly because your memory is increasingly getting reserved? Let's see why this occurs and how we can decrease hardware reserved memory.



What is hardware reserved memory?

Hardware reserved memory is a separate division in the memory that is dedicated to crucial functions of the computer. This chunk of memory ensures coordination between CPU and external peripherals like graphics, keyboard, printer, etc. It is not accessible for day-to-day usual processes.

Everyone wants their device to run like a horse. The big cheese of system performance is RAM. It provides a temporary storage location for various applications.

For instance, if you start playing Fortnite, first your saved maps will be copied from the storage location to RAM. Then, you start doing missions and your RAM works at lightning speeds to deliver a dynamic gaming experience. Later, files are once again moved to the storage disk.

Now, where does hardware reserved memory fit in this picture? Well, it works on the back burner making sure that various computer parts work harmoniously during all this saga.

How does free RAM relate to system speed?

RAM can single-handedly determine the efficiency of the system. There are two factors of RAM that contribute to system speed.

- Memory Capacity: It is the amount of storage that can be stored in the RAM. It is measured in Gigabytes.
- Memory Speed: It is the speed at which RAM can process various programs.

Generally, an increase in memory capacity will exponentially affect system performance. This equates to RAM storing more data and processing information at a faster pace.

How is the hardware reserved memory used?

Processing of images and video requires breakneck speeds. RAM works like wind, so hardware reserved memory is mostly a part of vRAM used to optimize graphics performance. Moreover, hardware reserved memory is also used to store drivers of computer peripheral devices like monitor, keyboard, mouse, and trackpad are provided with dedicated storage to make sure that their working is never interrupted.

What are the causes of high hardware reserve memory?

An increase in hardware reserve memory can occur due to a variety of reasons. Mostly, it occurs when your graphic card is outdated or is designed to consume a part of RAM for its own processing. Errors in BIOS can also increase hardware reserved memory.

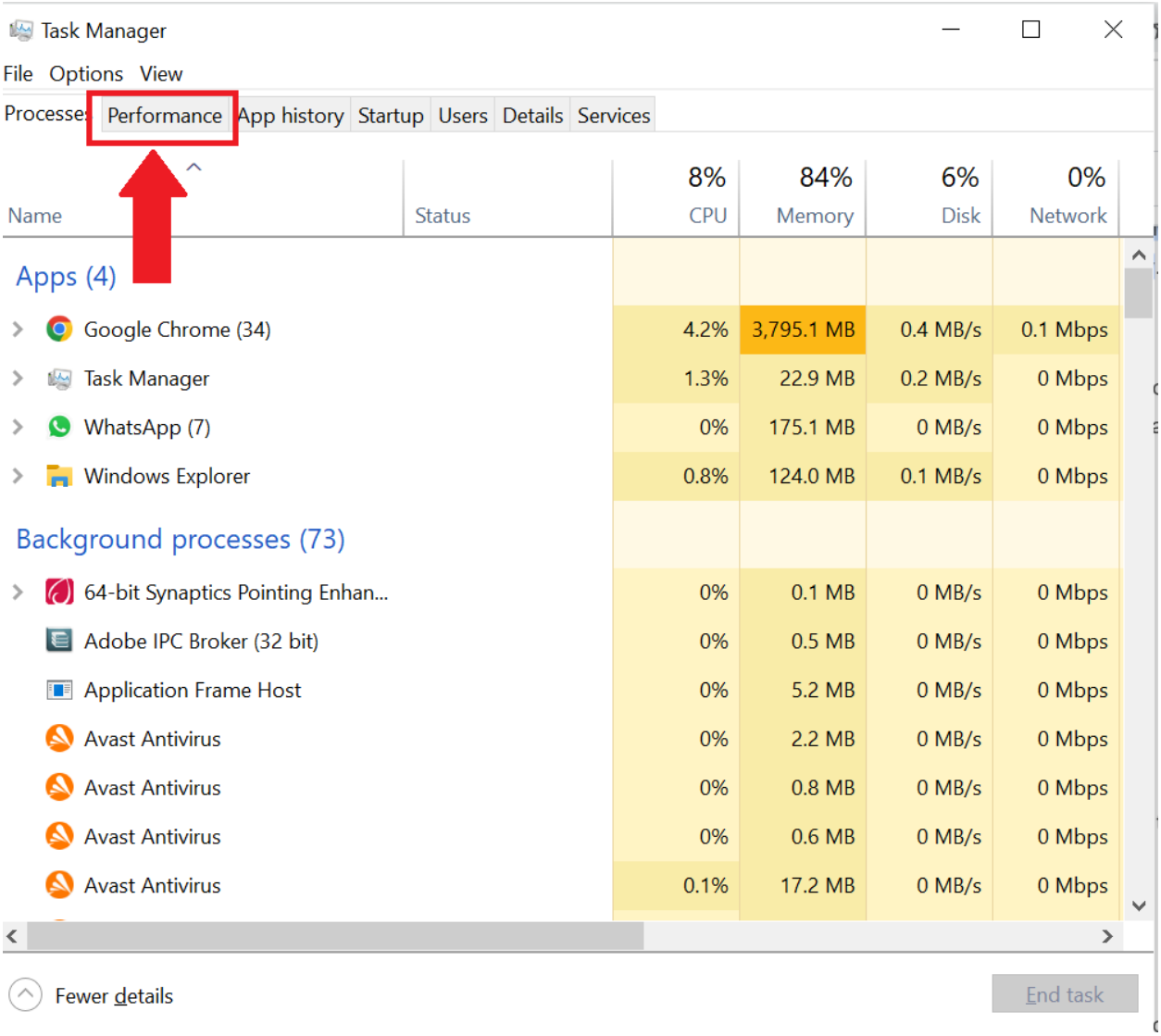
Warning

When you see that hardware reserved memory has increased to the value of the whole RAM module, then this means that RAM is damaged. RAM is the part and parcel of a computer, so go get a new RAM module immediately!

