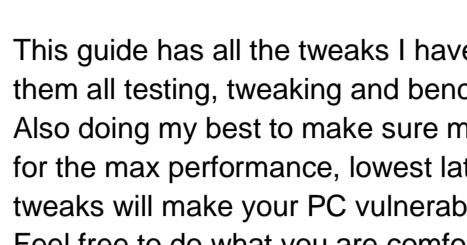




FR33THY'S TWEAK GUIDE



Disclaimer

I'm not responsible if you break your OS or PC, loose anything or get hacked at a later date by following this guide. Follow below at your own risk.

This guide has all the tweaks I have collected over the years. I have personally grinded through them all testing, tweaking and benchmarking. Doing my best to be sure they are not placebo. Also doing my best to make sure my testing methods are not flawed or variable. This guide is for the max performance, lowest latency and a competitive advantage for gaming. Some of the tweaks will make your PC vulnerable, be aware and use a separate OS and system for gaming. Feel free to do what you are comfortable with, no one is judging if you skip steps.

Remember less is more...

This guide will constantly be updated, so please come back and recheck it regularly. I did not invent or discover any of these myself, this list is compiled from the internet and personally tested by me. I can't take credit for the tweaks themselves but I can take credit for compiling everything and spending the time to debunk/test them.

A big flaw has been discovered with new windows versions.

All windows versions 1809+ have a forced synthetic QPC timer of 10mhz.

Previous versions are true TSC between 2-4mhz (give or take) depending on the CPU speed.

As far as low latency and high performance, an older version under 1809 is the way to go.

I believe this synthetic timer is something to do with spectre, meltdown or security.

We all may be all on linux in the future with the way windows is going, time will tell.

Microsoft locked this thread, it's worth reading...

<https://answers.microsoft.com/en-us/windows/forum/all/queryperformancefrequency-returns-10mhz-on-windows/44946807-5355-4b36-ba3e-43aa86ce30c0>

MO Monkburger

Created on December 20, 2018 ▾

QueryPerformanceFrequency returns 10mhz on Windows 10 Build 1809+, causing performance loss/increased jitter/latency

It appears something has happened to the timer subsystem resolution on Windows 10 starting from Build 1809.

QueryPerformanceFrequency() returns 10mhz (10ms) which is causing the GUI etc to have latency. DPC latency is also elevated post 1809 installation. This happens on multiple, different motherboards (AMD, Intel) as well as various configurations.

Video editing software is no longer able to render things as quickly as it used to, on post 1809.

The hilarious part is, my Mac Mini with less ram, CPU and video card power is able to perform the rendering faster than Windows 10 (1809). It can also boot up faster than anything Windows 10 servers.

Some issues with 1809:

- Logging into windows takes 8-12 seconds before I get into the desktop. This is on a m.2 SSD, with a threadripper 1950x / 128G of memory. (1809)
- Removing 1809 allowed it to boot into the desktop around ~2 seconds. (Tested on 4 different machines, AMD, intel, etc)
- 1809+ has caused additional lag when clicking, launching and performing any kind of tasks.

Notes:

- Removing 1809 causes QueryPerformanceFrequency() to return ~3mhz, which is the TSC. Performance returns to its snappy self.
- Forcing the use of the slow, awful, HPET makes things better, for a time, until multiple one-shot timers are running and then the boxes crawl to a halt.
- What timer subsystem returns 10mhz? The TSC doesn't, PIT doesn't, APIC doesn't, ACPI doesn't, HPET may do it with a divisor.

TBH, If this doesn't get solved soon, I'll just move the rest of my stuff over to Apple Products and never used Microsoft products for enterprise again.

⚠ This thread is locked. You can follow the question or vote as helpful, but you cannot reply to this thread.

I recommend this discussion (126) ...

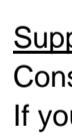
This guide was made for windows 10 pro 1809 redstone 5 october 2018 update.

Why?! To keep up to date with things, it's easier to apply all tweaks from a later version to an older version vs the other way round. Do I recommend 1809, No! Many of the tweaks can be used in older versions so keep reading. Although I highly recommend a fresh install.

1903 also has the synthetic timer of 10mhz, including a serious kernel latency issue. Avoid 1903...

If you really want raytracing you will need 1809 or above. My friends and I have tried to swap and edit system files in 1809/1903 from older versions to bring back the true timer. All attempts were unsuccessful. Stay posted, let's hope we find a fix. That way you can have your cake and eat it too, regarding raytracing. Although I think it's safe to say that anyone reading this guide, including myself are not interested in raytracing.

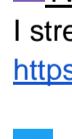
Regarding low latency and high performance I would recommend...



- Windows 7 ultimate
(Build service pack 1)
Only up to dx11
The option to disable desktop composition natively



- Windows 8.1 pro
(Build 6.3.9600)
Up to dx 11.3



- Windows 10 pro 1709
(Build 10.0.16299)
Comes with all dx versions
If you choose 1709 please see "Windows 1709" below before you start this guide



Desktop composition

8, 8.1 and 10 are fine in exclusive fullscreen which overrides composition
This is a huge problem if you play windowed mode or desktop style games
Some games refuse to run in exclusive fullscreen also which is a big problem
This can be disabled although not easily, read below for more details



2000 series graphics cards

Older windows 10 versions under 1709 are not supported



- z390 motherboards

There is finally USB drivers for windows 7 and z390 motherboards

<http://www.smxdiy.com/thread-1518-1-1.html>



I highly recommend Windows 7 for raw latency and performance

This is HANDS DOWN the best performing OS for raw latency and performance

Windows 1809 or later "qpc timer"

ACPI	QPC	RTC	
3.580 MHz	10.000 MHz	1.000 KHz	
40.87 sec	40.87 sec	40.87 sec	

Stop Reset Close

Windows 1803 or earlier "qpc timer"

ACPI	QPC	RTC	
3.580 MHz	3.914 MHz	1.000 KHz	
4.56 sec	4.56 sec	4.56 sec	

Start Reset Close

More on timers below

A big thank you to

All the creators of tweak guides linked below

All my friends who have helped me on this journey

Some names worth mentioning, thank you for your help guys

n1kobg, St1cky, Cindafella, Munty, Dev0x0, Kristjan, Markus, Narf, detox, TopSnek, Felipe, 1tap1337s, Dreammjow, detox, Klubnjakk, Joana d'Arc, PanosXidis, Hybrid, lipz, John_,

If you have anything to add or correct please contact me

I will be happy to mention you in this guide for your efforts

I really don't like calling this "MY" guide, it should be "OUR" guide.

Although someone needs to format and compile it, so here we are.

This will be eventually be ported to a website so stay posted.

Support me

Consider supporting me, I do not expect donations although the offer is there.

If you really want to support me subscribing to my discord, youtube and twitch is enough.

Thank you in advance...

Discord

Use this discord invite link

<https://discord.gg/pTc37y7>

YouTube

I make pc, windows and gaming optimization guide videos.

<https://youtube.com/c/FR33THY>

Twitch

I stream pc, windows and gaming optimization guide content.

<https://twitch.tv/fr33thy>

Twitter

I provide pc, windows and gaming optimization guide services.

To boost performance, fps, responsiveness, lower latency and improve throughput.

Including tech support, advice, training and teaching for a fair priced fee.

<https://twitter.com/fr33thytwacks>

Patreon

Another way of showing support.

<https://patreon.com/fr33thy/>

GOOGLE DRIVE

<https://drive.google.com/open?id=1D5wcsheEs9ickPv1ssGbDxrhqU0YzyB>

All the shortcuts, scripts, reg files and programs you need for this guide

Some programs may be a false positive flagged by your antivirus

Keep in mind, running the script/reg files straight away may not apply

This is due to windows permissions, recheck manually as shown below

Quick tip

Download the complete google drive to save time

Download this document as a .rtf file for easy viewing

Use wordpad to follow the guide through

Remember to come back, this list will be updated

COMPETITIVE HARDWARE

Desktop vs laptop

A desktop build is a must for performance

Although new laptops have come a long way, they still thermal throttle

Laptops also have limited bios settings most of the time

Motherboards

I highly recommend a good top end motherboard with good vrm and cooling

Check real reviews of boards from experts so you know what the motherboard is capable off

Never trust the manufacturers advertising, below are some reviewers I trust

Actual Hardware Overclocking

<https://youtube.com/channel/UCrwObTfqv8u1KO7Fgk-FXHQ>

Gamers Nexus

<https://www.youtube.com/user/GamersNexus>

Der8auer

<https://www.youtube.com/user/der8auer>

Many motherboard manufacturers claim to be high end nowadays are just not capable.

I have been burnt in the past by false advertising and quite possibly my lack of research.

A perfect example of this is the money I have wasted in the past on boards trying to get the advertised memory speeds of 4000mhz. My ram kit and the board I had at the time was "supposed" to be supported it was just not capable of doing so because of bad design, bad vrm cooling and bad vrm. It's a tough subject but as a rough guide at this time many z390 boards have good vrm and cooling.

You also want to consider the possibility of being locked out of options or simply BIOS options being hidden from you. Things like High Precision Event Timer among many other things tend to be excluded from user view and hidden in your BIOS. Without HPET option in bios you are unable to try out ACPI Power Management Timer. You can get your bios unlocked and modified like I did. There is a high risk doing this.

I was able to get my microcode flashed to remove spectre and meltdown patches, HPET option unlocked, Intel Management Engine Interface option unlocked and TCO Timer unlocked. These are all things to consider and worth talking about, I'm sure there are others.

Hard drives

Nvme or sata ssds for quick load speeds, boot times and no game stutters

I highly recommend steering clear of mechanical drivers unless you want them for storage

Processor

Intel "K" CPUs for overclocking

Most games only are really using 4 cores at this stage

New games are not optimized for more than 12 max threads/cores currently

Games most of the time perform better on just the cores, with hyperthreading disabled

INTEL recommended for lower overall latency

AMD CPU's typically have higher latency and can't run high end speed memory

AMD CPU's are typically clocked lower and require more cycles to access memory or I/O

Graphics card

Nvidia XX80ti series GPU's

EVGA for older series

Cheapest "A" card for 1000 and 2000 series (bios can be flashed later)

Titan series GPU's are a waste of money

Only run one graphics card as sli or nvlink causes input lag

Sli or nvlink are only good for benchmarks and usually do not benefit game performance

Avoid AMD GPU's, there are less options typically to remove input lag

Memory

At least 16gb of memory 3200hz DDR4 is the sweet spot for windows and most motherboards

High hz memory such as 4-4500hz DDR4 can help top end fps although only a little

Top end motherboards with good memory controllers are needed to run high hz memory

Low timing is crucial for memory at least 10 nanoseconds or lower is best

Try to pick something with solid speed and low latency

I highly recommend anything B Die at this stage

<https://notkyon.moe/ram-latency.htm>

https://docs.google.com/spreadsheets/d/1fXhkcVexz0YaLLc7dlm_WXfAqqY4IdxScKFxFNFxeNgA/edit#gid=0

Cooling

Closed or custom loop water coolers for CPU and GPU recommended

There are some really good air coolers out there, I will always recommend/prefer water

I recommend closed loop systems, they are easy to work with and install

Lower GPU and CPU temperatures will perform and overclock better

<https://alphacool.com>

<https://noctua.at/en/products/cpu-cooler-retail>

Monitor

Run only one monitor to avoid input lag

Go for high refresh rate and low response time

I highly recommend a TN panel that is NOT freesync or gsync compatible

This is so you can set scaling to "display" NOT "gpu"

TN panels are worse for quality but have much lower latency

144-240hz refresh rate and 1ms (gtg) response time

Stick with 1920x1080p as higher resolutions kill frame rates

Displayport cable mostly recommended (ideally shorter the better)

Never use wireless devices

Do not run splitter or port boxes

Do not run extension cables

Keyboard

PS2 keyboards are debatably better for key rollover and latency

Although recently I have found the ps2 windows i8042prt driver to be a latency hog

If your getting a USB keyboard be sure to get NKRO (n-key rollover)

Mechanical switches are best (most gamers like cherry reds)

New optical keyboards have debatably lower latency

Never use wireless devices

Do not run splitter or port boxes

Do not run extension cables

Mouse

Anything over 1000hz polling is unstable unless we are talking about the WMO mice

Don't buy into the higher hz marketing, the stability isn't there yet

1000hz polling rate

Lightweight

No acceleration

No angle snapping

A shape that's comfortable for you

Decent sensor such as the new hero or 3366 sensor

Never use wireless devices (logitech are an exception)

Do not run splitter or port boxes

Do not run extension cables

Links worth looking at

<https://teamliquid.net/forum/tech-support/333648-an-overview-of-mouse-technology>

https://overclock.net/forum/375-mice/1607990-click-latencies-compiled.html#post_25414692

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<http://www.test-gear.pl/testy-i-recenzje/myszki/szybkosc-kliku/#szybkosc-kliku>

<http://esreality.com/?a=longpost&id=1265679&page=4>

<http://www.test-gear.pl/testy-i-recenzje/myszki/>

<http://rocketjumpninja.com/top-40/>

<https://sensor.fyi/list/>

Regarding wireless mouse, I have found in my testings with mouse tester that wireless mouse can sometimes go into a "sleep state" while in full use. I have confirmed this with the g900 and logitech wireless pro. Due to this, I now use these mice in wired mode.

See MICE TESTING below.

Mouse bungee

Get yourself a mouse bungee

Para cable

A new trend for mouse modding, it has been a nice upgrade from a factory clunky mouse cable

Mouse skatez

Worth mentioning here, many reddit users are on the skatez trend

Mouse pad

Ideally a cloth and large pad

Glass pads are becoming a new trend, I am unsure of how the sensor can read the mouse pad

External audio interface

Gaming, motherboard and normal sound cards have around 250ms total sound directx latency

Audio interfaces can get as low as half the above directx total sound latency

Gaming, motherboard and normal sound cards also tend to produce whine/static

I highly recommend an audio interface if viable

Never use wireless devices

Do not run splitter or port boxes

Do not run extension cables

Links worth looking at

<https://teamliquid.net/forum/tech-support/333648-an-overview-of-mouse-technology>

https://overclock.net/forum/375-mice/1607990-click-latencies-compiled.html#post_25414692

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<http://www.test-gear.pl/testy-i-recenzje/myszki/szybkosc-kliku/#szybkosc-kliku>

<http://esreality.com/?a=longpost&id=1265679&page=4>

<http://www.test-gear.pl/testy-i-recenzje/myszki/>

<http://rocketjumpninja.com/top-40/>

<https://sensor.fyi/list/>

Headphones

Gaming and normal headphones are not recommended

Studio monitoring headphones are best for true sound

Never use wireless devices

Do not run splitter or port boxes

Do not run extension cables

Clean power

Your house may have a bad earth or bad neutral connection.

This affects everything! Including latency, mouse input and PC performance.

Consider a power conditioner or UPS System that backs up and conditions power.

https://en.m.wikipedia.org/wiki/Power_conditioner

djdallmann's github a good read

<https://github.com/djdallmann/GamingPCSetup/blob/master/TROUBLESHOOTING/ELECTRICALINTERFERENCE.MD>

Pc build tips

Delid your CPU</p

<http://overclock.net/t/1433882/gaming-and-mouse-response-bios-optimization-guide-for-modern-pc-hardware>

TURN CSM ON IN BIOS

INSTALL WINDOWS IN MBR LEGACY MODE

A windows legacy install will have lower latency and will perform slightly better

Legacy also provides a much more snappier and consistent mouse movement

UEFI will always have something running in the background

This is such a debatable topic, although this is what I have found in my tests

The trade off to legacy is longer boot times vs uefi

I highly recommend using MBR legacy for your windows install

Disable any unused devices

Usb ports

Usb controllers

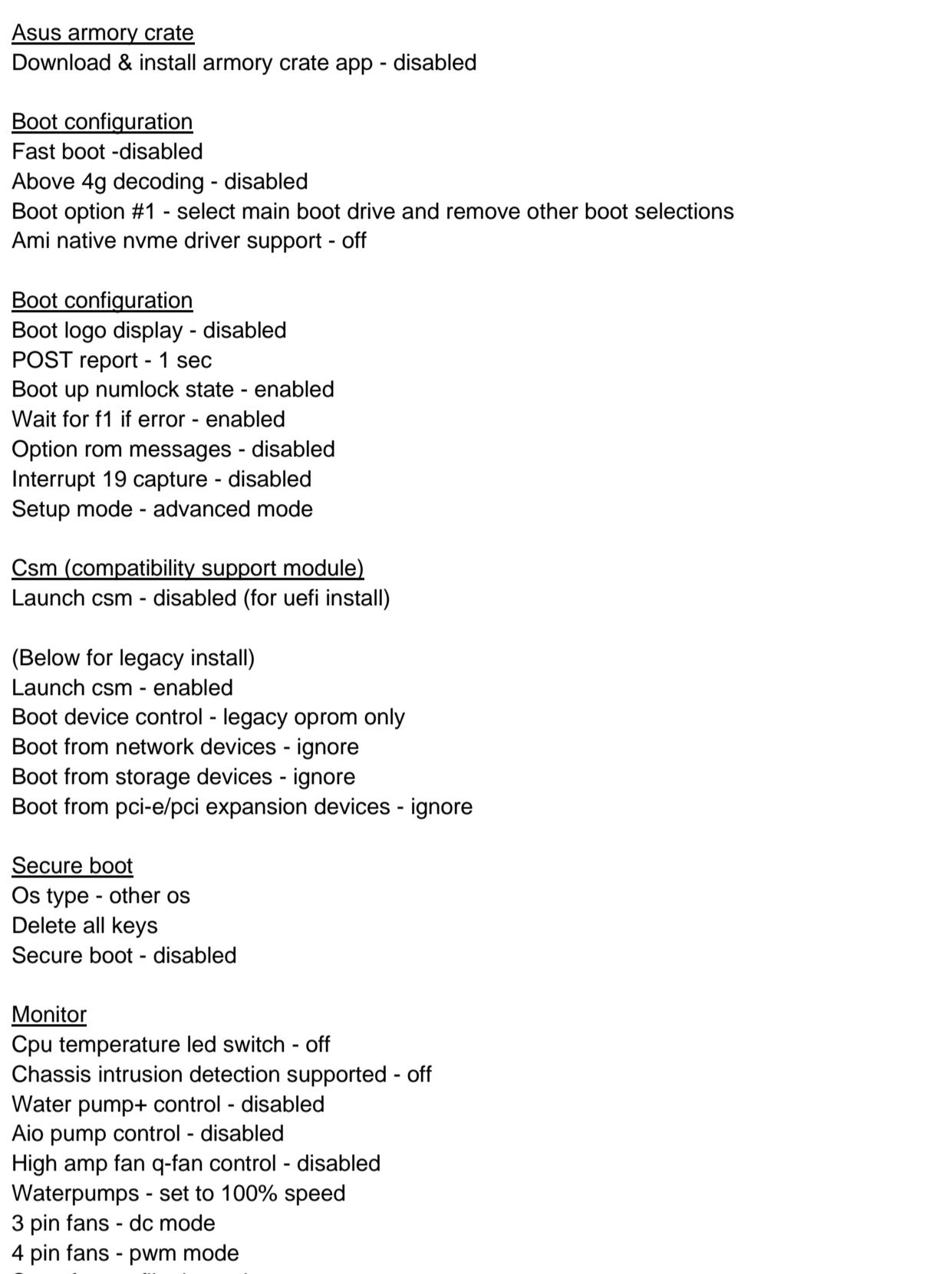
Wifi

Bluetooth

Unused features etc

Less is more

BELOW APEX XI Z390 AS AN EXAMPLE OR GUIDE



Tool

Setup animator - disabled

Asus armory crate

Download & install armory crate app - disabled

Boot configuration

Fast boot -disabled

Above 4g decoding - disabled

Boot option #1 - select main boot drive and remove other boot selections

Ami native nvme driver support - off

Boot configuration

Boot logo display - disabled

POST report - 1 sec

Boot up numlock state - enabled

Wait for f1 if error - enabled

Option rom messages - disabled

Interrupt 19 capture - disabled

Setup mode - advanced mode

Csm (compatibility support module)

Launch csm - disabled (for uefi install)

(Below for legacy install)

Launch csm - enabled

Boot device control - legacy oprom only

Boot from network devices - ignore

Boot from storage devices - ignore

Boot from pci-e/pci expansion devices - ignore

Secure boot

Os type - other os

Delete all keys

Secure boot - disabled

Monitor

Cpu temperature led switch - off

Chassis intrusion detection supported - off

Water pump+ control - disabled

Aio pump control - disabled

High amp fan q-fan control - disabled

Waterpumps - set to 100% speed

3 pin fans - dc mode

4 pin fans - pwm mode

Set a fan profile that suits you

Advanced

Cpu configuration

Sw guard extensions (sgx) - disabled

Tcc offset time window - disabled

Hardware prefetcher - enabled

Adjacent cache line prefec - enabled

Intel virtualization technology - disabled

Hyper threading -

Enabled -

Faster workloads/processing/rendering

Better for encoding/streaming

Higher latency

Higher temps

Most of the time (lower fps - game engine dependant)

Can cause stutter

Disabled -

Slightly slower workloads/processing/rendering

Lower latency

Better response

Lower temps

Most of the time (higher fps - game engine dependant)

Less stutter

Better response

Better mouse input and feel

Hyperthreading will always have much more input latency than just the cores

Some games like Battlefield Multiplayer will benefit from hyperthreading ON

Although most games will not benefit and run smoother with hyperthreading OFF

Default is (Enabled)

Set to "Enabled" if you are unsure

I was proven wrong and I don't use hyperthreading anymore

You will be able to overclock your CPU more or run a lower vcore voltage with HT disabled

Active processor cores - all

Thermal monitor - disabled

Execute disable bit - disabled

Cpu power management control

Boot performance mode - turbo performance

Intel speedstep - disabled

Intel speed shift technology - disabled

Turbo mode - enabled

Cpu c states - disabled

Cfg lock - disabled

System agent configuration

Vt-d - disabled

Above 4g decoding - disabled

Memory configuration

Memory remap - enabled

Dmi/opi configuration

Pcie link speeds - gen3

Pcie spread spectrum clocking - disabled

Pch configuration

Pcie speed - gen3

High precision timer - unlocked with my custom BIOS mod

High precision timer - enabled

Enable TCO timer - unlocked with my custom BIOS mod

Enable TCO timer - disabled

Ioapic 24-119 entries - disabled

High precision event timer should always be enabled in the bios and disabled in the OS.

The only disadvantage of not having the HPET option unlocked/unhidden in your bios means you can't use or try the ACPI PMT clock. I would not recommend the ACPI PMT clock anyway.

HPET is hidden and enabled by default in most motherboard bios's now.

Having HPET - disabled in bios will give you a lower timer resolution, although this will also cause major syncing issues. Including bad latency, mouse movement and performance.

This reflects in the timer resolution.

HPET "off" in bios & "off" in OS = a lowest timer res of 0.488XX

HPET "on" in bios & "off" in OS = a lowest timer res of 0.50000

More on this topic below

Pci express configuration

Pcie speed - gen3

Pch storage configuration

Sata controllers - enabled

Sata mode selection - ahci (don't use raid it's not reliable)

Aggressive lpm support - disabled

S.m.a.r.t. status check - disabled

Sata drives - disabled unused ports

Hot plug - disable all

Pch-fw configuration

Ptt configuration

Ptt - disable

ME state - unlocked with my custom BIOS mod = Intel Management Engine Interface

ME state - disabled (**tested enabled vs disabled, disabled is fine - cold boot times longer**)
ME state - disabled (**tested enabled vs disabled, disabled is fine - cold boot times longer**)

Tpm device selection - dtpm
Ptp aware os - ptpt aware

Onboard devices configuration

Hd audio controller - disabled
Dvi port audio - disabled
Audio led lighting - disabled
When system is in working state - disabled
Q-code led function - disabled
Pch led lighting - disabled
Pcie16_3 bandwidth x4 mode
M.2 configuration - pcie mode
Hyper m.2 x16: - disabled
Usb power delivery in soft off state (s5) - disabled
Asmedia back usb 3.1 controller - enabled
Intel lan controller - enabled
Intel lan pxe option rom - disabled
Connectivity mode (wi-fi & bluetooth) - disable
Wifi - disabled
Bluetooth - disabled
Serial port - disabled

Apm configuration

Erp ready - disabled
Restore ac power loss - power off
Power on by ps/2 keyboard - disabled
Power on by pci-e/pci - disabled
Power on by ring - disabled
Power on by rtc - disabled

Pci subsystem settings

Sr-iov support - disabled

Platform misc configuration

Pci express native power management - disabled
Pci dmi aspm - disabled
Aspm 0 - disabled
L1 substates - disabled
Pci express clock gating - disabled
Ami link aspm control - disabled
Peg-aspm - disabled

Usb configuration

Legacy usb support - disabled (enable this to install windows in legacy mbr with usb)
Usb keyboard and mouse simulator - disabled
Xhci hand-off - enabled (I have found better mouse input with this on, test for yourself)

Usb single port override

Disable all unused ports

Network stack configuration

Network stack - disabled

Graphics configuration

Primary display - peg

Igpu multi-monitor - disabled

Ethernet connection/Nic configuration

Link speed - 100 mbps full

Wake on lan - disabled

Ai tweaker

Ai overclock tuner - xmp or manual
Xmp - xmp profile
Bclk frequency - 100
Bclk spread spectrum - disabled
Asus multicore enhancement - enabled - remove all limits
Svid behavior - best case scenario
Avx instruction core ratio negative offset - 0
Cpu core ratio - sync all cores
Core ratio - max turbo boost for cpu specs
Bclk frequency : dram frequency ratio 100:133 (ddr4 on some mobos prefer this vs 100:00)
Dram odd ratio mode - enabled
Dram frequency - set to max xmp profile
Oc tuner - keep current settings
Cpu svid support - disabled

Dram timing control

Maximus tweak - mode 2
Dram cas# latency - set to max xmp profile
Dram ras# to cas# delay - set to max xmp profile
Dram ras# act time - set to max xmp profile
Dram command rate - set to max xmp profile

External digi+ power control

Cpu load line calibration - level 6
Synch acdc loadline with vrm loadline - disabled
Cpu current capability - 140% (max)

Cpu vrm switching frequency - manual

Fixed spu vrm switching frequency(khz) - 500 (max)

Cpu power duty control - t.probe

Cpu power phase control - extreme

Cpu power thermal control - 120

Cpu vrm thermal control - enabled

Dram current capability - 130%

Internal cpu power management

Intel speedstep - disabled

Turbo mode - enabled

Long duration package power limit - 4095 (max)

Package power time window - 127 (max)

Short duration package power limit - 4095 (max)

Fclk frequency for early power on - 1ghz

BCLK spread spectrum - disabled

Cpu core/cache current limit max - 255.57 (max)

Ring down bin - disabled

Min cpu cache ratio - set to max for cpu specs

Max cpu cache ratio - set to max for cpu specs

Extreme over-voltage - disabled

Bclk aware adaptive voltage - disabled

Cpu core/cache voltage - manual mode

Cpu core voltage override - auto for now then

(find a stable value in stress testing for you and set it 1-1.4v)

Dram voltage - set to max xmp profile

Cpu vccio voltage - auto for now then

(find a stable value in stress testing for you and set it 1-1.3v)

Cpu system agent voltage - auto for now then

(find a stable value in stress testing for you and set it 1-1.3v)

Some low end motherboards will set SA and VCCIO voltages too low (under 1v)

In this case set it to a minimum 1.1v manually and stress test

This is for the memory controller and values will depend on ram specs and speeds

BELOW LAPTOP MSI GT73VR 6RF AS AN EXAMPLE OR GUIDE

Sata mode selection - ahci (don't use raid it's not reliable)

Intel(r) speedstep(tm) - enabled

(disabled for a desktop msi bios would not run turbo mode without this)

Erp lot 3 support - disabled

Wake up on lan s5 support - disabled

Win/fn key swap - disabled

Network stack - disabled

Intel virtualization technology - disabled

Vt-d - disabled

Thunderbolt firmware update - disabled

Cpu hyper-threading

(See bios settings above regarding pros and cons with hyperthreading, leave enabled if unsure)

Cpu c states - disabled

(Enable these below to install windows in legacy mbr with usb)

Legacy usb support - enabled

Xhci hand-off - enabled (I have found better mouse input with this on, test for yourself)

Usb mass storage driver support - disabled

Usb transfer time-out - 20 sec

Device reset time-out - 20sec

Device power-up delay - auto

Full fan speed - disabled

Adjust cpu ratio - max turbo boost for cpu specs (or downclock if thermal throttling)

Adjusted cpu frequency - max turbo boost for cpu specs (or downclock if thermal throttling)

Adjust ring ratio - max turbo boost for cpu specs (or downclock if thermal throttling)

Cpu core voltage - auto for now then

(find a stable value in stress testing for you and set it 0.8-1.2v?)

Cpu core voltage offset - 0

Cpu ring voltage - auto for now then

(find a stable value in stress testing for you and set it 0.8-1.2v?)

Clock frequency - 10000 (max)

Vr current limit 1022 (max)

Power limit 1 - 500 (max)

Power limit 2 - 500 (max)

Dram profile - default dimm xmp profile

Bootup numlock state - enabled

Fast boot - disabled

Boot mode select - csm for legacy/uefi for uefi

(see above, legacy install recommended)

Boot option 1 - select main boot drive and remove other boot selections

Security device support - disable

Delete all keys
Secure boot - disabled
Secure boot mode - disabled

🔥 Overclock cpu & ram

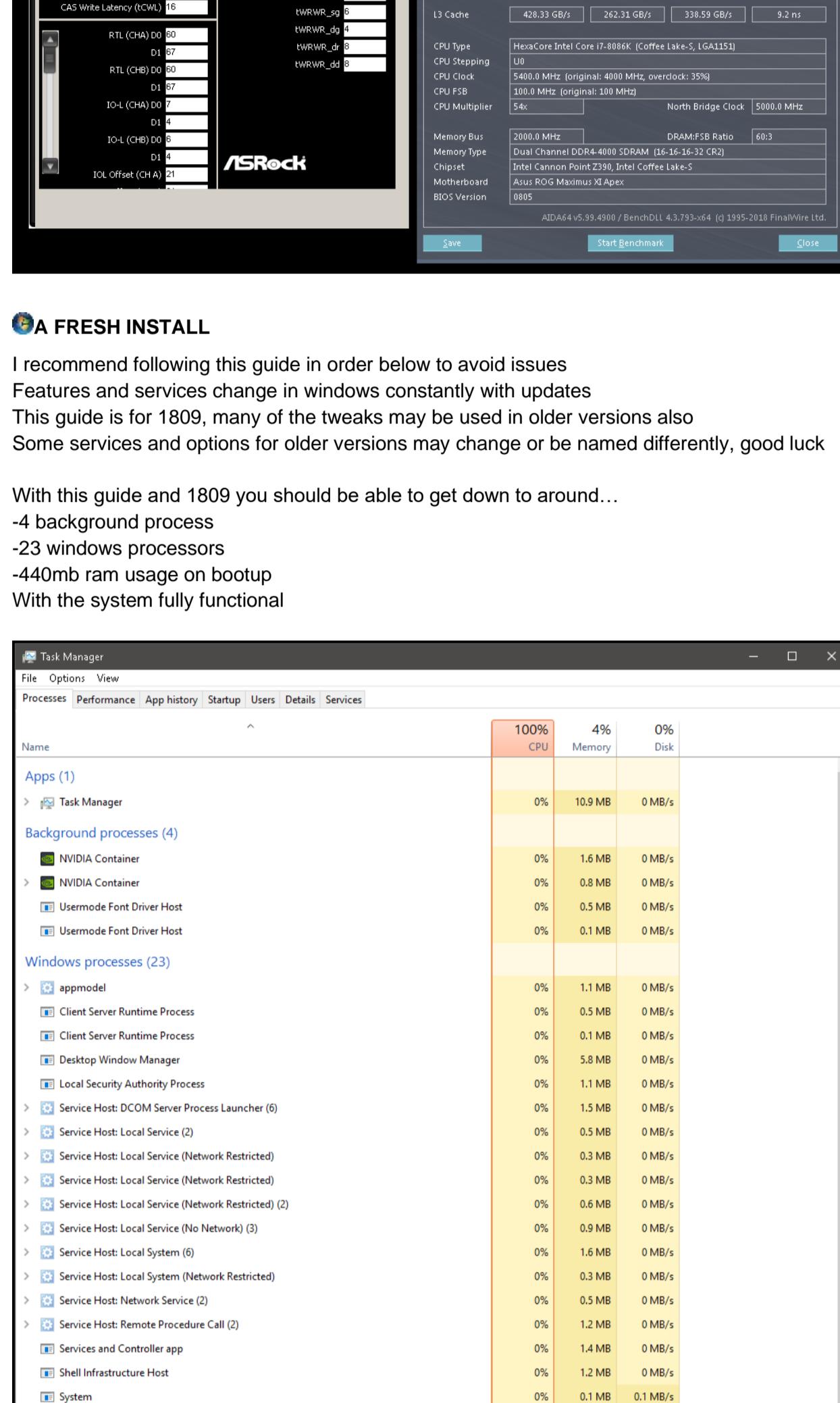
Due to this topic being complex, I will leave this up to you (the reader) to configure.

Setting all ram timings manually is recommended or the motherboard will train and change them to produce worse results, yes this includes rtl timings. I have found some motherboards will fight against you when timings are left at automatic.

Stress test your CPU with a NON AVX stress tester, 90% of us will not be using AVX

Stress test your RAM with a decent stress tester

See A STABLE SYSTEM below



💻 A FRESH INSTALL

I recommend following this guide in order below to avoid issues

Features and services change in windows constantly with updates

This guide is for 1809, many of the tweaks may be used in older versions also

Some services and options for older versions may change or be named differently, good luck

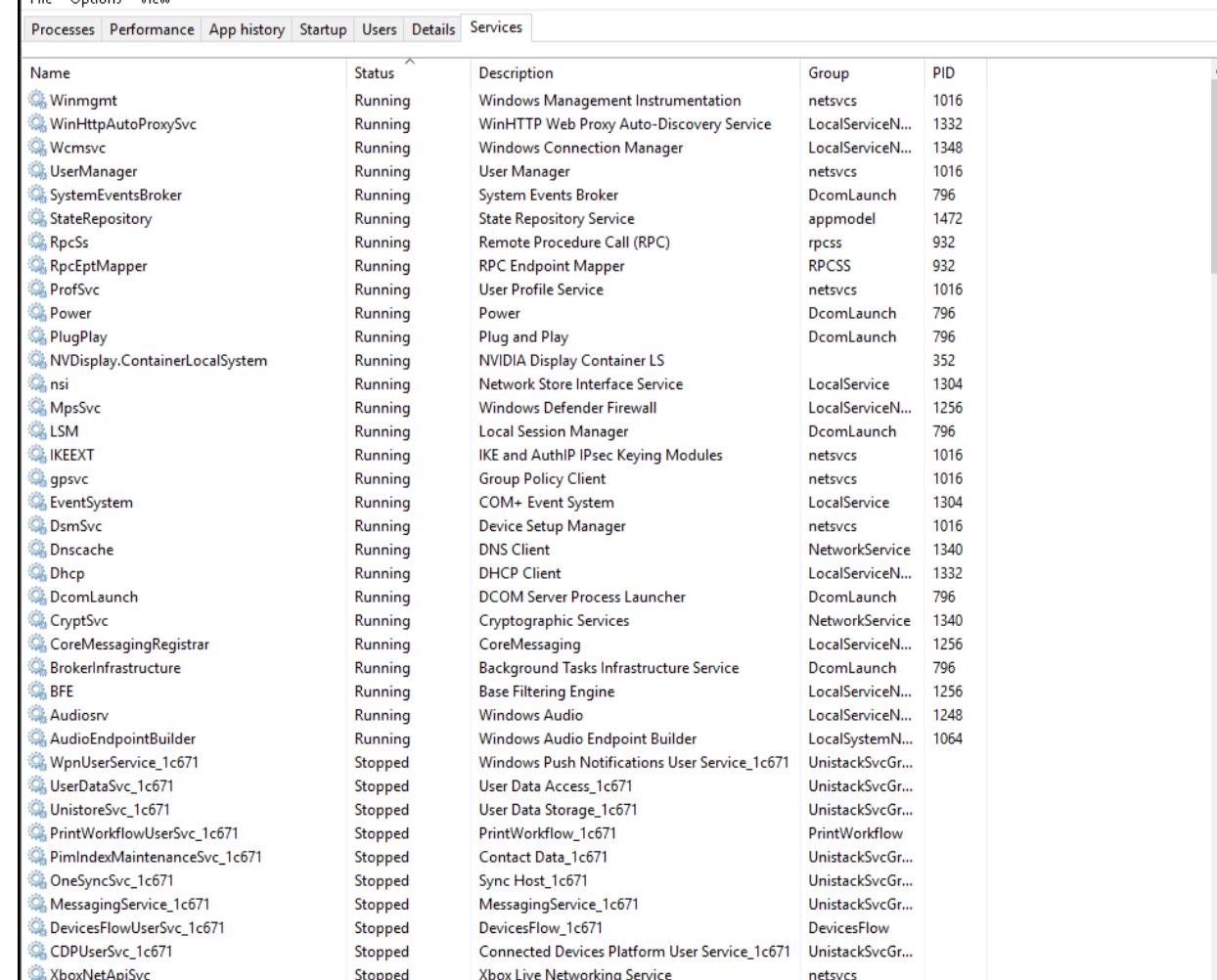
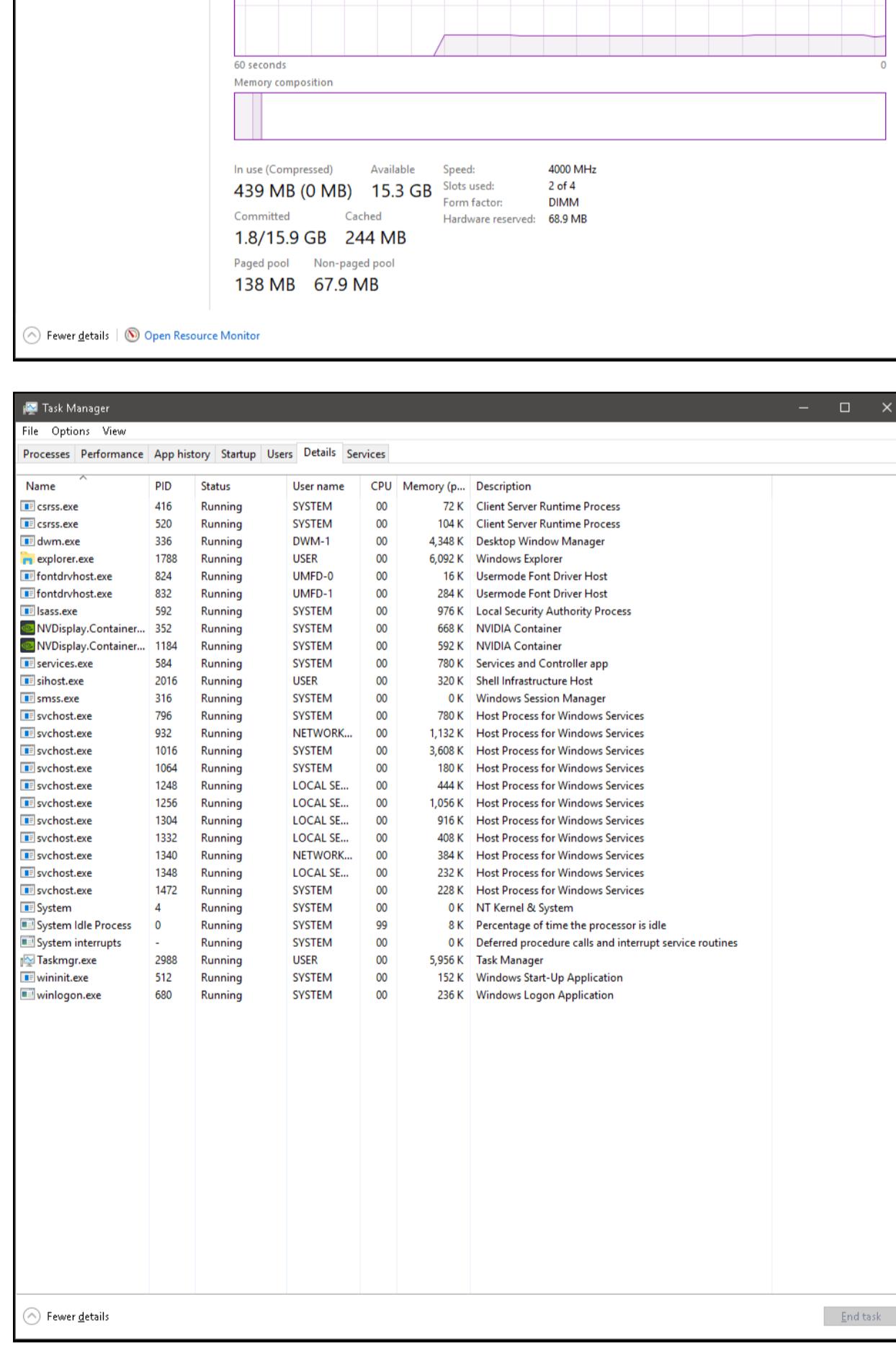
With this guide and 1809 you should be able to get down to around...