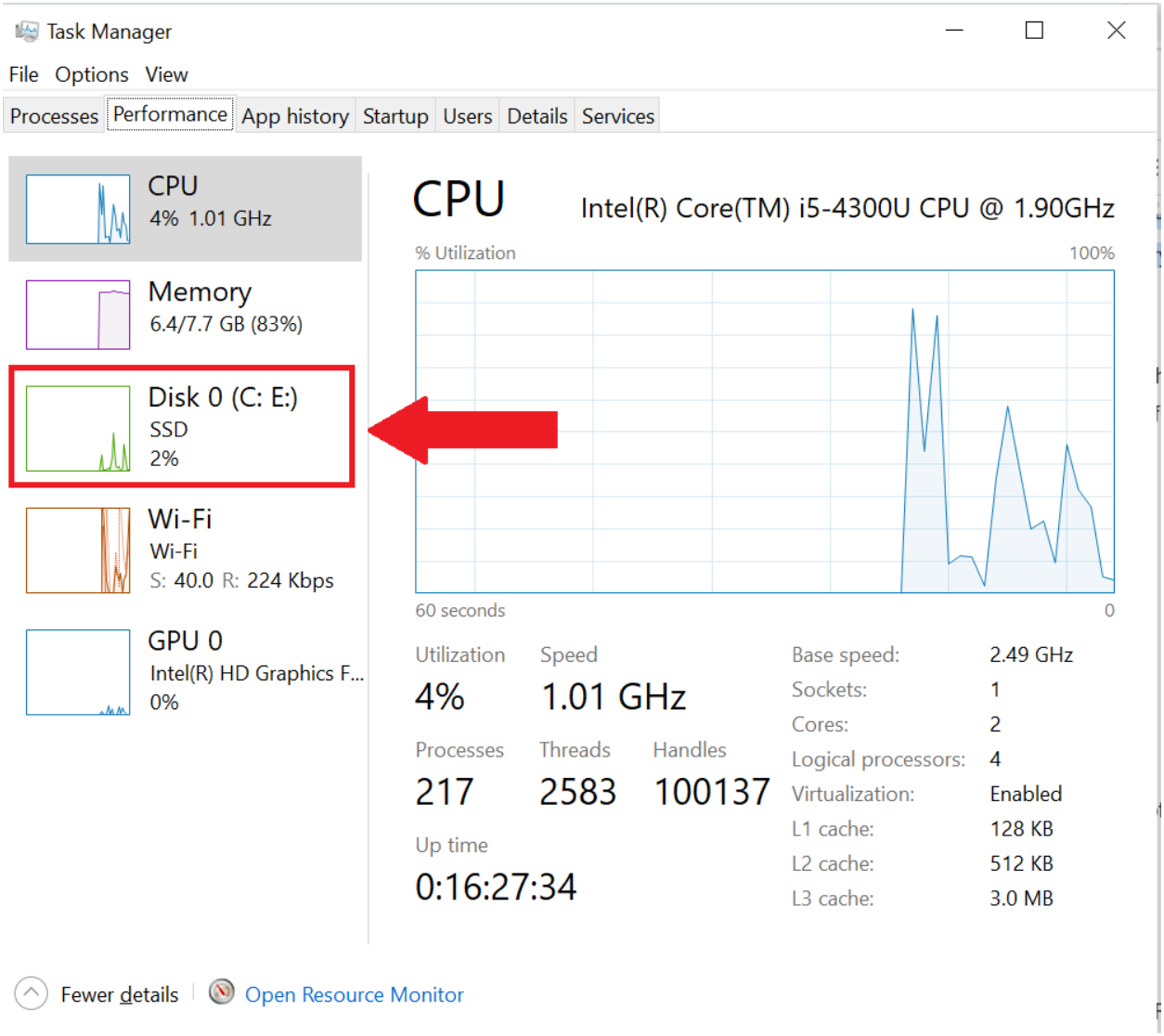
How to check hardware reserved memory?

To check how much hardware reserved memory follow these steps:

- Open the task manager by pressing Ctrl + Shift + Esc.
- Click on the Performance tab.



- Finally, press Disk.



- Now look for the Hardware Reserved option in the lower right of the corner of the task manager.

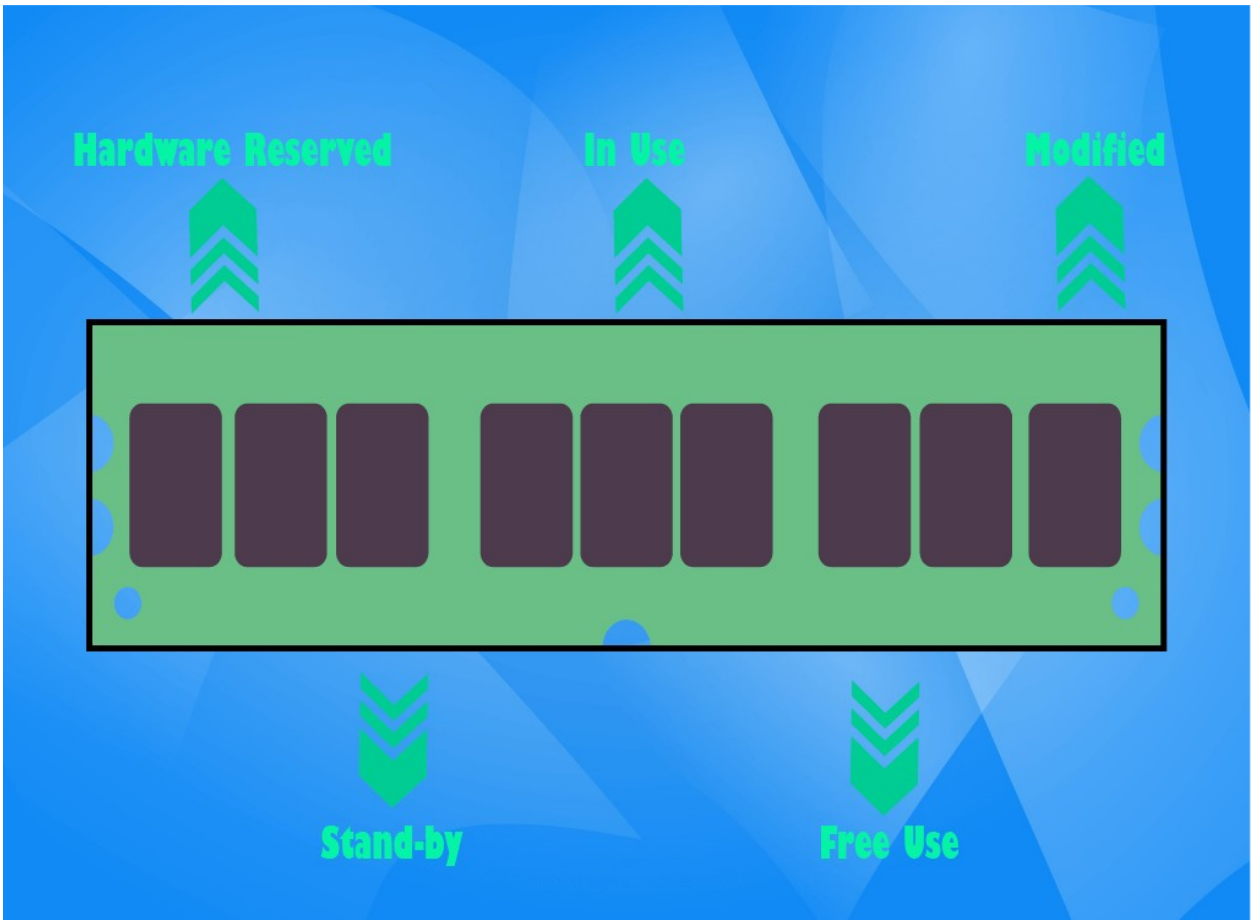
How much is hardware reserved memory suitable for your PC?