-4 background process

-23 windows processes

-440mb ram usage on bootup

With the system fully functional



This guide is not at all for security and will make things vulnerable

I recommend using a separate drive and separate updated windows install for secure use
Use this guide, install drive, tweaks for gaming and performance use

Backup your files on an external hard drive before you go ahead with this
You might want to download and backup your network driver on a USB depending on the card
Unplug other hard drives to save yourself the hassle of creating a bootable system partition later
Windows skips creating a bootable system partition with other OS install drives connected

Follow the guide in order
Driver updates, windows updates and windows feature updates must be disabled in gpedit.msc
(Before you connect to the internet)
Any kind of major driver or os update/install may revert all your tweaks back to default
Windows will install drivers for you without a choice
Major changes such as sfc/ scannow, tron script and some repair programs will revert things
Be aware and save yourself the hassle of doing it all over again

A work around for security may be to install an old enterprise version (avoid 1809)
They typically come with 10 years of security updates
Although I do not recommend this from a performance standpoint
Security updates tend to ruin performance

🚫Enterprise

I do NOT recommend LTSC 2019 enterprise
Others and myself have tested 1809 Itsc, it's unstable for overclocked gaming rigs
Driver and device support can be a big issue for some systems (blue screens)
Older versions of enterprise are ok
Enterprise still comes with bloatware and will only save you a few minutes

Ntllite, msmsg toolkit and winreducer

https://www.majorgeeks.com/files/details/msmg_toolkit.html
<https://www.ntllite.com/>
<https://www.winreducer.net/winreducer-ex-100.html>

Feel free to use Ntllite, MSMG toolkit or Winreducer on your ISO to save some time if you wish
Although, this guide includes stripping out everything manually so it's up to you

Download windows iso

I have provided the genuine 1709 ISO in my Google Drive
If you wish to find your own ISO here are some options for you below

For the latest version, use an agent switcher on your web browser then go to
Microsoft download website
<https://microsoft.com/en-au/software-download/windows10>

Microsoft windows and office ISO download tool

https://www.majorgeeks.com/files/details/microsoft_windows_iso_download_tool.html

The eye

<http://the-eye.eu/>

Tech bench

<https://tb.rg-adguard.net/public.php>

Mount windows ISO to a bootable USB

Rufus

<https://rufus.ie/>

Insert a USB - at least 8GB

Open Rufus Windows USB Tool

Create a bootable disk using - select (open ISO file)

Device - USB

Boot selection - standard windows installation

Partition scheme - GPT partition scheme for UEFI

- MBR partition scheme for legacy (recommended)

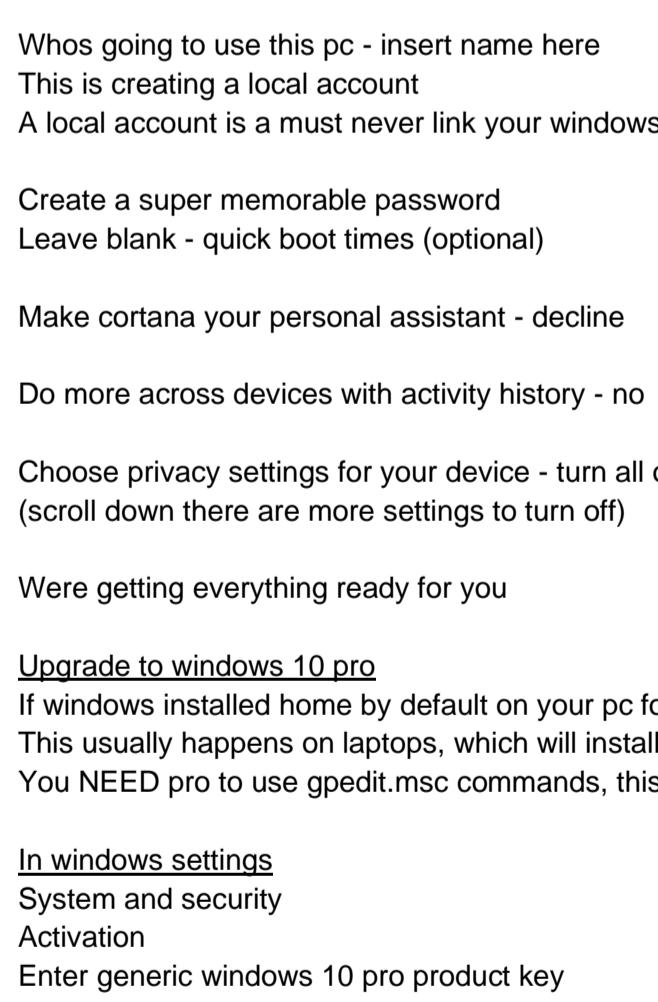
Target system - FAT32 for UEFI

- NTFS for legacy (recommended)

Cluster size - default

New volume label - insert a name here

Start



🌐 INSTALLING WINDOWS

⚠️ IMPORTANT STEP - DISABLE INTERNET OR UNPLUG ETHERNET CABLE

Some USB BIOS settings may need to be turned on for a USB boot, see above

Set your bootable USB in BIOS to boot

(IF INSTALLING LEGACY INSTALL - CHOOSE NON UEFI USB TO BOOT)

Sometimes there will be two USB bootable options in BIOS; select the one that does not say UEFI

Windows install

Language - English United States

Time - English United States

Keyboard - US

Activate Windows - skip this step

Select - Windows 10 Pro

If this page does not show for your PC

It will install "Home"

"Pro" can be activated later by following below

Accept terms - next

Custom: install Windows only

Windows setup

Delete all partitions

Next

Installing Windows

Windows needs to restart to continue

Once restarting, take out USB or change BIOS boot settings

Set region

Set keyboard layout

Skip 2nd keyboard layout if possible

🚫 DON'T CONNECT TO THE INTERNET

Connect now to save time later - no

Who's going to use this PC - insert name here

This is creating a local account

A local account is a must never link your Windows account

Create a super memorable password

Leave blank - quick boot times (optional)

Make Cortana your personal assistant - decline

Do more across devices with activity history - no

Choose privacy settings for your device - turn all off to no

(scroll down there are more settings to turn off)

We're getting everything ready for you

Upgrade to Windows 10 Pro

If Windows installed Home by default on your PC follow below

This usually happens on laptops, which will install Home without giving you a choice

You NEED Pro to use gpedit.msc commands, this is the only way to properly disable updates

In Windows Settings

System and Security

Activation

Enter generic Windows 10 Pro product key

VK7JG-NPHTM-C97JM-9MPGT-3V66T

Activate and restart

Check you installed Legacy

Run msinfo32

Bios mode - Legacy

Run

Diskmgmt.msc

Right click, properties on disk

Volumes tab, partition style - MBR

If you wanted Legacy and you see UEFI and GPT

You did something wrong, start over

Turn updates and driver installs off

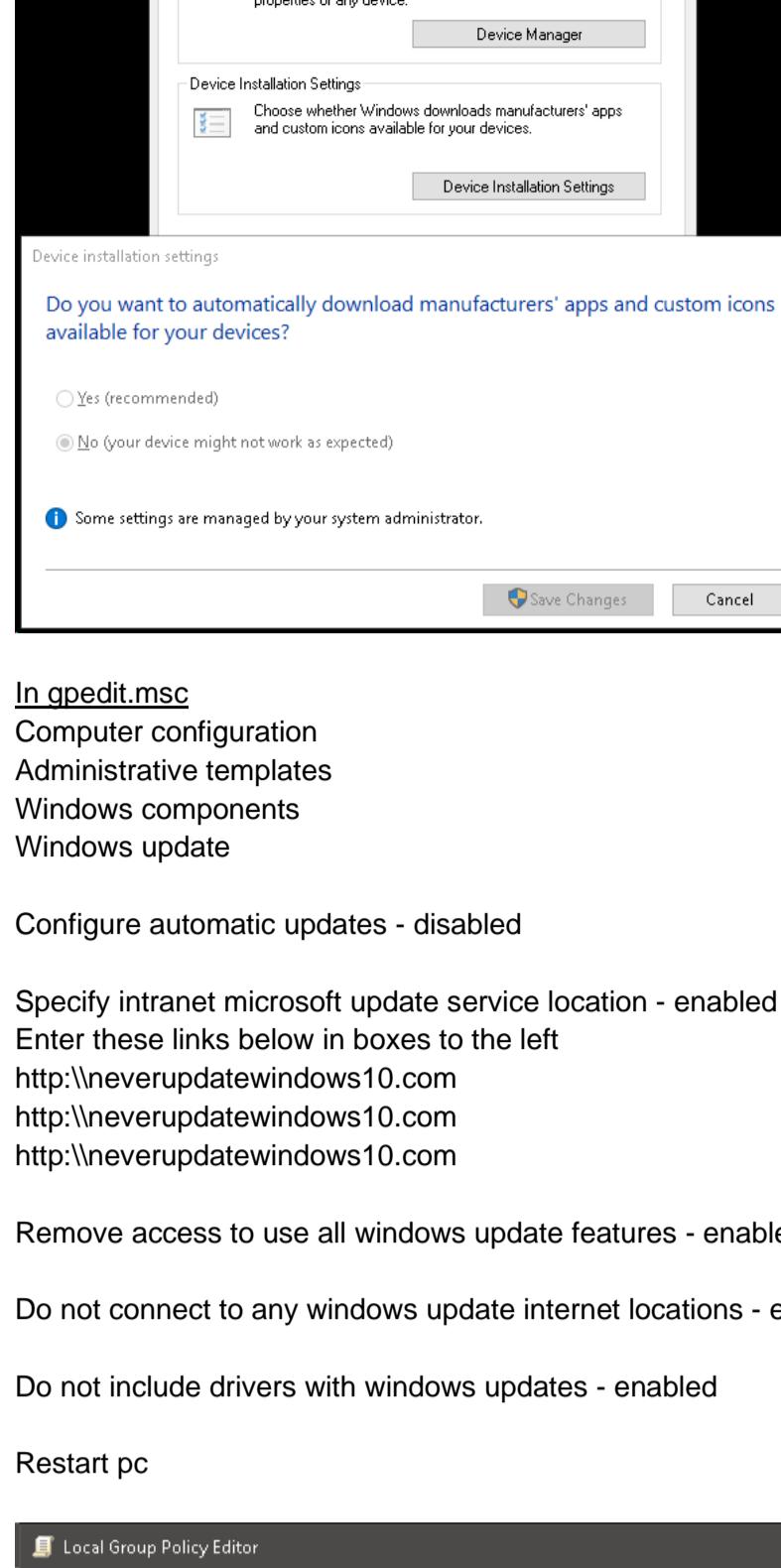
Control Panel\System and Security\System

Advanced system settings

Hardware

Device Installation Settings

No



In gpedit.msc

Computer configuration

Administrative templates

Windows components

Windows update

Configure automatic updates - disabled

Specify intranet microsoft update service location - enabled

Enter these links below in boxes to the left

http://neverupdatewindows10.com

http://neverupdatewindows10.com

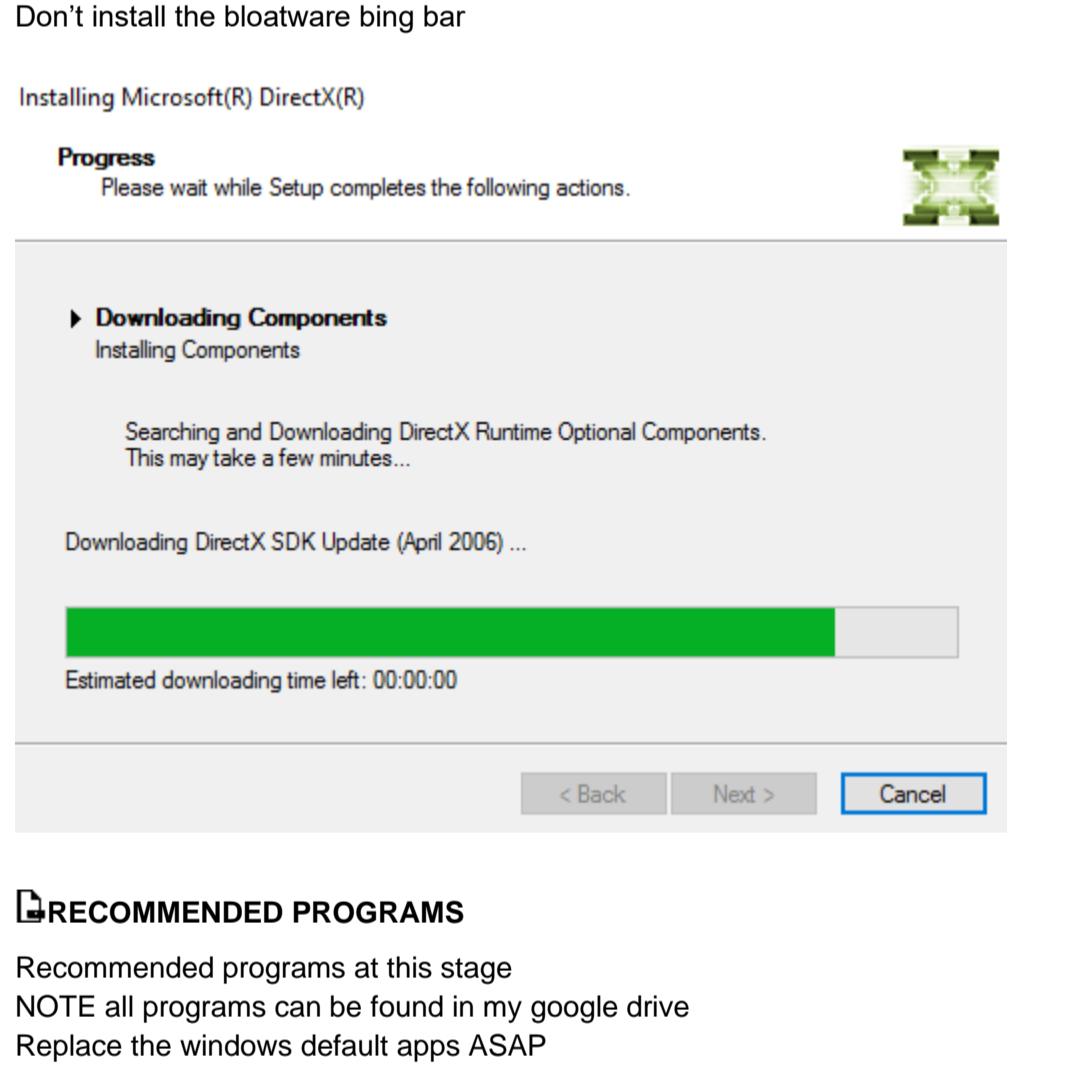
http://neverupdatewindows10.com

Remove access to use all windows update features - enabled

Do not connect to any windows update internet locations - enabled

Do not include drivers with windows updates - enabled

Restart pc



IT'S NOW SAFE TO CONNECT TO THE INTERNET

Activate windows 10 pro

Enable internet

Activate windows 10 pro with a key

Cheap ebay windows 10 pro keys can be found for around \$2

In windows settings

System and security

Activation

Enter key

Activate

Change pc name

Control Panel\System and Security\System

Computer name

Insert name here

Change

Computer name

Insert name here

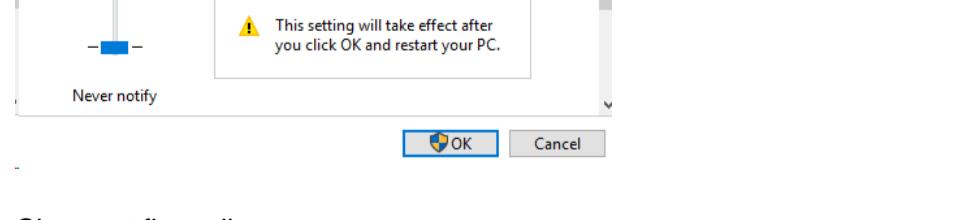
Restart pc

Install direct x

This might be needed on older os versions

Don't install the bloatware bing bar

Installing Microsoft(R) DirectX(R)



RECOMMENDED PROGRAMS

Recommended programs at this stage

NOTE all programs can be found in my google drive

Replace the windows default apps ASAP

I highly recommend using firefox as this is a fast web browser when tweaked

Firefox also has the least amount of telemetry

I go as far to not use edge or explorer at all, they do not even get opened once

Google chrome is very fast but has a lot of telemetry

Desktop composition cannot be disabled for google chrome to work in windows 10

Further down is the option to uninstall edge and explorer if you wish

7zip - extract everything

<https://7-zip.org/download.html>

Firefox - web browsing - reading pdfs - with uBlock Origin addon

<https://mozilla.org/en-US/firefox/new/>

VLC Player - audio and 1k video

Old version 2.2.1 with flac codec fix recommended check my google drive

(It's all done for you in the "VLC Player.7z" archive)

You might have problems setting VLC to default for files

Download and install the latest version and replace the files with my google drive ones

The new VLC player comes with a lot of telemetry and has been much buggier for me

<https://drive.google.com/open?id=1JsVS9MUJnd3Rud18zjvPQRMr1p3M59Wm>

<https://videolan.org/vlc/index.html>

VLC Player - black skin - edark vlc

<https://videolan.org/vlc/skins.html>

Notepad++ - edit anything

<https://notepad-plus-plus.org/download/v7.6.4.html>

Uninstall "mozilla maintenance service"

Open 7zip as admin

Tools

Options

System

Associate 7zip with all files

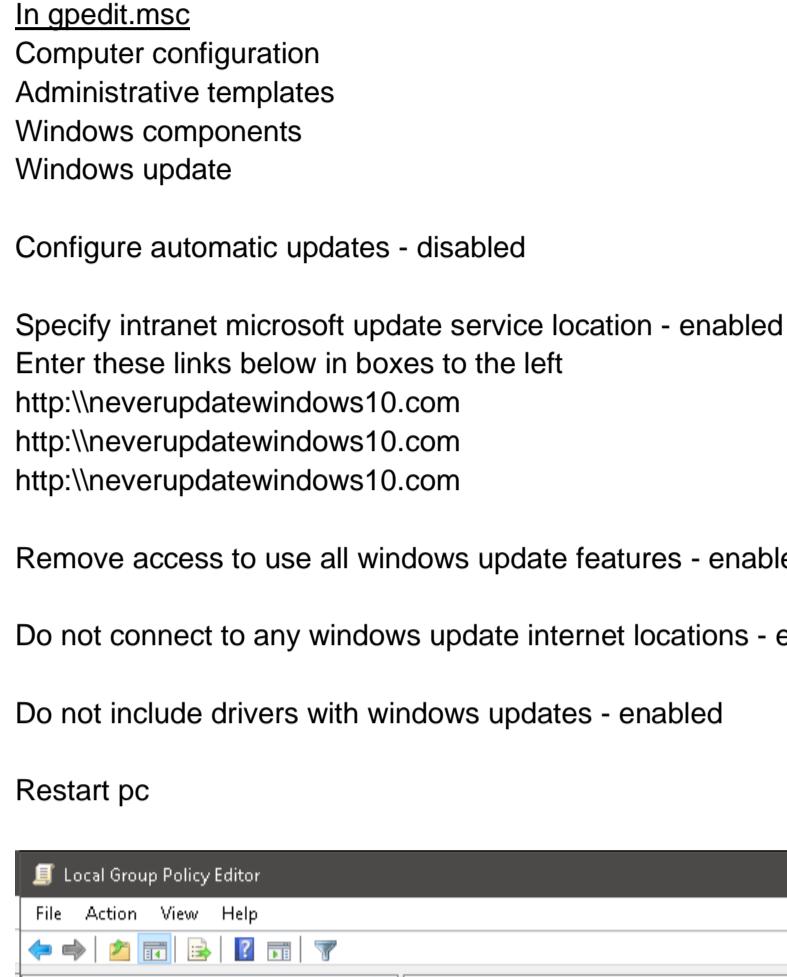
Click plus on both tabs until associations are made for all

REMOVE BLOATWARE

Turn off uac

Control Panel\System and Security\Security and Maintenance

Change user account control settings - never notify



Clear out firewall

Control Panel\System and Security\Windows Defender Firewall

Advanced settings

Inbound rules - delete all

(Apart from firefox)

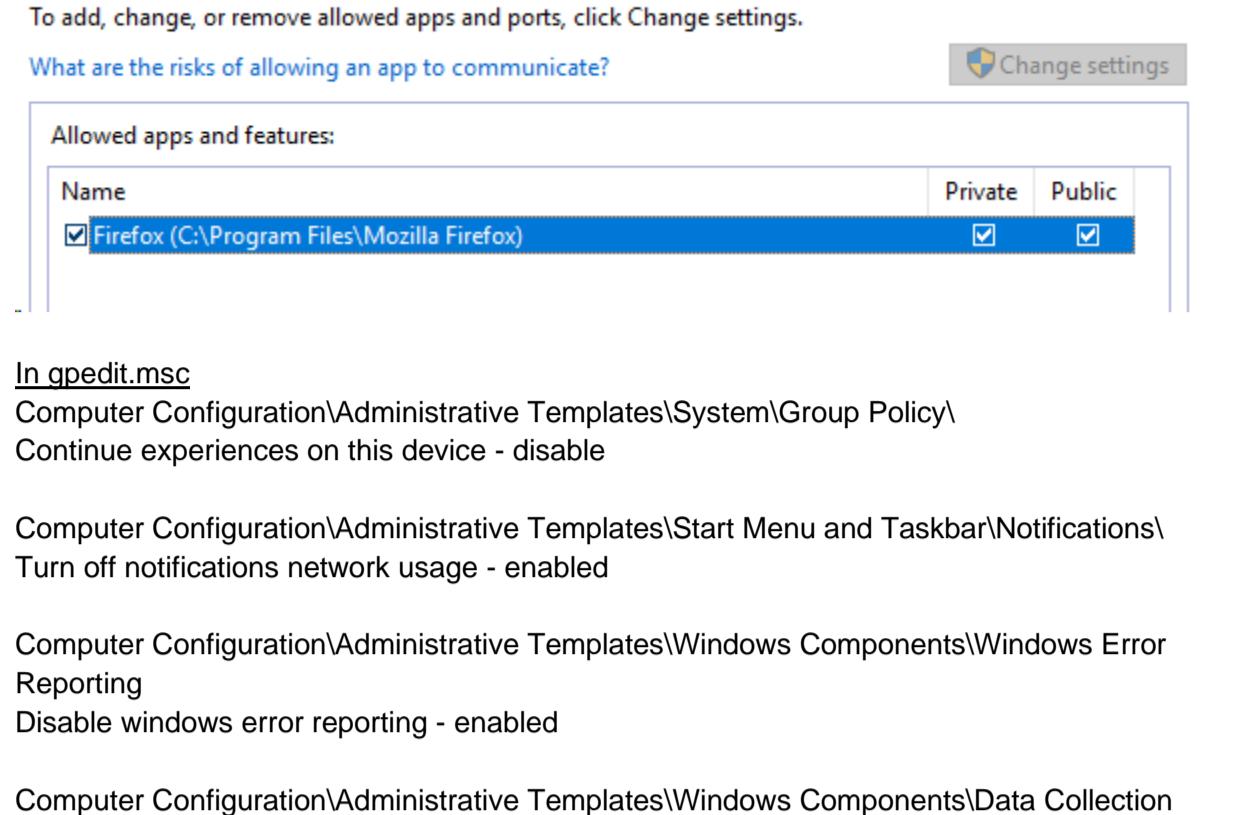
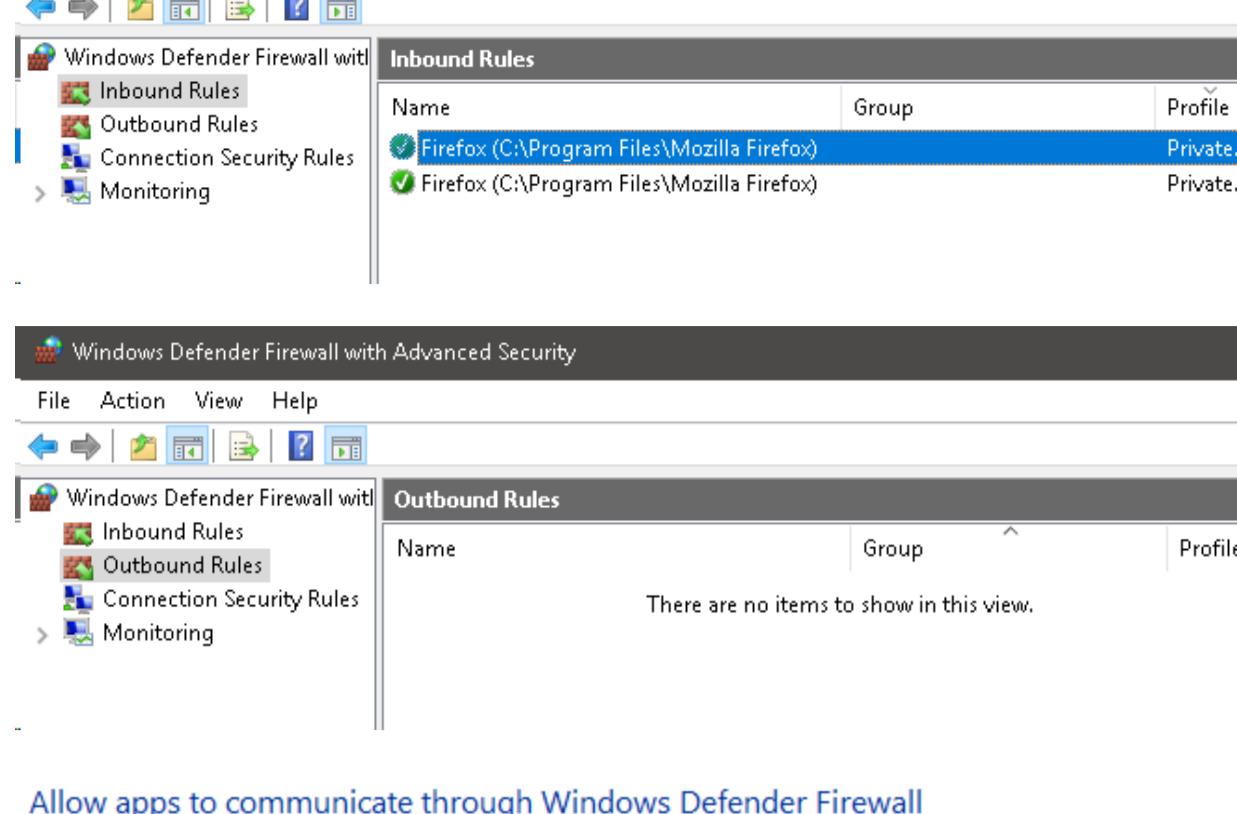
Outbound rules - delete all

Control Panel\System and Security\Windows Defender Firewall\Allowed apps

Private - tick all

Public - tick all

(Which should just be firefox at this stage)



Allow apps to communicate through Windows Defender Firewall

To add, change, or remove allowed apps and ports, click Change settings.

What are the risks of allowing an app to communicate?

[Change settings](#)

Allowed apps and features:		Private	Public
<input checked="" type="checkbox"/> Firefox (C:\Program Files\Mozilla Firefox)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

In gpedit.msc

Computer Configuration\Administrative Templates\System\Group Policy
Continue experiences on this device - disable

Computer Configuration\Administrative Templates\Start Menu and Taskbar\Notifications
Turn off notifications network usage - enabled

Computer Configuration\Administrative Templates\Windows Components\Windows Error Reporting
Disable windows error reporting - enabled

Computer Configuration\Administrative Templates\Windows Components\Data Collection
Allow telemetry - disabled
0 - security [enterprise only]

User Configuration\Administrative Templates\Windows Components\Data Collection
Allow telemetry - disabled
0 - security [enterprise only]

In regedit

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Schedule\Maintenance
MaintenanceDisabled=1

The screenshot shows the Registry Editor with the path 'Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Schedule\'. The 'Maintenance' key is selected. The right pane shows a table with two entries: '(Default)' (REG_SZ, value not set) and 'MaintenanceDisabled' (REG_DWORD, 0x00000001).

Name	Type	Data
(Default)	REG_SZ	(value not set)
MaintenanceDisabled	REG_DWORD	0x00000001 (1)

In windows settings

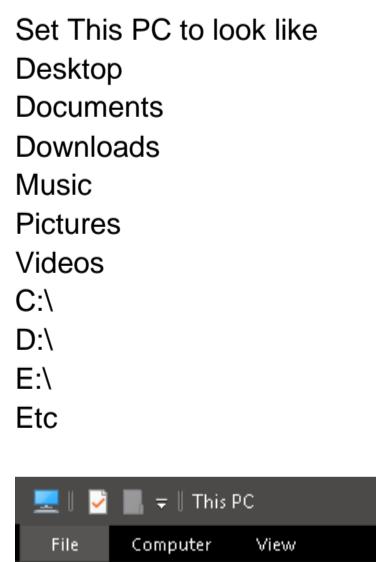
Accounts
Sign in options
Use my sign in info - off

In windows settings

Personalization
Start
Turn all off
Choose which folders appear on start
Turn all off (apart from settings)

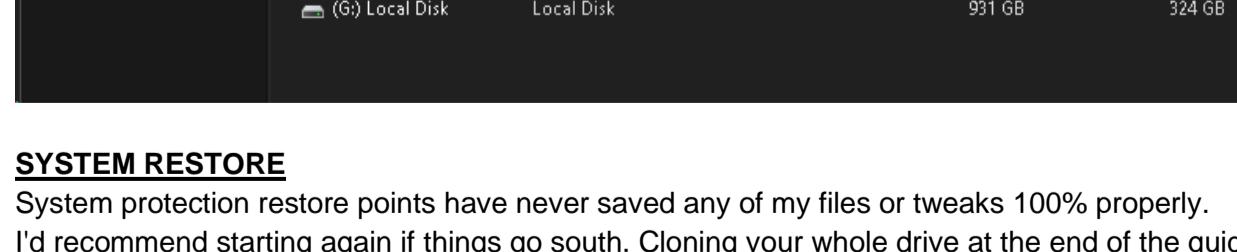
Start menu

Unpin and uninstall all apps
Right click clear recent apps



Control panel\appearance and personalization

File explorer options
Privacy
Show recently used files in quick access - off
Show frequently used folders in quick access - off
Clear files explorer history - clear
Apply



Task bar

Right click taskbar
Cortana - hidden
Show task view button - off
Show people button - off
Show windows ink workspace button - off
Show touch keyboard button - off
Lock the taskbar - on

Unpin all icons shortcuts
Pin these icon shortcuts
Windows settings
Control panel
File explorer
Firefox

Add toolbars for programs if you wish

If on a laptop

Power icon
Power mode - best performance

Restart

Get winaero tweaker

<https://winaero.com/download.php?view.1796>

File explorer

With winaero tweaker remove
-Quick access
-Internet icon
-3d object icon

Set This PC to look like
Desktop
Documents
Downloads
Music
Pictures
Videos
C:\
D:\
E:\
Etc

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Power mode - best performance



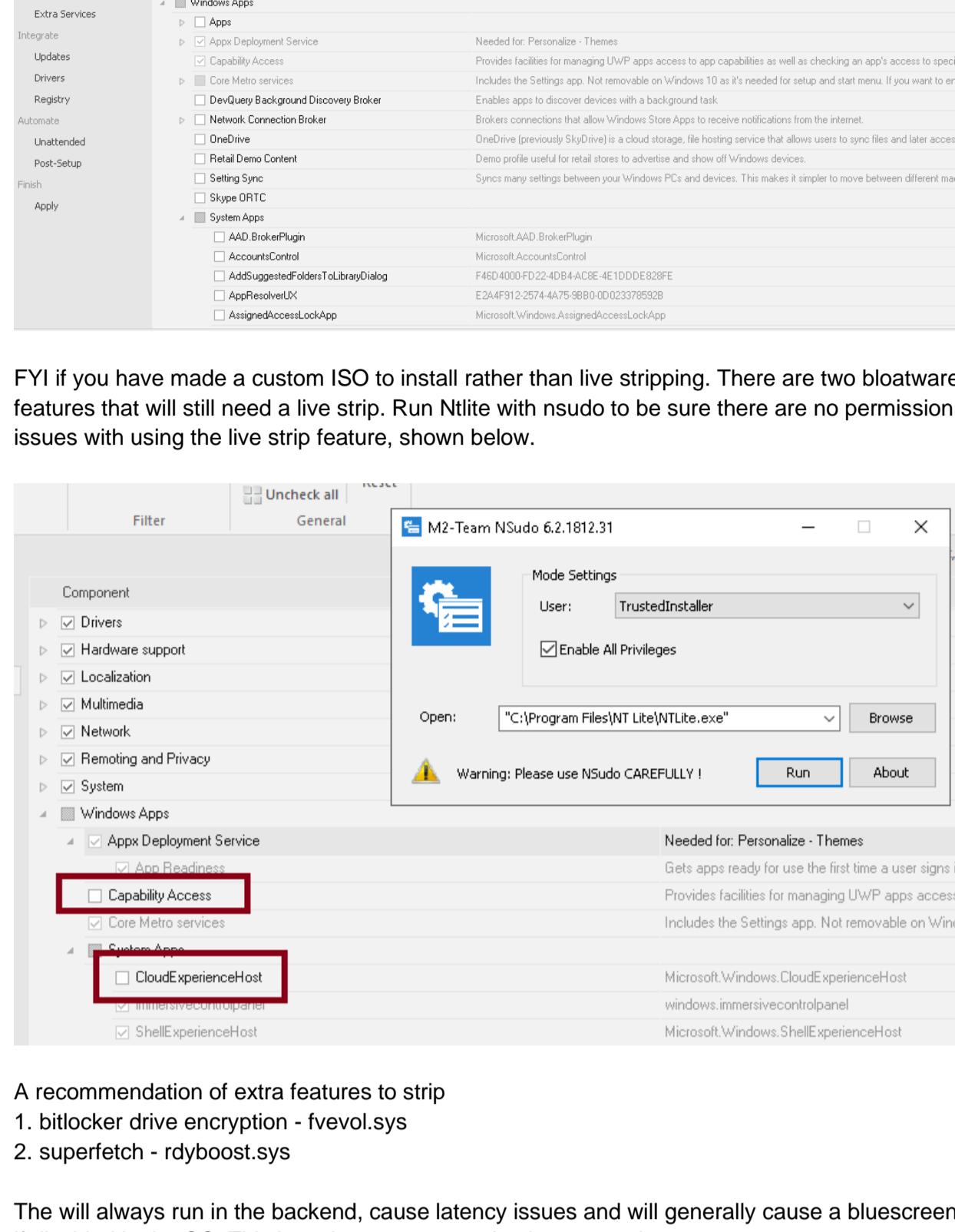
Removing bloatware with the Ntlite livestrrip feature

<https://www.ntlite.com/>

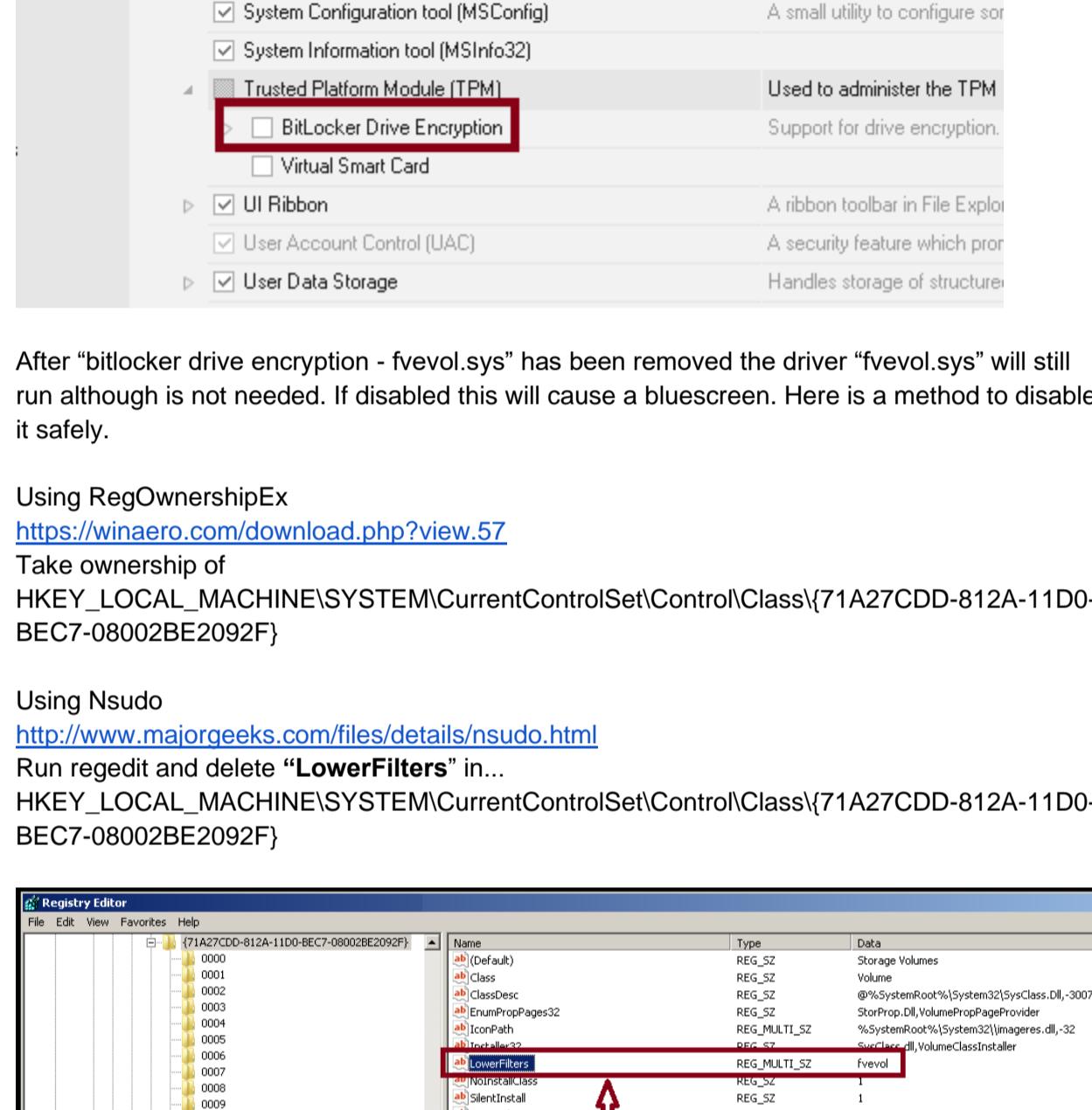
Ntlite has an amazing live strip feature, the free version does not support livestrrip.

ADVANCED USERS ONLY

SKIP TO MANUAL REMOVAL BELOW IF UNSURE



FYI if you have made a custom ISO to install rather than live stripping. There are two bloatware features that will still need a live strip. Run Ntlite with nsudo to be sure there are no permission issues with using the live strip feature, shown below.

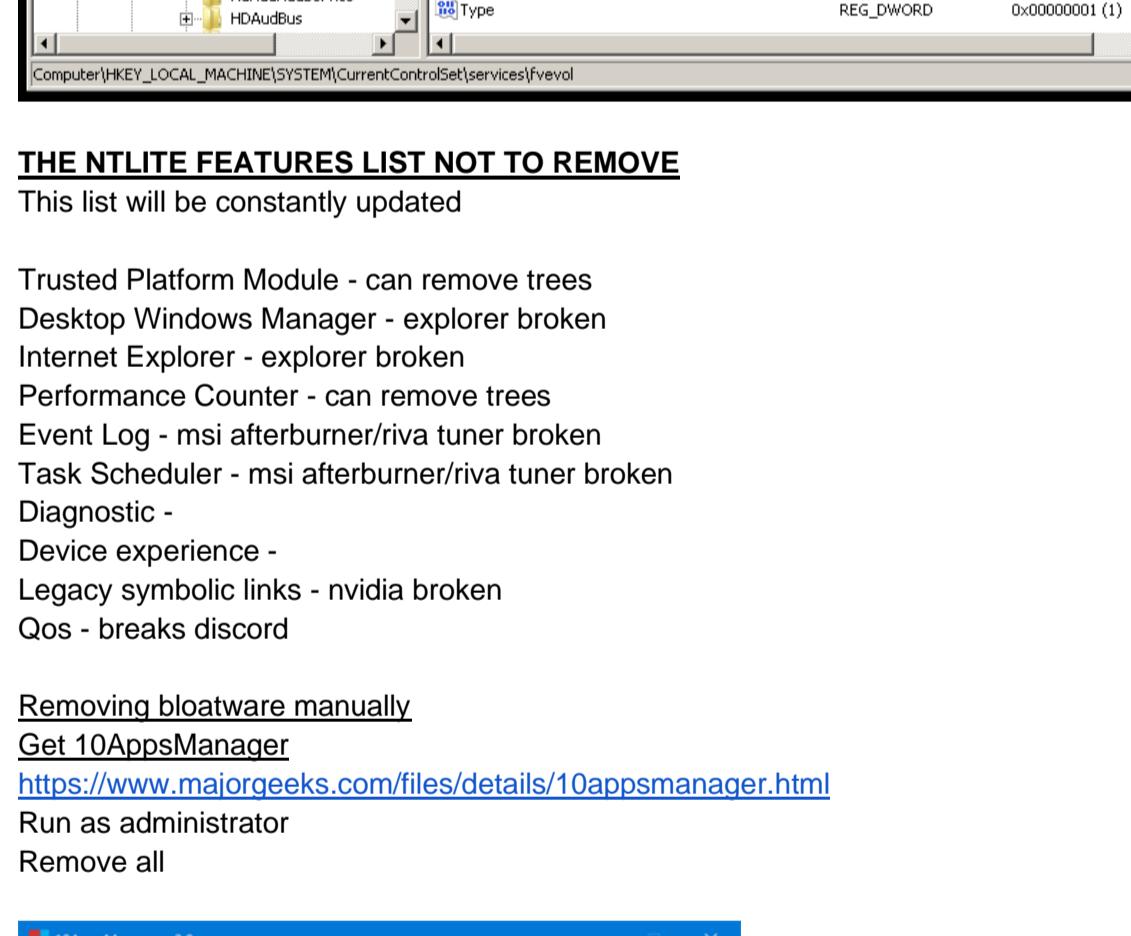


A recommendation of extra features to strip

1. bitlocker drive encryption - fvevol.sys

2. superfetch - rdyboost.sys

The will always run in the backend, cause latency issues and will generally cause a bluescreen if disabled in the OS. This is a nice way to completely remove them.



After "bitlocker drive encryption - fvevol.sys" has been removed the driver "fvevol.sys" will still run although is not needed. If disabled this will cause a bluescreen. Here is a method to disable it safely.

Using RegOwnershipEx

<https://winaero.com/download.php?view.57>

Take ownership of

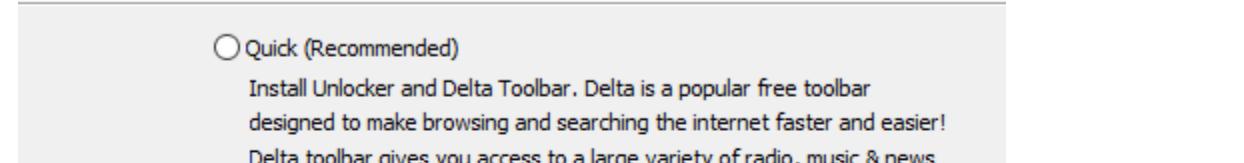
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Class\{71A27CDD-812A-11D0-BEC7-08002BE2092F}

Using Nsudo

<http://www.majorgeeks.com/files/details/nsudo.html>

Run regedit and delete "LowerFilters" in...