The usual value of hardware reserved memory is a couple of hundred megabytes. For 32-bit systems, the maximum that can be used is 3.5Gb. For 64-bit systems, out of 16GBs of RAM 1Gb of RAM is usually reserved. Having hardware reserved memory between 1Gb and 4Gb is faulty and requires fixes.

How is RAM subdivided into various partitions?

Division of labor ensures higher productivity and efficiency of any system. Similarly, different components of RAM specialize in particular tasks. Here is a table showing various components of RAM and their associated functions:

Partition	Functions
Actively Used	Used at the moment for various operations
Hardware Reserved	BIOS and other peripherals
Modified	Processes that are being transferred to the hard disk for permanent storage
Stand By	Involved in processing cached data
Free Use	Not involved in any function



How is cached memory different from hardware reserved memory?

Cached memory stores information from previous processes, so the next processes occur at a much faster speed. Cached memory clicks with the CPU and ends up being processed faster. On the other hand, hardware reserved memory is from another world working on ensuring the basic functionality of the system.

Is it safe to reduce hardware reserved memory?

In most conditions, it is relatively safe to reduce hardware reserved memory. Mostly this has no adverse effects on your computer. However, in some cases, it may interfere with boot procedure.

Top 10 Solutions to reduce hardware reserved memory

Here are the top 10 solutions to decrease hardware reserved memory:

- Install 64 Bit windows
- Update BIOS and reset to Default Settings
- Troubleshoot Windows Startup
- Turn off Auto RAM Virtualization
- Update your registry
- Scan RAM for errors
- Inspect if RAM is properly installed
- Shuffle RAM modules
- Update your drivers and Windows

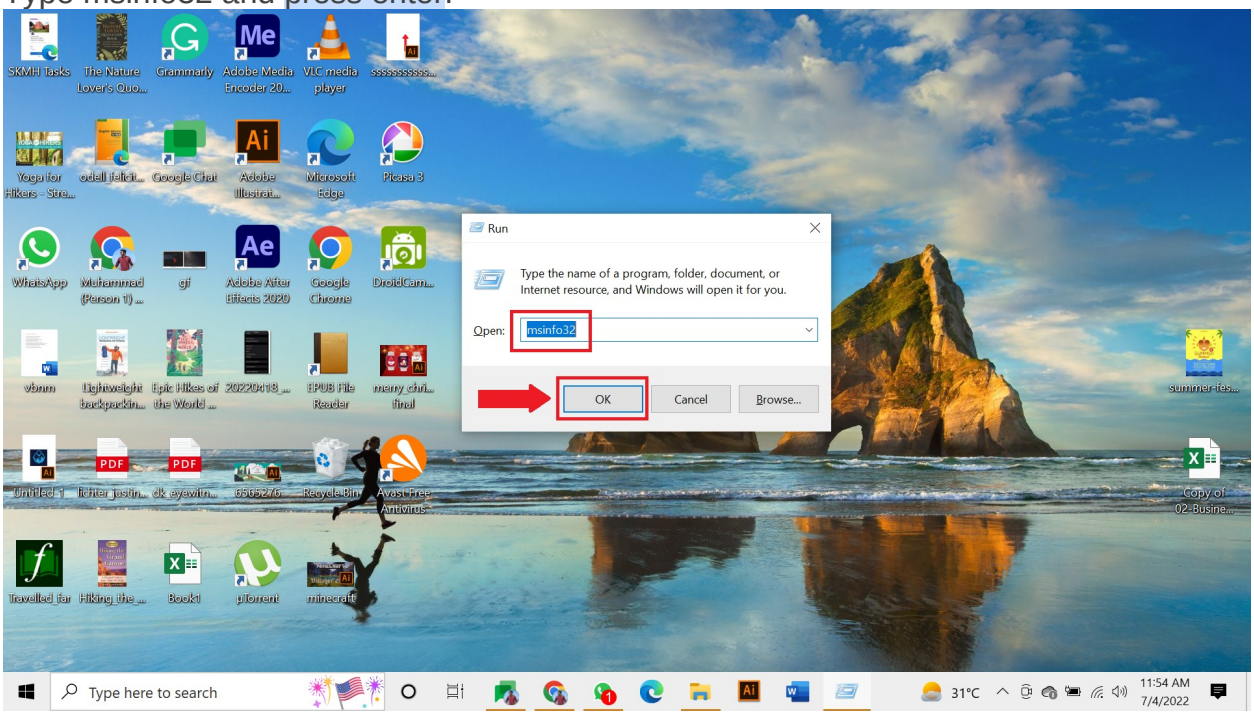
Let's now start working to reduce hardware reserved memory:

1. Install 64-Bit Windows

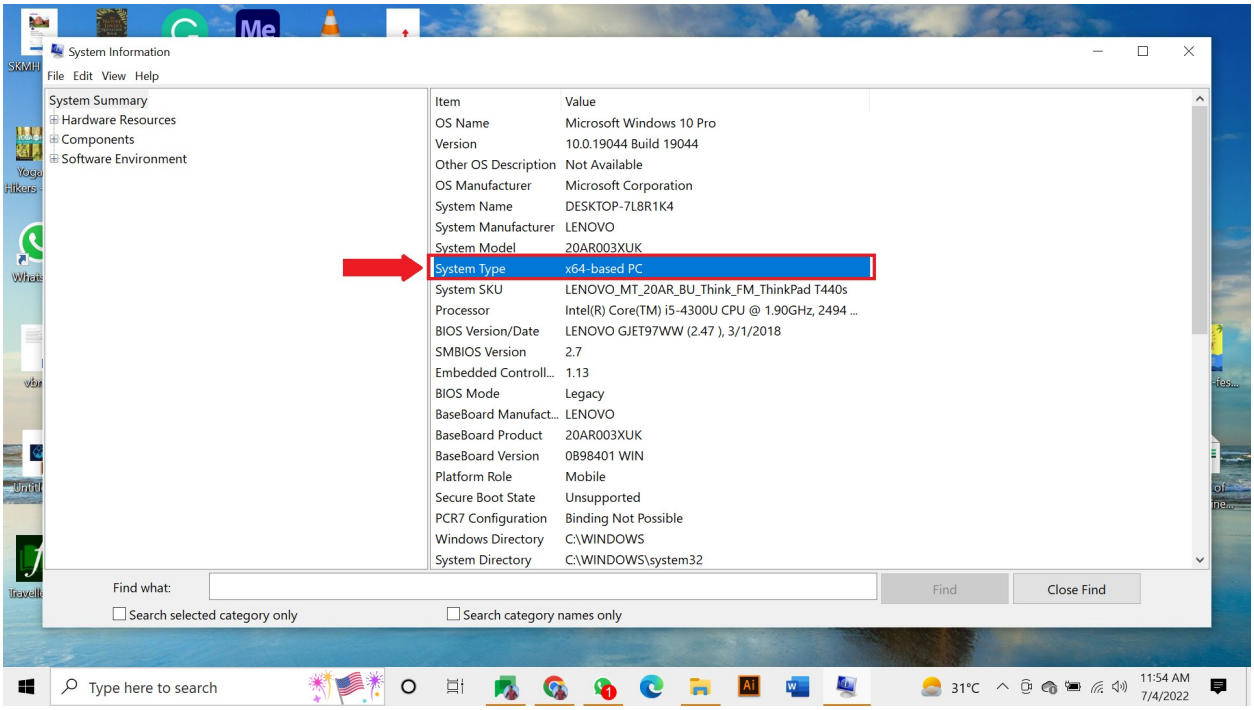
The maximum usable memory for a 32-bit Windows OS is 3.5Gb. Therefore, all memory above 3.5 Gb is reserved.

Follow these steps to see if your computer is a 32-bit OS or a 64-bit OS:

- Use the shortcut Windows key + R to open the RUN dialog.
- Type msinfo32 and press enter.



- In the right pane look for System type if it is mentioned as ×86, then this means 32-bit windows have been installed.



- Install new windows if your system supports 64-bit operating systems.

2. Fix BIOS settings:

Certain BIOS settings can increase hardware reserved memory. To fix system BIOS follow these instructions:

- Use F2, F10, F12, F1, or Del, according to your manufacturer, while you boot up to open BIOS settings.
- For those PCs which have an external dedicated graphic card installed, you follow the path Advanced graphics<Internal Graphics Mode<Disabled. Alternatively, find On Board Graphics and turn them off.
- Turn on the Memory Mapping feature. Follow the path System Configuration < BIOS/Platform Configuration (RBSU) < Memory Options < Memory Remap.
- Turn on Render Standby. Go to System Agent < Graphics Configuration < Render Standby (RC6)
- Now turn off Multi-Monitor by going to OnBoard Device configuration < Intel Multi-Display < Turn off.
- Locate iGPU memory and set it to AUTO.
- Save all these settings and restart your computer

Note: The most common path of altering BIOS setup is mentioned above. You will have to search the path to change settings for your PC on the internet.