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Class\{71A27CDD-812A-11D0-BEC7-08002BE2092F}

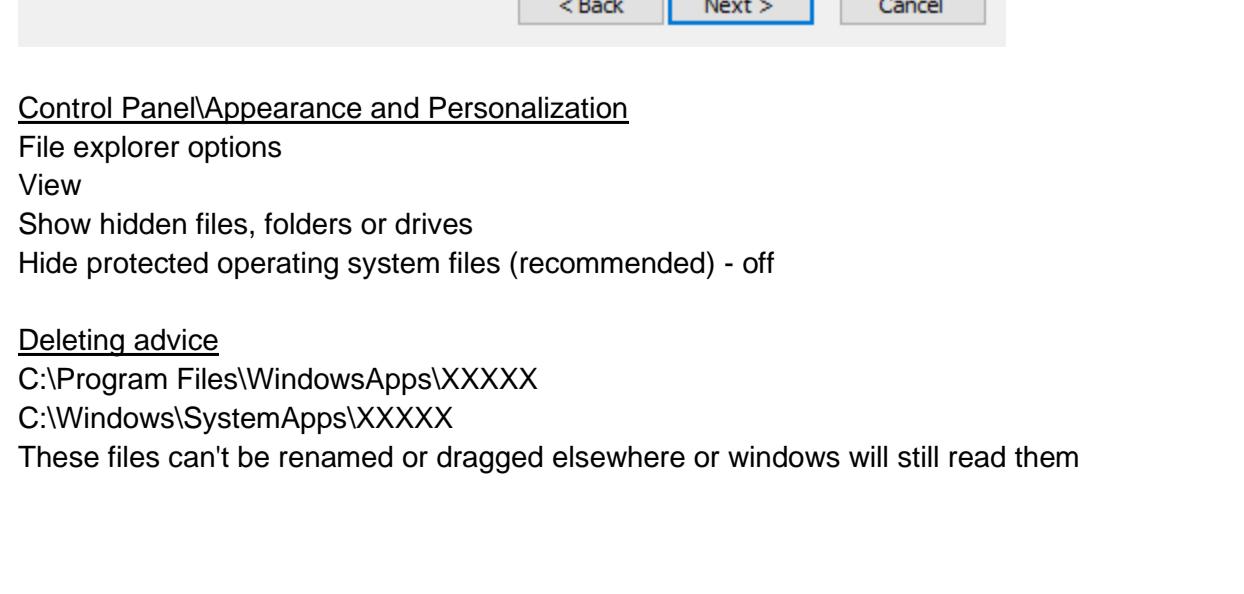


In regedit

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\fvevol

error control = 0

start = 4



THE NTLITE FEATURES LIST NOT TO REMOVE

This list will be constantly updated

Trusted Platform Module - can remove trees

Desktop Windows Manager - explorer broken

Internet Explorer - explorer broken

Performance Counter - can remove trees

Event Log - msi afterburner/riva tuner broken

Task Scheduler - msi afterburner/riva tuner broken

Diagnostic -

Device experience -

Legacy symbolic links - nvidia broken

QoS - breaks discord

Removing bloatware manually

[Get 10AppsManager](https://www.majorgeeks.com/files/details/10appsmanger.html)

<https://www.majorgeeks.com/files/details/10appsmanger.html>

Run as administrator

Remove all

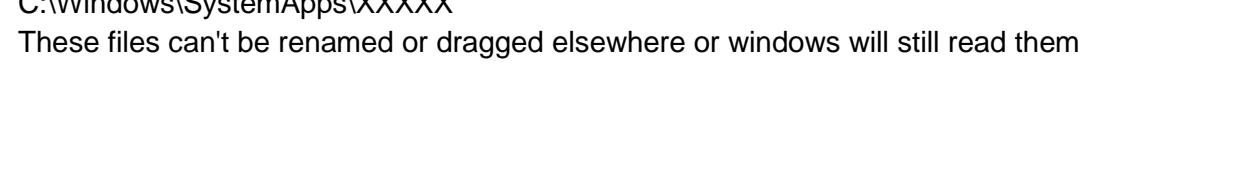
Get unlocker

Don't install the bloatware that comes with it

Use the context menu with unlocker for this guide below

<https://www.majorgeeks.com/files/details/unlocker.html>

[Unlocker 1.9.2 Setup](https://www.majorgeeks.com/files/details/unlocker.html)



Control Panel\Appearance and Personalization

File explorer options

View

Show hidden files, folders or drives

Hide protected operating system files (recommended) - off

Deleting advice

C:\Program Files\WindowsApps\XXXXXX

C:\Windows\SystemApps\XXXXXX

These files can't be renamed or dragged elsewhere or windows will still read them

Windows will not read them if they are in a 7zip archive
Permissions need to be taken if you wish to back them all up with 7zip (it's tedious)
Some folders and files refuse to be taken ownership of easily
If you will never use windows store or UI apps don't bother with backing them up

Use winaero tweaker

Take ownership

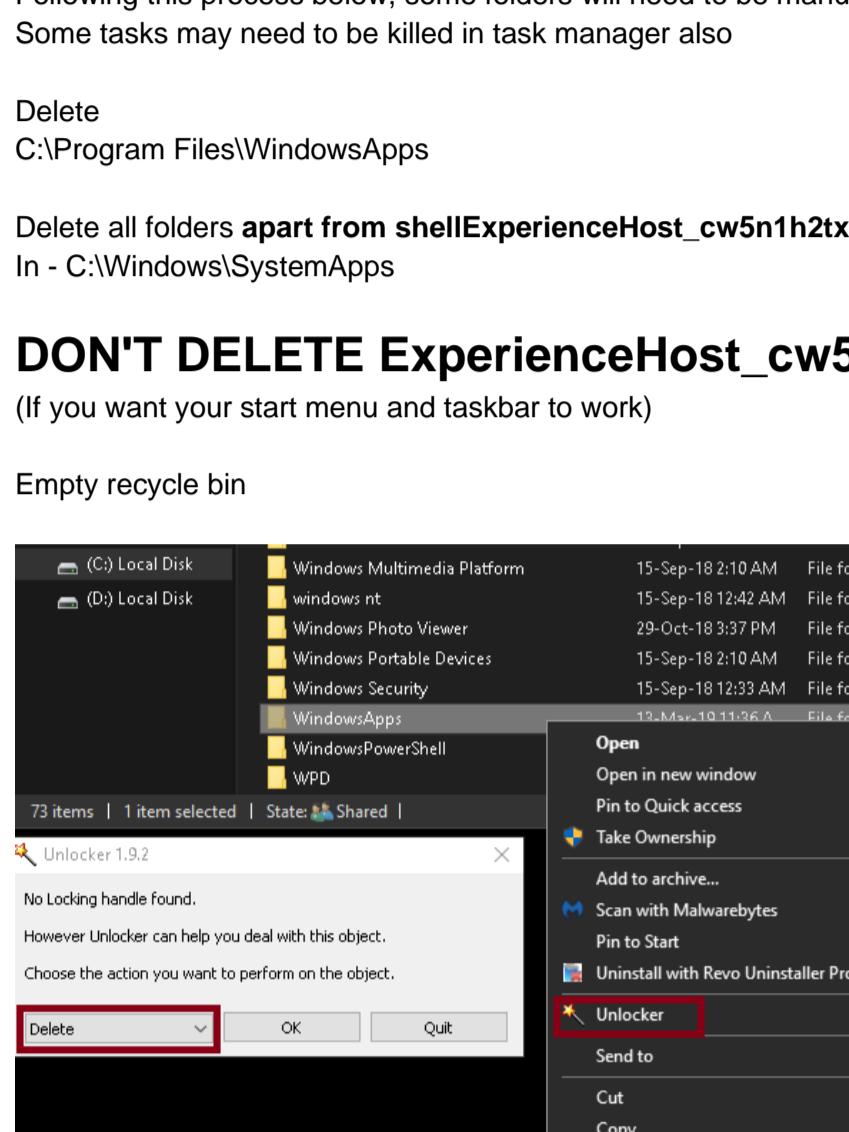
Add "take ownership" context menu to files and folders - on

Right click and take ownership of this folder

C:\Program Files\WindowsApps\

Right click and take ownership of this folder

C:\Windows\SystemApps\



Use unlocker

Following this process below, some folders will need to be manually done with unlocker
Some tasks may need to be killed in task manager also

Delete

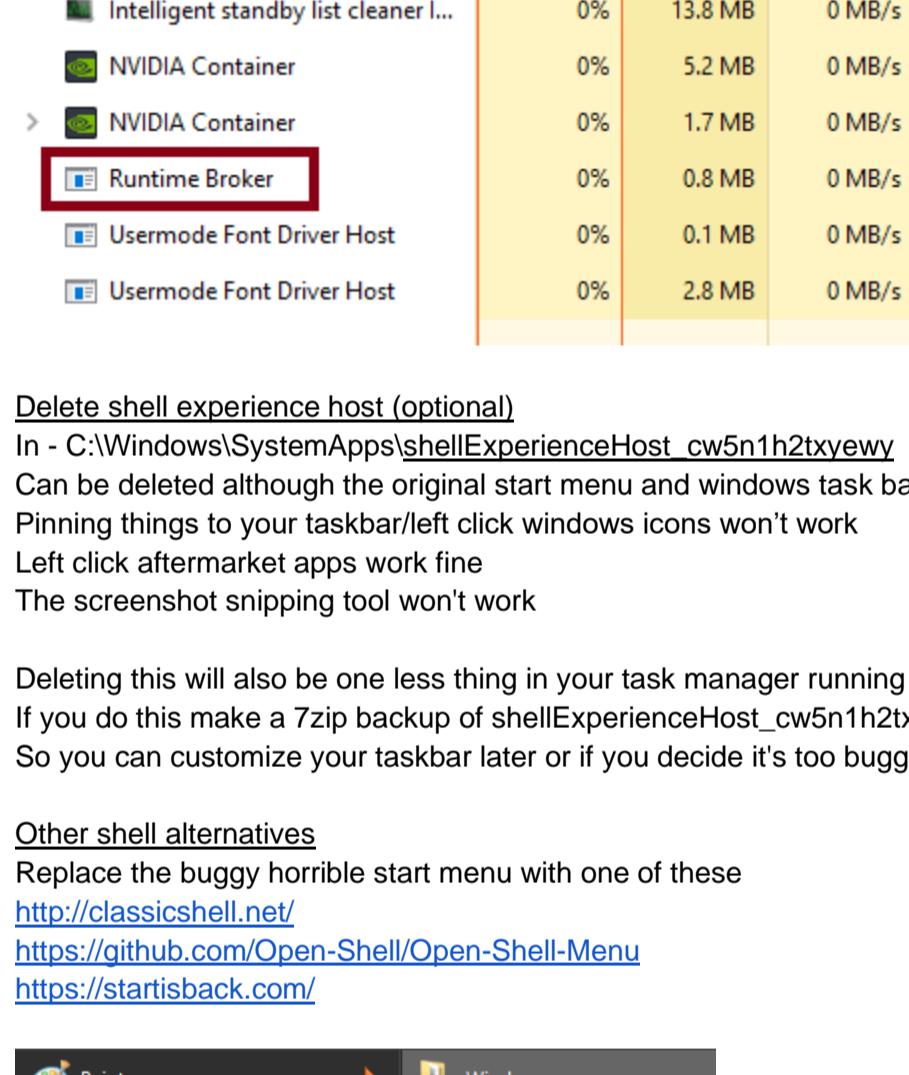
C:\Program Files\WindowsApps

Delete all folders **apart from shellExperienceHost_cw5n1h2txyewy**
In - C:\Windows\SystemApps

DON'T DELETE ExperienceHost_cw5n1h2txyewy

(If you want your start menu and taskbar to work)

Empty recycle bin



Restart

Right click and take ownership of this folder

C:\Windows\SystemApps\

Right click and take ownership of this folder

C:\Windows\SystemApps\shellExperienceHost_cw5n1h2txyewy

The above ownership is needed if you want your start menu and task bar to work properly

This process is tedious but works

Restart

Check if your start menu works

If not take ownership again as above

Start menu bug

If you are still using the default start menu and it comes up with empty boxes or available apps

Even though you have already uninstalled and unpinned them

Uninstall and unpinn them again

Check your start menu settings again in windows settings

Take ownership and delete defaultLayouts.xml files in
C:\Users\Default\AppData\Local\Microsoft\Windows\Shell
C:\Users\USER\AppData\Local\Microsoft\Windows\Shell

Delete RuntimeBroker.exe in system32

RuntimeBroker.exe - Runtime Broker

If you do this make a 7zip backup of RuntimeBroker.exe in the same location

This is needed for any Universal Windows Platform's (UWP's)

If you don't use any UWP's, it's safe to remove

Intelligent standby list cleaner l...	0%	13.8 MB	0 MB/s	0 Mbps	0%
NVIDIA Container	0%	5.2 MB	0 MB/s	0 Mbps	0%
NVIDIA Container	0%	1.7 MB	0 MB/s	0 Mbps	0%
Runtime Broker	0%	0.8 MB	0 MB/s	0 Mbps	0%
Usermode Font Driver Host	0%	0.1 MB	0 MB/s	0 Mbps	0%
Usermode Font Driver Host	0%	2.8 MB	0 MB/s	0 Mbps	0%

Delete shell experience host (optional)

In - C:\Windows\SystemApps\shellExperienceHost_cw5n1h2txyewy

Can be deleted although the original start menu and windows task bar will not work properly

Pinning things to your taskbar/left click windows icons won't work

Left click aftermarket apps work fine

The screenshot snipping tool won't work

Deleting this will also be one less thing in your task manager running

If you do this make a 7zip backup of shellExperienceHost_cw5n1h2txyewy in the same location

So you can customize your taskbar later or if you decide it's too buggy for you

Other shell alternatives

Replace the buggy horrible start menu with one of these

<http://classicshell.net/>

<https://github.com/Open-Shell/Open-Shell-Menu>

<https://startisback.com/>

When you install a new program

Shortcuts are put in these below folders

C:\Users\USER\AppData\Roaming\Microsoft\Windows\Start Menu\Programs

C:\ProgramData\Microsoft\Windows\Start Menu\Programs

Feel free to delete them if you wish (**don't delete the folder list shown below**)

Do not delete below folders

Maintenance

Startup

Windows Accessories

Windows Administrative Tools

Windows Ease of Access

Windows System

Settings.ink

If they are deleted control panel shortcuts will not work

C:\Windows\SysWOW64

Take ownership and delete files

flashPlayerCPLApp.cpl

flashPlayerApp.exe

Take ownership and delete folders

C:\Windows\System32\Macromed\

C:\Windows\SysWOW64\Macromed\

%appdata%\Adobe\

C:\Windows

Take ownership and delete file

helpPane.exe

C:\Windows\System32

Take ownership and delete files

backgroundTaskHost.exe

gamebarpresencewriter.exe

gamepanel.exe

magnify.exe

mblctr.exe

mbsync.exe

narrator.exe

osk.exe

smartscreen.exe

WSClient.dll

WSCollect.exe

Control Panel\Programs\Programs and Features

Uninstall onedrive

Uninstall mozilla maintenance service

Uninstall programs not needed

Install net framework 3.5 offline

You might need this for some programs and games

If you install it online it either won't work or will come with bloatware

Insert your windows 10 bootable usb

Run CMD as admin

Enter

Dism /online /enable-feature /featurename:NetFx3 /All /Source:D:\sources\sxs /LimitAccess

D = Hard drive label, change if needed

```
-> C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.17763.107]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\FR33THY>Dism /online /enable-feature /featurename:NetFx3 /All /Source:D:\sources\sxs /LimitAccess=
```

Control Panel\Programs\Programs and Features

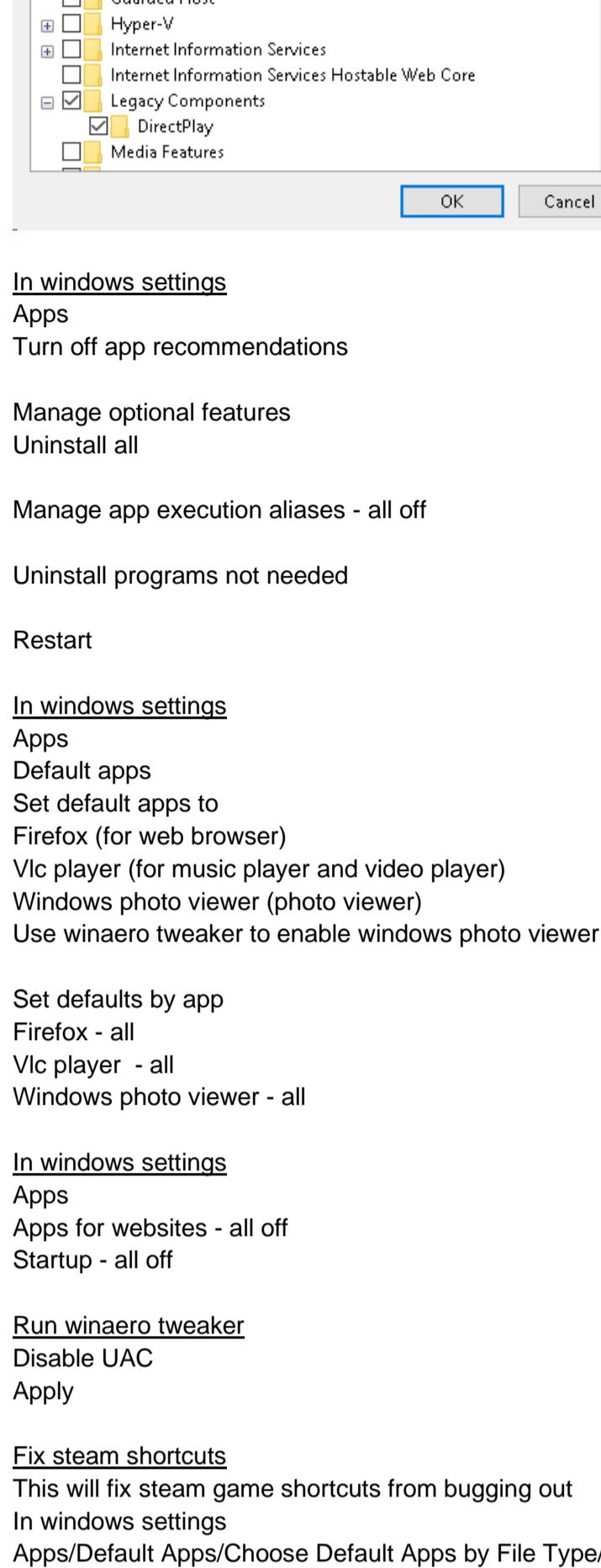
Turn windows features on or off

Turn all off apart from

3.5 (You might need this for some programs and games)

4.7 (You might need this for some programs and games)

Legacy components - direct play (this is for old games to work)



In windows settings

Apps

Turn off app recommendations

Manage optional features

Uninstall all

Manage app execution aliases - all off

Uninstall programs not needed

Restart

In windows settings

Apps

Default apps

Set default apps to

Firefox (for web browser)

Vlc player (for music player and video player)

Windows photo viewer (photo viewer)

Use winaero tweaker to enable windows photo viewer

Set defaults by app

Firefox - all

Vlc player - all

Windows photo viewer - all

In windows settings

Apps

Apps for websites - all off

Startup - all off

Run winaero tweaker

Disable UAC

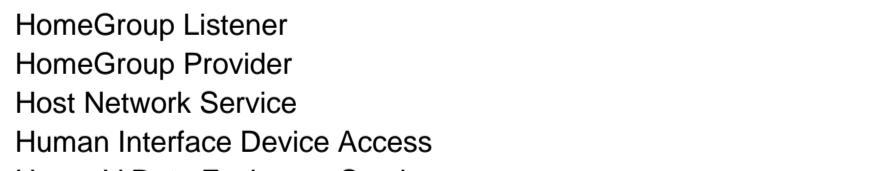
Apply

Fix steam shortcuts

This will fix steam game shortcuts from bugging out

In windows settings

Apps/Default Apps/Choose Default Apps by File Type/URL > Internet Browser



Restart

DISABLE SERVICES

Black vipers services guide

Viper is worth mentioning here, although I've taken some more aggressive measures

<http://blackviper.com/windows-services/>

<http://blackviper.com/service-configurations/black-vipers-windows-10-service-configurations/>

Windows security

App & browser control

Check apps and files - off

Get the services disable enable batch file in my google drive

Big thanks to Dev0x0 for making this script

This will save a lot of time, has been fully tested and includes a revert script if needed

<https://drive.google.com/open?id=1PwUZawyG-QAoejlpA2PUT8JaHhs3dEK>

Get Nsudo

<http://www.majorgeeks.com/files/details/nsudo.html>

In nsudo with

TrustedInstaller

Enable all privileges - on

Run Services Disable.bat

Restart

THIS LIST/SCRIPT WILL WORK WITH 1709/1803/1809/1903

Services that get disabled

AllJoyn Router Service

App Readiness

AppX Deployment Service (AppXSVC)

Application Layer Gateway Service

Application Management

AssignedAccessManager Service

Auto Time Zone Updater

Background Intelligent Transfer Service

BitLocker Drive Encryption Service

Block Level Backup Engine Service

Bluetooth Audio Gateway Service

Bluetooth Handsfree Service

Bluetooth Support Service

Bluetooth User Support Service_XXXXXX

BranchCache

CNG Key Isolation

CaptureService_XXXXXX

Certificate Propagation

Client License Service (ClipSVC)

Connected Devices Platform Service

Connected Devices Platform User Service_XXXXXX

Connected User Experiences and Telemetry

ConsentUX_XXXXXX

Contact Data_XXXXXX

Credential Manager

Data Usage

Delivery Optimization

DevicePicker_XXXXXX

DevicesFlow_XXXXXX

Diagnostic Execution Service

Diagnostic Policy Service

Diagnostic Service Host

Diagnostic System Host

Display Enhancement Service

Distributed Link Tracking Client

Distributed Transaction Coordinator

dmwappushsvc

Downloaded Maps Manager

Encrypting File System (EFS)

Enterprise App Management Service

File History Service

Function Discovery Provider Host

Function Discovery Resource Publication

GameDVR and Broadcast User Service_XXXXXX

Geolocation Service

GraphicsPerfSvc

HV Host Service

HomeGroup Listener

HomeGroup Provider

Host Network Service

Human Interface Device Access

Hyper-V Data Exchange Service

Hyper-V Guest Service Interface

Hyper-V Guest Shutdown Service

Hyper-V Heartbeat Service

Hyper-V PowerShell Direct Service

Hyper-V Remote Desktop Virtualization Service

Hyper-V Time Synchronization Service

Hyper-V Volume Shadow Copy Requestor

IP Helper

IP Translation Configuration Service

IPsec Policy Agent

Infrared monitor service

Internet Connection Sharing (ICS)

Internet Explorer ETW Collector Service

Link-Layer Topology Discovery Mapper

MessagingService_XXXXXX

Microsoft (R) Diagnostics Hub Standard Collector Service

Microsoft Account Sign-in Assistant

Microsoft App-V Client

Microsoft Passport

Microsoft Passport Container

Microsoft Software Shadow Copy Provider

Microsoft Storage Spaces SMP

Microsoft Store Install Service

Microsoft Windows SMS Router Service

Microsoft iSCSI Initiator Service

Natural Authentication

Net.Tcp Port Sharing Service

Netlogon

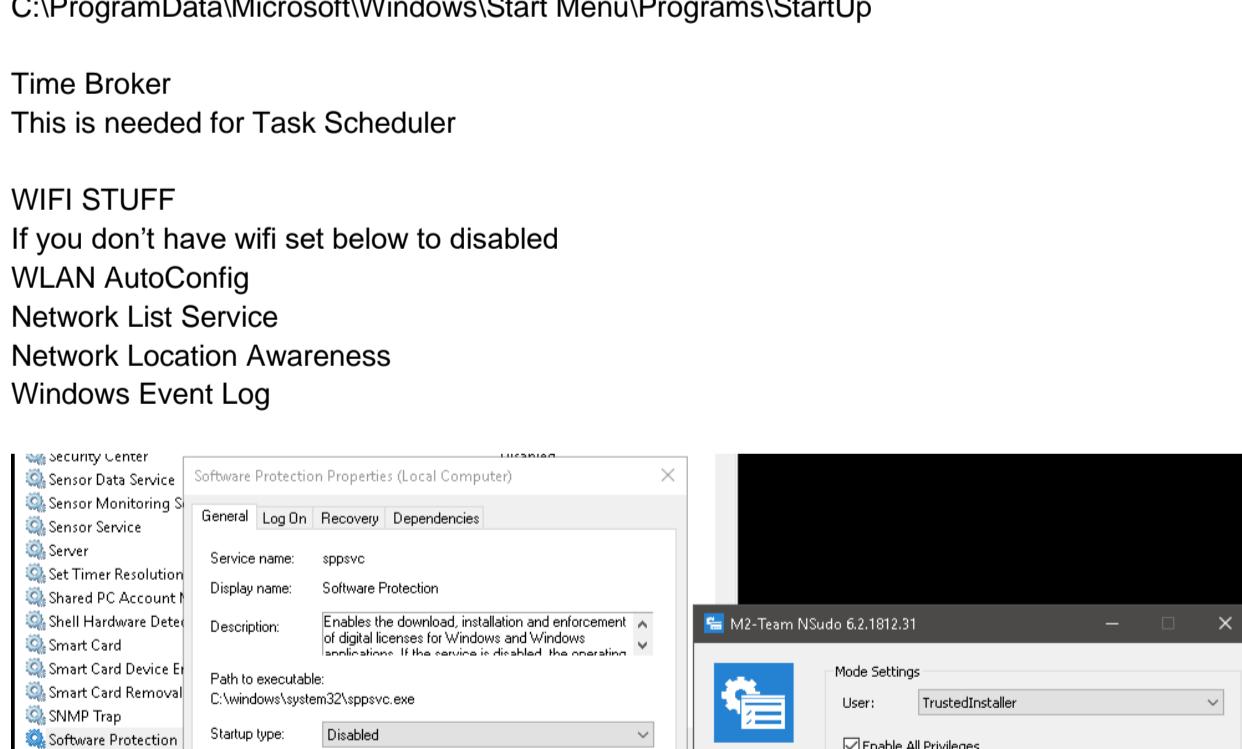
Network Connected Devices Auto-Setup

Network Connection Broker

Network Connectivity Assistant

Offline Files

Optimise drives
Parental Controls
Payments and NFC/SE Manager
Peer Name Resolution Protocol
Peer Networking Grouping
Peer Networking Identity Manager
Performance Logs & Alerts
Phone Service
Portable Device Enumerator Service
Print Spooler
PrintWorkflow_XXXXX
Printer Extensions and Notifications
Program Compatibility Assistant Service
Quality Windows Audio Video Experience
Radio Management Service
Remote Access Auto Connection Manager
Remote Access Connection Manager
Remote Desktop Configuration
Remote Desktop Services
Remote Desktop Services UserMode Port Redirector
Remote Procedure Call (RPC) Locator
Remote Registry
Retail Demo Service
Routing and Remote Access
SNMP Trap
Secondary Log-on
Security Accounts Manager
Security Center
Sensor Data Service
Sensor Monitoring Service
Sensor Service
Server
Shared PC Account Manager
Shell Hardware Detection
Smart Card
Smart Card Device Enumeration Service
Smart Card Removal Policy
Spatial Data Service
Storage Service
Storage Tiers Management
Sync Host_XXXXX
Sysmain
System Guard Runtime Monitor Broker
TCP/IP NetBIOS Helper
Telephony
Themes
Tile Data model server
Touch Keyboard and Handwriting Panel Service
Update Orchestrator Service
User Data Access_XXXXX
User Data Storage_XXXXX
User Experience Virtualization Service
Volume Shadow Copy
WMI Performance Adapter
WWAN AutoConfig
WalletService
Web Account Manager
WebClient
Wi-Fi Direct Services Connection Manager Service
Windows Backup
Windows Biometric Service
Windows Camera Frame Server
Windows Connect Now – Config Registrar
Windows Defender Advanced Threat Protection Service
Windows Defender Antivirus Network Inspection Service
Windows Defender Antivirus Service
Windows Defender Security Center Service
Windows Encryption Provider Host Service
Windows Error Reporting Service
Windows Event Collector
Windows Font Cache Service
Windows Image Acquisition (WIA)
Windows Insider Service
Windows License Manager Service
Windows Media Player Network Sharing Service
Windows Mobile Hotspot Service
Windows Perception Service
Windows Perception Simulation Service
Windows Presentation Foundation Font Cache 3.0.0.0
Windows Push Notifications System Service
Windows Push Notifications User Service_XXXXX
Windows Remote Management (WS-Management)
Windows Search
Windows Security Service
Windows Time
Windows Update
Windows Update Medic Service
Workstation
Xbox Accessory Management Service
Xbox Game Monitoring
Xbox Live Auth Manager
Xbox Live Game Save
Xbox Live Networking Service



Extra services that can be disabled
Run services.msc through nsudo for permissions

-Capability Access Manager Service
-Human Interface Device Service
-Network List Service
-Network Location Awareness
-Software Protection
-Task Scheduler
-Time Broker

-WLAN AutoConfig
-Windows Event Log

Capability Access Manager Service
This can be disabled in 1709
It will stop your microphone working in 1809

Human Interface Device Service
This service runs things like volume up/down buttons on the keyboard and hotkeys
You might want to leave it enabled for a laptop

Software protection
If you get the activate windows logo you will need to run this then disable it again
Software protection is needed for office 365

Sounds stupid, although legitimately the activate overlay causes buffering and lag issues
Even without the overlay but windows not activated, I've had issues with latency and polling
Keep software protection service on

Task Scheduler
It will stop all scheduled tasks from running completely
If disabled you will need to use these folders below if you want programs to run on startup
C:\Users\USER\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup
Or
C:\ProgramData\Microsoft\Windows\Start Menu\Programs\StartUp

Time Broker
This is needed for Task Scheduler

WIFI STUFF
If you don't have wifi set below to disabled

WLAN AutoConfig

Network List Service

Network Location Awareness

Windows Event Log

Security Center
Sensor Data Service
Sensor Monitoring Service
Sensor Service
Service
Set Timer Resolution
Shared PC Account
Shell Hardware Detection
Smart Card
Smart Card Device Enumeration Service
Smart Card Removal Policy
SNMP Trap
Software Protection
Spatial Data Service
SpotVerifier
SSDP Discovery
Steam Client Service
Still Image Acquisitio
Storage Service
Storage Tier Manag
Sync Host_25c23
SyMain
System Event Notific
System Events Broke

In windows settings

System

Notifications & actions

Turn all off

Set Split Threshold for Svchost

This will make viewing services in task manager much easier
HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Control
SvcHostSplitThresholdInKB=VALUEHERE

Enter VALUEHERE depending on your ram below

RAM Value

Default - 380000

4 GB - 4194304

6 GB - 6291456

8 GB - 8388608

12 GB - 12582912

16 GB - 16777216

24 GB - 25165824

32 GB - 33554432

64 GB - 67108864

Restart

SHARDCORE SERVICES LIST

Want more, don't care if things might break?

You have come to the right place

This is not for everyone, you have been warned!

This works in 1709, what might work for me might not for you

Legacy services that cause latency issues

In regedit (run with nsudo)

Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services

Start=4

bam
Beep
CSC - disabled causes issues with wifi icon
cdrom - breaks iso creating programs

CldFlt
GpuEnergyDrv
i8042prt - if not using ps2 keyboard

Lltdio

Iuafv

Modem

MsLldp

NdisVirtualBus

ndu

NetBIOS

NetBT

Psched - can cause internet connection issues for some network cards

QWAVEdrv

RasAcD

RasAgileVpn

RasPppoe

RasSstp

Rasl2tp

rspnldr

sermouse - if not using ps2 mouse

stornvme - if not using nvme/m.2 drives

TPM

Tcpip6 - if not using ipv6

tcpipreg

tunnel

vmgid

Vwififlt - disabled causes issues with wifi icon

Wanarpv6 - if not using ipv6

Wdboot

WdFilter - needs nsudo

WdNisDrv

Wdnsfltr

Wof

fvevol.sys - bitlocker drive encryption - see method above

superfetch.sys - rdyboost.sys - stripped with ntltile

tdx.sys - remove dependencies below before disabling

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\DHcp

-remove "tdx" from DependOnService

Registry Editor			
File Edit View Favorites Help			
Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Beep			
> bam	Name	Type	Data
> BasicDisplay	(Default)	REG_SZ	(value not set)
> BasicRender	DisplayName	REG_SZ	Beep
> BattC	ErrorControl	REG_DWORD	0x00000000 (0)
> BcastDVRUserService	Group	REG_SZ	Base
> bcmfn2	Start	REG_DWORD	0x00000004 (4)
> BDESVC	Tag	REG_DWORD	0x00000002 (2)
> Beep	Type	REG_DWORD	0x00000001 (1)

Bare services list everything else disabled

Automatic

Background Tasks Infrastructure Service

CoreMessaging

Cryptographic Services

DCOM Server Process Launcher

DHCP Client

Local Session Manager

Network Store Interface Service

NVIDIA Display Container LS

Power

Remote Procedure Call (RPC)

RPC Endpoint Mapper

User Profile Service

Windows Audio

Windows Audio Endpoint Builder

Windows Connection Manager

Windows Management Instrumentation

Software Protection

Group Policy Client

System Events Broker

User Manager

ActiveX Installer (AxInstSV)

Manual

Device Install Service

Embedded Mode

Local Profile Assistant Service

Network Setup Service

Device Management Enrollment Service

Network Connections

Performance Counter DLL Host

State Repository Service

Virtual Disk

Windows Installer

Windows Modules Installer

Disabled task scheduler?

If you choose to disable task scheduler

Use this folder below for programs to run on start, place your shortcuts in it.

C:\Users\USER\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup

File Explorer			
C:\Users\FR33THY\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup			
Organize	Include selected folder in library	New folder	
This PC	Name	Date modified	Type
Desktop	Intelligent Standby List Cleaner	16-Jun-19 9:07 PM	Shortcut
Documents	MSI Afterburner	15-Jun-19 9:01 PM	Shortcut
Downloads			2 KB

WIFI not working after this hardcore list

Network List Service - manual

Network Location Awareness - manual

WLAN AutoConfig - automatic

Windows Connection Manager - manual

Windows Event Log - manual

Can't connect to a new WIFI spot

Windows settings menu bugging out because of a disabled service?

I've got you covered...

Windows Settings			
Wi-Fi			
Find a setting	Wi-Fi	Connected, secured	
Network & Internet	PARA@33	Show available networks	
Status	Hardware properties		
Wi-Fi	Manage known networks		
Ethernet	Random hardware addresses		

Windows Error			
Microsoft Visual C++ Runtime Library			
×	IGNORE THIS		
Program:	C:\Windows\ImmersiveControlPanel\SystemSettings.exe		

This application has requested the Runtime to terminate it in an unusual way.
Please contact the application's support team for more information.

OK

Windows Settings			
Add a new network			
Network name	xxxx	Startup Type	
Security type	WPA2-Personal AES	Connect automatically	
Security key	xxxx	Connect even if this network is not broadcasting	
	Save	Cancel	

Windows Settings			
Wi-Fi			
Find a setting	Wi-Fi	Connected, secured	
Network & Internet	PARA@33	Show available networks	
Status	Hardware properties		
Wi-Fi	Manage known networks		
Ethernet	Random hardware addresses		

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Windows Settings			
Wi-Fi			
Find a setting	Wi-Fi	Connected, secured	
Network & Internet	PARA@33	Show available networks	
Status	Hardware properties		
Wi-Fi	Manage known networks		
Ethernet	Random hardware addresses		

Windows Settings			

<tbl_r cells="1" ix="2"

A useful driver and services tool serviwins

<https://www.nirsoft.net/utils/serviwins.html>

Use the view tab to switch between drivers and services

You can group select and disable drivers/services with this tool

ADVANCED USERS ONLY

Name	Display Name	Status	Startup Type	ErrorControl	Group	Dependencies	File Di
Flpydisk	Floppy Disk Driver	Started	Manual	Normal	Primary disk		Flopp
FltMgr	FltMgr	Started	Boot	Ignore	FSFilter Infrastru...		Micro
Ftdisk	Volume Manager Driver	Started	Boot	Normal	System Bus Extende...		FT Dis
Genuwa	Genuwa	Started	Boot	Normal	AWDrivers		
Gpc	Generic Packet Classifier	Started	Manual	Normal	PNP_TDI		MS Ge
i8042prt	i8042 Keyboard and PS/2 ...	Started	System	Normal	Keyboard Port		i8042
ichaud	Service for AC'97 Driver (...)	Stopped	Manual	Normal			Integ
in910u	in910u	Stopped	Disabled	Normal	SCSI miniport		
IntelIde	IntelIde	Stopped	Disabled	Normal	System Bus Extende...		
IpFilterDriver	IP Traffic Filter Driver	Stopped	Manual	Normal		Tcpip	IP FIL
IpInIp	IP in IP Tunnel Driver	Stopped	Manual	Normal		Tcpip	IP in I
IpNat	IP Network Address Tran...	Started	Manual	Normal		Tcpip	IP Nel

173 item(s), 1 Selected

SHORTCUTS

https://drive.google.com/open?id=1wIQPTph3jrBWAofOLKwmXHc2D4U_-fl-hw

Desktop icons

In windows settings

Personalization

Themes (themes menu will be broken)

To change desktop icons use the shortcut below

C:\Windows\System32\rundll32.exe shell32.dll,Control_RunDLL desk.cpl,,0

Shutdown shortcut

%windir%\System32\shutdown.exe /s /t 0

Restart shortcut

C:\Windows\System32\shutdown.exe /r /t 0

Control panel

control

Windows settings

ms-settings:

Explorer

explorer.exe

Device manager

devmgmt.msc

Disk cleanup

cleanmgr.exe

Temp folder 1

temp

Temp folder 2

%temp%

DRIVERS & CHIPSETS

Try to run and install the least amount of drivers and programs as possible.

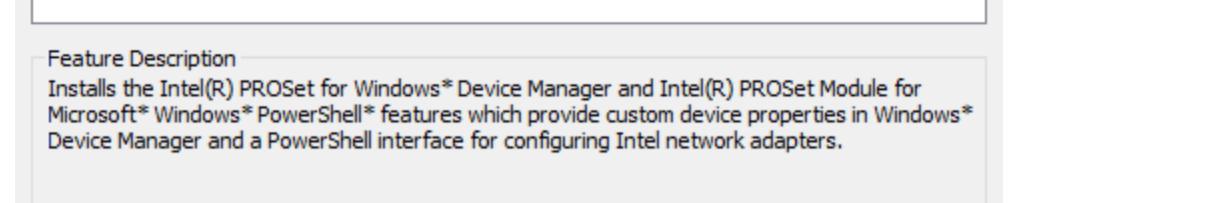
Some driver versions can cause large latency issues, if so try different ones.

Most bare windows drivers are fine and best for latency, see latency monitor below.

Following these steps will ensure that you don't get bloatware with drivers.

You do not need all the bloatware/trash that comes with your product drivers from a cd, the motherboard/device vendor website or in some cases the driver install exe itself.

Also disable any motherboard update download feature.



Chipsets

Chipset drivers are a meme, they do not need to be installed.

You will end up disabling them in device manager anyway, installing chipset drivers has caused higher latency for myself and others.

See what Fernando from win-raid forums has to say about them

<https://www.win-raid.com/t895f42-Intel-Chipset-Device-quot-Drivers-quot-INF-files.html>

Consider AHCI/USB drivers from win-raid

Try these out if the bare windows ones are not working for you

<https://www.win-raid.com/t834f25-USB-Drivers-original-and-modded.html>

<https://www.win-raid.com/t11f23-Modded-Intel-AHCI-and-RAID-Drivers-digitally-signed.html>

USEFUL DRIVER INSTALLER TOOLS

These are great and the drivers do not come with bloatware. Although I recommend skipping these unless needed and getting only the essential drivers from the vendor.

Snappy driver installer

<https://sdi-tool.org/>

Snappy driver installer origin

<https://www.snappy-driver-installer.org/>

Download and install the lite edition

When you open it, download the INDEXES only

DO NOT install Intel(R) Management Engine Interface

DO NOT install chipset drivers

Touchpad driver

If you are on a laptop and wish to disable the touchpad with the keyboard shortcut or software, install the touchpad driver through snappy.

Internet drivers

Install internet drivers from your actual vendor website (intel, realtek, killer etc)

Don't install from the motherboard vendor website these are outdated

Do not install the included programs and bloatware just get the bare driver

(Uncheck the other options in the installer apart from the driver)

Intel(R) Network Connections Install Wizard

Msi mode

This is covered in the LATENCY section below, although needs a mention here.

Msi mode can help prevent IRQ sharing and devices in msi mode will generally run better.

Some drivers will install things into msi mode for you which is a good thing!

As an example in the photo below, the bare windows AHCI driver for my hard drives was not in msi mode. Setting the bare windows AHCI driver in msi mode caused a blue screen.

Installing the AHCI driver with snappy driver installer put the driver into msi mode for me.

WARNING: there is a chance of a bluescreen setting something in msi mode if it's not supported. Sometimes the driver install will do this for you. If the windows driver is not msi mode supported and you put it in msi mode you will bluescreen. It's trial and error. Make a backup before playing with this please.