3. Update BIOS and reset to Default Settings

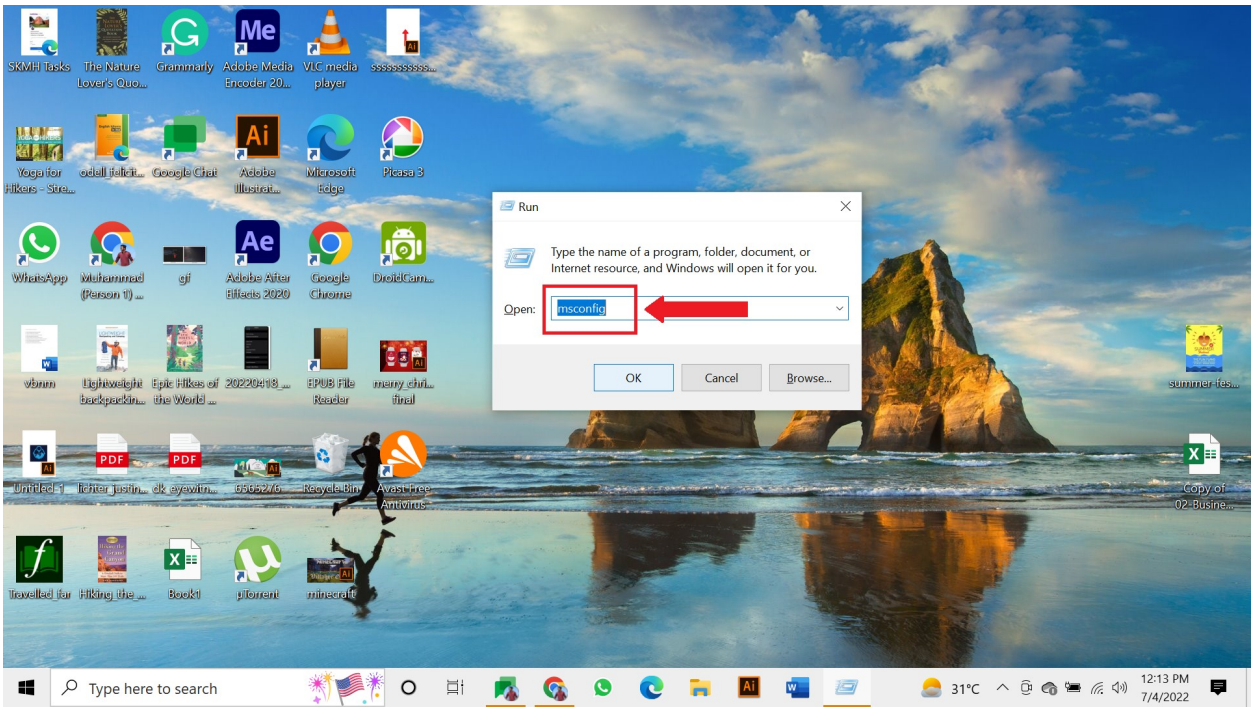
Bugs may appear in the BIOS setup of your computer. To update BIOS follow these steps:

- Go to the website of your manufacturer and download the latest BIOS version available on the USB Drive.
- Open the BIOS setup of your computer according to your manufacturer.
- Look for BIOS version, System Information or Firmware Version.
- In this tab, click update BIOS.
- Load the USB drive to initiate the process.
- Restart and wait for the results.
- Alternatively, try resetting BIOS to Default Settings. Mostly it can be done using the key F9 or F5. However, read your computer manual or search the web to know the exact instructions for your computer.

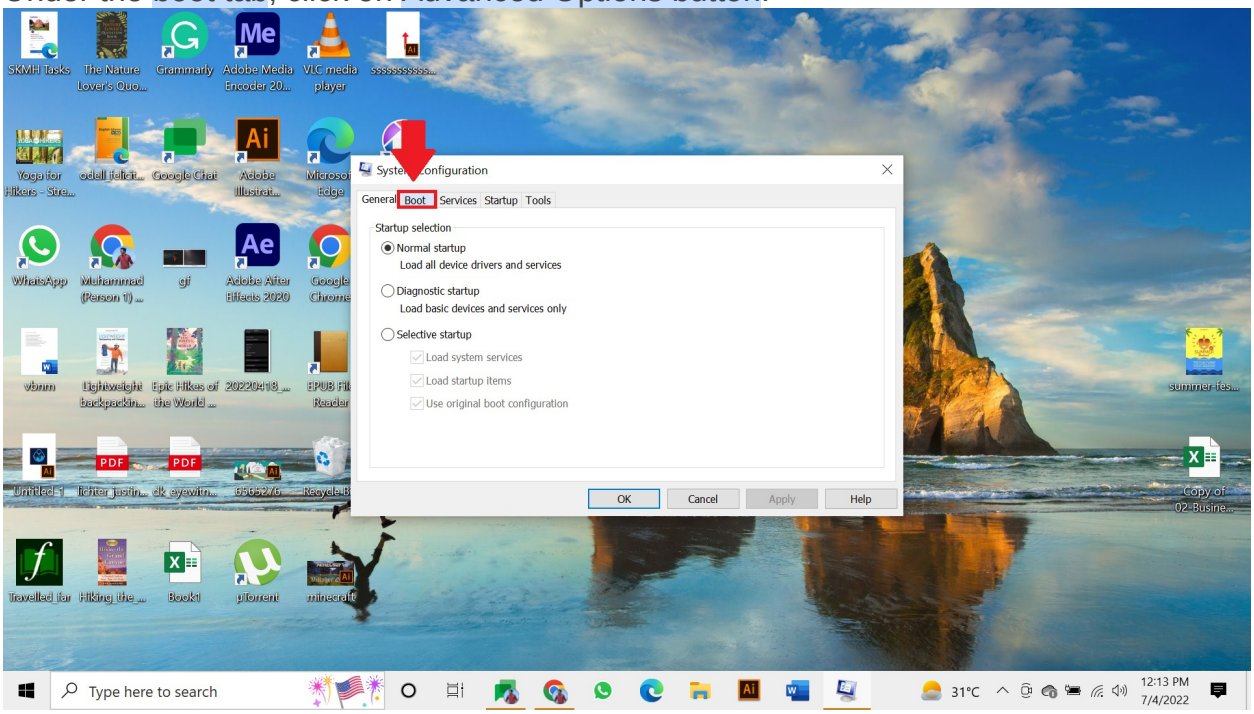
4. Troubleshoot Windows Startup

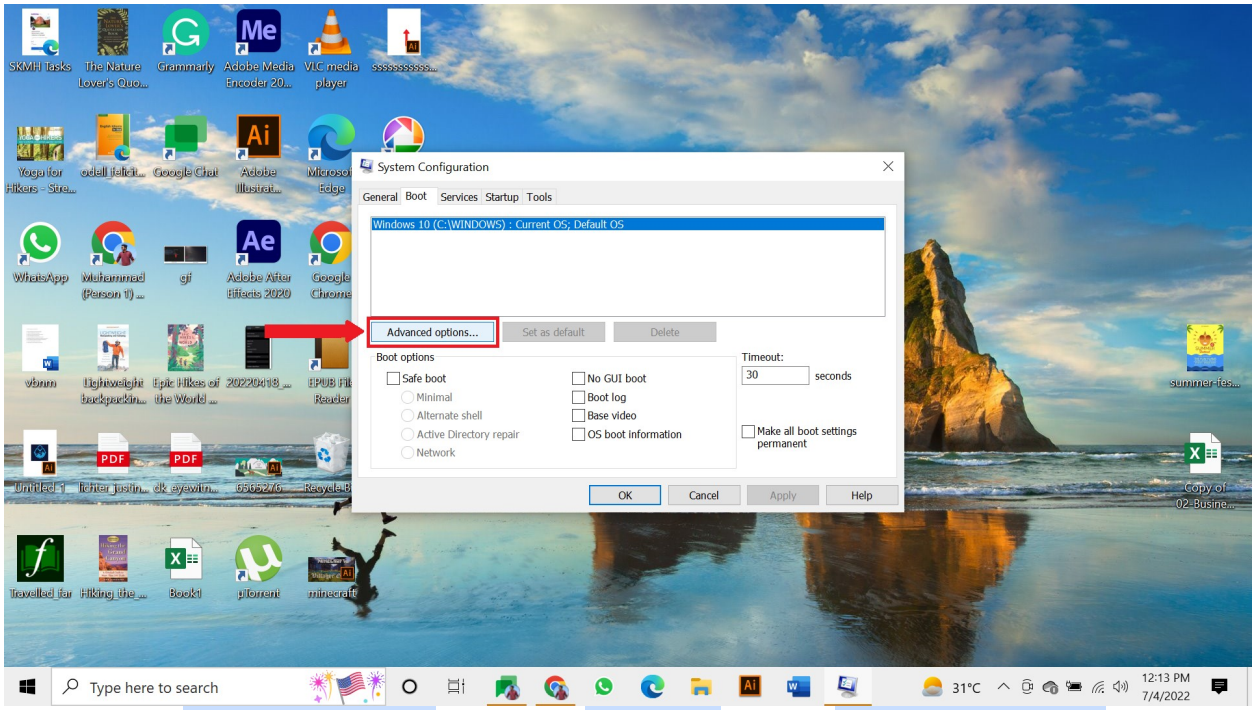
Follow these steps to instruct Windows Startup to use all the available RAM:

- Hold Windows Key + R to open the RUN menu
- Type msconfig and press Enter to open the System Configuration Window



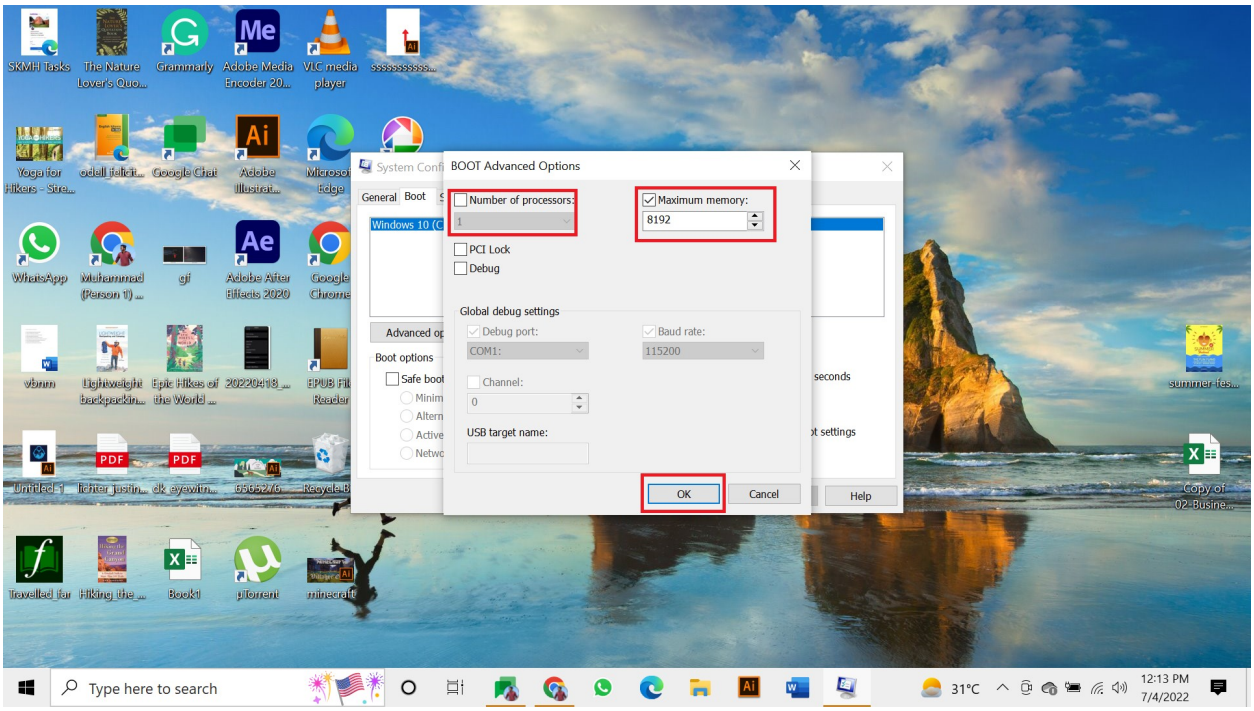
- Under the boot tab, click on Advanced Options button.



- 

Near the upper right corner, clear the checkbox next to Max Memory value.

- Enter 1 in the maximum memory option
- Now enter the amount of RAM you have installed on your PC in Mb. 1Gb ram equals 1024Mb, so 4Gb of RAM equates to 4096Mb,while 8Gb is 8192Mb. Ensure that you enter the right value in MBs.



- Finally, click Okay.

5. Turn off Auto RAM Virtualization

Firstly, what is virtual memory? It is defined as the space that is allocated in the hard disk of your computer to perform the functions of the RAM. Long things short it is a Fake RAM. Turning off virtual memory to increase the performance of a system is a risky option. It can increase the chances of system bugs and app crashes. However, here are the steps to turn off Auto RAM Virtualization:

- Click on the Windows key and search Advanced.
- Choose View Advanced System Settings from the menu.
- Go to Advanced Tab and click on Settings. A new window of Performance Options will appear.
- Click on the tab Advanced and then press Change under the header Virtual Memory.
- Uncheck Automatically manage paging file size for all drives.
- Now select each drive from the list and choose No paging file.
- Finally, select Ok to save changes.
- Restart your computer.