GRAPHICS TWEAKS

Get display driver uninstaller

<https://guru3d.com/files-details/display-driver-uninstaller-download.html>

Reboot in safe mode

Win key + r

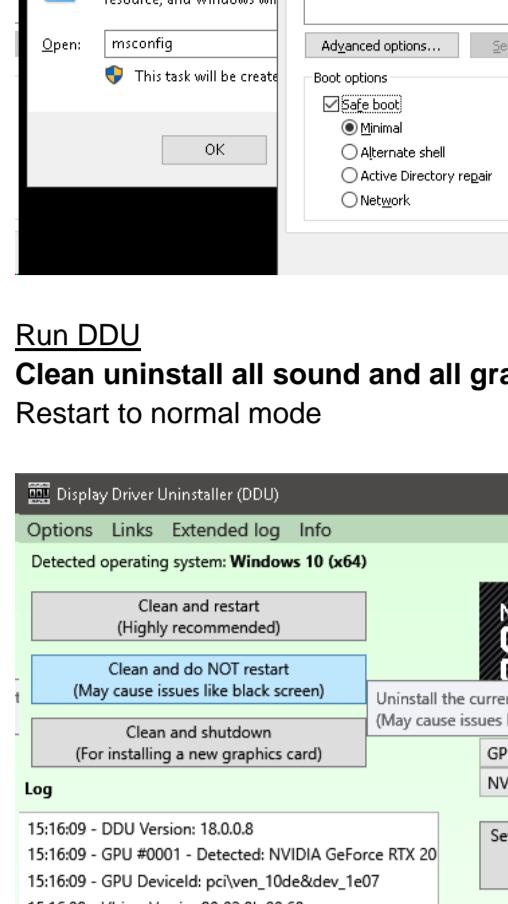
Msconfig

Boot tab

Select safe boot

Apply

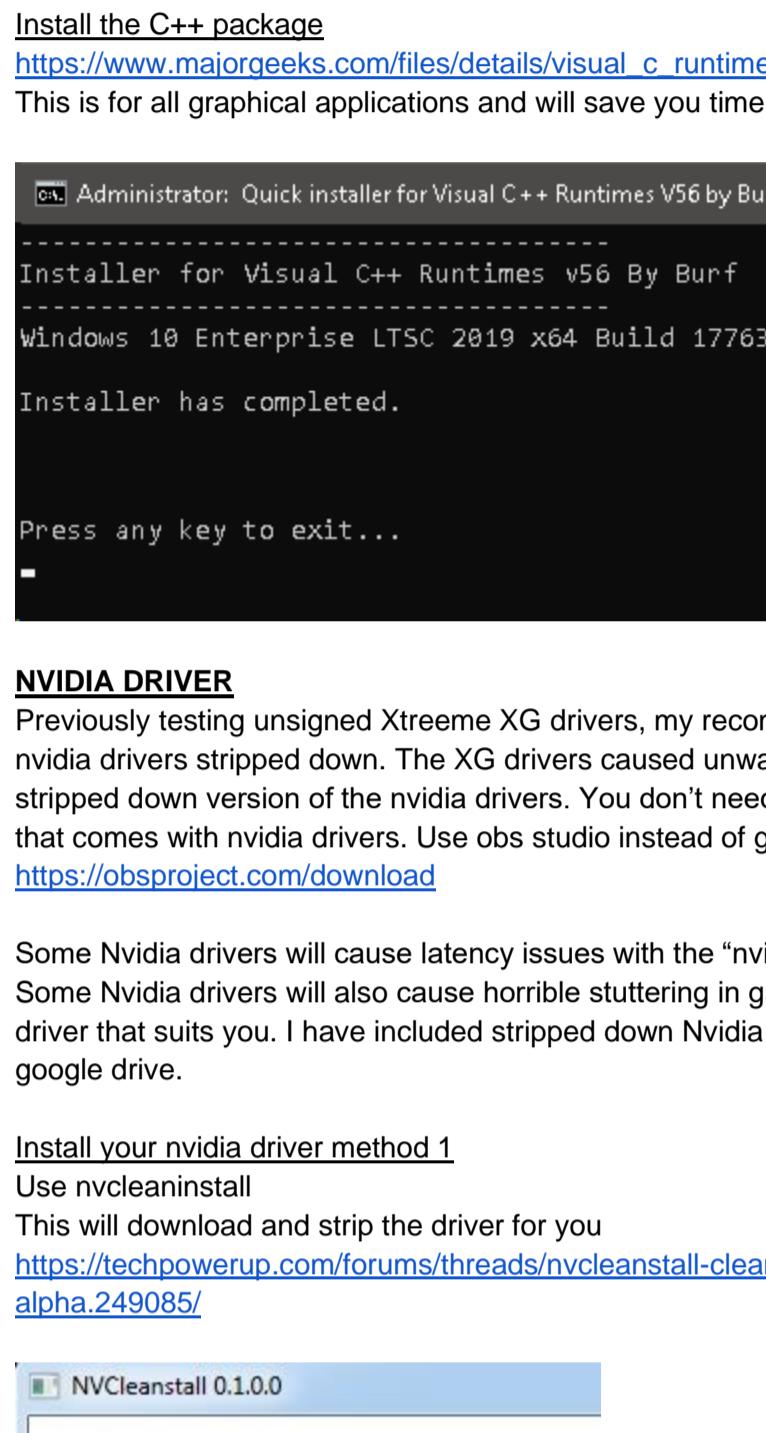
Restart



Run DDU

Clean uninstall all sound and all graphics drivers

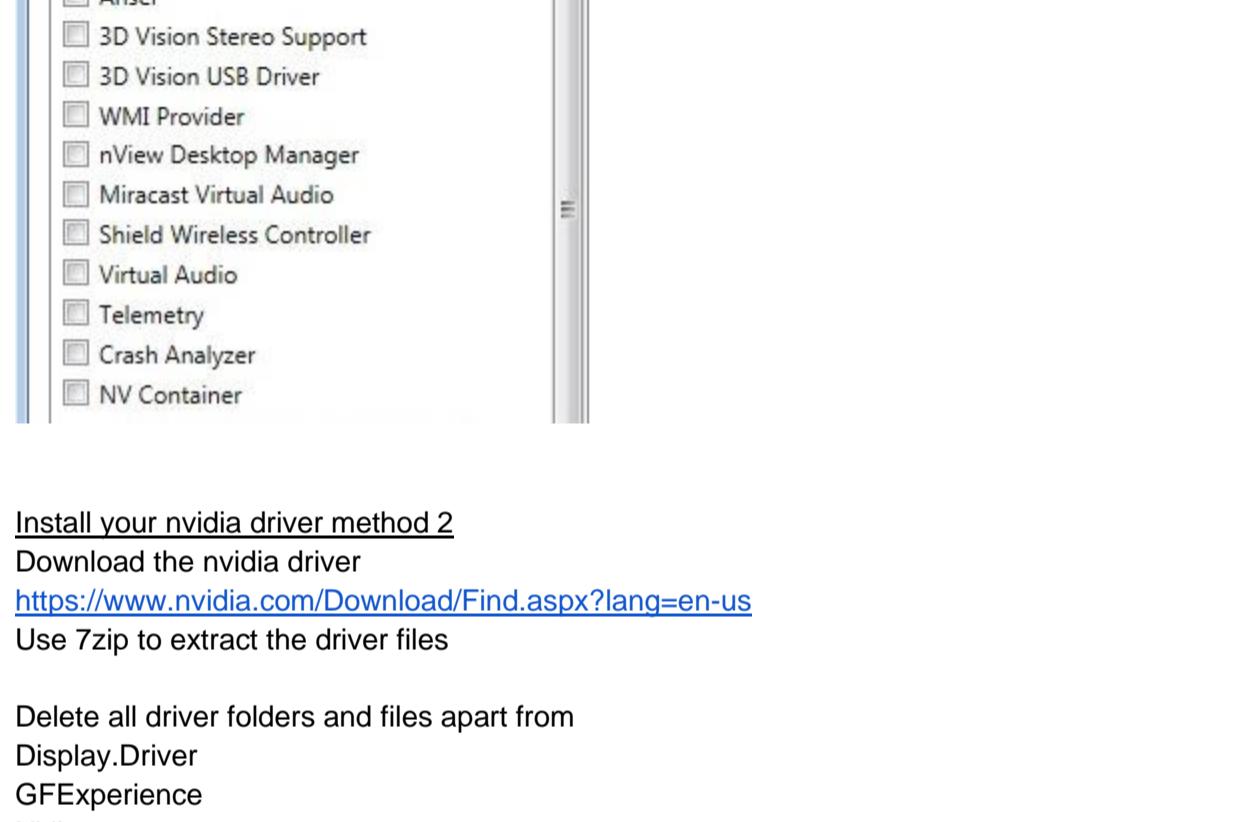
Restart to normal mode



Install the C++ package

https://www.majorgeeks.com/files/details/visual_c_runtime_installer.html

This is for all graphical applications and will save you time and headache later



NVIDIA DRIVER

Previously testing unsigned Xtreeme XG drivers, my recommendation goes to installing normal nvidia drivers stripped down. The XG drivers caused unwanted latency. Be sure to install a stripped down version of the nvidia drivers. You don't need the unwanted telemetry or bloatware that comes with nvidia drivers. Use obs studio instead of geforce experience for recording.

<https://obsproject.com/download>

Some Nvidia drivers will cause latency issues with the "nvidia driver" and "direct x driver".

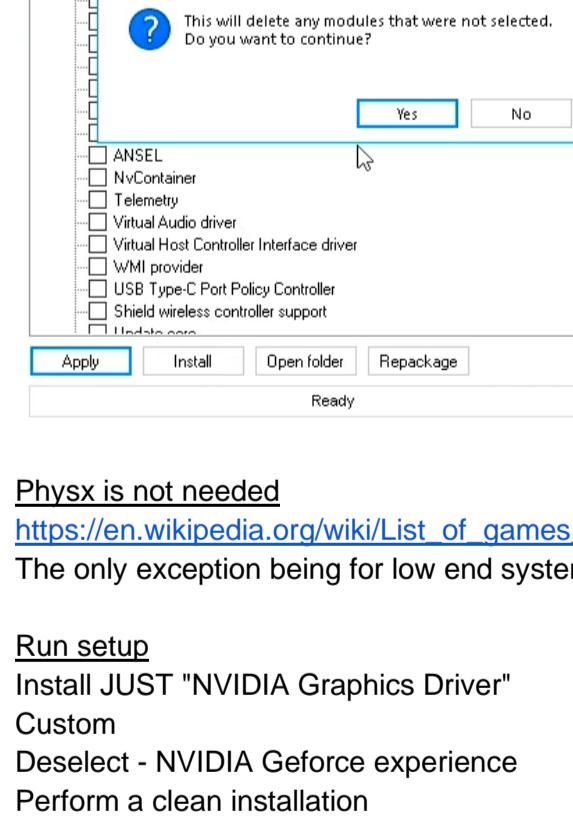
Some Nvidia drivers will also cause horrible stuttering in games. It's a matter of finding the best driver that suits you. I have included stripped down Nvidia drivers for w7, w8.1 and w10 in my google drive.

Install your nvidia driver method 1

Use nvcleaninstall

This will download and strip the driver for you

<https://techpowerup.com/forums/threads/nvcleaninstall-clean-installer-for-nvidia-drivers-alpha.249085/>



Install your nvidia driver method 2

Download the nvidia driver

<https://www.nvidia.com/Download/Find.aspx?lang=en-us>

Use 7zip to extract the driver files

Delete all driver folders and files apart from

Display.Driver

GFEExperience

NVI2

EULA.txt

license.txt

ListDevices.txt

setup.cfg

Setup.exe

(It's all done for you in the "18 Nvidia Drivers 430.86 Desktop WIN10 x64.7z" archive)
<https://drive.google.com/open?id=12-EIF6UGiYwNa6JEq4EA5bwRrYbQMTq>



Physx is not needed

https://en.wikipedia.org/wiki/List_of_games_with_hardware-accelerated_PhysX_support

The only exception being for low end systems that play the few games supporting physx

Run setup

Install JUST "NVIDIA Graphics Driver"

Custom

Deselect - NVIDIA Geforce experience

Perform a clean installation

Disable device manager functions

High Definition Audio Controller

PCI Device (if 2000 series)

NVIDIA USB 3.10 eXtensible Host Controller - 1.10 (if 2000 series)

Generic PnP Monitor (yes this can be disabled)

Block nvidia in firewall

Block Bat

https://drive.google.com/open?id=1wIQPTph3jBWafOLKwmXHc2D4U_-fHW

Use block.bat to block nvidia communicating with the internet through windows firewall

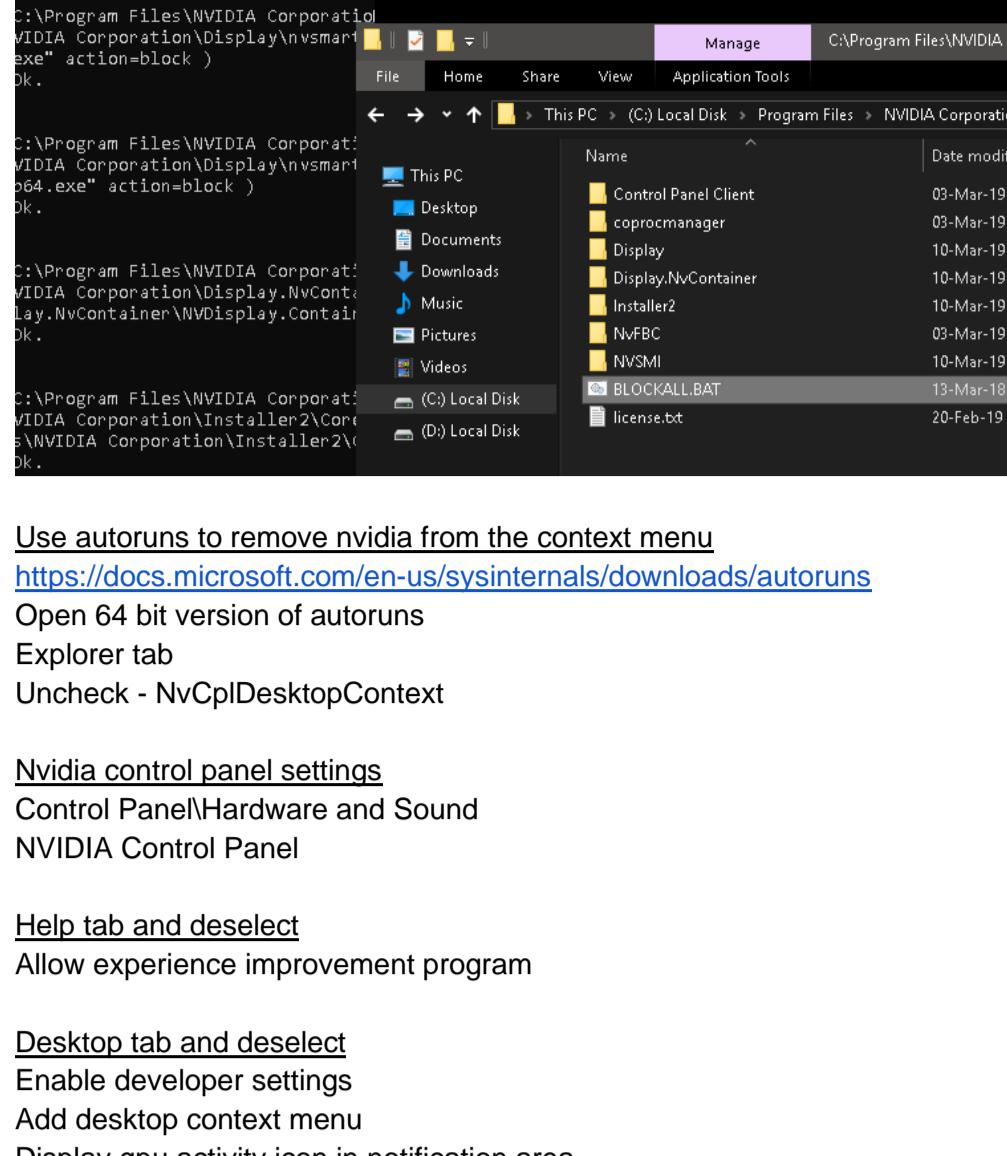
When block.bat is run in a folder, it will block all files in the folder through windows firewall

Run block.bat in the folders below

C:\Program Files\NVIDIA Corporation

C:\Program Files (x86)\NVIDIA Corporation

C:\Windows\System32\DriverStore\FileRepository\nv_dispi.inf_amd64_XXXXXXXXXXXXXX
(You will need permission to access/edit this folder, be sure to set permissions back to the original owner when you are done)



Use autoruns to remove nvidia from the context menu

<https://docs.microsoft.com/en-us/sysinternals/downloads/autoruns>

Open 64 bit version of autoruns

Explorer tab

Uncheck - NvCplDesktopContext

Nvidia control panel settings

Control Panel\Hardware and Sound

NVIDIA Control Panel

Help tab and deselect

Allow experience improvement program

Desktop tab and deselect

Enable developer settings

Add desktop context menu

Display gpu activity icon in notification area

Adjust video image settings

Edge Enhancement - use the nvidia setting 0

Noise reduction - use the nvidia setting 0

Deinterlacing - off

Adjust video colour settings

With the nvidia settings

Advanced

Full 0-255

Set up multiple displays

Only run one screen while competitive gaming

Unplug all other screens

TURN GSYNC OFF

TURN FREESYNC OFF

TURN ADAPTIVESYNC OFF

(These debatably create input lag)

Adjust desktop size and position

No scaling

Perform scaling on - display

Override the scaling mode set by games and programs - off

Set native resolution

Set max refresh rate

Size

Enable desktop resizing - off

Set up digital audio

Disable

Rotate display

Landscape

Adjust desktop color settings

Use the nvidia setting

Digital vibrance 100%

100% for some FPS games to help see other players

100% may be to high for some games and movies

Change resolution

Set native resolution at max refresh rate

Manage GPU performance counters

Allow access to the GPU performance counters to all users

Use NVIDIA color settings

Desktop colour depth - max

Output colour depth - max

Output colour format - rgb

Output dynamic range - full

Configure surround physx

Physx settings

Processor - gpu

Max performance competitive 3d settings

Manage 3D settings

Set "Global Settings"

Ambient Occlusion - OFF

Anisotropic Filtering - OFF

Antialiasing FXAA - OFF

Antialiasing Gamma Correction - OFF

Antialiasing Mode - OFF

Antialiasing Setting - OFF

Antialiasing Transparency - OFF

CUDA GPUs - ALL

DSR Factors - OFF

DSR Smoothness - OFF

Maximum pre rendered frames - 1

Multi-frame sampled AA (MFAA) - OFF

OpenGL rendering GPU - TO GRAPHICS CARD

Optimise For Compute Performance - OFF

Multi-display/mixed-GPU acceleration - SINGLE DISPLAY PERFORMANCE MODE

Power management mode - PREFER MAXIMUM PERFORMANCE

Preferred refresh rate - HIGHEST AVAILABLE

Shader Cache - ON

Texture filtering Anisotropic sample optimization - ON

Texture filtering Negative LOD bias - ALLOW

Texture filtering Quality - HIGH PERFORMANCE

Texture filtering Trilinear optimization - ON

Threaded buffering - OFF

Triple optimization - OFF

Vertical sync - OFF

Virtual Reality pre-rendered frames - 1

2. Apply the following settings:

Scaling | Size

Select a scaling mode:



Aspect ratio



Full-screen



No scaling

Perform scaling on:



Override the scaling mode set by games and programs

Preview

Resolution:

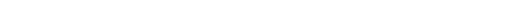
1920 x 1080 (current)

Refresh rate:

240Hz

Native resolution:

1920 x 1080



2. Choose how color is set.

Other applications control color settings

Use NVIDIA settings

Color channel:

All channels

Brightness:

- 50% + 50%

Contrast:

- 50% + 50%

Gamma:

- 1.00 + 1.00

Very high and very low Brightness and Contrast values can limit the Gamma range.

3. Apply the following enhancements:

Digital vibrance:

- 100% + 100%

Hue:

- 0° + 0°

PhysX settings

Processor:

GeForce GTX 1080

Auto-select (recommended)

GeForce GTX 1080

CPU

Restart

2 - Sync and Refresh

Flip Indicator	Disabled	0x00000000
Frame Rate Limiter	Off	0x00000040
Frame Rate Limiter Mode	Limiter V2 - Force Off [Enables Limiter V1 (Less Input Lag)]	0x00000000
GSync - Application Mode	Off	0x00000000
GSync - Application Requested State	Force Off	0x00000001
GSync - Application State	Force Off	0x00000001
GSync - Global Feature	Off	0x00000000
GSync - Global Mode	Off	0x00000000
GSync - Indicator Overlay	Off	0x00000000
Maximum pre-rendered frames	1	0x00000001
Preferred Refreshrate	Highest available	0x00000001
Triple buffering	Off	0x00000000
Vertical Sync	Force off	0x08416747
Vertical Sync Smooth AFR behavior	Off	0x00000000
Vertical Sync Tear Control	0x00000000	0x00000000

3 - Antialiasing

Antialiasing - Behavior Flags	None	0x00000000
Antialiasing - Gamma correction	Off	0x00000000
Antialiasing - Line gamma	Disabled	0x00000000
Antialiasing - Mode	Override any application setting	0x00000001
Antialiasing - Setting	Application-controlled / Off	0x00000000
Antialiasing - Transparency Multisampling	Disabled	0x00000000
Antialiasing - Transparency Supersampling	Off / Multisampling	0x00000000
Enable Maxwell sample interleaving (MFAA)	Off	0x00000000
NVIDIA Predefined FXAA Usage	Disabled	0x00000000
Toggle FXAA Indicator on or off	Off	0x00000000
Toggle FXAA on or off	Off	0x00000000

4 - Texture Filtering

Anisotropic filtering mode	User-defined / Off	0x00000001
Anisotropic filtering setting	Off [Point]	0x00000000
Prevent Anisotropic filtering	On	0x00000001
Texture filtering - Anisotropic filter optimization	Off	0x00000000
Texture filtering - Anisotropic sample optimization	On	0x00000001
Texture filtering - Driver Controlled LOD Bias	On	0x00000001
Texture filtering - LOD Bias (DX)	+0.0000	0x00000000
Texture filtering - LOD Bias (OGL)	+0.0000	0x00000000
Texture filtering - Negative LOD bias	Allow	0x00000000
Texture filtering - Quality	High performance	0x00000014
Texture filtering - Trilinear optimization	On (will be ignored if using high quality)	0x00000000

5 - Common

Ambient Occlusion setting	Off	0x00000000
Ambient Occlusion usage	Disabled	0x00000000
CUDA - Force P2 State	Off	0x00000000
Extension limit	Off	0x00000000
Multi-display/mixed-GPU acceleration	Single display performance mode	0x00000000
OpenGL - Version Override	Disabled	0x00000000
Power management mode	0x00000003 PREFERRED_PSTATE_PREFER_CONSISTENT_PERFORMANCE	0x00000003
Shadercache	On	0x00000001
Show PhysX Visual Indicator	Off	0x34534064
Threaded optimization	Off	0x00000002

Other

Ansel flags for enabled applications	0x00000000 ANSEL_WHITELISTED_DISALLOWED	0x00000000
Application Profile Notification Popup Timeout	0x00000000 APPLICATION_PROFILE_NOTIFICATION_TIMEOUT_DISABLED	0x00000000
Battery Boost	0x00000000 BATTERY_BOOST_DISABLED	0x00000000
Battery Boost Application FPS	0x00000000	0x00000000
Buffer-flipping mode	0x00000000 OGL_FORCE_BLIT_OFF	0x00000000
Deep color for 3D applications	0x00000000 OGL_DEEP_COLOR_SCANOUT_DISABLE	0x00000000
Display the VRVR Overlay Indicator	0x00000000 VROVERLAYINDICATOR_DISABLED	0x00000000
Do not display this profile in the Control Panel	0x00000000 CPL_HIDDEN_PROFILE_DISABLED	0x00000000
Enable Ansel	0x00000000 ANSEL_ENABLE_OFF	0x00000000
Enable application for Optimus	0x00000010 SHIM_RENDERING_MODE_AUTO_SELECT	0x00000010
Enable GTX950 specific features	0x00000000	0x00000000
Enable NV_guru multicast extension	0x00000000 OGL_SLI_MULTICAST_DISABLE	0x00000000
Enable overlay	0x00000000 OGL_OVERLAY_SUPPORT_OFF	0x00000000
Event Log Severity Threshold	0x00000000 OGL_EVENT_LOG_SEVERITY_THRESHOLD_DISABLE	0x00000000
Event Log Tmon Severity Threshold	0x00000000 OGL_TMON_LEVEL_DISABLE	0x00000000
Export Performance Counters	0x00000000 EXPORT_PERF_COUNTERS_DISABLE	0x00000000
Export Performance Counters for DX9 only	0x00000000 EXPORT_PERF_COUNTERS_DX9_ONLY_OFF	0x00000000
Exported Overlay pixel types	0x00000000 OGL_OVERLAY_PIXEL_TYPE_NONE	0x00000000
Frame Rate Monitor	0x00000000 PS_FRAMERATE_LIMITER_GPS_CTRL_DISABLED	0x00000000
Frame Rate Monitor Control	0x00000000 PS_FRAMERATE_MONITOR_CTRL_FPS_USE_FRL	0x00000000
G-SYNC Compatibility	0x00000000	0x00000000
High level control of the rendering quality on OpenGL	0x00000000 OGL_QUALITY_ENHANCEMENTS_QUAL	0x00000000
ICafe Settings	none	none
List of Universal GPU ids	0x00000000	0x00000000
Maximum AA samples allowed for a given application	0x00000001	0x00000001
Maximum frames allowed	0x00000001	0x00000001
Maximum GPU Power	0	0
Maximum resolution allowed for a given application	0x00000000	0x00000000
Memory Allocation Policy	0x00000000 WKS_MEMORY_ALLOCATION_POLICY_AS_NEEDED	0x00000000
NVIDIA Predefined Ansel Usage	0x00000000 ANSEL_ALLOW_DISALLOWED	0x00000000
NVIDIA Quality upscaling	0x00000000 NV_QUALITY_UPSCALING_OFF	0x00000000
OpenGL default swap interval	0xF0000000 OGL_DEFAULT_SWAP_INTERVAL_FORCE_OFF	0xF0000000
OpenGL default swap interval fraction	0x00000000 OGL_DEFAULT_SWAP_INTERVAL_FRACTION_ZERO_SCA...	0x00000000
OpenGL default swap interval sign	0x00000000 OGL_DEFAULT_SWAP_INTERVAL_SIGN_POSITIVE	0x00000000
Optimus flags for enabled applications	0x00000010 SHIM_MCOMPAT_AUTO_SELECT	0x00000010
PowerThrottle	0x00000000 SET_POWER_THROTTLE_FOR_PCIE_COMPLIANCE_OFF	0x00000000
Preferred OpenGL GPU	id:2.0:E0710DE.00000100.GF-(352,2,161,11264)@{0}	id:2.0:E0710D...
Set CTF mode	0x00000000	0x00000000
Shim Rendering Mode Options per application for Optimus	0x00000000 SHIM_RENDERING_OPTIONS_DEFAULT_RENDERING_MODE	0x00000000
SILK Smoothness	0x00000000	0x00000000
Steam Application ID	0x00000000	0x00000000
Texture filtering - Quality Substitution	0x00000000	0x00000000
Unified back/depth buffer	0xFFFFFFFF	0xFFFFFFFF
VAB Default Data	0xFFFFFFFF SET_VAB_DATA_USE_API_DEFAULTS	0xFFFFFFFF
Variable refresh Rate	0x00000000 VSYNCVRRCONTROL_DISABLE	0x00000000
Virtual Reality pre-rendered frames	0x00000001	0x00000001
VSync - Behavior Flags	0x00000000 VSYNC_BEHAVIOR_FLAGS_NONE	0x00000000
Whisper Mode	0x00000000	0x00000000
Whisper Mode Application FPS	0x00000000	0x00000000

Setup msi afterburner

(It's all there for you in the "MSI Afterburner.7z" archive)

<https://drive.google.com/open?id=1Ou69o63aB2gb3XJTlWm8e3lbelfKs7no>

<https://guru3d.com/files-details/msi-afterburner-beta-download.html>

I don't recommend any other GPU overclocking software, MSI Afterburner is the best.
No matter your GPU brand, use MSI Afterburner.

Unlock voltage and limits

Open msi afterburner and close it

Follow the instructions provided in my "MSI Afterburner.7z" archive

Edit the configs to unlock the voltage and limits

Keep an eye on everything

Skin - msi dragon army afterburner skin by derek wood

Monitoring tab

Core clock

Gpu voltage

Memory clock

Cpu clock

Gpu temperature

Cpu temperature

Graph columns - 2

Core voltage(%) - max

Power limit(%) - max

Link - off

Temp limit(C) - max

Set a custom fan profile

I highly recommend this to stop your gpu downclocking due to temperatures under load

The default GPU fan curve never does a good job, this will help your fps stability in games

60-70% fan speed for idle

80-100% fan speed at 60deg

Msi afterburner will need to run in the background for a custom fan profile to work

Kboost/clock lock

Use kboost skin (for older graphics cards)

Change the skin in msi afterburner and press kboost

OR

For newer graphics cards

Use the voltage curve editor to lock your clocks at the gpus max voltage

Find your gpus max voltage, do your research

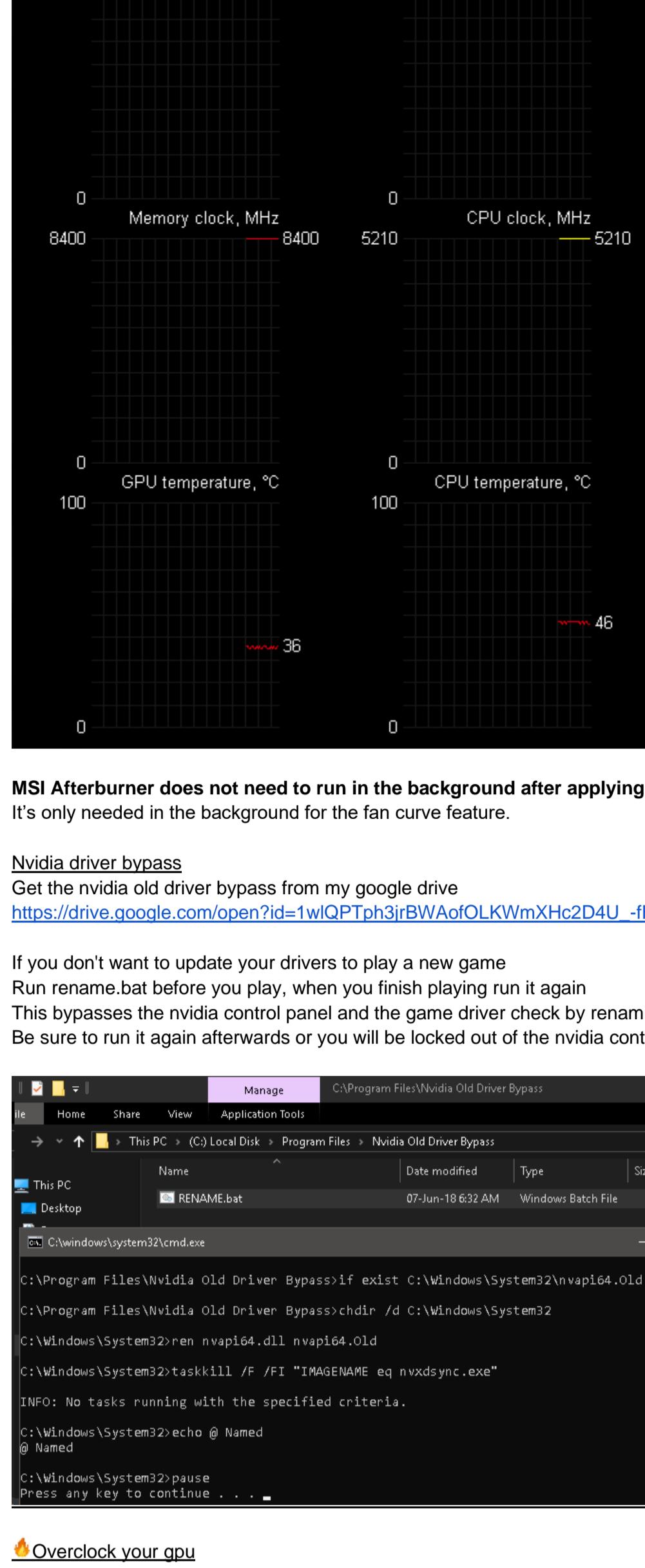
To access the voltage curve editor - "Control + F"

To lock the clocks, select top voltage box - "L"

Then "apply" in Msi Afterburner

Save to a profile

Apply overclocking on system startup



MSI Afterburner does not need to run in the background after applying your overclock!
It's only needed in the background for the fan curve feature.

Nvidia driver bypass

Get the nvidia old driver bypass from my google drive

https://drive.google.com/open?id=1wIQPTph3irBWAofOLKwmXHc2D4U_-fHw

If you don't want to update your drivers to play a new game

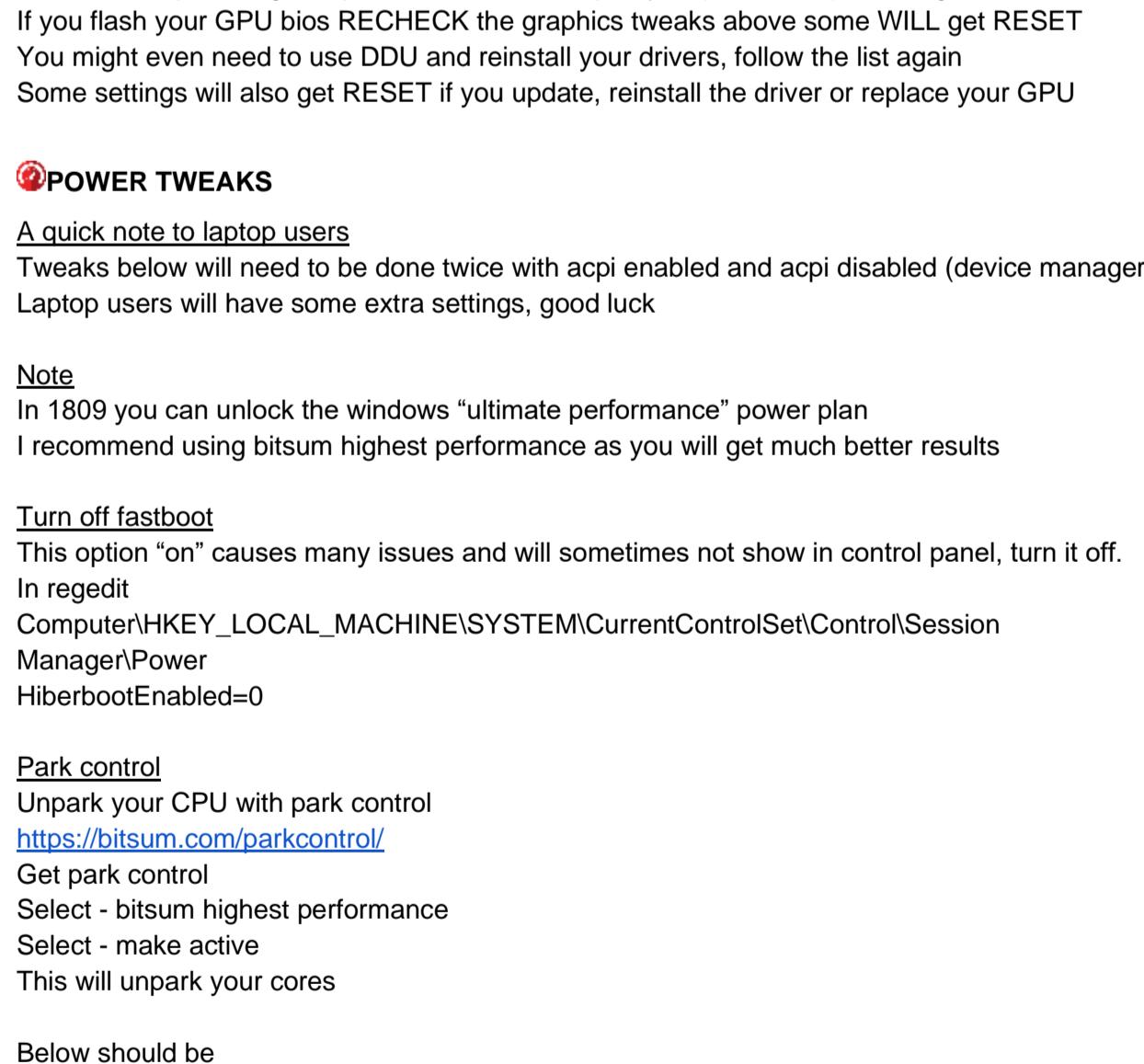
Run rename.bat before you play, when you finish playing run it again

This bypasses the nvidia control panel and the game driver check by renaming nvapi64.dll
Be sure to run it again afterwards or you will be locked out of the nvidia control panel settings

```
C:\Program Files\Nvidia Old Driver Bypass>if exist C:\Windows\System32\nvapi64.Old goto Old
C:\Program Files\Nvidia Old Driver Bypass>chdir /d C:\Windows\System32
C:\Windows\System32>ren nvapi64.dll nvapi64.old
C:\Windows\System32>taskkill /F /FI "IMAGENAME eq nvxsync.exe"
INFO: No tasks running with the specified criteria.
C:\Windows\System32>echo @ Named
@ Named
C:\Windows\System32>pause
Press any key to continue . . .
```

🔥 Overclock your gpu

Due to this topic being complex I will leave this up to you (the reader) to configure
I recommend doing this last after all these tweaks



Unigine Heaven Benchmark 4.0

FPS: **215.0**

Score: **5415**

Min FPS: **44.6**

Max FPS: **413.6**

System

Platform:	Windows NT 6.2 (build 9200) 64bit
CPU model:	Intel(R) Core(TM) i7-8086K CPU @ 4.00GHz (4007MHz) x6
GPU model:	NVIDIA GeForce RTX 2080 Ti 25.21.14.2511 (4095MB) x1

Settings

Render:	Direct3D11
Mode:	1920x1080 BxAA fullscreen
Preset:	Custom
Quality:	Ultra
Tessellation:	Extreme

Powered by UNIGINE Engine

Unigine Corp. © 2005-2013

Flash your gpu bios to a higher power target

Due to this topic being complex I will leave this up to you (the reader) to configure

If you flash your GPU bios RECHECK the graphics tweaks above some WILL get RESET

You might even need to use DDU and reinstall your drivers, follow the list again

Some settings will also get RESET if you update, reinstall the driver or replace your GPU

POWER TWEAKS

A quick note to laptop users

Tweaks below will need to be done twice with acpi enabled and acpi disabled (device manager)

Laptop users will have some extra settings, good luck

Note

In 1809 you can unlock the windows "ultimate performance" power plan

I recommend using bitsum highest performance as you will get much better results

Turn off fastboot

This option "on" causes many issues and will sometimes not show in control panel, turn it off.

In regedit

Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session

Manager\Power

HiberbootEnabled=0

Park control

Unpark your CPU with park control

<https://bitsum.com/parkcontrol/>

Get park control

Select - bitsum highest performance

Select - make active

This will unpark your cores

Below should be

Parking ac - disabled - 100%

Parking dc - disabled - 100%

Freq scaling ac - disabled - 100%

Freq scaling dc - disabled - 100%

Apply

Bitsum dynamic boost enabled - no

Show power plan change notifications - no

Show park settings in windows power options - yes

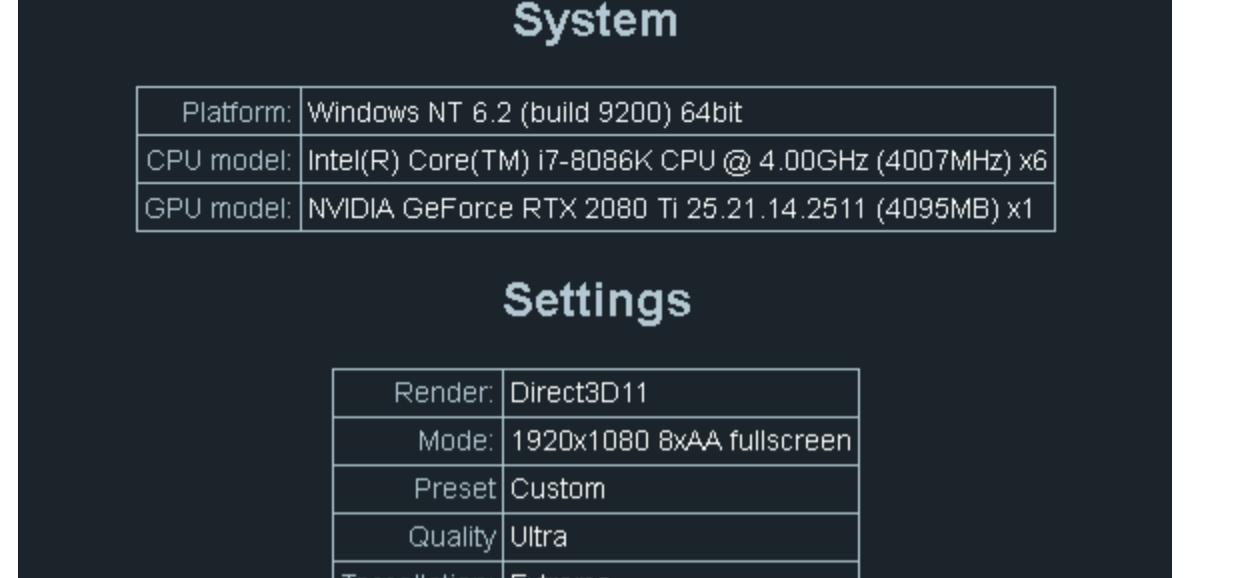
Ok

You don't need this program running in the background disable it

Right click park control icon

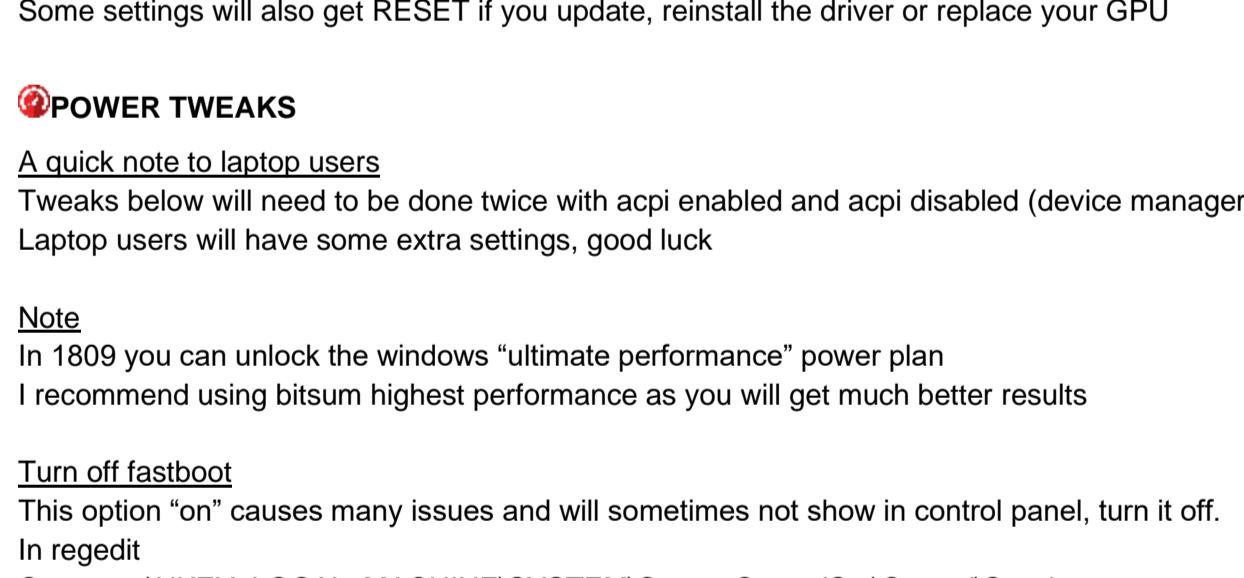
Settings

Start at user logon - off



[Control Panel\Hardware and Sound\Power Options\](https://controlpanel.hardwarerunning.com/poweroptions/)

Select - bitsum highest performance



Delete all other power plans in powershell

powercfg /list

powercfg -delete Power Scheme GUID

```
[Administrator: Windows PowerShell]
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Users\FR33THY> powercfg /list
Existing Power Schemes (* Active)
-----
Power Scheme GUID: 381b4222-f694-41f0-9685-ff5bb260df2e (Balanced)
Power Scheme GUID: 77feddb3-7e01-42ec-acc6-6958a9f24be2 (Bitsum Highest Performance) *
Power Scheme GUID: 8c5e7fda-e8bf-4a96-9a85-a6e23a8c635c (High performance)
Power Scheme GUID: a1841308-3541-4fab-bc81-f71556f20b4a (Power saver)
PS C:\Users\FR33THY> powercfg -delete 381b4222-f694-41f0-9685-ff5bb260df2e
PS C:\Users\FR33THY> powercfg -delete 8c5e7fda-e8bf-4a96-9a85-a6e23a8c635c
PS C:\Users\FR33THY> powercfg -delete a1841308-3541-4fab-bc81-f71556f20b4a
PS C:\Users\FR33THY> /list
Existing Power Schemes (* Active)
-----
Power Scheme GUID: 77feddb3-7e01-42ec-acc6-6958a9f24be2 (Bitsum Highest Performance) *
PS C:\Users\FR33THY> -
```

Disable power throttling in qedit.msc

Computer Configuration\Administrative Templates\System\Power Management\Power Throttling Setting

Turn off power throttling - enabled

Or

Disable power throttling in regedit

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Power\PowerThrottling
PowerThrottlingOff=1

Unlock disable processor idle state option

In powershell

powercfg -attributes SUB_PROCESSOR 5d76a2ca-e8c0-402f-a133-2158492d58ad -ATTRIB_HIDE

Power Settings Explorer

Unlock extra power settings

<https://forums.guru3d.com/threads/windows-power-plan-settings-explorer-utility.416058/>

There are a number of extra hidden ones that can be unlocked.

Below are the settings I recommend to unlock...

Tweaking many of the extra hidden ones that are NOT included in this guide made zero difference in gains and latency for my testings. So to keep it simple follow below.