Now, check if hardware reserved memory is reduced. If not revert the changes immediately.

6. Update your registry

- Press the Windows key + R.
- Type Regedit and press enter.
- Now navigate to the following key:

"HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management"

- Set the value data to 1 and click on OK.

7. Scan RAM for errors

Faulty RAM can increase hardware reserved memory to many times its normal value. Before having a hands-on approach by inspecting the RAM for errors uses memtest86 to scan for errors. Follow these instructions:

- Download memtest86 from its website.
- Get a USB drive and install the software into it.

- Boot the USB Drive from the BIOS.
- Run the software to inspect for errors.
- Inspect hardware in the next steps for further details.

8. Inspect if RAM is properly installed

Physical inspection of RAM should be done by a computer professional. However, taking the right precautions you can also inspect the RAM by following these steps:

- Unplug the power cable and other computer wires.
- Uncover the chassis top or side cover of the CPU.
- On the CPU, there will be rectangular chips on the motherboard.
- Unclip the RAM modules and pull out the chips.
- Use alcohol swabs to clean the RAM modules and reinstall them.
- Put the chassis top or side cover back to the CPU and plug back the wires.
- Finally, turn on the CPU to see if the error is solved.

Precaution

- Use plastic gloves all the time.
- There should be no liquid around your worktable as a spill may occur.
- Do not touch any other computer part apart from RAM modules.

9. Arrange RAM modules in the correct order

Hardware reserved memory can increase due to the wrong installation of the RAM modules. The general rule of thumb while installing many RAM modules on a computer is that they should be installed in slots of the same size in sets of two, three, or four. Follow these instructions to check if RAM modules are installed right.

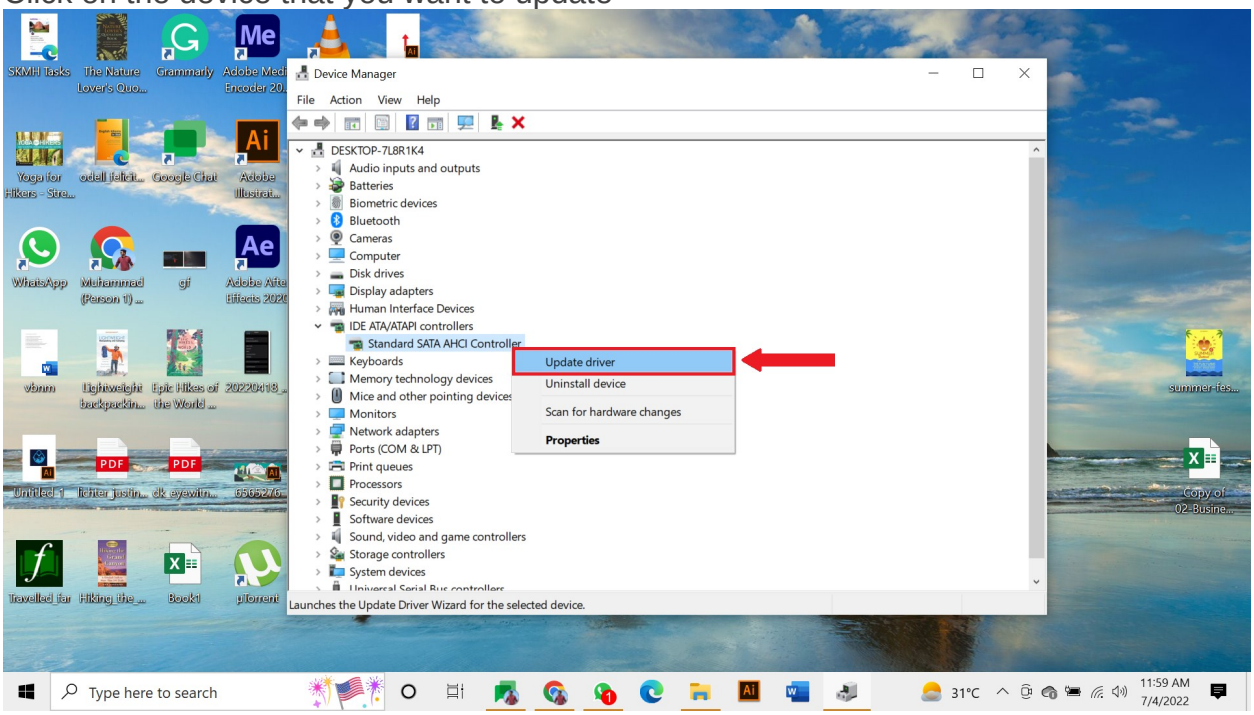
- Consult your motherboard manual.
- Unplug the power cable and take off the CPU cover case.
- Follow the instructions of your manual to check if the RAM modules are installed in the right way.
- Plug the cables back and turn on your PC.