USB settings

Hub Selective Suspend Timeout - uncheck

USB selective suspend setting - uncheck

Setting IOC on all TDs - uncheck

USB 3 Link Power Management - uncheck

Processor power management

Allow Throttle States - uncheck

Category	Setting	Description
USB settings	Hub Selective Suspend Timeout	<input type="checkbox"/> This value will be used as idle timeouts for all USB hubs
	USB selective suspend setting	<input type="checkbox"/> Specify whether USB selective suspend is turned on or off
	Setting IOC on all TDs	<input type="checkbox"/> Should IOC be set for all TDs
	USB 3 Link Power Management	<input type="checkbox"/> Specifies the power management policy to use for USB 3 links when they are idle
Idle Resiliency	Execution Required power request timeout	<input checked="" type="checkbox"/> Specifies Execution Required power request timeout
	IO coalescing timeout	<input checked="" type="checkbox"/> Specifies IO coalescing timeout
	Processor Idle Resiliency Timer Resolution	<input checked="" type="checkbox"/> Specifies Processor Idle Resiliency Timer Resolution
	Deep Sleep Enabled/Disabled	<input checked="" type="checkbox"/> Specifies if Deep Sleep is Enabled
Interrupt Steering Settings	Interrupt Steering Mode	<input checked="" type="checkbox"/> Interrupt Steering Mode
	Target Load	<input checked="" type="checkbox"/> Target Load for each Processor
	Unparked time trigger	<input type="checkbox"/> Time a processor must remain unparked before interrupts are moved onto it
Power buttons and lid	Lid close action	<input type="checkbox"/> Specify the action that your computer takes when you close the lid on your mobile device
	Power button action	<input type="checkbox"/> Specify the action to take when you press the power button
	Enable forced shutdown	<input checked="" type="checkbox"/> Enable forced shutdown for button and lid actions
	Sleep button action	<input checked="" type="checkbox"/> Specify the action to take when you press the sleep button
	Lid open action	<input checked="" type="checkbox"/> Specify the action to take when the lid is opened
	On battery power button	<input type="checkbox"/> Specify the action to take when you press the Start menu power button
PQ Express	Link State Power Management	<input checked="" type="checkbox"/> Specifies the Active State Power Management (ASPM) policy to use for capable links
Processor power management	Processor performance increase threshold	<input type="checkbox"/> Specifies the upper busy threshold that must be met before increasing the processor's performance
	Processor performance increase threshold for Processor Power Efficiency Class 1	<input checked="" type="checkbox"/> Specifies the upper busy threshold that must be met before increasing the processor's performance for Processor Power Efficiency Class 1
	Processor performance core parking min cores	<input checked="" type="checkbox"/> Specifies the minimum number of unparked cores/packages allowed in percentage
	Processor performance core parking min cores for Processor Power Efficiency Class 1	<input checked="" type="checkbox"/> Specifies the minimum number of unparked cores/packages allowed for Processor Power Efficiency Class 1
	Processor performance decrease threshold	<input type="checkbox"/> Specifies the lower busy threshold that must be met before decreasing the processor's performance
	Processor performance decrease threshold for Processor Power Efficiency Class 1	<input checked="" type="checkbox"/> Initial performance state for Processor Power Efficiency Class 1 when wake from stop
	Initial performance for Processor Power Efficiency Class 1 when unparked	<input checked="" type="checkbox"/> Initial performance state for Processor Power Efficiency Class 1 when unparked
	Processor performance core parking concurrency threshold	<input checked="" type="checkbox"/> Specifies the busy threshold that must be met when calculating the concurrency of cores
	Processor performance core parking increase time	<input checked="" type="checkbox"/> Specifies the minimum number of perf check intervals that must elapse before more cores are parked
	Processor energy performance preference policy	<input type="checkbox"/> Specifies how much processors should favor energy savings over performance when selecting a power plan
	Allow Throttle States	<input type="checkbox"/> Allow processors to use throttle states in addition to performance states

Control Panel\Hardware and Sound\Power Options>Edit Plan Settings

Change advanced power settings

Hard disk

Turn off hard disk after - never

Desktop background settings

Slide show - paused

Wireless adapter settings

Power saving mode - maximum performance

Sleep

Sleep after - never

Allow wake timers - never

USB settings

Hub selective suspend timeout - 100000 (max)

USB selective suspend setting - disabled

Setting IOC on all TDs - enabled

USB 3 link power management - off

Power buttons and lid

Power button action - do nothing

Sleep button action - do nothing

PCI express

Link state power management - off

Processor power management

Processor performance increase threshold - 10%

Processor performance decrease threshold - 10%

Processor energy performance preference policy - 0%

Allow throttle states - off

Processor performance decrease policy - ideal

Processor idle demote threshold - 10%

Processor duty cycling - disabled

Processor idle disable

Enable idle

- lower temps, slightly more fps

Disable idle

- lower latency, better response, better mouse input, higher temps & slightly lower fps

The CPU will run 100% all of the time.

Some systems may have issues with this, set to enable idle if you are unsure.

I don't recommend this unless you have a decent stable pc, decent cooling and don't care about CPU degradation. Your task manager will read at 100% disabling idle it's probably a bug.

Latency sensitivity hint processor performance - 100%

Processor idle promote threshold - 5%

Minimum processor state - 100%

Processor performance autonomous mode - enabled

Processor performance core parking overutilization threshold - 10%

System cooling policy - active

Maximum processor state - 100%

Processor autonomous activity window - leave default

Display

Turn off display after - never

Laptops

Some extra settings will be in there for laptops

Test for stability with prime95 and benchmark with cinebench as you go

Good luck

Make sure your cores are unparked in regedit

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Power\PowerSettings\54533251-1-82be-4824-96c1-47b60b740d00\0cc5b647-c1df-4637-891a-dec35c318584]

ValueMax=0

ValueMin=0

[HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Control\Power\PowerSettings\54533251-82be-4824-96c1-47b60b740d00\ea062031-0e34-4ff1-9b6d-eb1059334028]

ValueMax=0

ValueMin=0

[HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Control\Power\PowerSettings\54533251-82be-4824-96c1-47b60b740d00\ea062031-0e34-4ff1-9b6d-eb1059334029]

ValueMax=0

ValueMin=0

My power plan

<https://www.intowindows.com/how-to-import-and-export-power-plans-schemes-in-windows-7/>

https://drive.google.com/open?id=1O5GJkjL4IfdCOndTbzU-ytIsDU_78Uz

Extract to your C:\ drive

In cmd

Powercfg /Import C:\FR33THYSPOWERPLAN.POW

Check park control unparked your CPU Cores

Open resource monitor



Disable spectre and meltdown

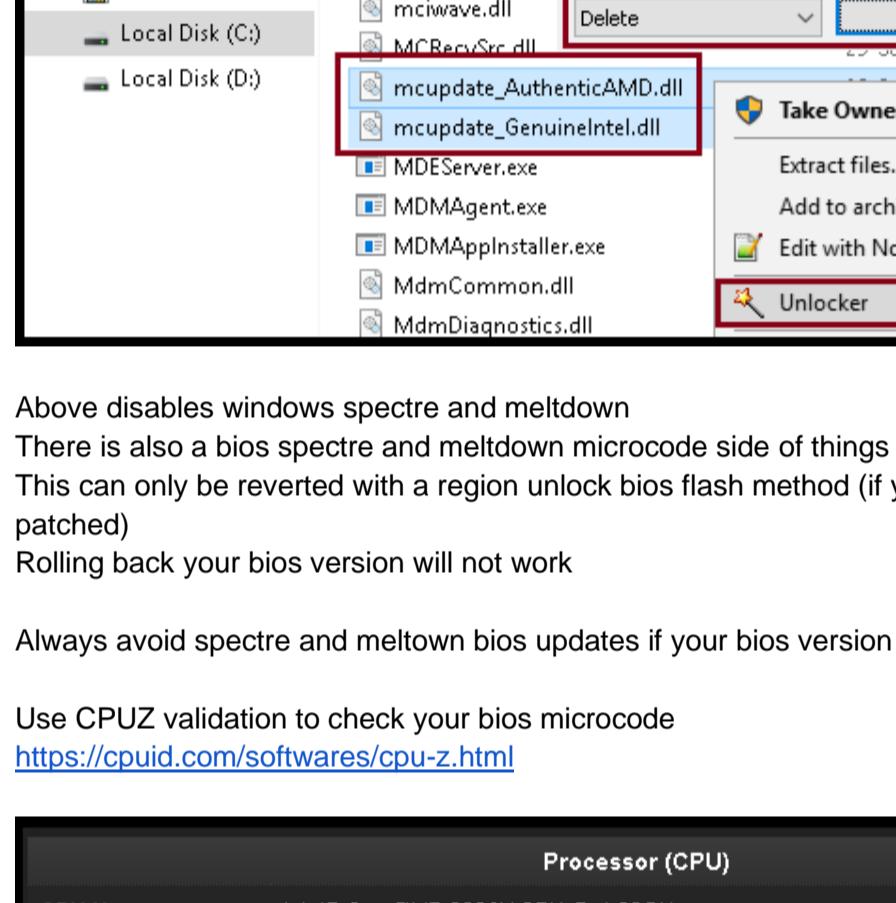
https://drive.google.com/open?id=1wIQPTph3rBWAofOLKWmXHc2D4U_-fHw

In regedit
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management
FeatureSettingsOverride=3
FeatureSettingsOverrideMask=3

Restart

Check with inspectre

<https://grc.com/inspectre.htm>



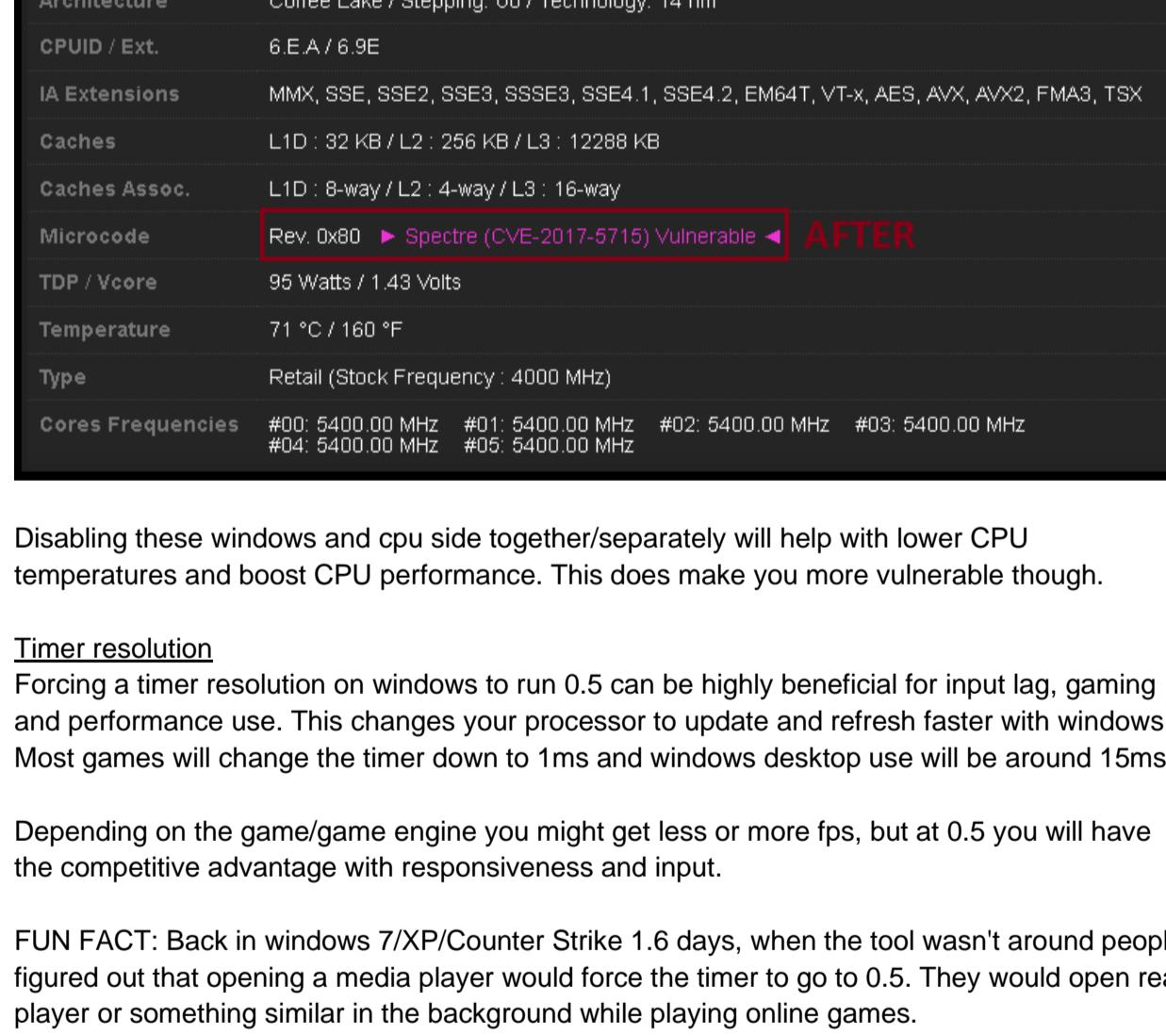
Remove microcode updates

Remove microcode that comes with newer versions of windows and fall back to your bios.

Take ownership of and delete - or delete with unlocker

C:\Windows\System32\mcupdate_GenuineIntel.dll

C:\Windows\System32\mcupdate_AuthenticAMD.dll



Above disables windows spectre and meltdown

There is also a bios spectre and meltdown microcode side of things

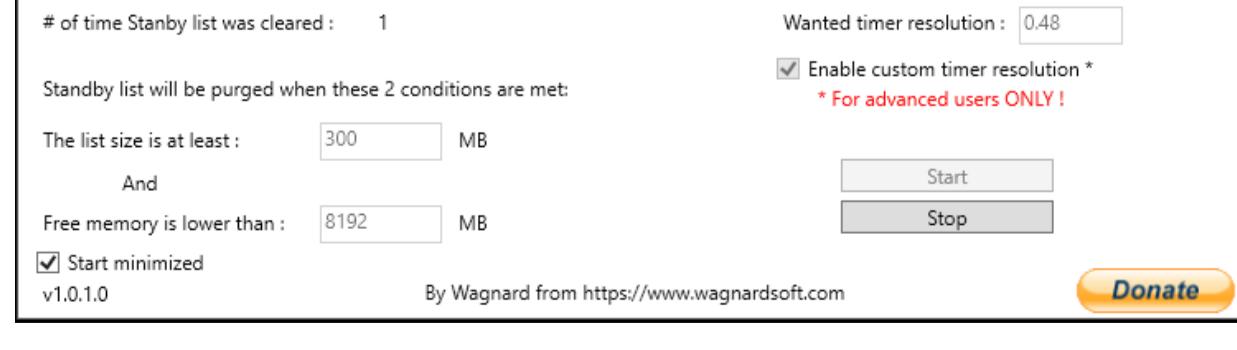
This can only be reverted with a region unlock bios flash method (if your bios is already patched)

Rolling back your bios version will not work

Always avoid spectre and meltdown bios updates if your bios version does not have it already

Use CPUZ validation to check your bios microcode

<https://cpuid.com/softwares/cpu-z.html>



Disabling these windows and cpu side together/separately will help with lower CPU temperatures and boost CPU performance. This does make you more vulnerable though.

Timer resolution

Forcing a timer resolution on windows to run 0.5 can be highly beneficial for input lag, gaming and performance use. This changes your processor to update and refresh faster with windows. Most games will change the timer down to 1ms and windows desktop use will be around 15ms.

Depending on the game/game engine you might get less or more fps, but at 0.5 you will have the competitive advantage with responsiveness and input.

FUN FACT: Back in windows 7/XP/Counter Strike 1.6 days, when the tool wasn't around people figured out that opening a media player would force the timer to go to 0.5. They would open real player or something similar in the background while playing online games.

Intelligent standby list cleaner with timer resolution

(It's all here or you in the "Timer Resolution.7z" archive)

<https://drive.google.com/open?id=182B5ivzBFIBJcV9MQEYxj-i7dO81PqR>

<https://wagnardsoft.com/content/intelligent-standby-list-cleaner-v1000-released>

Set to run on start with taskschd.msc or In a startup folder

Start minimized

Enable timer resolution to 0.5ms (or lower if it lets you)

Purge standby list before you play a game

Standby list will be purged when these 2 conditions are met

The size is at least - 300

And

Free memory is lower than 8192

Start minimized - on

The extra part of this program (purge standby list)

Can help eliminate stutters in long game sessions

Intelligent standby list cleaner bugs out?

Intelligent standby list cleaner does not work or comes up with an error message?

Manually rebuild performance counter library values.

In cmd

LODCTR /R

LODCTR /R

Restart

```

Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.16299.15]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\FR33THY>LODCTR /R
Info: Successfully rebuilt performance counter setting from system backup store
C:\Users\FR33THY>LODCTR /R
Info: Successfully rebuilt performance counter setting from system backup store
C:\Users\FR33THY>

```

(I recommend just using the ISLC program above)
Here are some other options for you....

Timer resolution service

(It's all here or you in the "Timer Resolution.7z" archive)

<https://drive.google.com/open?id=182B5ivzBFIBJcV9MQEYxi-i7dO81PqR>

<https://forums.guru3d.com/threads/windows-timer-resolution-tool-in-form-of-system-service.376458/>

SetTimerResolutionService.exe gets installed as a service
It's sets your timer resolution to 0.5ms

Move the "SetTimerResolutionService Folder"

To C:\Program Files

Open cmd

Type:

cd..

press Enter (until only "C:\\" is shown, usually have to do it 3 times)

Then type:

cd Program Files\Set Timer Resolution Service\

Press Enter

Then type:

SetTimerResolutionService -install

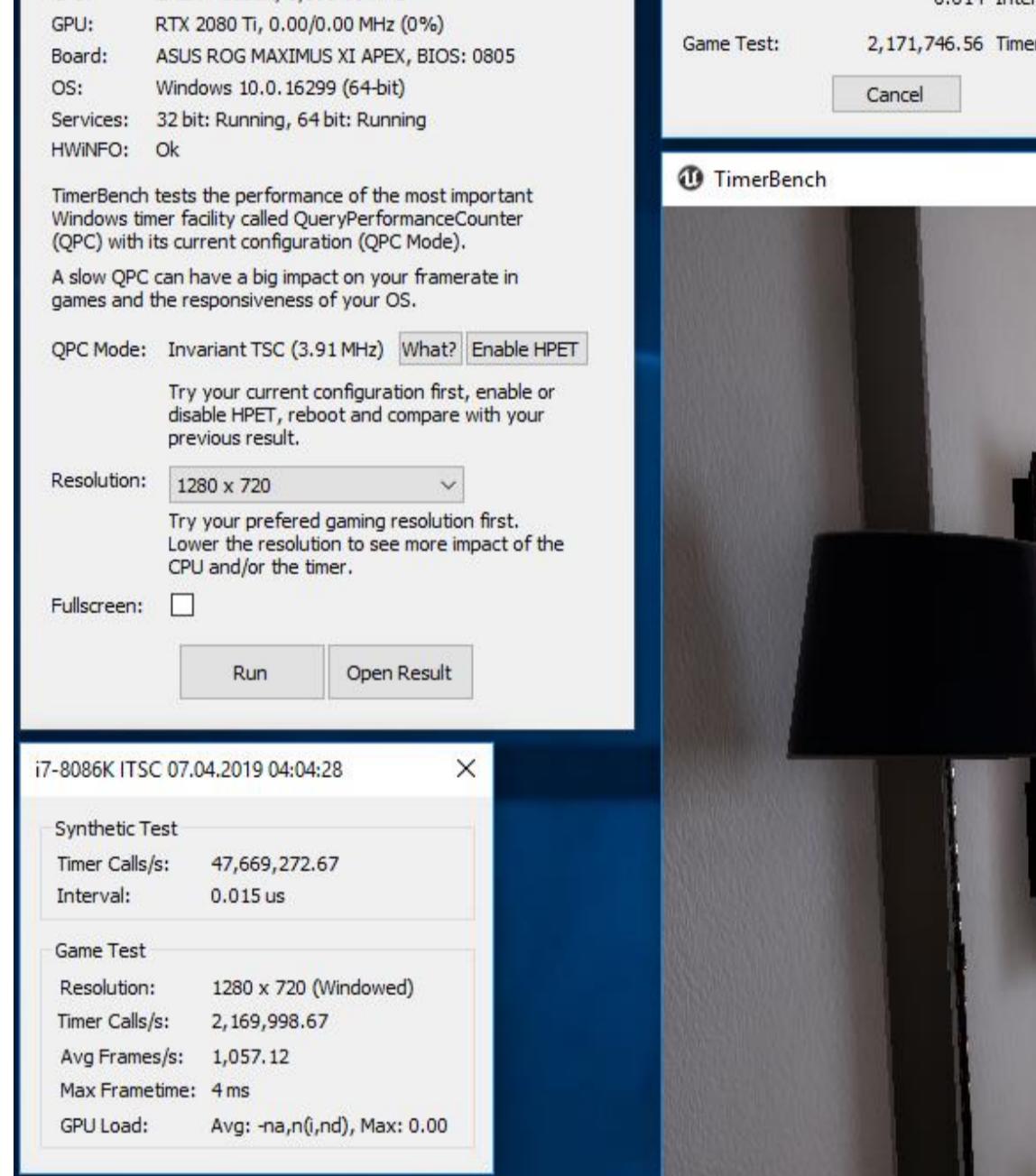
Press Enter

In services.msc

Find SetTimerResolutionService and set it to automatic

Reboot and open TimerResolution.exe

If timer resolution is at 0.5ms the service is working



Timer Resolution Program

Here is another alternative to the above methods

<https://cms.lucashale.com/timer-resolution/>

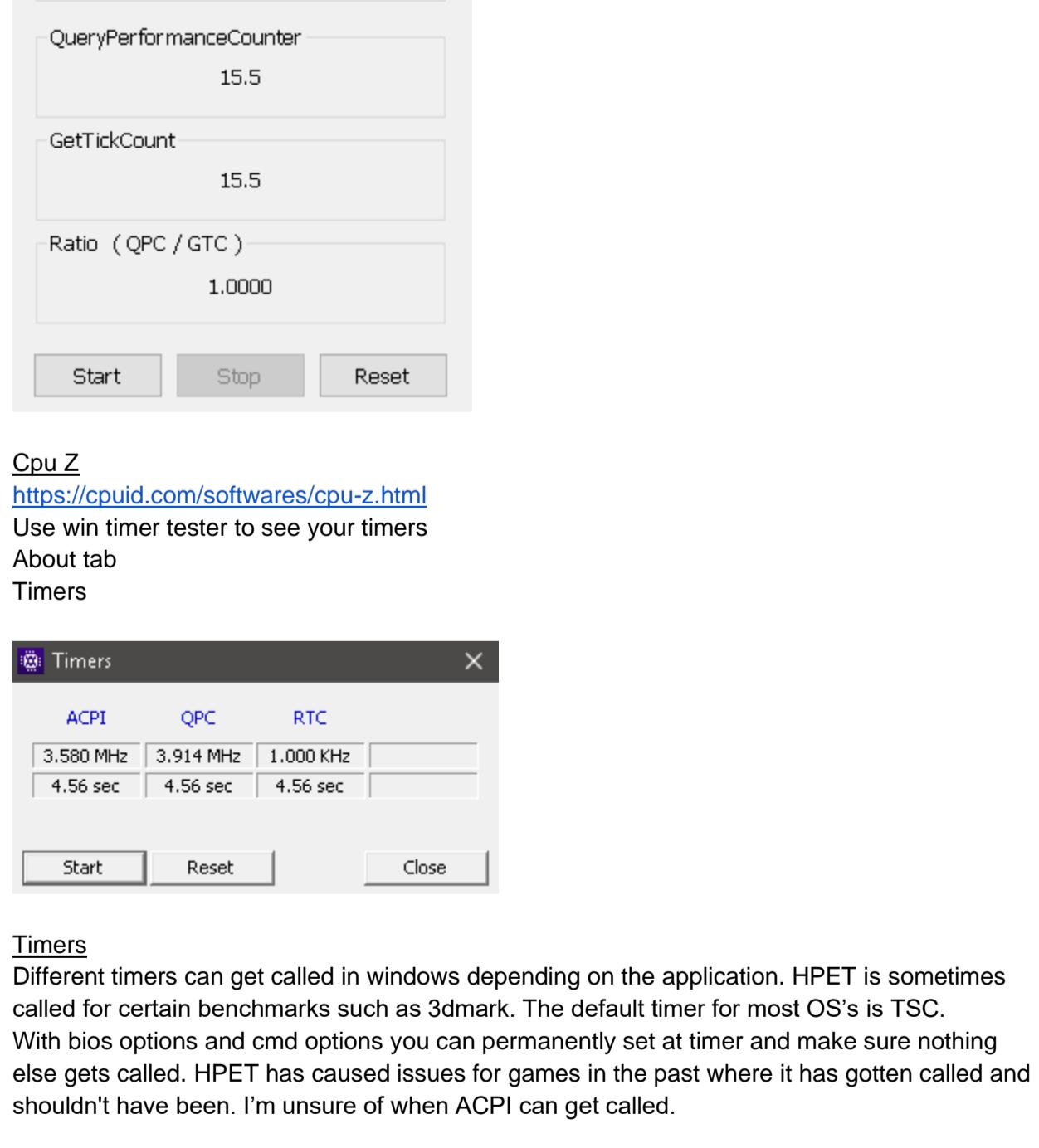
Timer bench

Use timer bench to see your frame times and fps

Lower frame times are better

<https://overclockers.at/articles/the-hpet-bug-what-it-is-and-what-it-isnt>

(I have found this program buggy with frametime readings, it prefers a mechanical hard drive)



Timers and HPET

https://wiki.osdev.org/Timer_Interrupt_Sources

<https://anandtech.com/show/12678/a-timely-discovery-examining-amd-2nd-gen-ryzen-results/2>

<https://ocaholic.ch/modules/publisher/item.php?itemid=1071>

Use these timer tools to measure your current timer configuration

Make sure the timer resolution is running and set to 0.5 to test timers below so it's more accurate

Win timer tester

Use win timer tester to check your timer

Press start

Ideally after 40-60 seconds the timertester should be 1.000 (+/- .0001 is ok)

<http://forum.notebookreview.com/threads/setfsb-game-timing-problem-q60jx.568525/page-2#post7364805>

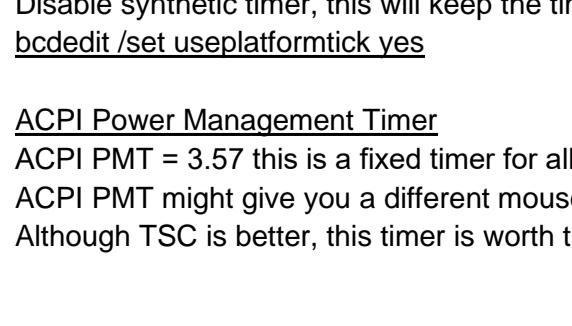
Cpu Z

<https://cpuid.com/softwares/cpu-z.html>

Use win timer tester to see your timers

About tab

Timers



Timers

Different timers can get called in windows depending on the application. HPET is sometimes called for certain benchmarks such as 3dmark. The default timer for most OS's is TSC.

With bios options and cmd options you can permanently set at timer and make sure nothing else gets called. HPET has caused issues for games in the past where it has gotten called and shouldn't have been. I'm unsure of when ACPI can get called.

Windows 1809+ has a synthetic TSC timer of 10mhz there is no work around currently.

TSC Time Stamp Counter

TSC = 2-4mhz (give or take) depending on the CPU speed

TSC will give you the lowest latency and highest fps

TSC is usually the default timer

To run only TSC

In cmd

bcdedit /set useplatformclock no

The HPET option in bios does not matter if this is set in cmd

The HPET option in bios should be ON to make the timer resolution more accurate

Disable synthetic timer, this will keep the timer resolution at an even number avoiding issues

[bcdedit /set useplatformtick yes](http://bcdedit.com/parameters/setuseplatformtick)

ACPI Power Management Timer

ACPI PMT = 3.57 this is a fixed timer for all PC's

ACPI PMT might give you a different mouse feel and clock sync

Although TSC is better, this timer is worth trying out

To run only ACPI PMT
In cmd
bcdedit /set useplatformclock yes
&
Disable HPET in bios

[HPET High Precision Event Timer](#)
HPET = 10-24mhz (give or take) depending on the PC and OS version
HPET runs like trash
HPET feels like trash
HPET is trash... trash

To run only HPET
In cmd
bcdedit /set useplatformclock yes
&
Enable HPET in bios

Find the best timer for you its 99% probably going to be TSC.

[Device manager](#)
High precision event timer - disable
It's a meme, this does nothing
Some new motherboards with HPET disabled in bios, HPET will still show in device manager

[Bcdedit settings worth trying out in cmd](#)
<https://docs.microsoft.com/en-us/windows-hardware/drivers/devtest/bcdedit--set>
Test them individually for yourself, some of these may help or break your OS
Some of them can make your PC insecure also, you have been warned
Your PC will need to be restarted for any commands below to work

[How to check your bcdedit settings](#)

bcdedit /enum

```
Administrator: C:\windows\system32\cmd.exe
Microsoft Windows [Version 10.0.17763.107]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\FR33THY>bcdedit /enum

Windows Boot Manager
-----
```

[Enable/Disable useplatformclock](#)

Disable/enable HPET
bcdedit /set useplatformclock yes
bcdedit /set useplatformclock no

Useplatformclock is usually not shown in bcdedit and is off by default in windows
Unless HPET is called by a certain program
I like to make sure it never gets called with "bcdedit /set useplatformclock no"
This is highly recommended

[Disable dynamic tick](#)

Dynamic tick is a power saving feature for laptops
bcdedit /set disabledynamictick yes

```
Administrator: C:\windows\system32\cmd.exe
Microsoft Windows [Version 10.0.17763.107]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\FR33THY>bcdedit /set disabledynamictick yes
The operation completed successfully.

C:\Users\FR33THY>
```

[Integrity checks](#)

This is useful for bypassing driver signing on some windows versions

DISABLE INTEGRITY CHECKS
bcdedit /set loadoptions DISABLE_INTEGRITY_CHECKS
&
bcdedit /set nointegritychecks yes

ENABLE INTEGRITY CHECKS
bcdedit /set loadoptions ENABLE_INTEGRITY_CHECKS
&
bcdedit /set nointegritychecks no
Or
bcdedit /deletevalue loadoptions
&
bcdedit /deletevalue nointegritychecks

[Remove Integrity Services](#)

bcdedit /deletevalue {bootmgr} integrityservices

[Speed up boot time](#)

bcdedit /timeout 0

[Disable data execution prevention](#)
bcdedit /set nx alwaysoff

[Disable boot screen animation](#)

bcdedit /set bootux disabled

[Enable extended xAPIC - better performance](#)

bcdedit /set x2apicpolicy enable

[Prevents legacy APIC from being used](#)

bcdedit /set uselegacyapicmode no

[Change the TSC timer synchronization policy](#)

bcdedit /set tscsyncpolicy enhanced

bcdedit /set tscsyncpolicy legacy (works best for me)

bcdedit /set tscsyncpolicy default

[Speed up boot times](#)

Changes F8 on boot (may help boot times)

bcdedit /set bootmenupolicy standard

[Disable hyper virtualization](#)

bcdedit /set hypervisorlauchtype off

[Disable trusted platform module \(TPM\)](#)

bcdedit /set tpmbootentropy ForceDisable

[Remove windows login logo](#)

bcdedit /set quietboot yes

[Disable synthetic timers](#)

bcdedit /set useplatformtick yes

This is highly recommended

[To undo bcdedit settings](#)

bcdedit /deletevalue XXXXXXXX

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.16299.15]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\FR33THY>bcdedit /enum

Windows Boot Manager
-----
identifier          {bootmgr}
device              partition=\Device\HarddiskVolume1
description        Windows Boot Manager
locale             en-US
inherit             {globalsettings}
default            {current}
resumeobject       {cd39e55c-914b-11e9-9707-8b21ccafab2d}
displayorder       {current}
toolsdisplayorder {memdiag}
timeout            0

Windows Boot Loader
-----
identifier          {current}
device              partition=C:
path                \Windows\system32\winload.exe
description        Windows 10
locale             en-US
inherit             {bootloadersettings}
recoverysequence   {cd39e55e-914b-11e9-9707-8b21ccafab2d}
displaymessagewindow Recovery
recoverenabled     Yes
nointegritychecks  Yes
allowedinmemorysettings 0x15000075
osdevice           partition=C:
systemroot         \Windows
resumeobject       {cd39e55c-914b-11e9-9707-8b21ccafab2d}
nx                 AlwaysOff
x2apicpolicy      Enable
tscsyncpolicy     Legacy
bootmenupolicy    Standard
hypervisorlauchtype Off
bootux             Disabled
tpmbootentropy    ForceDisable
quietboot          Yes
uselegacyapicmode No
usefirmwarepcisettings No
useplatformclock   Yes
useplatformtick    Yes
disabledynamictick Yes

C:\Users\FR33THY>
```

[Certain devices/drivers don't work all of a sudden?](#)

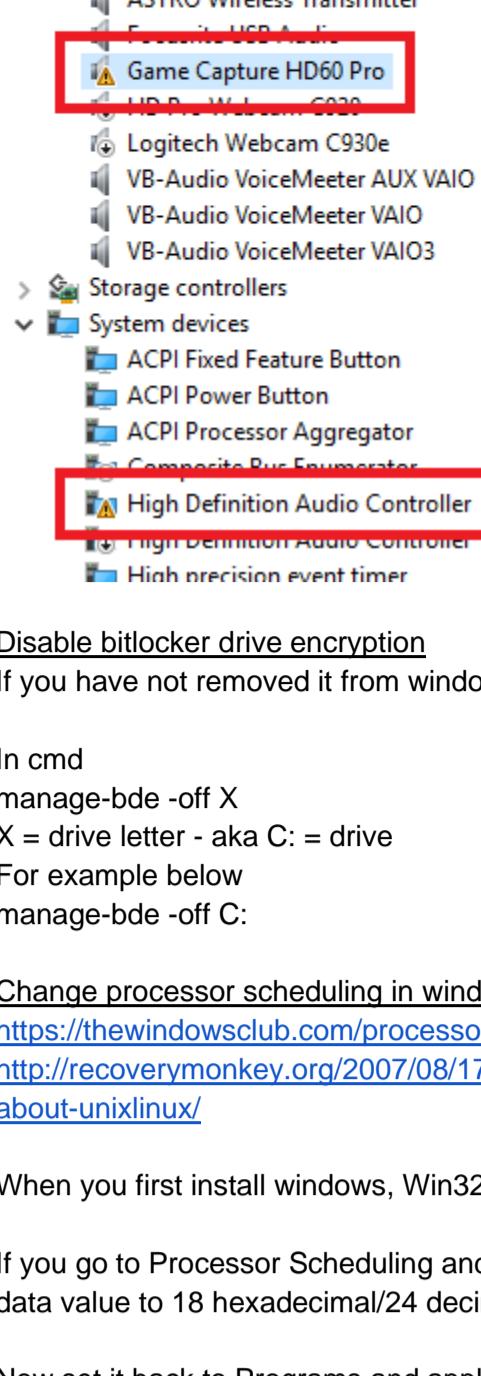
bcdedit /deletevalue usefirmwarepcisettings

or

bcdedit /set usefirmwarepcisettings no

[usefirmwarepcisettings Yes](#)

C:\Windows\system32> THIS CAN CAUSE ISSUES
FOR SOME PC'S



Disable bitlocker drive encryption

If you have not removed it from windows here is how to disable it

In cmd

manage-bde -off X

X = drive letter - aka C: = drive

For example below

manage-bde -off C:

Change processor scheduling in windows

<https://thewindowsclub.com/processor-scheduling-in-windows-7-8>

<http://recovermonkey.org/2007/08/17/processor-scheduling-and-quanta-in-windows-and-a-bit-about-unixlinux/>

When you first install windows, Win32PrioritySeparation=2 for backwards compatibility with NT.

If you go to Processor Scheduling and set it to Background services and apply, this will set the data value to 18 hexadecimal/24 decimal.

Now set it back to Programs and apply, the value/data will change to 26 hexadecimal/38 decimal.

Variations

$32 + 8 + 2 = 42$ Dec / 2A Hex = Short, Fixed , High foreground boost.

$32 + 8 + 1 = 41$ Dec / 29 Hex = Short, Fixed , Medium foreground boost.

$32 + 8 + 0 = 40$ Dec / 28 Hex = Short, Fixed , No foreground boost.

$32 + 4 + 2 = 38$ Dec / 26 Hex = Short, Variable , High foreground boost.

$32 + 4 + 1 = 37$ Dec / 25 Hex = Short, Variable , Medium foreground boost.

$32 + 4 + 0 = 36$ Dec / 24 Hex = Short, Variable , No foreground boost.

$16 + 8 + 2 = 26$ Dec / 1A Hex = Long, Fixed, High foreground boost.

$16 + 8 + 1 = 25$ Dec / 19 Hex = Long, Fixed, Medium foreground boost.

$16 + 8 + 0 = 24$ Dec / 18 Hex = Long, Fixed, No foreground boost.

Control Panel\System and Security\System

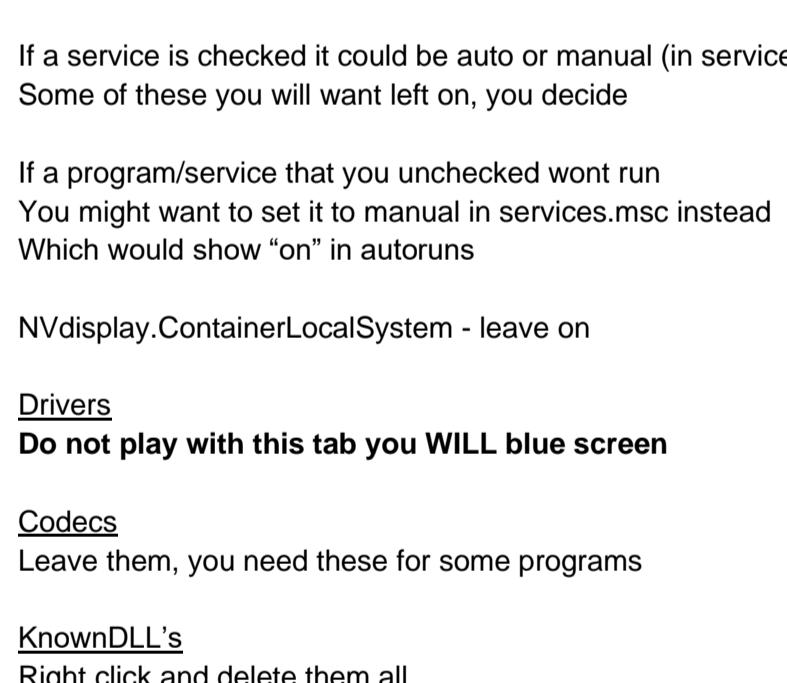
Advanced system settings

Advanced

Performance/settings

Advanced

Performance Options



Background services =

Computer\HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Control\PriorityControl

Win32PrioritySeparation=18

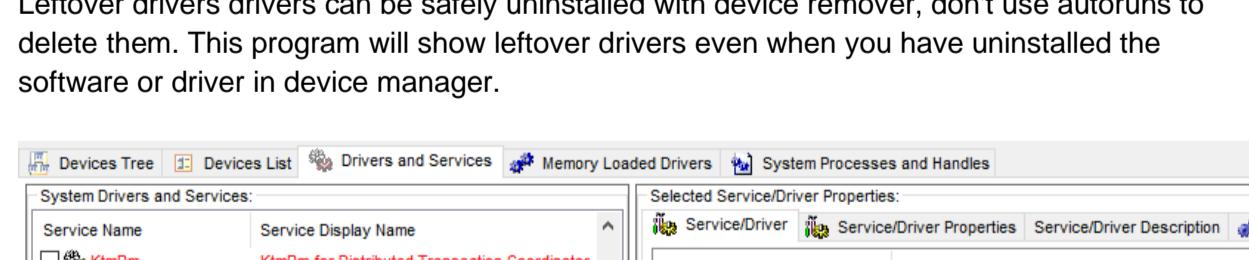
($16 + 8 + 0 = 24$ Dec / 18 Hex = Long, Fixed, No foreground boost.)

Programs =

Computer\HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Control\PriorityControl

Win32PrioritySeparation=26

($32 + 4 + 2 = 38$ Dec / 26 Hex = Short, Variable , High foreground boost.)

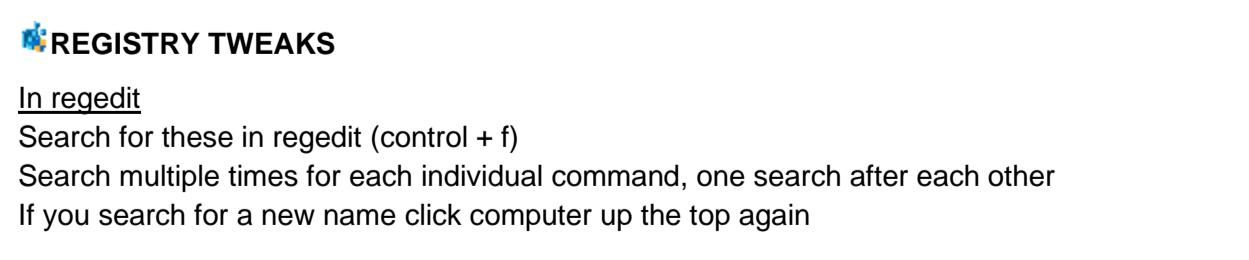


Works for me =

Lately I have had better results in games and lower latency with

Win32PrioritySeparation=16

($16 + 4 + 2 = 22$ Dec / 16 Hex = Long, Variable, High foreground boost.)



AUTORUNS

Open 64 bit version of autoruns

This program is powerful be careful

DO NOT "show" hidden windows entries

This is a great program to use after you have installed something.

You can quickly check if any service/driver/scheduled task etc has been added on your pc.

Uncheck all in all tabs apart from

Explorer

You might want these in for your context menu, you decide

Services

These are linked to services.msc

Unchecking - disable service

Deleting - delete service (not recommended)

If a service is checked it could be auto or manual (in services.msc)

Some of these you will want left on, you decide

If a program/service that you unchecked wont run

You might want to set it to manual in services.msc instead

Which would show "on" in autoruns

NVdisplay.ContainerLocalSystem - leave on

Drivers

Do not play with this tab you WILL blue screen

Codecs

Leave them, you need these for some programs

KnownDLL's

Right click and delete them all

Unselect the ones that it wont let you delete

Restart and they should disappear

Restart

Device remover

https://www.majorgeeks.com/files/details/device_remover_543c.html

ADVANCED USERS ONLY

Leftover drivers drivers can be safely uninstalled with device remover, don't use autoruns to delete them. This program will show leftover drivers even when you have uninstalled the software or driver in device manager.



REGISTRY TWEAKS

In regedit

Search for these in regedit (control + f)

Search multiple times for each individual command, one search after each other

If you search for a new name click computer up the top again

Click computer and search for below setting to these values

MenuShowDelay = 0

MouseHoverTime = 0

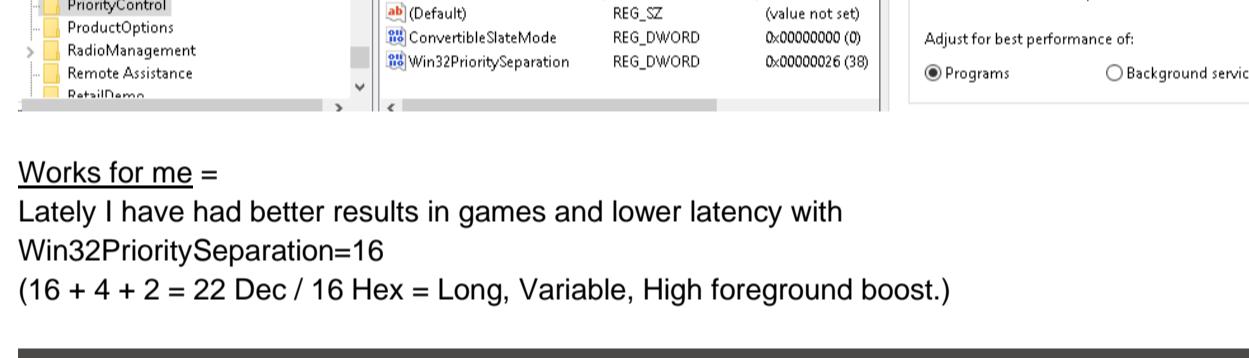
CursorBlinkRate = -1

EnableSuperfetch=0

EnablePrefetcher=0

HibernateEnabled = 0

AllowTelemetry=0



Click computer and search for below setting to these values

MenuShowDelay = 0

MouseHoverTime = 0

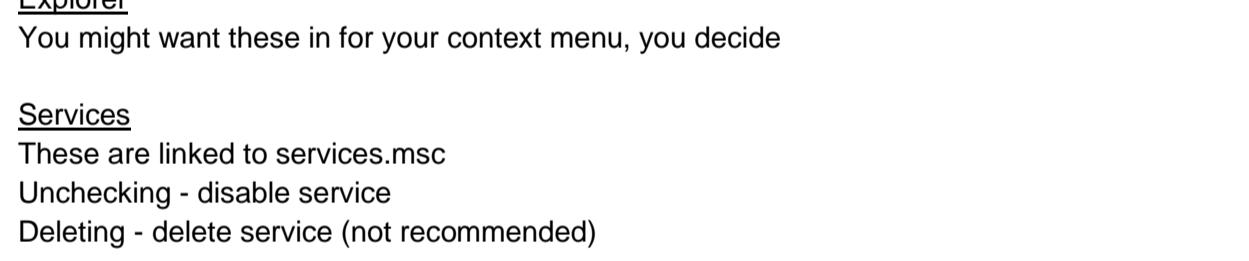
CursorBlinkRate = -1

EnableSuperfetch=0

EnablePrefetcher=0

HibernateEnabled = 0

AllowTelemetry=0



Click computer and search for below setting to these values

MenuShowDelay = 0

MouseHoverTime = 0

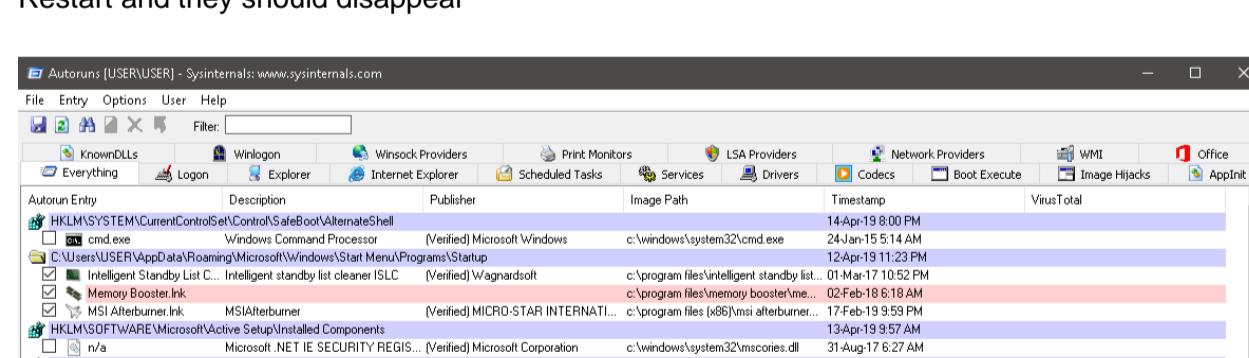
CursorBlinkRate = -1

EnableSuperfetch=0

EnablePrefetcher=0

HibernateEnabled = 0

AllowTelemetry=0



Click computer and search for below setting to these values

MenuShowDelay = 0

MouseHoverTime = 0

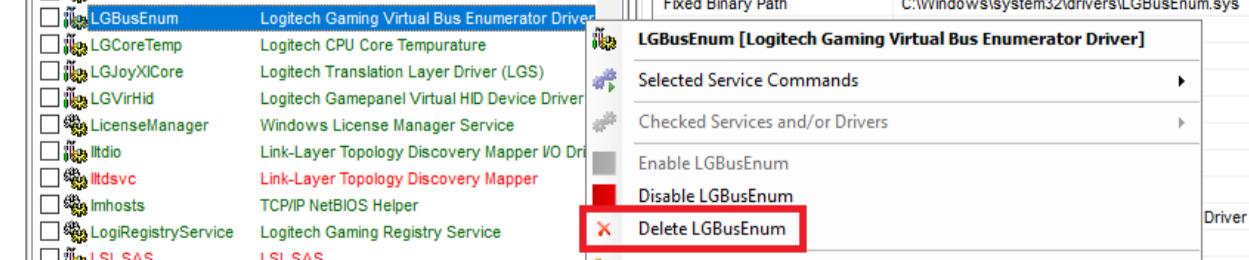
CursorBlinkRate = -1

EnableSuperfetch=0

EnablePrefetcher=0

HibernateEnabled = 0

AllowTelemetry=0



Click computer and search for below setting to these values

MenuShowDelay = 0

MouseHoverTime = 0

CursorBlinkRate = -1

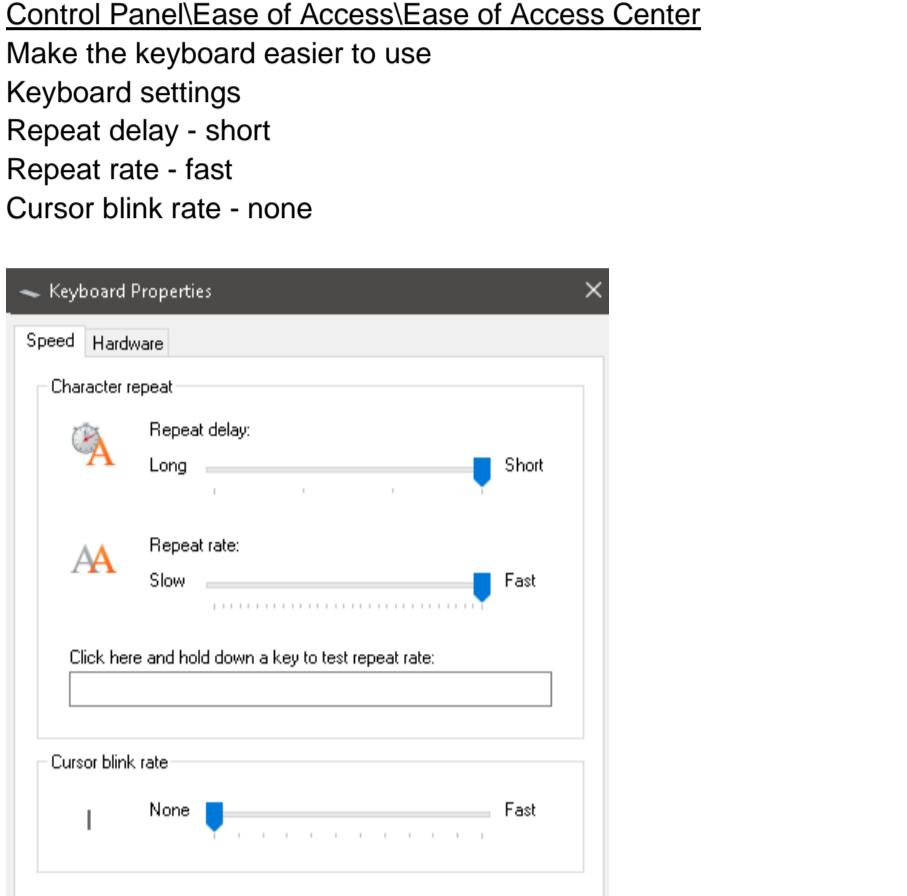
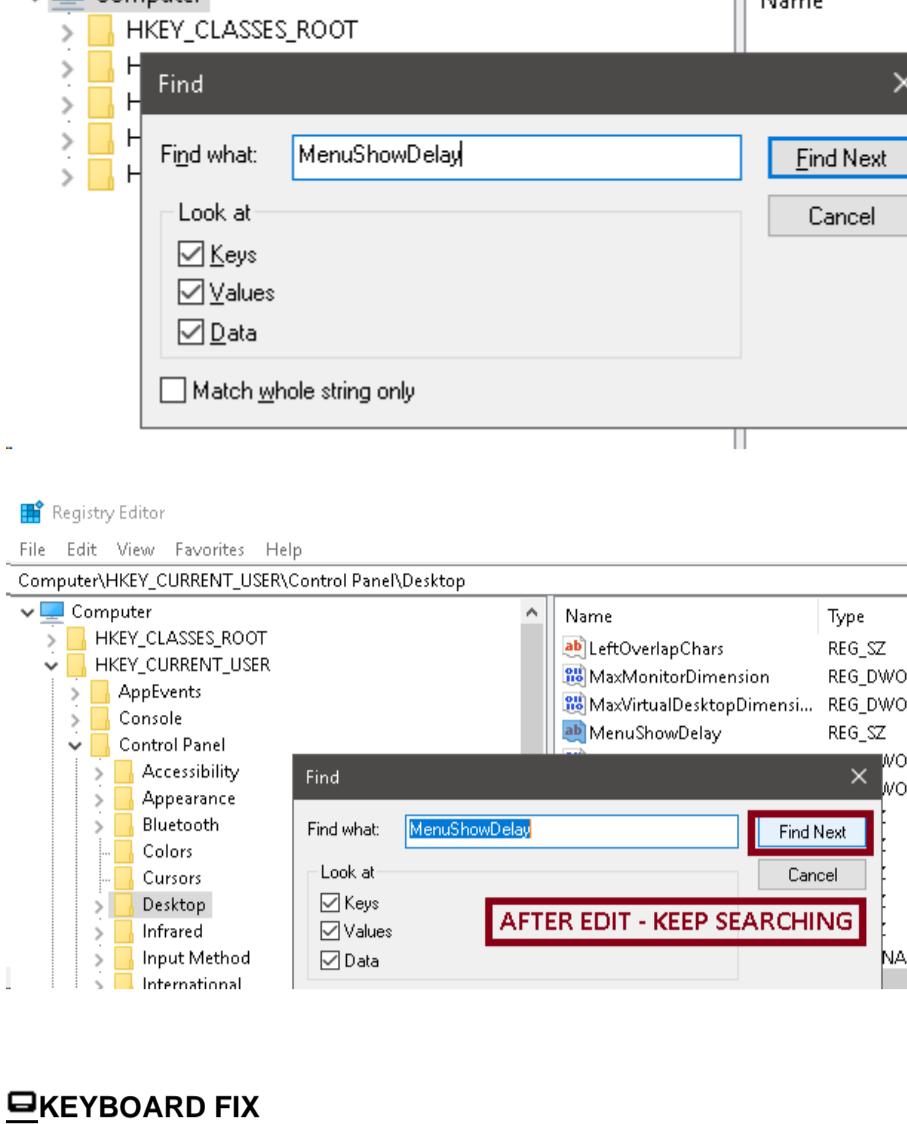
EnableSuperfetch=0

EnablePrefetcher=0

HibernateEnabled = 0

AllowTelemetry=0





KEYBOARD FIX

Control Panel\Ease of Access\Ease of Access Center

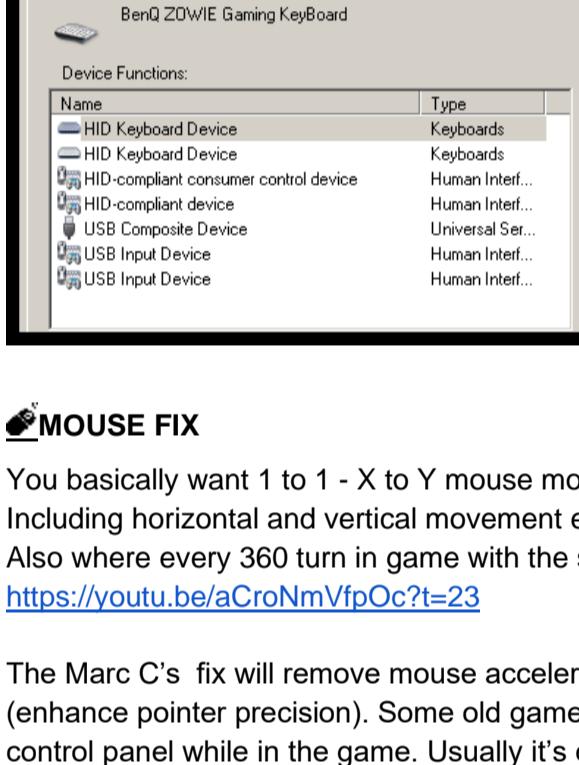
Make the keyboard easier to use

Keyboard settings

Repeat delay - short

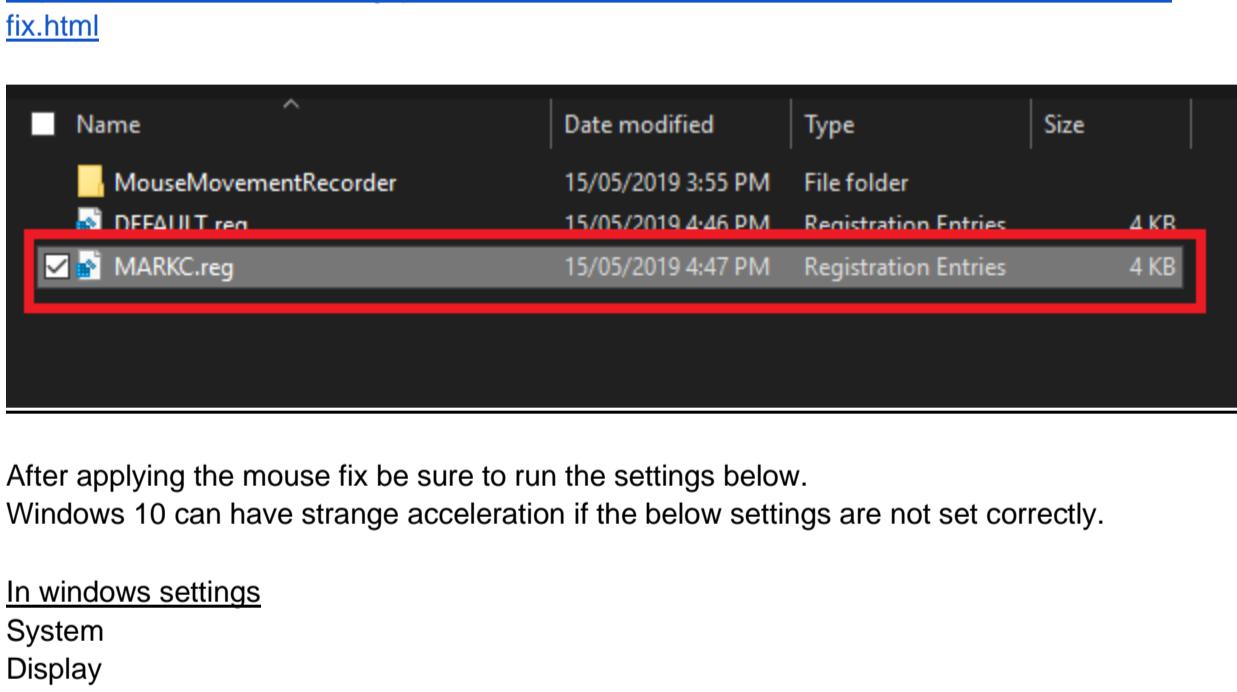
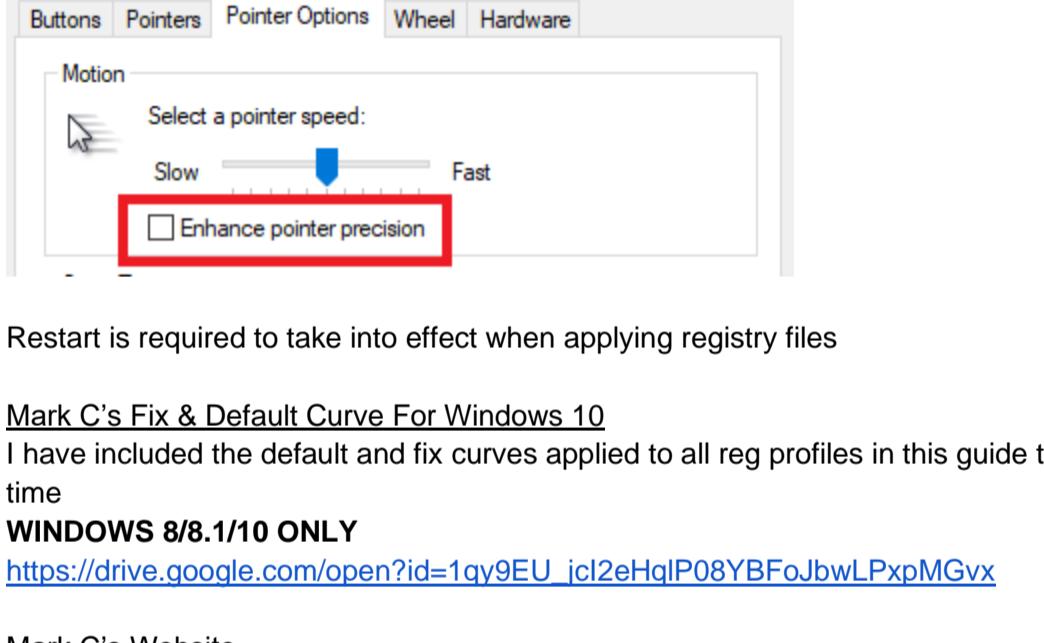
Repeat rate - fast

Cursor blink rate - none



Disable unneeded keyboard device functions

Many device functions can be safely disabled with still full function of the device



MOUSE FIX

You basically want 1 to 1 - X to Y mouse movement and NO ACCELERATION

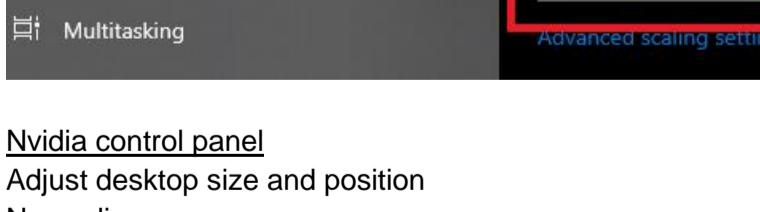
Including horizontal and vertical movement equal with the same distance moved on the mouse

Also where every 360 turn in game with the same movement distance is consistent/equal

<https://youtu.be/aCroNmVfpOc?t=23>

The Marc C's fix will remove mouse acceleration in many old games that force EPP ON (enhance pointer precision). Some old games would force this on even if it's unchecked in control panel while in the game. Usually it's old games that need the fix, although I'm sure there are recent games that need it.

The fix ONLY adjusts the mouse curve for when EPP is on so it's flat/matched to EPP OFF.



Restart is required to take into effect when applying registry files

Mark C's Fix & Default Curve For Windows 10

I have included the default and fix curves applied to all reg profiles in this guide to help save time

WINDOWS 8/8.1/10 ONLY

https://drive.google.com/open?id=1qy9EU_jcl2eHqlP08YBFoJbwLPxpMGvx

Mark C's Website

<http://donenewmouseaccel.blogspot.com.au/2010/03/markc-windows-7-mouse-acceleration-fix.html>



After applying the mouse fix be sure to run the settings below.

Windows 10 can have strange acceleration if the below settings are not set correctly.

In windows settings

System

Display

Scale and layout - 100%

I can't stress this one enough, USE 100%

New windows versions cause mouse acceleration problems with anything other than 100%!

I don't care if you have a 4k screen and the icons are small, deal with it.

Nvidia control panel

Adjust desktop size and position

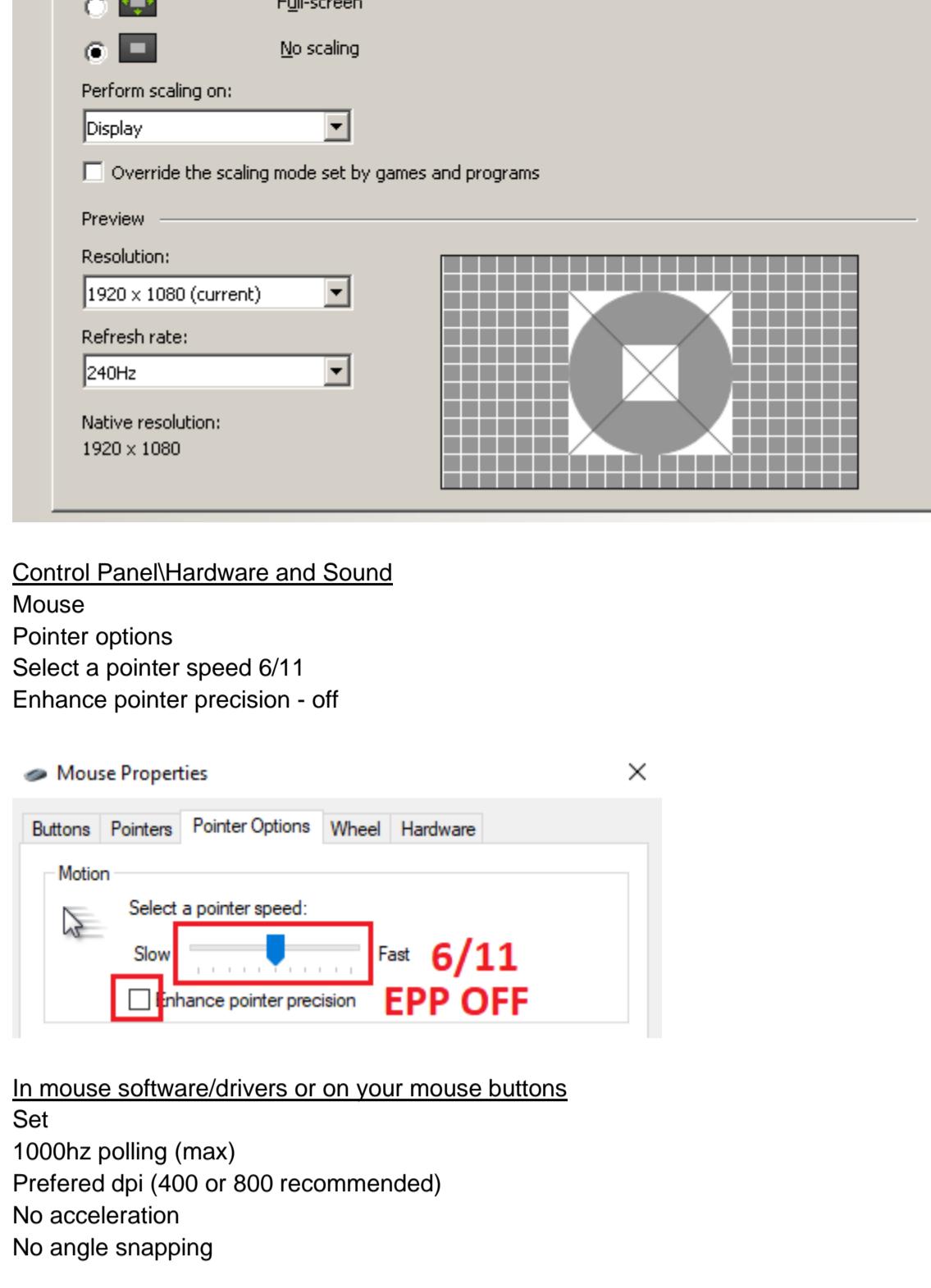
No scaling

Perform scaling on - display

Override the scaling mode set by games and programs - off

Set native resolution

Set max refresh rate



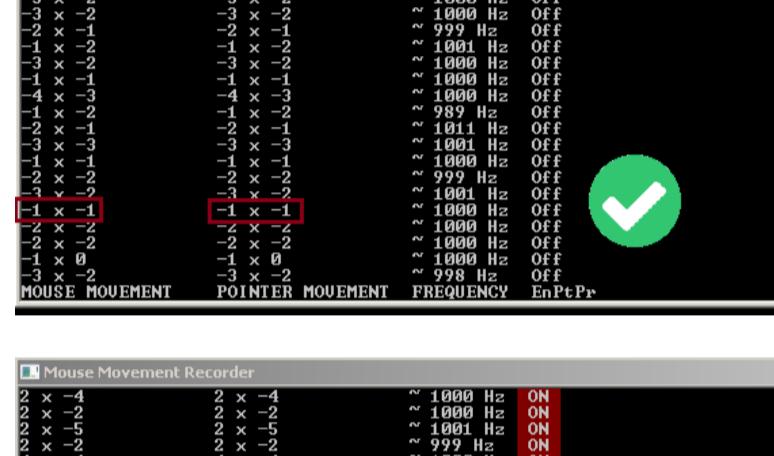
Control Panel\Hardware and Sound

Mouse

Pointer options

Select a pointer speed 6/11

Enhance pointer precision - off



In mouse software/drivers or on your mouse buttons

Set

1000hz polling (max)

Prefered dpi (400 or 800 recommended)

No acceleration

No angle snapping

Using the mouse software

Save your settings/preferences to the on board memory of the mouse with the software

Uninstall the software, it's bloatware you don't need it

Use device remover to remove left over drivers see DRIVERS & CHIPSETS

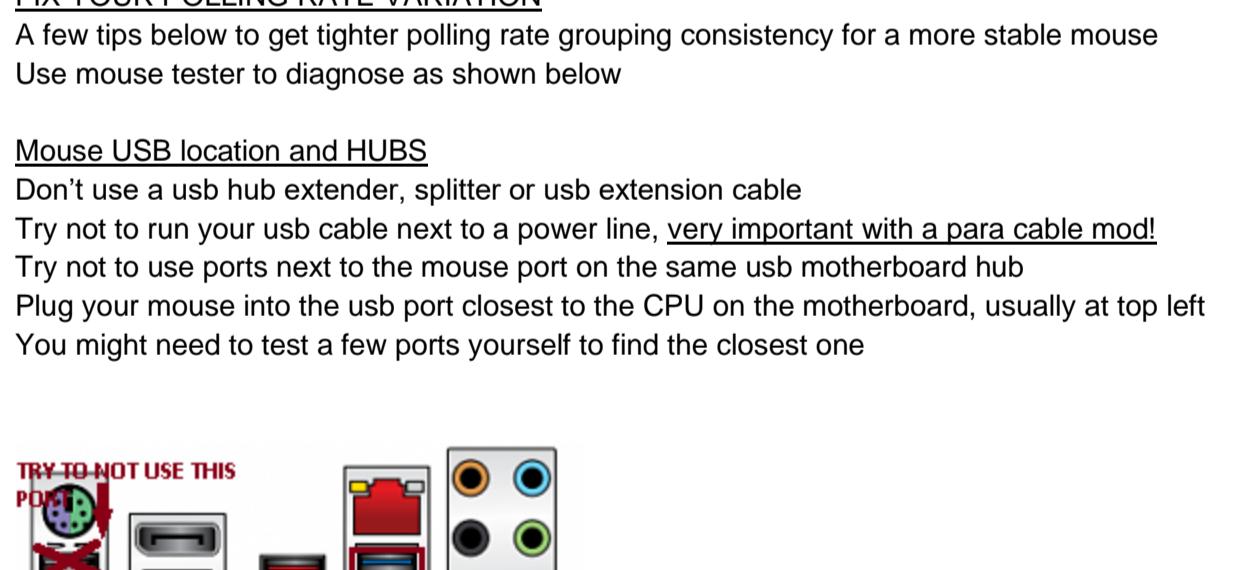
Disable usb power saving as shown in DEVICE MANAGER TWEAKS

Check for acceleration

MouseMovementRecorder.exe - provided in Mouse Fix folder

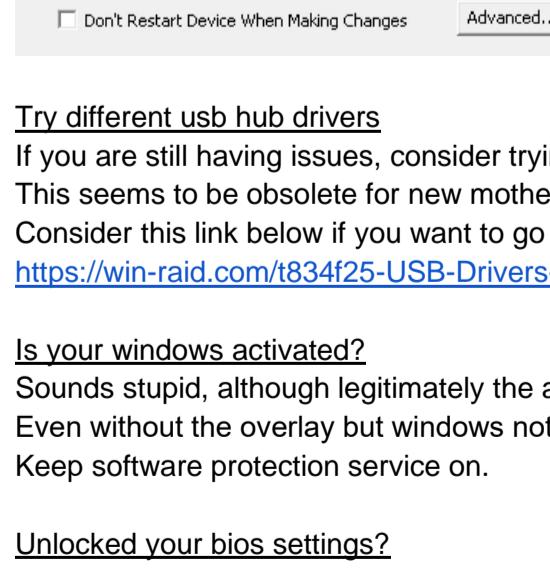
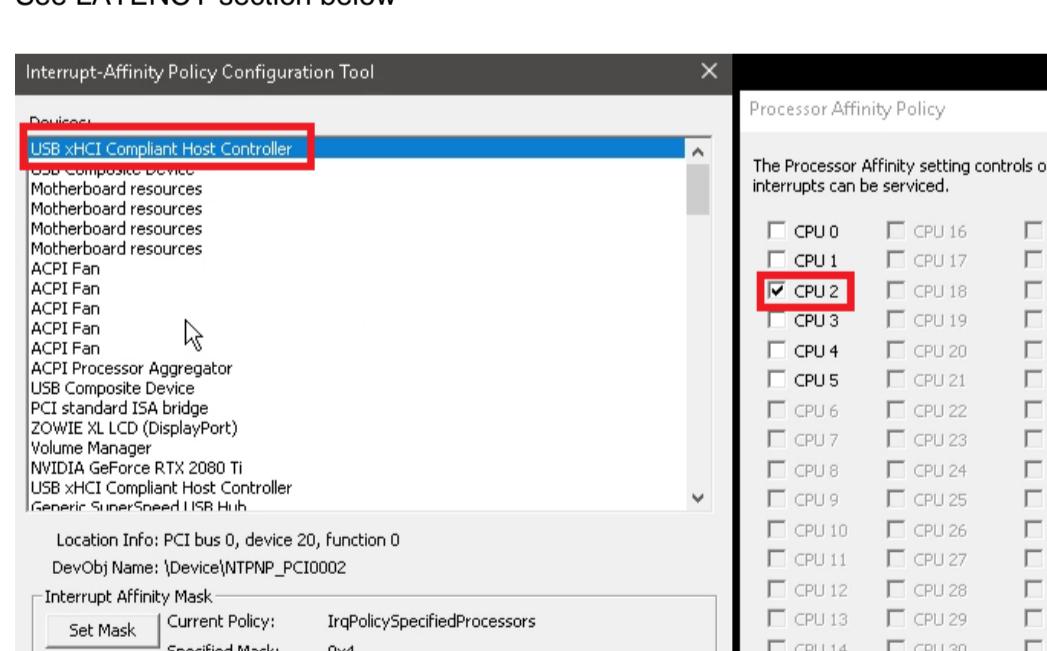
Open mouse movement recorder and check for acceleration

Move the mouse around and make sure MOUSE MOVEMENT + POINTER MOVEMENT match
Do this also with EPP Enhance pointer precision - ON to see if the mouse fix worked



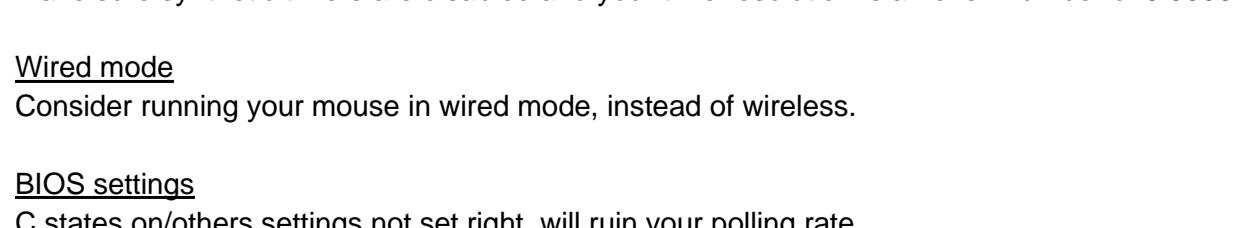
Disable unneeded mouse device functions

Many device functions can be safely disabled with still full function of the device



Setting USB controller affinities

See LATENCY section below



Try different usb hub drivers

If you are still having issues, consider trying different usb drivers.

This seems to be obsolete for new motherboards using Intel® xHCI USB 3.0 eXtensible Host.

Consider this link below if you want to go the extra mile.

<https://win-raid.com/t834f25-USB-Drivers-original-and-modded.html>

Is your windows activated?

Sounds stupid, although legitimately the activate overlay causes buffering and lag issues.

Even without the overlay but windows not activated, I've had issues with latency and polling.

Keep software protection service on.

Unlocked your bios settings?

Wow, nice work taking it to that extra level right! Ehhh, think again!

Guess what disabling "Intel Management Engine Interface" in BIOS did...

Ruined my polling rate grouping, don't disable that in BIOS.

Disabling "Intel Management Engine Interface" in device manager is fine.

Running without the "Intel Management Engine Interface" driver is also fine.

HPET/ Synthetic timer

Make sure HPET is enabled in BIOS and disabled in the OS.

Make sure synthetic timers are disabled and your time resolution is an even number of 0.5000

Wired mode

Consider running your mouse in wired mode, instead of wireless.

BIOS settings

C states on/others settings not set right, will ruin your polling rate.

Power plan & disable idle

Bistum ultimate performance and disabling CPU idle should help.

Clean power

Your house may have a bad earth or bad neutral connection.

This affects everything! Including latency, mouse input and PC performance.

Consider a power conditioner or UPS System that backs up and conditions power.

https://en.m.wikipedia.org/wiki/Power_conditioner

Something I should say

Strangely enough, desktop composition on did not hinder mouse tests.

Consider you might have a bad mouse

Is it time to face reality and buy yourself some decent hardware?

Mouse polling tweak guide

By HAGGARD

<https://overclock.net/forum/375-mice/1550666-usb-polling-precision.html>

MOUSE OVERCLOCKING

Advanced users only!

I don't recommend this for most of you, this only works with certain mice.

Just buy yourself a decent mouse, set it to 1000hz and forget it.

If you have an old mouse or WMO go for it.

Known mice that overclock

Logitech - have never liked overclocking

Old 125hz Mice - will overclock to at least 500hz

Zowie - 1400hz - stable

Razer - 1400hz - stable

Wmo - 2000hz - stable

Wmo - 4000hz - unstable

SweetLow's mouse overclocking guide

<https://overclock.net/forum/375-mice/1589644-usb-mouse-hard-overclocking-2000-hz.html>

Download Mouse Overclock.7z

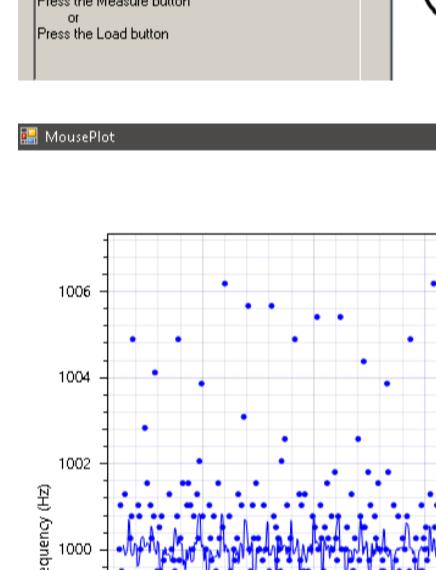
Check my google drive

For a method that works with new windows 10 versions

https://drive.google.com/open?id=1shUe_i2BwbeYO6H1CaES4aNcb4d35bBV

A WMO 1.1a sensor mouse in full force, an ancient legend