10. Update your drivers and Windows

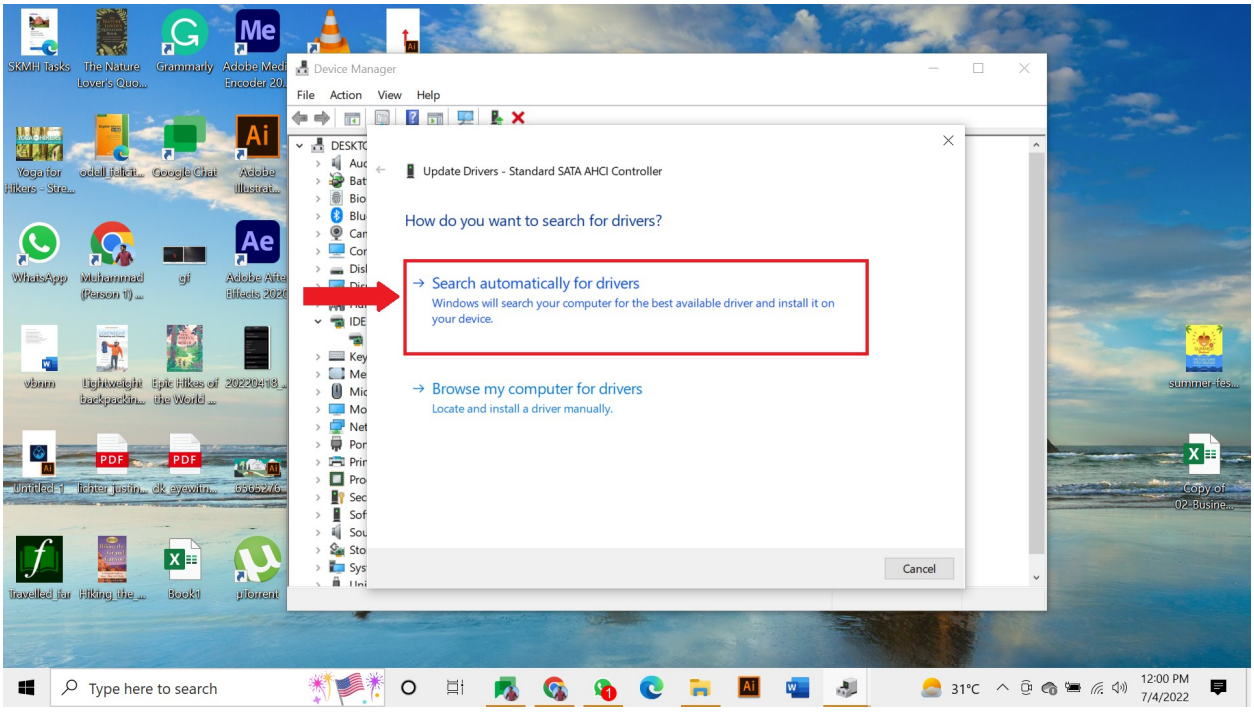
Keeping your drivers up to date is the key to ensuring low hardware reserved memory. Updated drivers increase the collaboration between peripherals and the CPU. Keeping Windows up to date has the same objective. To check for driver updates:

- Search Device Manager

- Click on the device that you want to update

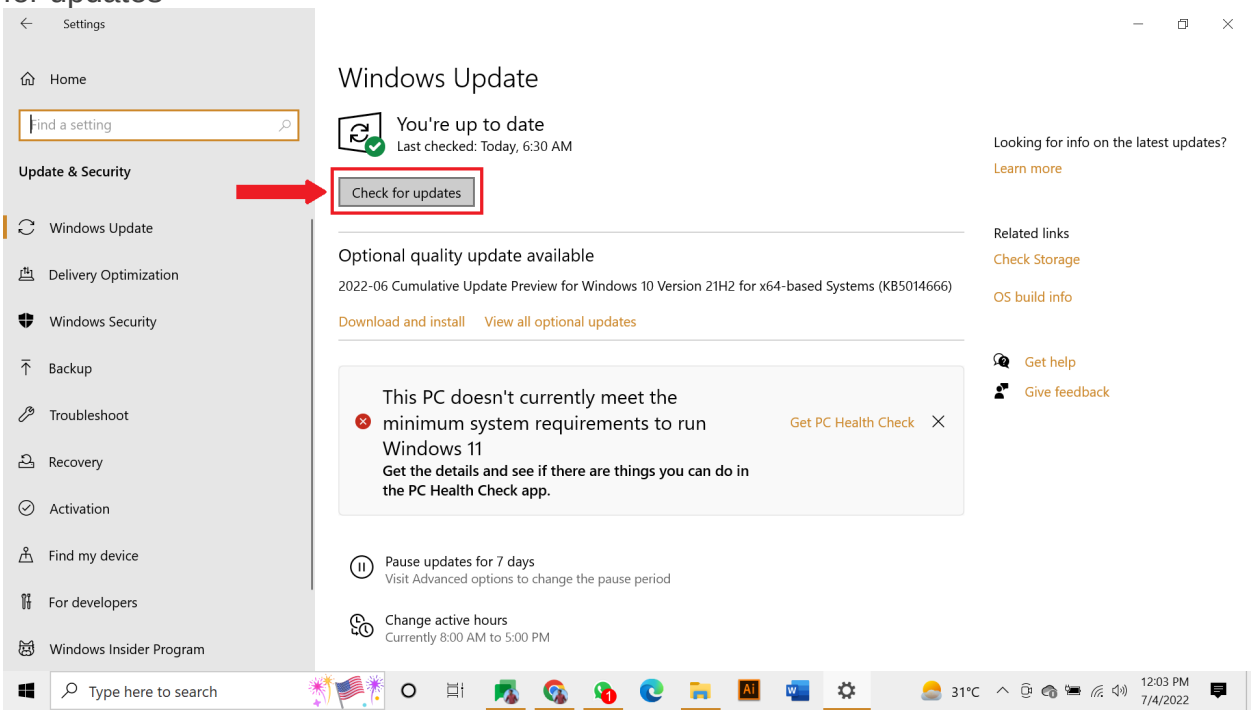


- Select Search Automatically for the Updated drivers



Follow this path to check for windows updates manually:

- Start > Settings > Update & Security > Windows Update, and then select Check for updates



FAQs

How can change my RAM settings in BIOS?

Press Windows Key + R> Enter msconfig.> Click Enter> Click OK> tap on Advanced options> Enter the number of MB you have in the Maximum memory option> Save changes> Restart your computer.

How can I boot up my laptop if it is not starting after releasing my hardware reserve RAM?

Releasing Hardware reserved memory can interfere with the start-up of the laptop. In such a scenario, run Safe Mode from the BIOS settings. Revert the changes that you've made and try restarting your computer.

Is it good to clear RAM cache?

Clearing your RAM cache removes all the junk files. This in turn speeds up your device.

Why my PC is using only half of my RAM?

Using only half of your RAM may slow down the performance of your device. This may happen because RAM may not be properly connected or you may be running a 32 bit system.