```
~ 4398 Hz Off
~ 4158 Hz Off
~ 3976 Hz Off
~ 4045 Hz Off
~ 3994 Hz Off
~ 4918 Hz Off
~ 3956 Hz Off
~ 4927 Hz Off
~ 3989 Hz Off
~ 3997 Hz Off
~ 4006 Hz Off
~ 3975 Hz Off
~ 4013 Hz Off
```



MOUSE TESTING

Check my google drive

Mouse Testing.7z

https://drive.google.com/open?id=1gn1bguCFu9EWL9RcBH3aV_PdRqqHqupU

Programs included

Dimr Mouse Test

Enotus Mouse Test

Input Lag AB

Mouse Movement Recorder

Mouse Rate

Mouse Tester

Reaction

Human Benchmark

Mouse Input Performance Tests

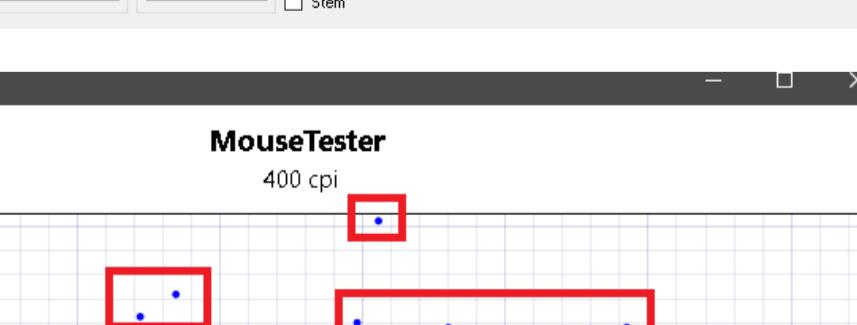
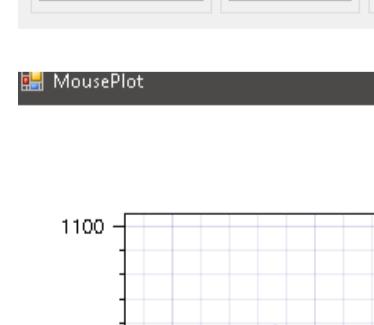
Zowie Benq Mouse Rate Checker

BASIC MOUSE TESTER GUIDE

Use this test after a fresh restart with no programs running.

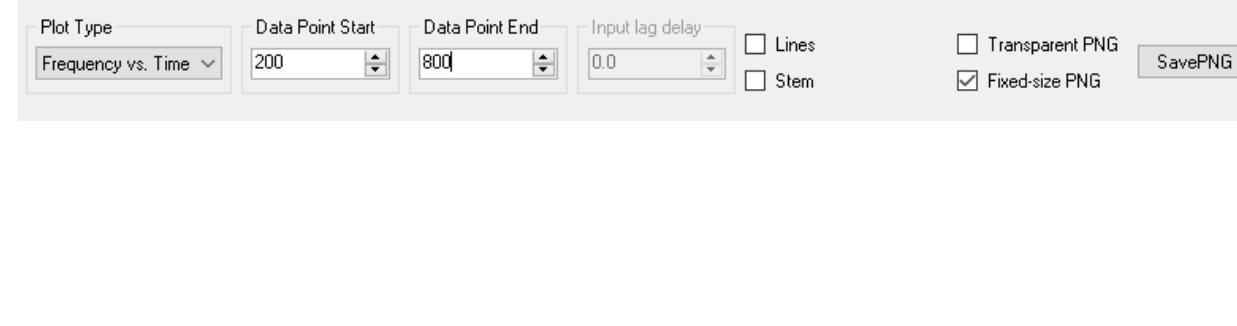
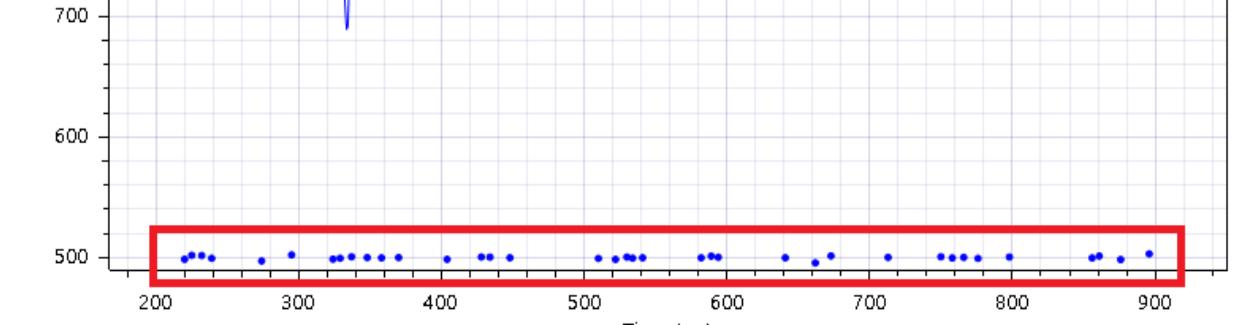
Run this a few times to be sure your input isn't due to human error.

- 1 - Spin that bad boy in desktop, get the sensor going
- 2 - Press f2, keep spinning for say 30 sec and then press f2 again
- 3 - Go to plot
- 4 - Frequency vs Time
- 5 - Clean up your graph
- 6 - Clean up your graph



A logitech wireless mouse going to sleep in full use
Yes the mouse was fully charged and the receiver was right next to it

 MousePlot



FULL MOUSE TESTER GUIDE

Big thanks to Munty for this section

Bellow is a brief explanation of what each plot type does and when to use it:

- x/y Count vs. Time -

This is for checking the raw counts of the mouse. If they are close to the line without much deviation it means that the mouse does not lose tracking. The opposite will happen for a mouse with low IPS (more about this later on) where you will see erratic deviation.

- Velocity vs. Time -

This calculates the velocity of the movement based on the time interval between updates, cpi and counts. By using fast swipes you can try to test the malfunction speed of your mouse. Just like x/yCount vs. Time going erratic, when the tracking is lost the velocity goes erratic as well.

- Interval vs. Time -

This is for checking the consistency of the update rate from the mouse (i.e. 1000hz mouse updates every 1 ms). The closer is the graph to 1 (1000hz), 2 (500hz) or 8 (125hz) the better.

- Frequency vs. Time -

This is for checking how stable and consistent the polling rate it is.

Using a lower hz will greatly improve the stability of your mouse.

- x/y Sum vs. Time -

This is useful for measuring acceleration.

Should be ignored as most mice no longer suffer from accel.

- X vs. Y -

This is just plotting the data that you collected as a path. Can be used to test the accuracy of the sensor by starting from a point "A" and returning back to it at different velocities. You should see the path that you moved the mouse along with the start and end points being roughly the same.

MICE CHARACTERISTICS

Mice have certain characteristics that can be classified using the following terms:

1. Tracking Speed:

Known as IPS (inches/second) is basically the maximum velocity the mouse can achieve before it either stops tracking or introduces acceleration to account for the lack of IPS. This can be tested by moving the mouse very quickly from one side to the other. Check the velocity plot for it.

2. Acceleration:

Can be either positive or negative. Test your mouse acceleration or lack thereof by moving it faster in one direction and returning it slower to the original position. Check the X vs. Y plot for it.

3. Jitter:

Moving the mouse in a relatively straight line results in an inconsistent (staircase like) movement. Do a slowly diagonal motion and check the X vs. Y plot - it should look uninterrupted.

4. Angle Snapping/Prediction/Drift Control:

This one has been called a few things but in general it is the mouse reporting straight lines when slight angles or curves are made. Draw a circle and check the X vs. Y plot for it.

5. Excessive Anti-Jitter:

Moving the mouse slightly or very slowly from a standstill may result in delay or no movement registration. Move the mouse very slowly and see what the counts reports look like.

6. Polling rate Consistency:

Move the mouse and see if the report rate is consistent at the supposed setting (125, 500, 1000hz). Check the Interval vs. Time for it. It should be a relatively straight line at the desired report rate.

7. Interpolation/Frame skipping:

Scaling the counts (cpi/dpi) from a mouse to one that's not native to the sensor. Basically if your mouse had interpolation it would try to guess values and it could cause the mouse to skip frames. However most mice are "interpolation-free" no need to bother with it (can't quite be tested either).

8. Measuring CPI:

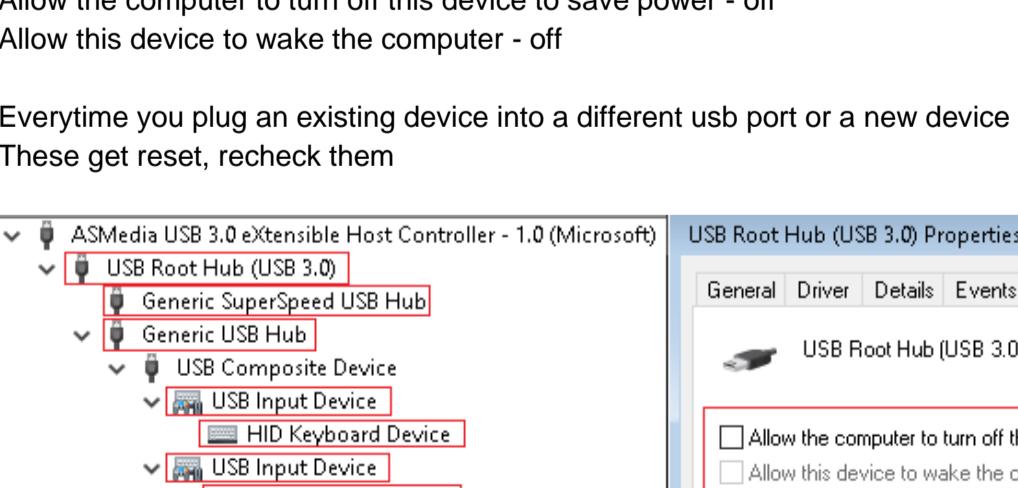
400 CPI/DPI isn't necessarily 400 CPI due to manufacturing tolerance, sensor implementation and other factors. That said the CPI you set might not be the same. For instance Logitech's new sensor (Hero) is off by about 50 CPI at the 800step or as much as 200 at 3200. You can test it to a degree on this website
<https://www.mouse-sensitivity.com/dpianalyzer/>

9. Smoothing/ Frame-induced delay:

There's a lot of information that can be discussed about this subject, but to keep things simple use 400 or 800 CPI as usually that's the "native resolution" of the sensor. Going beyond 1600 CPI on most sensors will result in x amount of smoothed frames, hero sensor however supposedly doesn't have any. More about this can be read here -

<https://overclock.net/forum/375-mice/1561041-reverse-engineering-3366-a-11.html>

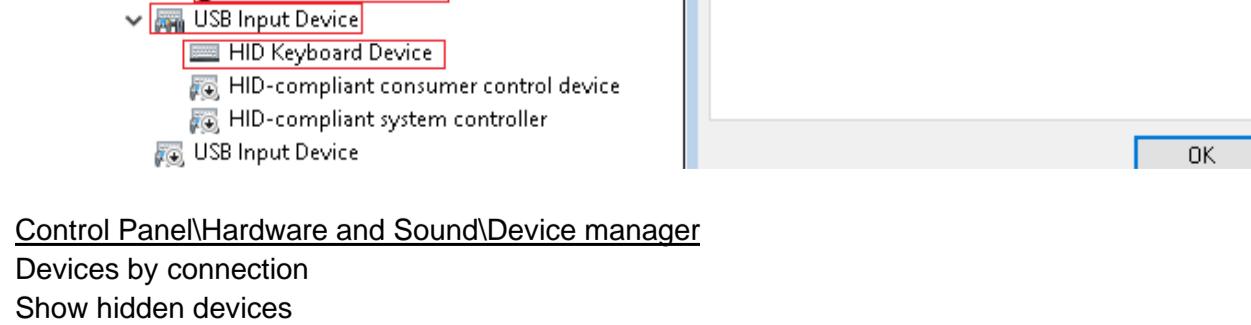
This is what you would call perfection



Key/Mouse Latency Tester

<https://bloody.com/en/download.php>

Test the click delay difference between 2 mice



DEVICE MANAGER TWEAKS

Control Panel\Hardware and Sound\Device manager

Devices by connection

In devices trees below (open all trees)

View Help

Devices by type

Devices by connection

Devices by container

Resources by type

Resources by connection

Show hidden devices

Customize...

Disable all usb power saving features for

-USB Root Hubs

-Generic SuperSpeed USB Hubs

-Generic USB Hubs

-USB Input Devices

-HID Keyboard Devices

Right click

Properties

Power Management

Allow the computer to turn off this device to save power - off

Allow this device to wake the computer - off

Everytime you plug an existing device into a different usb port or a new device into a usb port These get reset, recheck them

DISABLE POWER SAVING

FOR ALL DEVICES

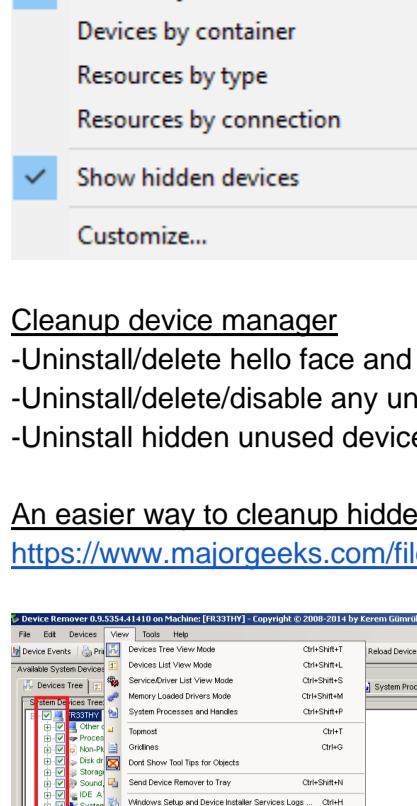
OK

Control Panel\Hardware and Sound\Device manager

Devices by connection

Show hidden devices

In devices trees below (open all trees)

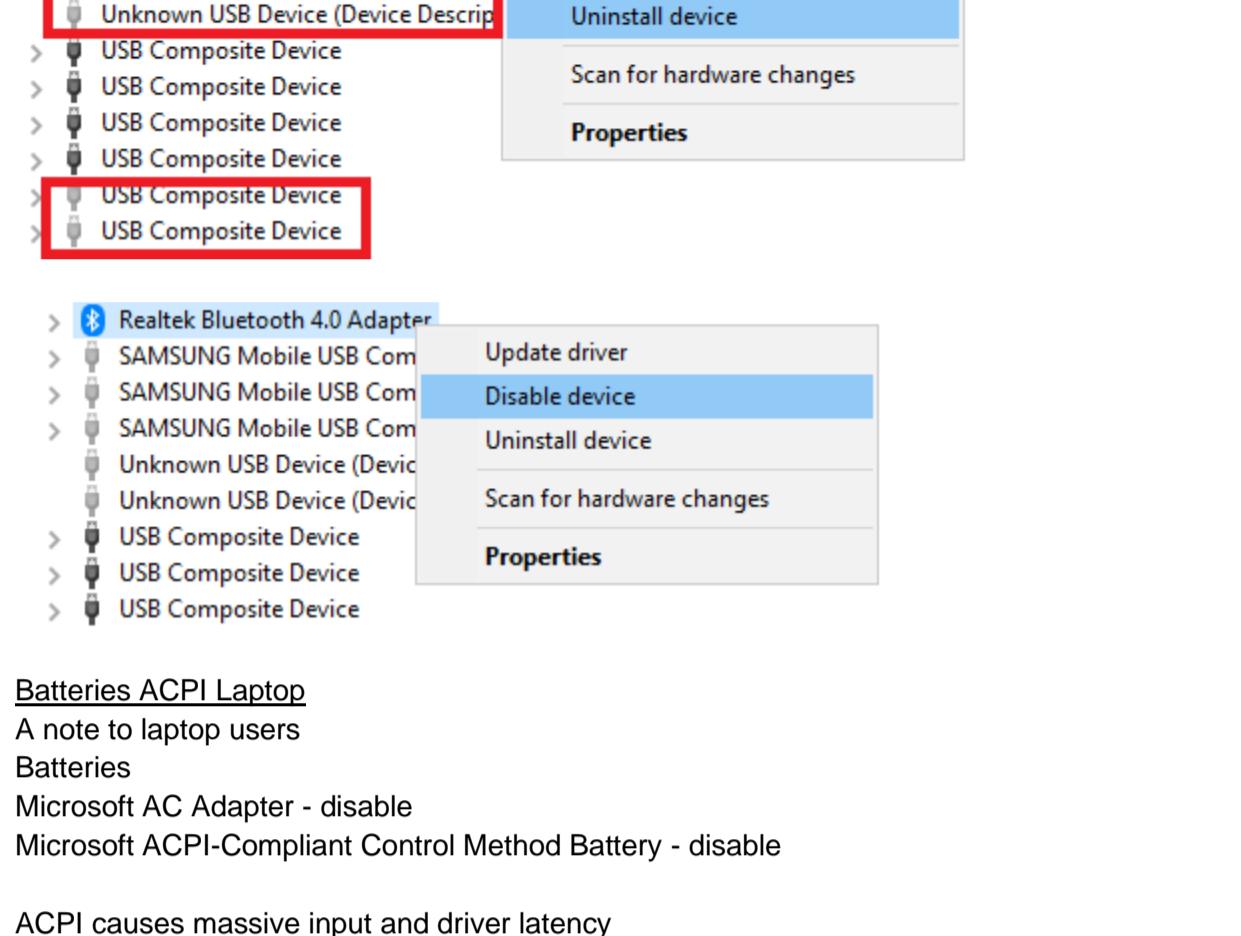


Cleanup device manager

- Uninstall/delete hello face and driver
- Uninstall/delete/disable any unused/unwanted device
- Uninstall hidden unused devices (these are the transparent ones)

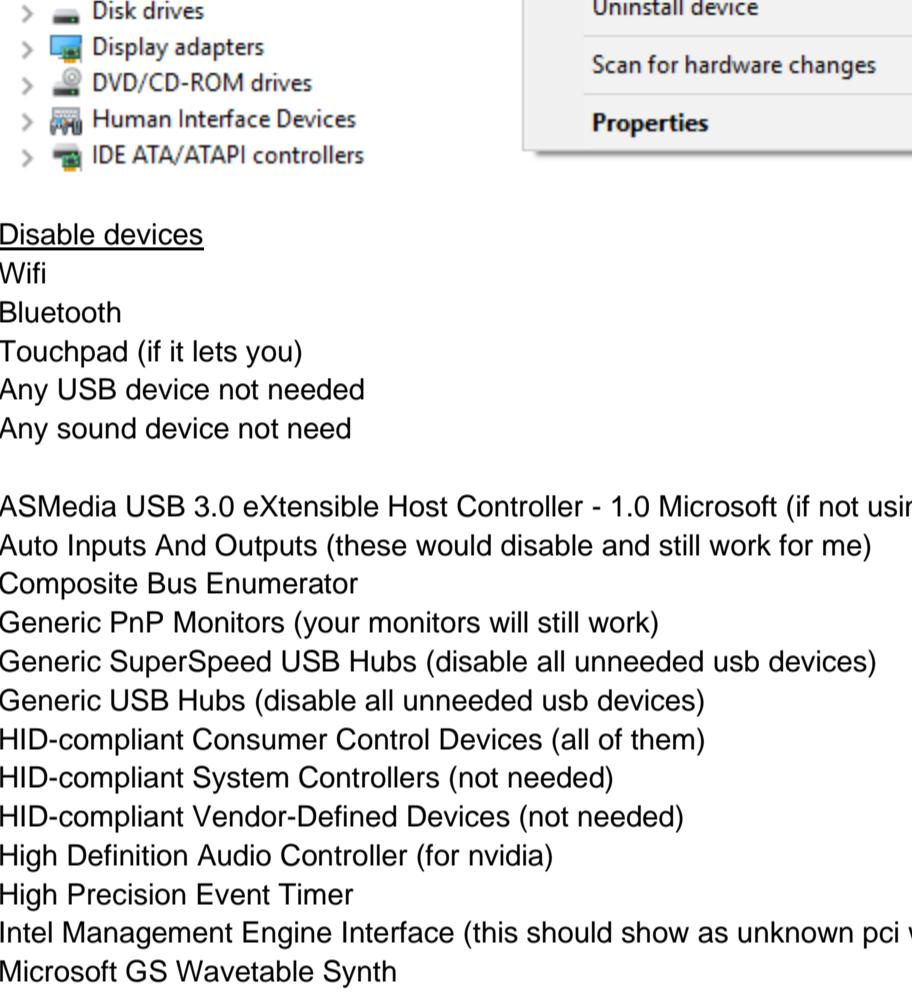
An easier way to cleanup hidden devices in device manager - device remover

https://www.majorgeeks.com/files/details/device_remover_543c.html



Some devices may reappear after a restart, these will have to be disabled

Ideally disable unwanted functions in your bios first, although your bios options may be limited
When disabled in bios if in use beforehand, the device will turn transparent and hidden



Batteries ACPI Laptop

A note to laptop users

Batteries

Microsoft AC Adapter - disable

Microsoft ACPI-Compliant Control Method Battery - disable

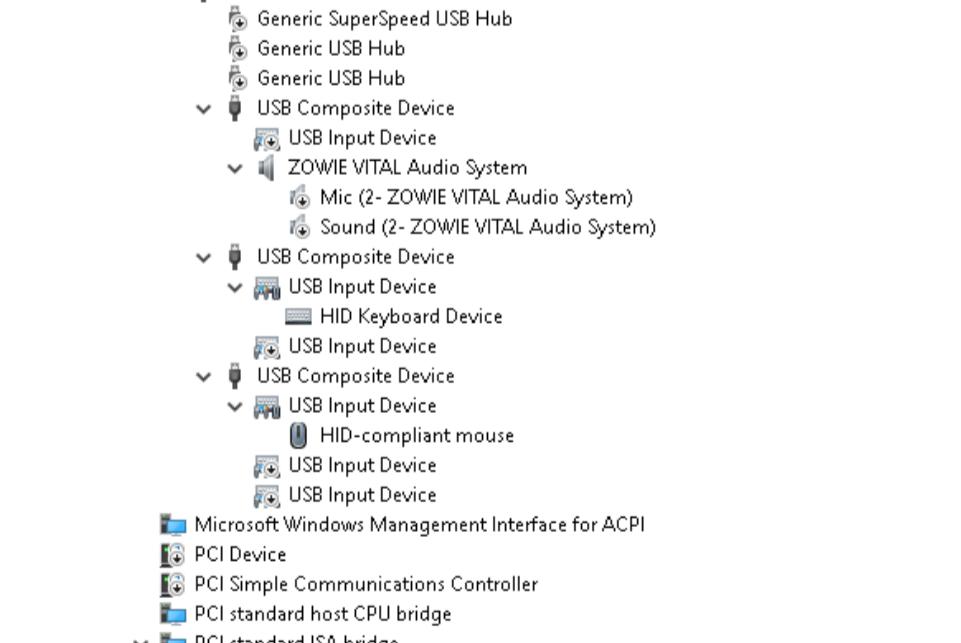
ACPI causes massive input and driver latency

There is no way to uninstall or remove it nor another work around, disable it

If you have an nvidia GPU "Microsoft ACPI-Compliant Control Method Battery"

May have to be re enabled before a restart or shutdown

As if this is disabled, the pc wont recognize your graphics card on boot



Disable devices

Wifi

Bluetooth

Touchpad (if it lets you)

Any USB device not needed

Any sound device not need

ASMedia USB 3.0 eXtensible Host Controller - 1.0 Microsoft (if not using)

Auto Inputs And Outputs (these would disable and still work for me)

Composite Bus Enumerator

Generic PnP Monitors (your monitors will still work)

Generic SuperSpeed USB Hubs (disable all unneeded usb devices)

Generic USB Hubs (disable all unneeded usb devices)

HID-compliant Consumer Control Devices (all of them)

HID-compliant System Controllers (not needed)

HID-compliant Vendor-Defined Devices (not needed)

High Definition Audio Controller (for nvidia)

High Precision Event Timer

Intel Management Engine Interface (this should show as unknown pci with no driver)

Microsoft GS Wavetable Synth

Microsoft System Management BIOS Driver

Microsoft Virtual Drive Enumerator

NDIS Virtual Network Adapter Enumerator

Plug and Play Software Device Enumerator

Remote Desktop Device Redirector Bus

UMBus Root Bus Enumerator

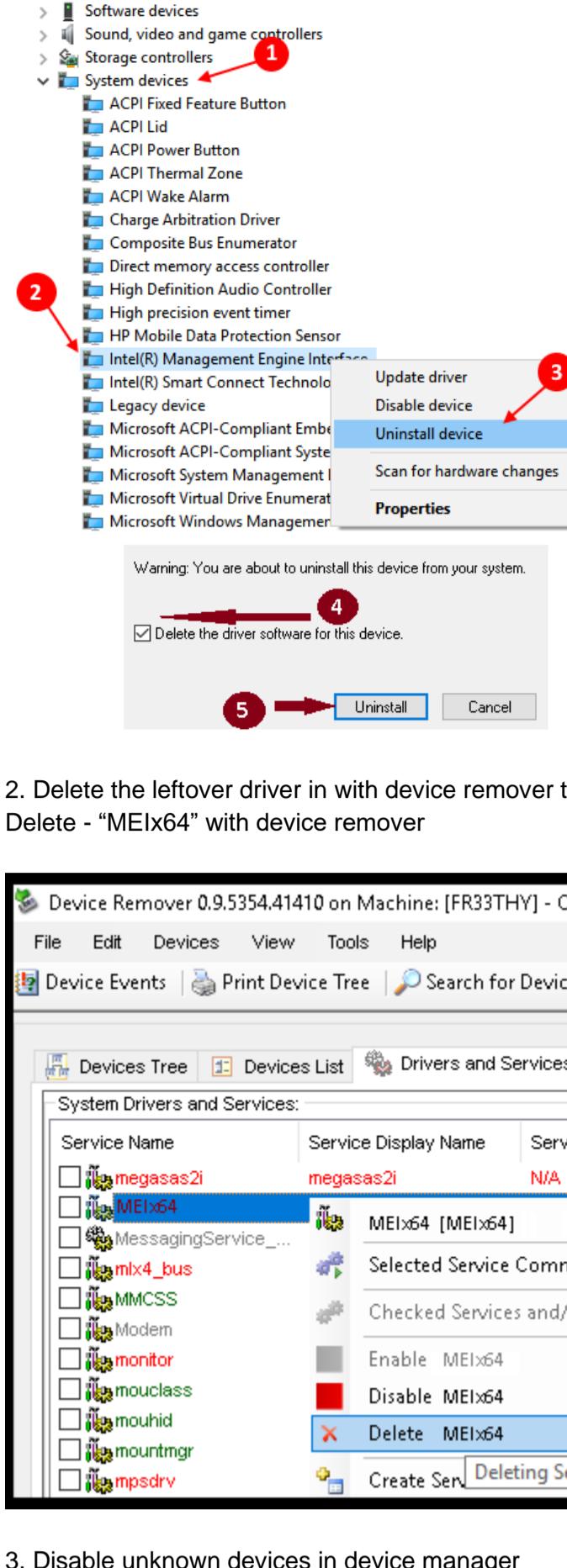
Intel(R) Management Engine Interface

This is an evil spyware feature from Intel built in your CPU

If IME was installed previously, or somehow reinstalled with a driver update or windows update

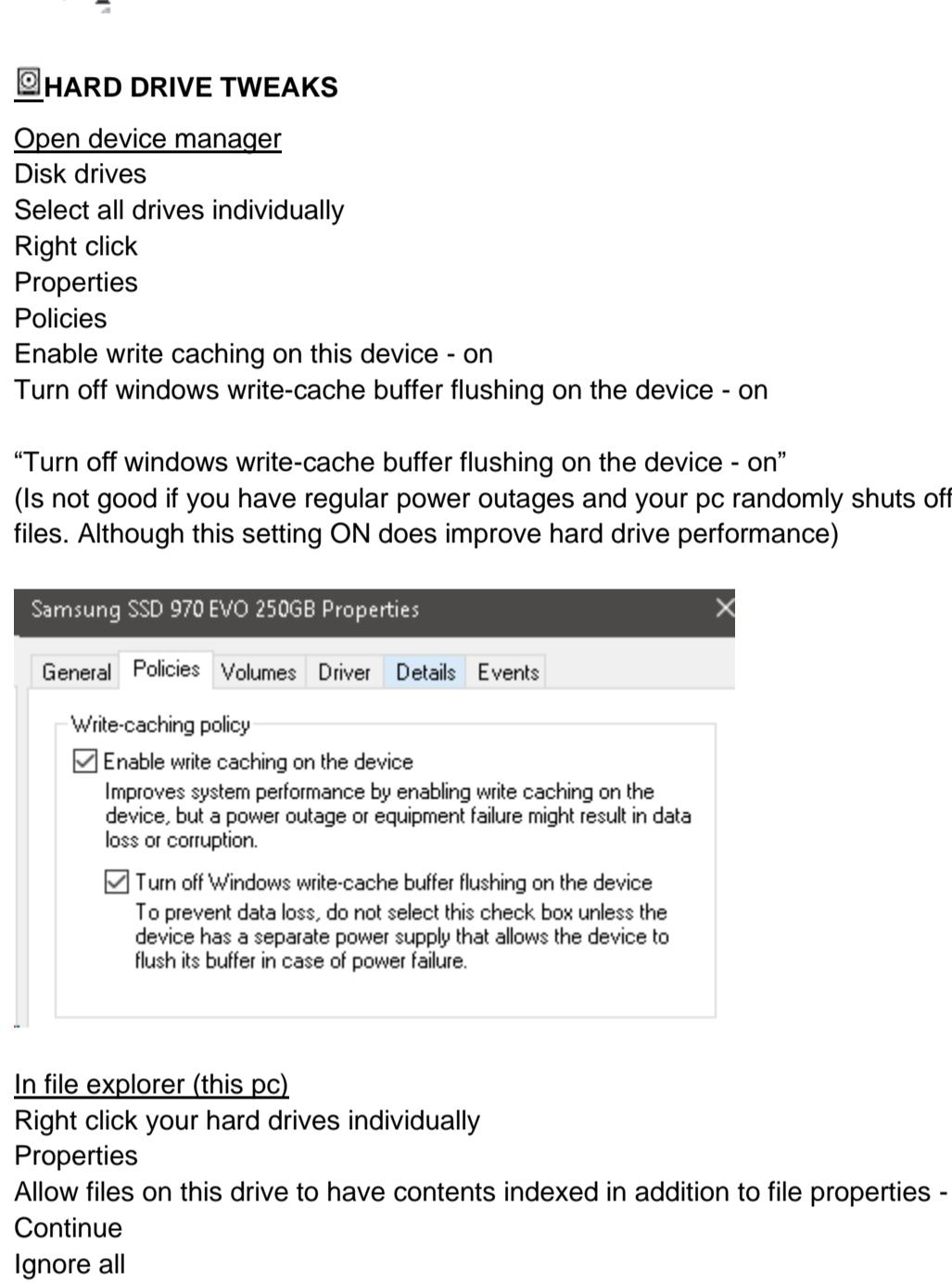
Or you are following this guide without a fresh install

1. Uninstall from device manager



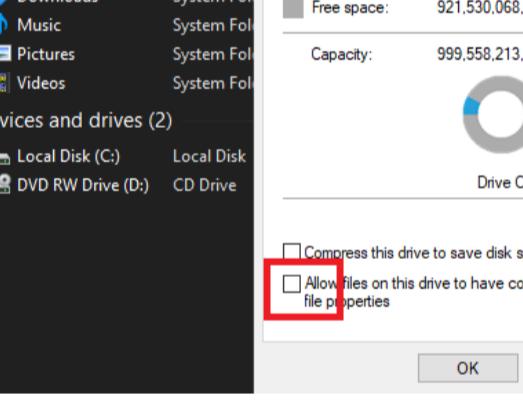
2. Delete the leftover driver in with device remover then restart

Delete - "MEIx64" with device remover



3. Disable unknown devices in device manager

PCI Simple Communications Controller = Intel(R) Management Engine Interface



HARD DRIVE TWEAKS

Open device manager

Disk drives

Select all drives individually

Right click

Properties

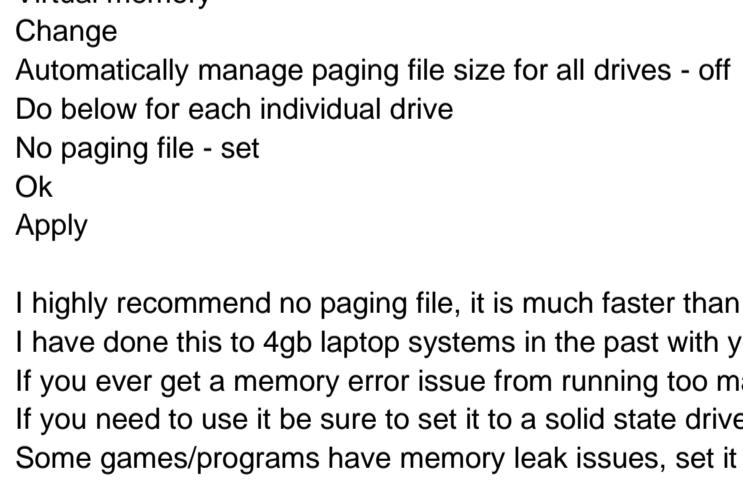
Policies

Enable write caching on this device - on

Turn off windows write-cache buffer flushing on the device - on

"Turn off windows write-cache buffer flushing on the device - on"

(Is not good if you have regular power outages and your pc randomly shuts off, it could damage files. Although this setting ON does improve hard drive performance)



In file explorer (this pc)

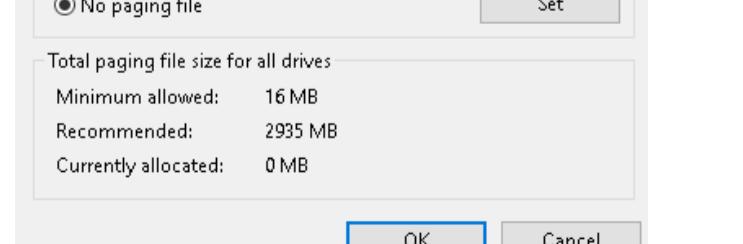
Right click your hard drives individually

Properties

Allow files on this drive to have contents indexed in addition to file properties - off

Continue

Ignore all



Right click your recycle bin

Properties

Select your hard drives individually

Custom size - 1000

Apply



Disable page filing

Control Panel\System and Security\System

Advanced system settings

Advanced

Performance

Settings

Advanced

Virtual memory

Change

Automatically manage paging file size for all drives - off

Do below for each individual drive

No paging file - set

Ok

Apply

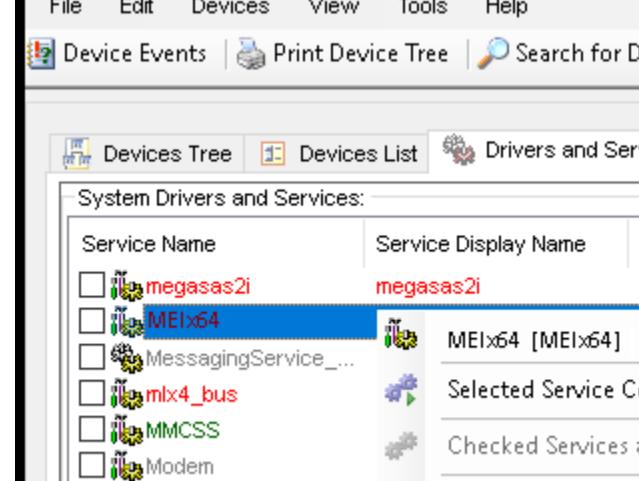
I highly recommend no paging file, it is much faster than using your hard drive for ram

I have done this to 4gb laptop systems in the past with years of use and no issues

If you ever get a memory error issue from running too many programs turn it back on

If you need to use it be sure to set it to a solid state drive

Some games/programs have memory leak issues, set it on to your ssd if you get errors/crashes



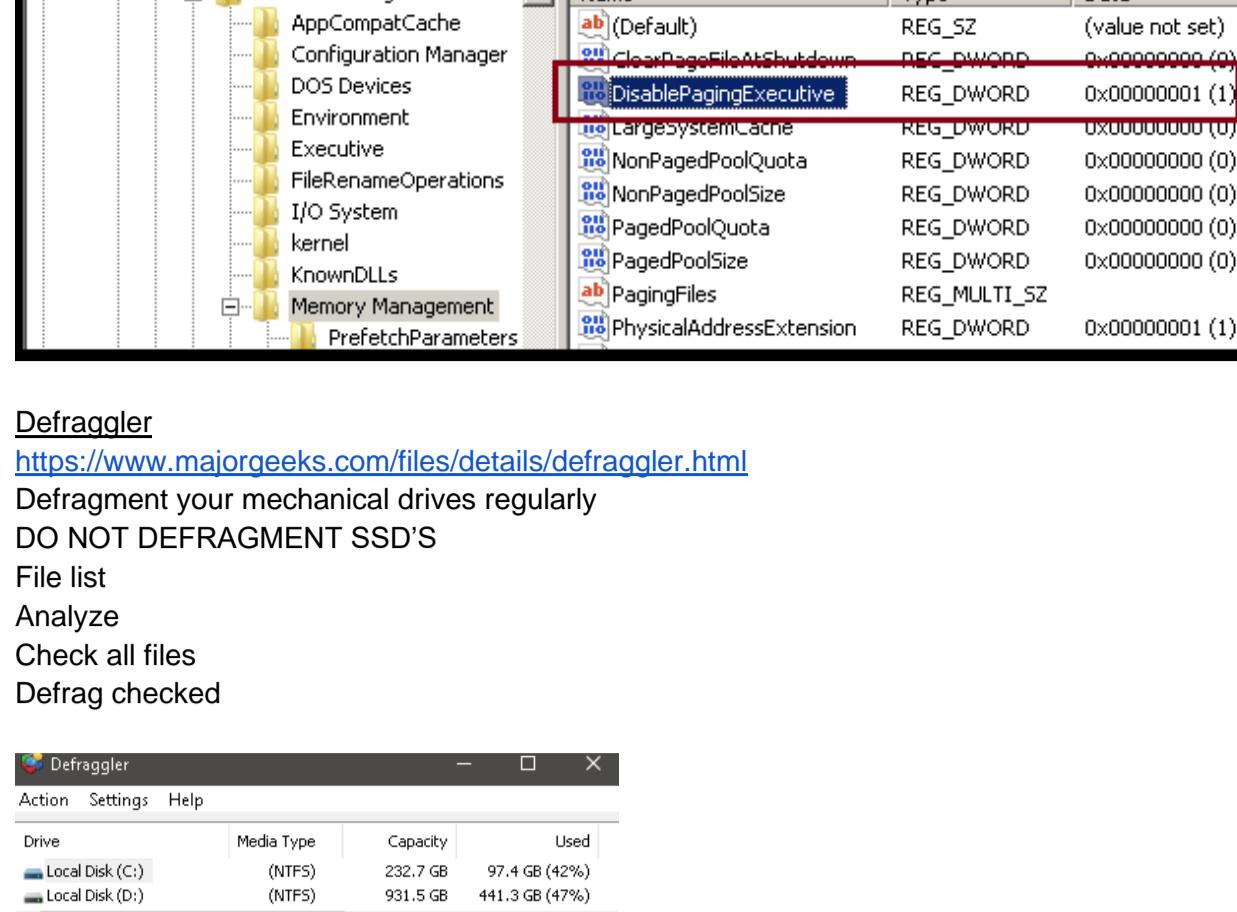
Disable Paging Executive

Keep the most important files, such as the kernel in system memory for faster loading.

I am unsure if this tweak works or has any benefit.

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

DisablePagingExecutive=1



Defraggler

<https://www.majorgeeks.com/files/details/defraggler.html>

Defragment your mechanical drives regularly

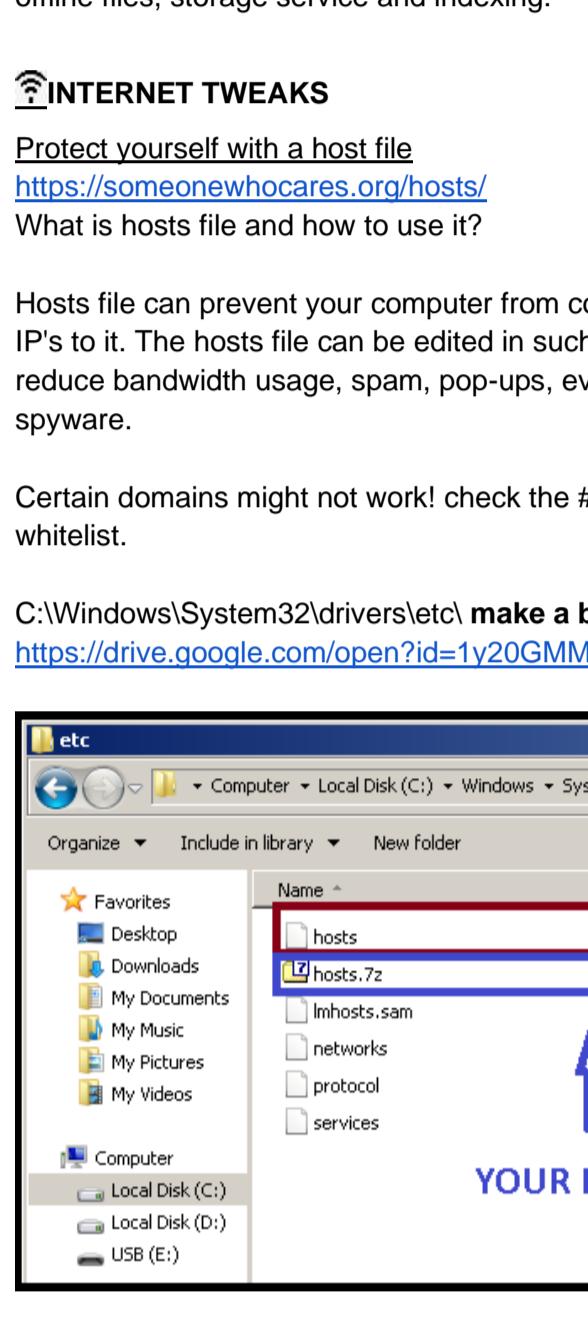
DO NOT DEFRAAGMENT SSD'S

File list

Analyze

Check all files

Defrag checked



Regarding hard drive performance

Services disabled & registry tweaks applied above in this guide already, helps HD performance. These are things such as disabling superfetch(sysmain), windows search, file history service, offline files, storage service and indexing.

INTERNET TWEAKS

Protect yourself with a host file

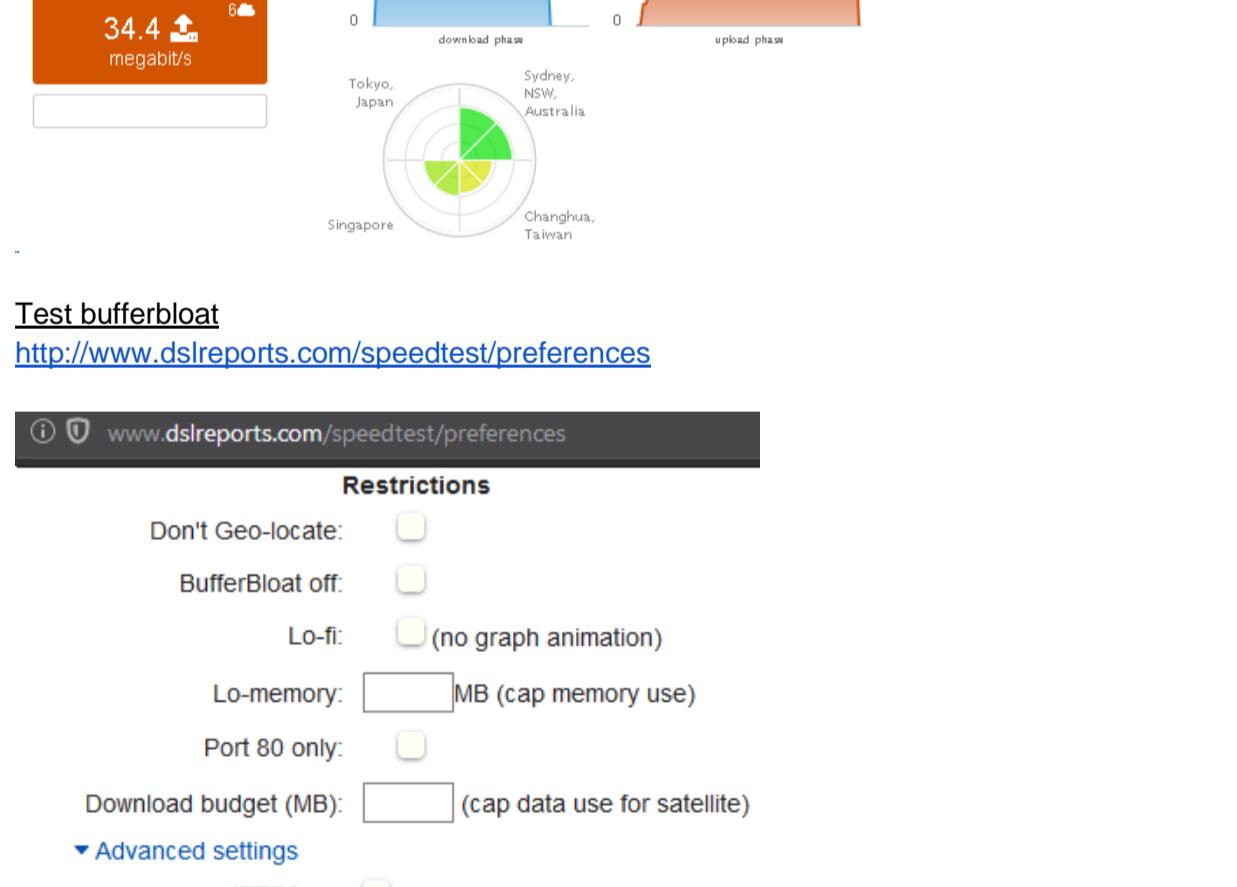
<https://someonewhocares.org/hosts/>

What is hosts file and how to use it?

Hosts file can prevent your computer from connecting to certain internet hosts by adding their IP's to it. The hosts file can be edited in such a way that you will be able to block telemetry, reduce bandwidth usage, spam, pop-ups, even grant you protection from many types of spyware.

Certain domains might not work! check the # -comments to choose what hosts you would like to whitelist.

C:\Windows\System32\drivers\etc\ make a back-up and replace it with the one provided
https://drive.google.com/open?id=1y20GMMg_uyXvusMFYaHkEtpuoM9Y-ExP



Philip's Internet tweak guides from speedguide

<https://speedguide.net/articles/gaming-tweaks-5812>

<https://speedguide.net/articles/wireless-network-speed-tweaks-5681>

<https://speedguide.net/articles/windows-8-10-2012-server-tcpip-tweaks-5077>

<https://speedguide.net/articles/windows-10-anniversary-updates-to-tcp-6266>

Always use an ethernet cable

Disable wifi and other devices when you want to play to win

Update your router firmware

Get your ISP to reset your port regularly

Get your ISP to switch your line to fastpath

Aftermarket routers can be better in most cases (can lower buffer bloat)

Some of these tweaks below will need to be set separately for each network card

(As an example your ethernet card and your wifi card)

Do your own testing

-Without any other devices connected or wifi on

-Preferably when your internet line isn't congested in your street/neighbourhood

Test ping to your DNS server

In cmd

Ping 1.1.1.1

OR make a shortcut

C:\Windows\System32\cmd.exe /k ping 1.1.1.1

Test speed

<https://speedtest.net/>

<http://dsreports.com/speedtest>

BEST bufferbloat

<http://www.dsreports.com/speedtest/preferences>

QOS quality of service

Quality of service "on" in the router is highly recommended to keep bufferbloat down. Limiting you download and upload speed in the router can help also

A low/stable bufferbloat will help with your hit registration and input in online games

Router modem settings

I highly recommend an aftermarket router compared to the ISP's provided one if viable.

If you really want to get your bufferbloat low and play with custom bioses for routers, here are some links below. There is always a risk for flashing bioses, things can be tricky.

<https://openwrt.org/>

<https://openwrt.org/toh/start>

<https://openwrt.org/docs/guide-user/network/traffic-shaping/sqm>

BEST HUAWEI HG659 AS AN EXAMPLE OR GUIDE

Below are my settings for my ISP provided router

Access by

<http://192.168.1.1/>

In a web browser

Internet

Internet settings

Delete all WAN connections apart from

INTERNET_TR069_VDSL_VID_100

INTERNET TR069_VDSL VID_100

Enable connection - on

Name - internet

Service type - internet

Connection type - ip routing PPP

MRU - 1492 (find your MTU from your ISP and set it right, same as for windows below)

MSS - 0

NAT type - full cone nat

DSL mode - vdsL2

Enable vlan - on

Vlan id - 100

802.1p - 0

PPP authentication mode - pap

PPP trigger mode - always online
Internet account - get from internet provider
Internet password - get from internet provider
PPP service name - dodo
IP protocol version - ipv4
Static DNS - on
IPv4 primary DNS server - 1.1.1.1
Pv4 secondary DNS server - 1.0.0.1

I highly recommend 1.1.1.1

<https://1.1.1.1/>

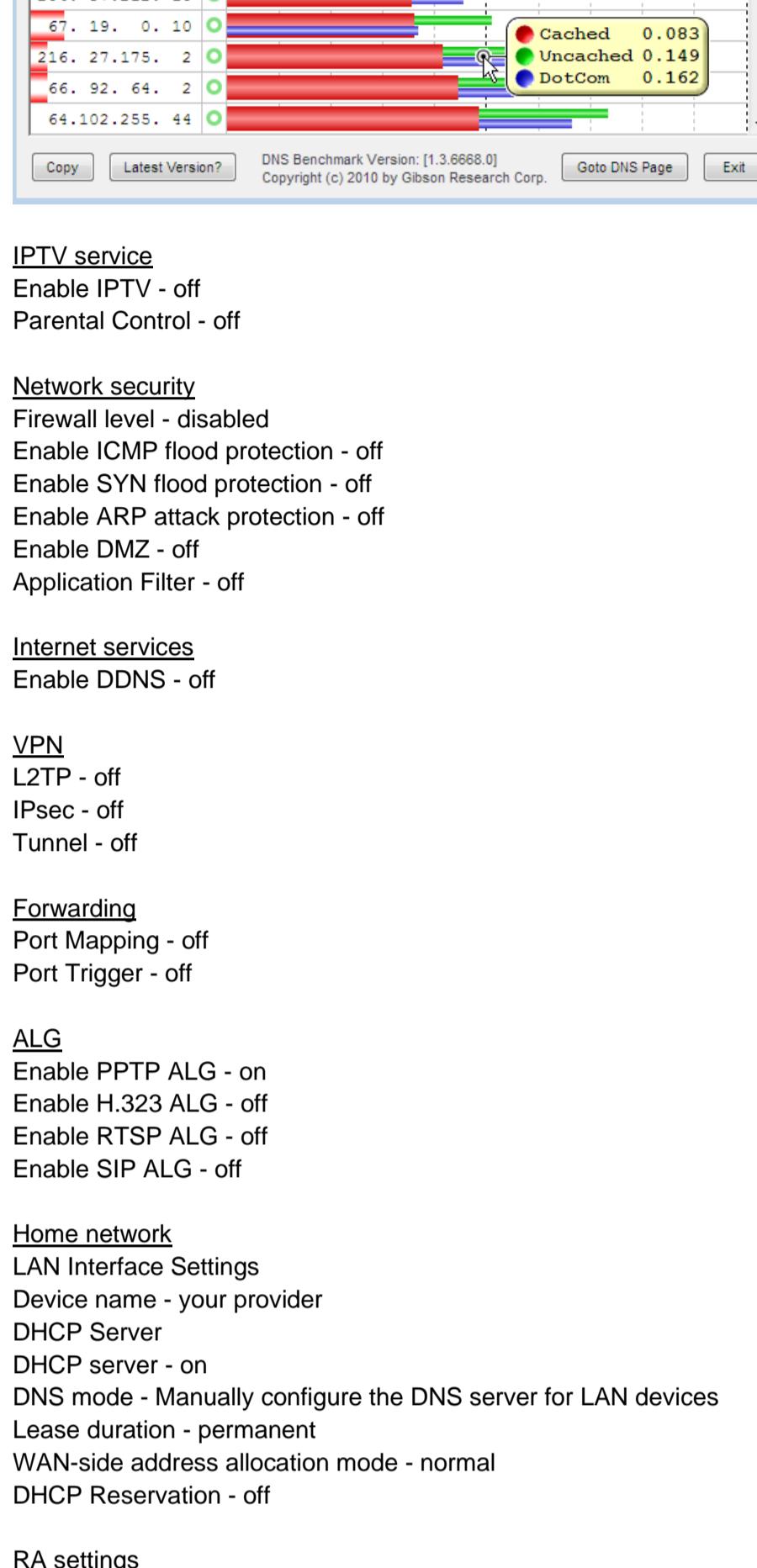
It is the fastest DNS and has the least amount of telemetry

DNS Benchmark

Test for yourself with dns bench to find the fastest DNS for you

<https://grc.com/dns/benchmark.htm>

This will help web pages load faster



IPTV service

Enable IPTV - off

Parental Control - off

Network security

Firewall level - disabled

Enable ICMP flood protection - off

Enable SYN flood protection - off

Enable ARP attack protection - off

Enable DMZ - off

Application Filter - off

Internet services

Enable DDNS - off

VPN

L2TP - off

IPsec - off

Tunnel - off

Forwarding

Port Mapping - off

Port Trigger - off

ALG

Enable PPTP ALG - on

Enable H.323 ALG - off

Enable RTSP ALG - off

Enable SIP ALG - off

Home network

LAN Interface Settings

Device name - your provider

DHCP Server

DHCP server - on

DNS mode - Manually configure the DNS server for LAN devices

Lease duration - permanent

WAN-side address allocation mode - normal

DHCP Reservation - off

RA settings

Enable RA - off

IPv6 DHCP Server

IPv6 DHCP server - off

UPnP

Enable UPnP - off

WLAN Settings

(Off if using external router for higher wifi speeds)

Basic Settings

Enable WLAN 2.4 GHz - off

Enable WLAN 5 GHz - on

Enable maximum power - on

WLAN Encryption

SSID - internet

Enable SSID - on

Security mode - WPA2-PSK

WPA encryption mode - AES

WPA pre-shared key - (choose yourself)

Advanced Settings

Transmit power (percentage) - 100%

Enable AP isolation - off

Hide broadcast - off

Transmission mode - - 802.11a/n/ac

Enable WMM (QoS) - off

11n/ac MCS - auto

11n/ac bandwidth - 80mhz

11n/ac guard interval - long

WLAN Access

WLAN WPS

Enable WPS - off

WLAN Access rules

Allow all devices in the WLAN

Guest Network - off

Storage Sharing

Service settings

Enable SAMBA - off

Enable FTP - off

User settings - off

FTP anonymous users

Enable anonymous users - off

Multimedia Sharing

Enable DMS - off

Telephony

All off

Maintain

System Logs

Enable log - off

Disable network data usage monitoring driver service

Possible memory leak fix

Usage will not show in task manager

In regedit

HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Services\Ndu

Start=4

Registry Editor

File Edit View Favorites Help

Computer\HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Services\Ndu

	Name	Type	Data
> ndiswanlegacy	(Default)	REG_SZ	(value not set)
> ndproxy	DependOnService	REG_MULTI_SZ	tcpip
> Ndu	Description	REG_SZ	@%SystemRoot%\
> NetAdapterCx	DisplayName	REG_SZ	@%SystemRoot%\
> NetBIOS	ErrorControl	REG_DWORD	0x00000001 (1)
> NetbiosSmb	ImagePath	REG_EXPAND_SZ	system32\drivers\
> NetBT	Start	REG_DWORD	0x00000004 (4)
> Netlogon	Type	REG_DWORD	0x00000001 (1)
> Netman			
> netprof			
> NetSetupSvc			

Network cmd settings

In cmd

netsh int tcp set global rss=disabled

netsh int tcp set global rss=enabled (if using checksum offloading)

netsh int tcp set global chimney=disabled

(removed from 1809+)

netsh int tcp set global autotuning=disabled

netsh int tcp set global autotuning=normal (for internet speeds above 100mbps)

netsh int tcp set supplemental Internet congestionprovider=CTCP

netsh int tcp set global ecncapability=disabled

(enable if you have bad packet loss)

```
netsh int tcp set global timestamps=disabled  
netsh int tcp set global initialRto=2000  
netsh int tcp set global rsc=disabled  
netsh int tcp set global nonsackrttressilency=disabled  
netsh int tcp set global maxsynretransmissions=2  
netsh int tcp set global fastopen=enabled  
netsh int tcp set global fastopenfallback=enabled  
netsh int tcp set global hystart=enabled  
(new to 1809 enabled by default needs testing has nothing to do with gaming leave enabled)  
netsh int tcp set global pacingprofile=off
```

```
Administrator: C:\Windows\system32\cmd.exe  
Microsoft Windows [Version 10.0.16299.15]  
(c) 2017 Microsoft Corporation. All rights reserved.  
C:\Users\FR33THY>netsh int tcp set global rss=disabled  
Ok.  
C:\Users\FR33THY>
```

Set CTCP

As above does not work for some systems

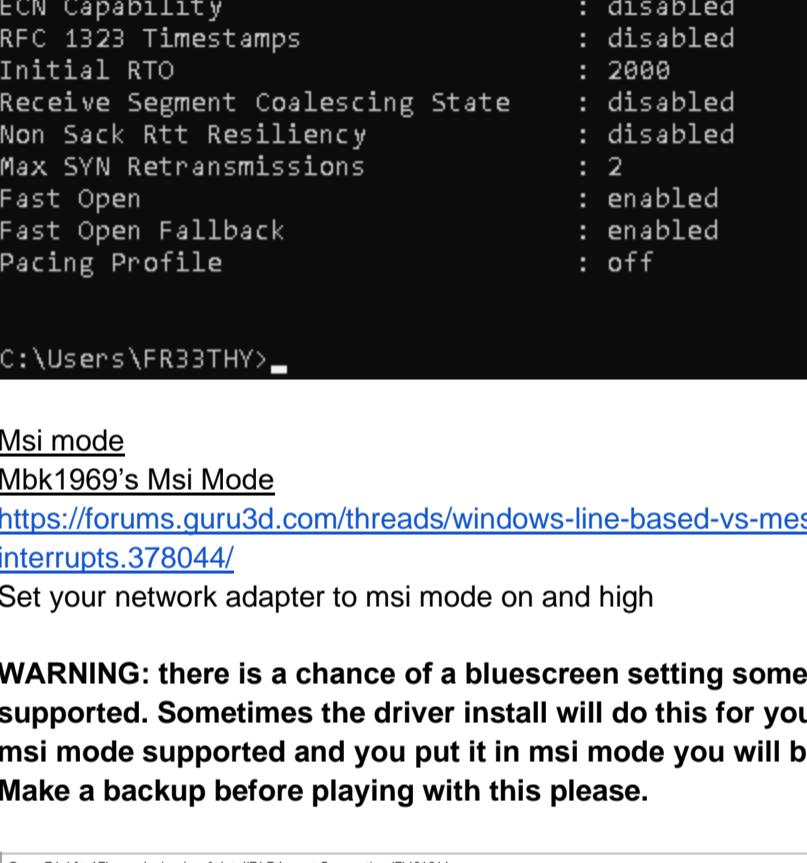
Run CTCP.reg file

Check my google drive

<https://drive.google.com/open?id=1wIQPTph3jrBWAofOLKWmXHc2D4U> -fHw

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Nsi\{eb004a03-9b1a-11d4-  
9123-0050047759bc}\0]  
"0200"=hex:00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\  
00,00,00,00,00,02,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\  
00,00,ff,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\  
ff,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00  
"1700"=hex:00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\  
00,00,00,00,00,02,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,\  
00,00,ff,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00  
ff,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00
```

Restart



Check cmd settings

In cmd

netsh int tcp show global

Check settings below

Receive-Side Scaling State - disabled

Receive-Side Scaling State - enabled (if using checksum offloading)

Chimney Offload State - disabled

Receive Window Auto-Tuning Level - disabled

Receive Window Auto-Tuning Level - manual (for internet speeds above 100mbps)

Add-On Congestion Control Provider - ctcp

ECN Capability - disabled

RFC 1323 Timestamps - disabled

Initial RTO - 2000

Receive Segment Coalescing State - disabled

Non Sack Rtt Resiliency - disabled

Max SYN Retransmissions - 2

Fast Open - enabled

Fast Open Fallback - enabled

Hystart - enabled

Pacing Profile - off

```
Administrator: C:\Windows\system32\cmd.exe  
Microsoft Windows [Version 10.0.16299.15]  
(c) 2017 Microsoft Corporation. All rights reserved.  
C:\Users\FR33THY>netsh int tcp show global  
Querying active state...
```

TCP Global Parameters

```
-----  
Receive-Side Scaling State : disabled  
Chimney Offload State : disabled  
Receive Window Auto-Tuning Level : disabled  
Add-On Congestion Control Provider : ctcp  
ECN Capability : disabled  
RFC 1323 Timestamps : disabled  
Initial RTO : 2000  
Receive Segment Coalescing State : disabled  
Non Sack Rtt Resiliency : disabled  
Max SYN Retransmissions : 2  
Fast Open : enabled  
Fast Open Fallback : enabled  
Pacing Profile : off
```

```
C:\Users\FR33THY>
```

Msi mode

Mbk1969's Msi Mode

<https://forums.guru3d.com/threads/windows-line-based-vs-message-signaled-based-interrupts.378044/>

Set your network adapter to msi mode on and high

WARNING: there is a chance of a bluescreen setting something in msi mode if it's not supported. Sometimes the driver install will do this for you. If the windows driver is not msi mode supported and you put it in msi mode you will bluescreen. It's trial and error. Make a backup before playing with this please.

```
@oem7.inf%e15bcnc.devcid%Intel(R) Ethernet Connection (7)I219-V
```

Device manager

Power management

Network adapter

Allow the computer to turn off this device to save power - off

Allow this device to wake the computer - off

Advanced

BELOW ARE SOME NETWORK CARDS AS AN EXAMPLE OR GUIDE

INTEL(R) ETHERNET CONNECTION (7) I219-V

Adaptive inter-frame spacing - disabled

Enable PME - disabled

Energy Efficient Ethernet - off

ARP offload - disabled

Flow control - disabled

Gigabit master slave mode - auto detect

(can disable internet or kills speeds for some pc's - if so leave at auto detect)

Interrupt moderation - disabled

Interrupt moderation rate - off

ipv4 checksum offload - rx & tx disabled

(enable for low end hardware)

Jumbo packet - disabled

Large send offload v2 (ipv4) - disabled

Large send offload v2 (ipv6) - disabled

Legacy Switch Compatibility Mode - disabled

Locally administered address - not present

Log link state event - disabled

Maximum Number of RSS Queues - 4 queues (**registry tweak below**)

Packet priority & vlan - disabled

Protocol ARP offload - disabled

Protocol NS offload - disabled

Receive buffers - 2048

(max for high speed internet - turn down for low speed internet)

Receive side scaling - disabled

Receive side scaling - enabled (if using checksum offloading)

Reduce Speed On Power Down - disabled

Speed & duplex - auto negotiation

(can disable internet or kills speeds for some pc's - if so leave at auto negotiation)

System Idle Power Saver - disabled

TCP checksum offload (ipv4) - rx & tx disabled

(enable for low end hardware)

TCP checksum offload (ipv6) - rx & tx disabled

(enable for low end hardware or disabled as not using ipv6)

Transmit buffers - 2048

(max for high speed internet - turn down for low speed internet)

UDP checksum offload (ipv4) - rx & tx disabled

(enable for low end hardware)

UDP checksum offload (ipv6) - rx & tx disabled

(enable for low end hardware or disabled as not using ipv6)

Ultra Low Power Mode - disabled

Wait For Link - off

Wake on Link Settings - disabled

Wake on Magic Packet - disabled

Wake on Pattern Match - disabled

Apply

LAPTOP KILLER WIRELESS-N/A /AC 1535 WIRELESS NETWORK

D0 packetcoalescing - disabled

Dynamic mimo power save - disabled

network address - not present

preferred band - no preference

roaming aggressiveness - highest

wireless mode - 12 -11 a/b/g/n/ac

Apply

KILLER E2400 GIGABIT ETHERNET CONTROLLER

Arp offload - disabled

Ecma - disabled

Energy efficient ethernet - disabled

Flow control - disabled

Interrupt moderation - disabled

Ipv4 checksum offload - disabled

(enable for low end hardware)

Jumbo frame - disabled

Large send offload ipv4 - disabled

Large send offload v2 ipv4 - disabled

Large send offload v2 ipv6 - disabled

Max irq per second - 10000

Maximum number of rss queues - 4

Network address - not present

Ns offload - disabled

Receive buffers - max

(max for high speed internet - turn down for low speed internet)

Receive side scaling - disabled

Receive side scaling - enabled (if using checksum offloading)

Shutdown and wakeup - disabled

Speed & duplex - auto negotiation

(can disable internet or kills speeds for some pc's - if so leave at auto negotiation)

Swqi - disabled

Tcp checksum offload ipv4 - disabled

(enable for low end hardware)

Tcp checksum offload ipv6 - disabled

(enable for low end hardware or disabled as not using ipv6)

Transmit buffers - max

(max for high speed internet - turn down for low speed internet)

Udp checksum offload ipv4 - disabled

(enable for low end hardware)

Udp checksum offload ipv6 - disabled

(enable for low end hardware or disabled as not using ipv6)

Vlan id - 0

Wake on magic packet - disabled

Wake on pattern match - disabled

Apply

INTEL(R) 82579V GIGABIT NETWORK CONNECTION

Adaptive inter-frame spacing - disabled

ARP offload - disabled

Flow control - disabled

Gigabit master slave mode - auto detect

(can disable internet or kills speeds for some pc's - if so leave at auto detect)

Interrupt moderation - disabled

Interrupt moderation rate - off

Ipv4 checksum offload - disabled

(enable for low end hardware)

Jumbo packet - disabled

Large send offload v2 (ipv4) - disabled

Large send offload v2 (ipv6) - disabled

Locally administered address - not present

Maximum number of rss queues - 4 **(registry tweak below)**

Log link state event - disabled

Ns offload - disabled

Packet priority & vlan - disabled

Receive buffers - max

(max for high speed internet - turn down for low speed internet)

Receive side scaling - disabled

Receive side scaling - enabled (if using checksum offloading)

Speed & duplex - auto negotiation

(can disable internet or kills speeds for some pc's - if so leave at auto negotiation)

TCP checksum offload (ipv4) - disabled

(enable for low end hardware)

TCP checksum offload (ipv6) - disabled

(enable for low end hardware or disabled as not using ipv6)

Transmit buffers - max

(max for high speed internet - turn down for low speed internet)

UDP checksum offload (ipv4) - disabled

(enable for low end hardware)

UDP checksum offload (ipv6) - disabled

(enable for low end hardware or disabled as not using ipv6)

Wait for link - off

Apply

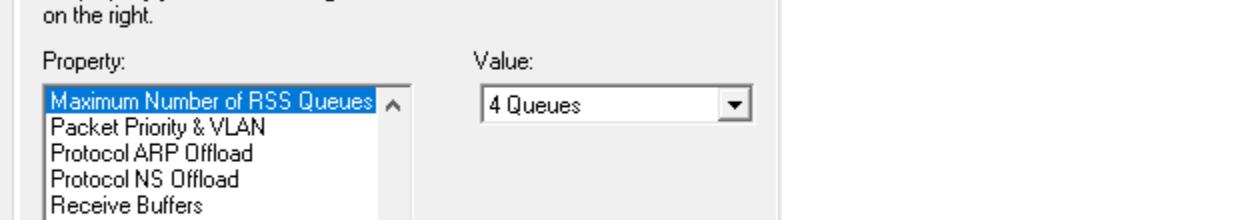
A note to very low end pc users

Disabling all "checksum offloads" will get your CPU to do the work rather than the network card.

Your CPU will always be faster than the network card.

If you are on a low end pc enable "checksum offloads"

"Receive side scaling" needs to be enabled if you use this feature.



Regedit rss queues 4

The below method has worked for me with intel network cards

This may not work for all network cards

Some will allow 4 by default

Device manager

Your network driver

Details

Driver key

Copy

As an example "{4d36e972-e325-11ce-bfc1-08002be10318}\0000"



Search driver key in regedit

In regedit

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Class\{4d36e972-e325-11ce-bfc1-08002be10318}

Control + f - 4d36e972-e325-11ce-bfc1-08002be10318

Open submenus in 4d36e972-e325-11ce-bfc1-08002be10318

0000

Ndi

Params

*NumRssQueues

Enum

New string value 3

3 = 3 Queues

New string value 4

4 = 4 Queues

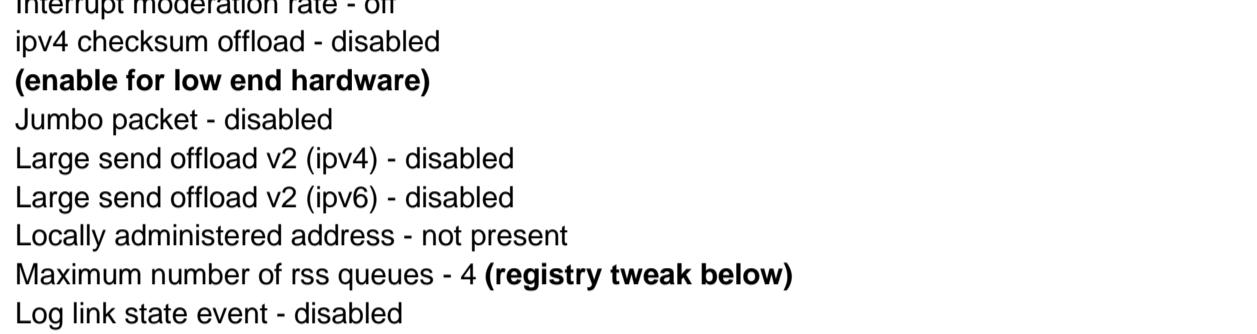
Device manager

Your network driver

Advanced

Maximum Number of RSS Queues - 4 queues

Apply



Search driver key in regedit

In regedit

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Class\{4d36e972-e325-11ce-bfc1-08002be10318}

Control + f - 4d36e972-e325-11ce-bfc1-08002be10318

Open submenus in 4d36e972-e325-11ce-bfc1-08002be10318

0000

Ndi

Params

*NumRssQueues

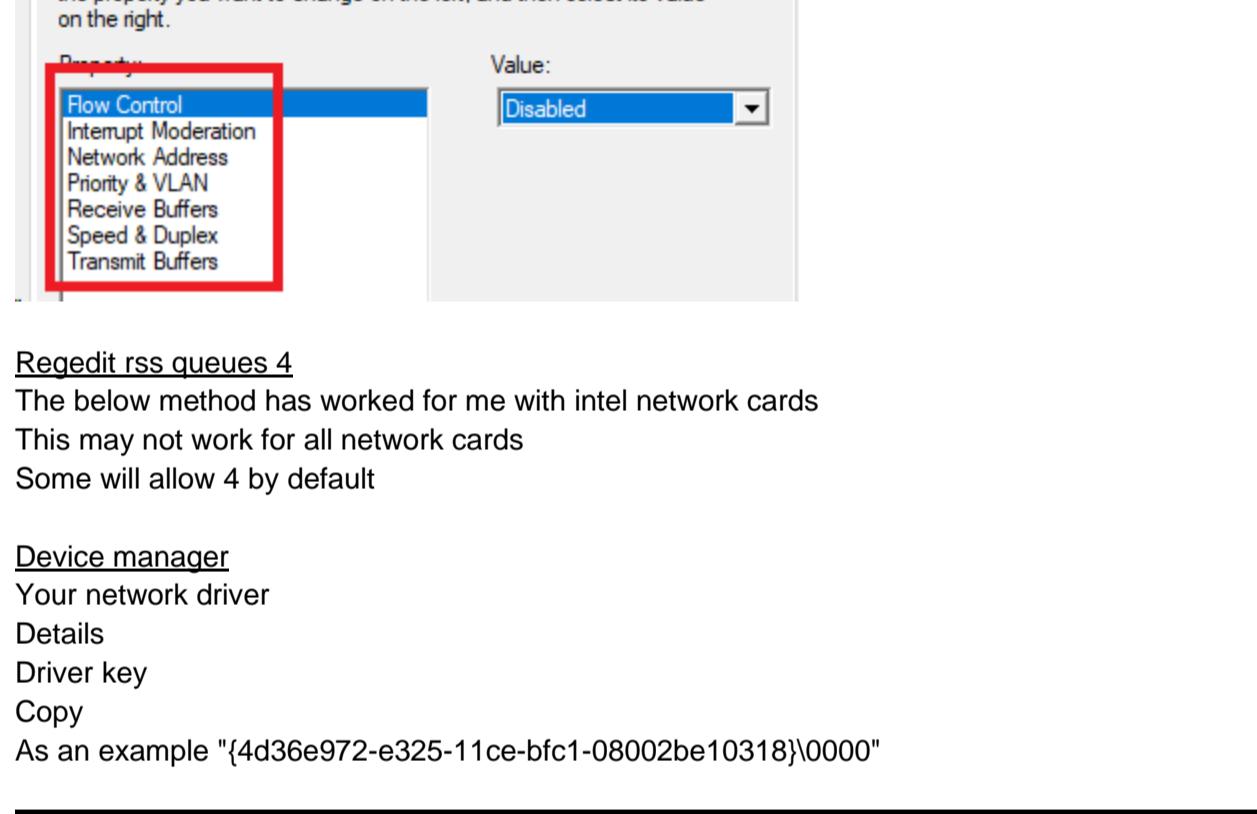
Enum

New string value 3

3 = 3 Queues

New string value 4

4 = 4 Queues



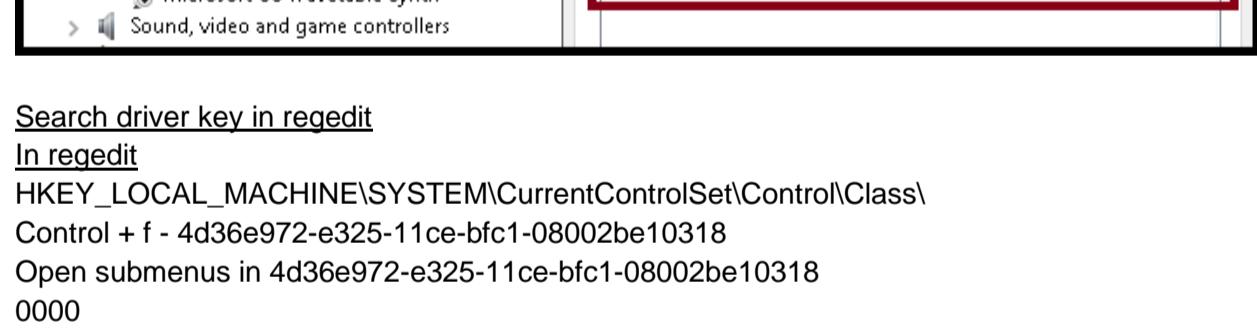
Device manager

Your network driver

Advanced

Maximum Number of RSS Queues - 4 queues

Apply



Disable network properties

Control Panel\Network and Internet\Network Connections

Your network card

Right click

Properties

Uncheck all OFF apart from

Internet Protocol Version 4 (TCP/IPv4)

Note

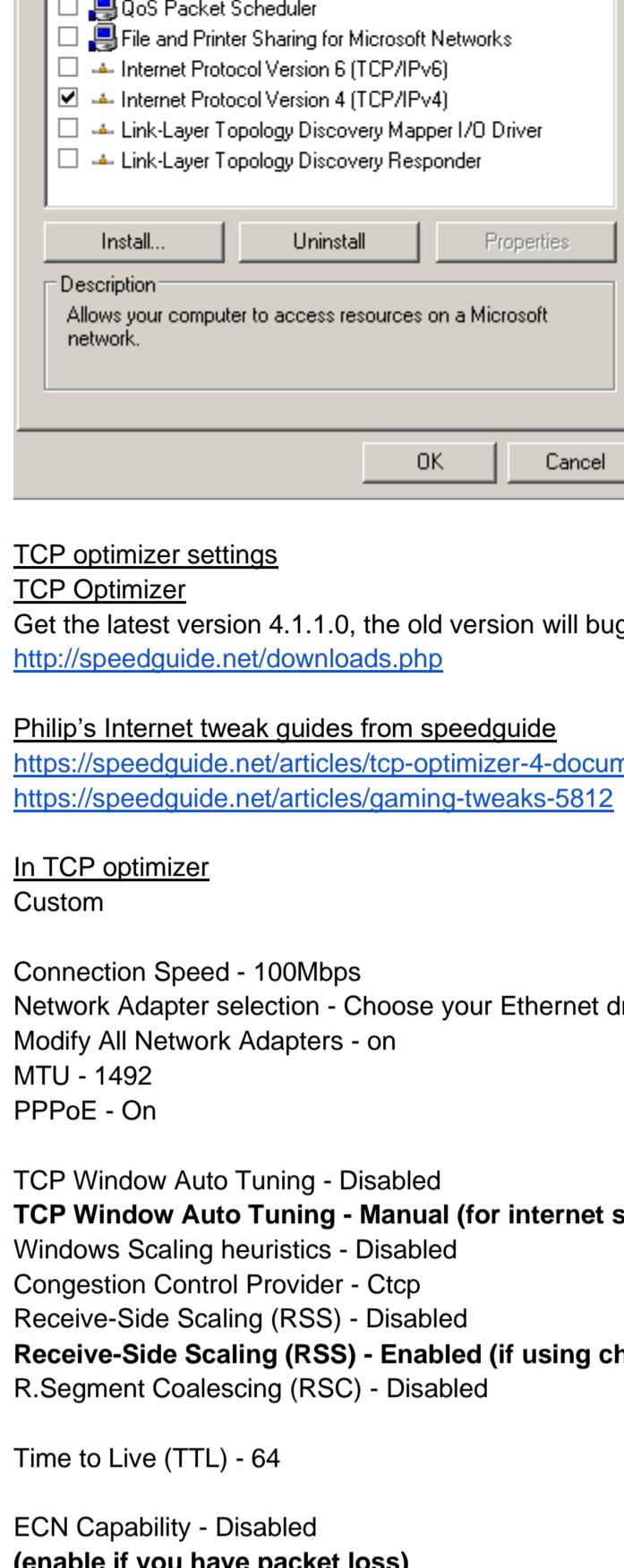
Internet Protocol Version 6 (TCP/IPv6)

(Enable if you are using this)

QoS Packet Scheduler - off

(Enable if you have a congested shared internet connection)

You can enable/disable this in your router settings also if available



TCP optimizer settings

TCP Optimizer

Get the latest version 4.1.1.0, the old version will bug out in new operating systems 1709+ <http://speedguide.net/downloads.php>

Philip's Internet tweak guides from speedguide

<https://speedguide.net/articles/tcp-optimizer-4-documentation-windows-7-8-10-2012-5821>

<https://speedguide.net/articles/gaming-tweaks-5812>

In TCP optimizer

Custom

Connection Speed - 100Mbps

Network Adapter selection - Choose your Ethernet driver

Modify All Network Adapters - on

MTU - 1492

PPPoE - On

TCP Window Auto Tuning - Disabled

TCP Window Auto Tuning - Manual (for internet speeds above 100mbps)

Windows Scaling heuristics - Disabled

Congestion Control Provider - Ctcp

Receive-Side Scaling (RSS) - Disabled

Receive-Side Scaling (RSS) - Enabled (if using checksum offloading)

R.Segment Coalescing (RSC) - Disabled

Time to Live (TTL) - 64

ECN Capability - Disabled

(enable if you have packet loss)

Checksum Offloading - Disabled

(enable for low end hardware)

TCP Chimney Offload - Disabled

Large Send Offload (LSO) - Disabled

TCP 1323 Timestamps - Disabled

Advanced settings

Internet Explorer Optimization

MaxConnectionsPer1_0Server - 10

MaxConnectionsPerServer - 10

Host Resolution Priority

LocalPriority - 4

HostPriority - 5

DnsPriority - 6

NetbtPriority - 7

Retransmissions

Max SYN Retransmissions - 2

NonSackRttResiliency - disabled

Retransmit Timeout (RTO)

Initial RTO - 2000

Min RTO - 300

Type/Quality of Service

QoS: NonBestEffortLimit - 0

QoS: Do not use NLA - 1

Gaming Tweak - Network Throttling Index

Network Throttling Index - disabled

SystemResponsiveness - 0

Gaming Tweak - Disable Nagle's algorithm

TcpAckFrequency - 1

TcpNoDelay - 1

TcpDelAckTicks - 0

Network Memory Allocation

LargeSystemCache - LEAVE

Size - LEAVE

Dynamic Port Allocation

MaxUserPort - 65534

TcpTimedWaitDelay - 30

SG TCP Optimizer - Windows 10 Pro (64-bit) Build:16299 6.3 Template: internet

File Preferences Help

General Settings Advanced Settings BDP MTU/Latency

Connection Speed 100 Mbps (100,000 kbps):

56 kbps 1 Mbps 5 Mbps 10 Mbps 20 Mbps 30 Mbps 50 Mbps 100+Mbps

Network Adapter selection:

Intel(R) Ethernet Connection (7) I219-V

MTU: 1492

Don't modify Network Adapters

PPPoE

Modify All Network Adapters

IP address: 192.168.1.243

TCP Window Auto-Tuning: disabled

Time to Live (TTL): 64

Windows Scaling heuristics: disabled

ECN Capability: disabled

Congestion Control Provider: ctcp

Checksum Offloading: disabled

Receive-Side Scaling (RSS): disabled

TCP Chimney Offload: disabled

R.Segment Coalescing (RSC): disabled

Large Send Offload (LSO): disabled

TCP 1323 Timestamps: disabled

TCP 1323 Timestamps: disabled

Choose settings: Windows Default Current Optimal Custom

speedguide.net

Apply changes

Exit

SG TCP Optimizer - Windows 10 Pro (64-bit) Build:16299 6.3 Template: internet

File Preferences Help

General Settings Advanced Settings BDP MTU/Latency

Internet Explorer Optimization

MaxConnectionsPer1_0Server: 10

MaxConnectionsPerServer: 10

Type/Quality of Service

QoS: NonBestEffortLimit: 0

QoS: Do not use NLA: optimal: 1

Host Resolution Priority

LocalPriority: 4

HostPriority: 5

DnsPriority: 6

NetbtPriority: 7

Gaming Tweak - Network Throttling Index

NetworkThrottlingIndex: disabled: ffffff

SystemResponsiveness: gaming: 0

Gaming Tweak - Disable Nagle's algorithm

TcpAckFrequency: disabled: 1

TcpNoDelay: enabled: 1

TcpDelAckTicks: disabled: 0

Network Memory Allocation

LargeSystemCache: disabled: 0

Size: 0

Dynamic Port Allocation

MaxUserPort: 65534

TcpTimedWaitDelay: 30

Choose settings: Windows Default Current Optimal Custom

speedguide.net

Apply changes

Exit

BOOT TWEAKS

Control Panel\System and Security\System

Advanced system settings

Startup and recovery

Settings

Default operating system - Windows 10

Time to display list of operating systems - off

Time to display recovery options when needed - off

System failure

Write an event to the system log - off

Automatically restart - off

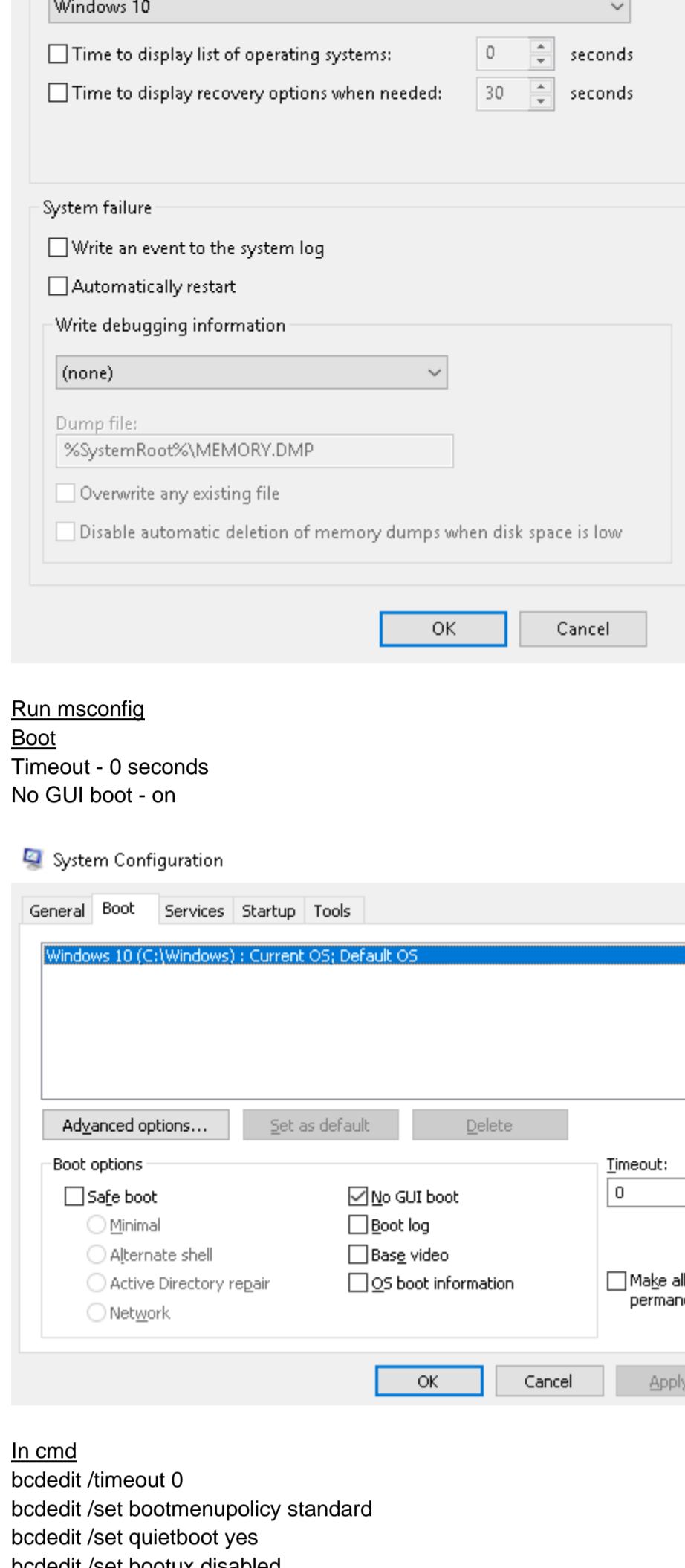
Write debugging information - none

Override any existing file - off

Disable automatic deletion of memory dumps when disk space is low - off

Ok

Apply

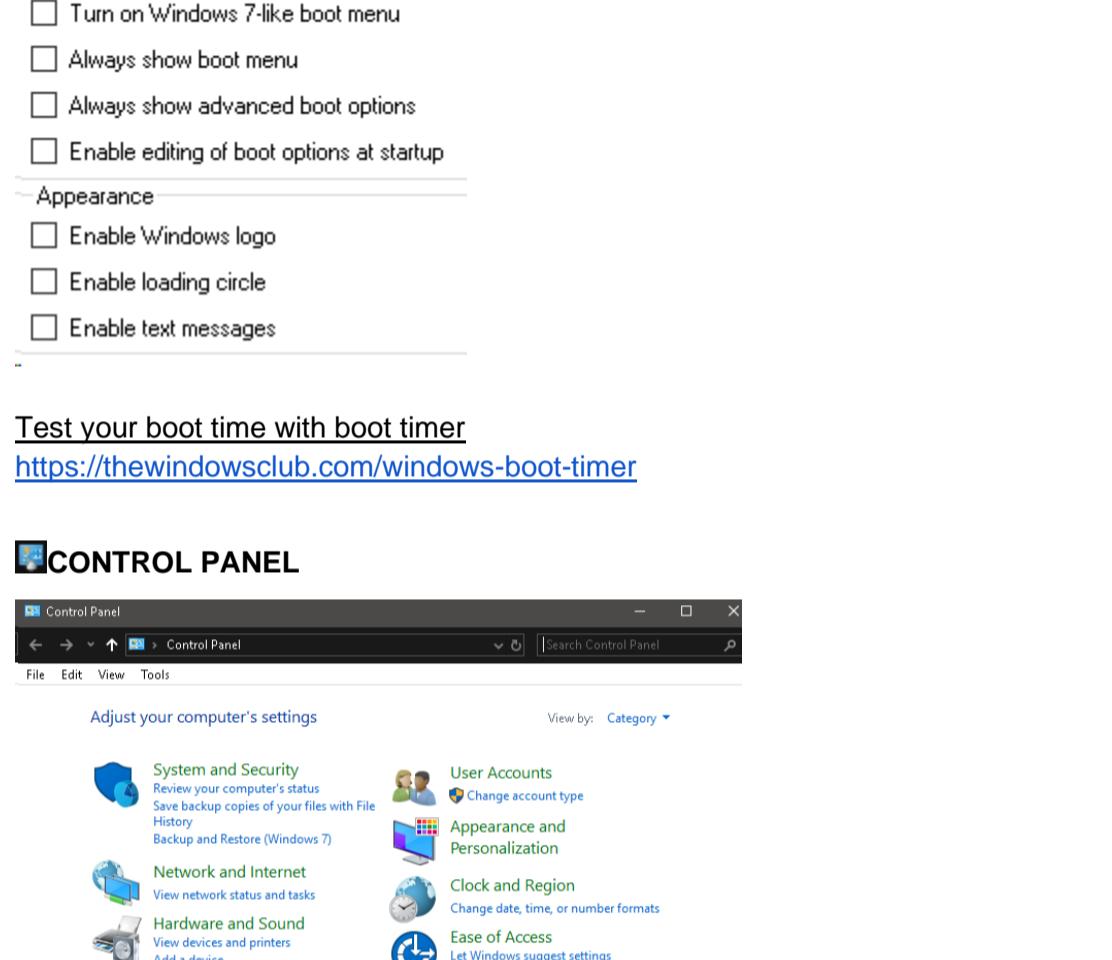


Run msconfig

Boot

Timeout - 0 seconds

No GUI boot - on



In cmd

bcdeedit /timeout 0

bcdeedit /set bootmenupolicy standard

bcdeedit /set quietboot yes

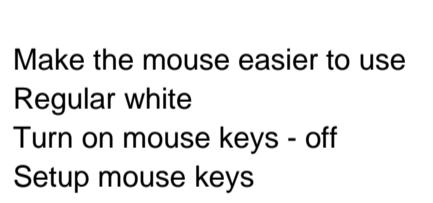
bcdeedit /set bootux disabled

In regedit

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System
DelayedDesktopSwitchTimeout=0

In winaero tweaker

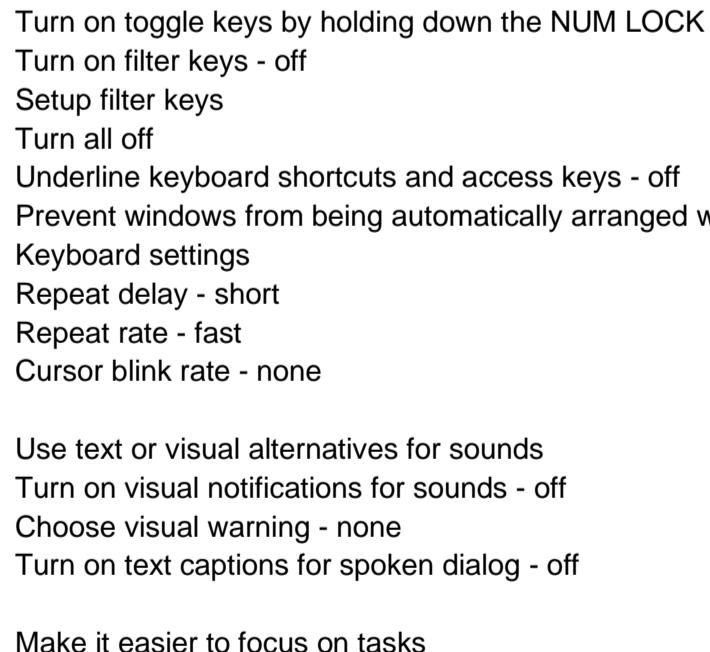
Boot options - turn all off



Test your boot time with boot timer

<https://thewindowsclub.com/windows-boot-timer>

CONTROL PANEL



EASE OF ACCESS

(Be sure to apply at each page)

Speech recognition

Advanced speech options + Text to speech

Turn all off

Ease of access center

Always read this section aloud - off

Always scan this section - off

Use the computer without a display

Turn on narrator - off

Turn on audio description - off

Turn off all unnecessary animations (when possible) - yes

How long should windows notification dialog boxes stay open - 5 min

Make the computer easier to see

Turn all off

Set the thickness of the blinking cursor - 1

Turn off all unnecessary animations (when possible) - on

Remove background images (where available) - on

Use the computer without a mouse or keyboard

Use on screen keyboard - off

Make the mouse easier to use

Regular white

Turn on mouse keys - off

Setup mouse keys

Turn all off

Turn on toggle keys - off

Turn on toggle keys by holding down the NUM LOCK key for 5 seconds - off

Turn on filter keys - off

Setup filter keys

Turn all off

Underline keyboard shortcuts and access keys - off

Prevent windows from being automatically arranged when moved to the edge of the screen - on

Keyboard settings

Repeat delay - short

Repeat rate - fast

Cursor blink rate - none

Use text or visual alternatives for sounds

Turn on visual notifications for sounds - off

Choose visual warning - none

Turn on text captions for spoken dialog - off

Make it easier to focus on tasks

Settings should be set as above

Make touch and tablets easier to use

Launching common tools - none

Change sign in settings

Turn all off

CLOCK AND REGION

Region

Personal preference

Date and time

Date and time

Notify me when the clock changes - no

APPEARANCE AND PERSONALIZATION

Nvidia control panel

(See above)

Fonts

Adjust cleartype text

Turn off

File explorer options

Open file explorer to - this pc

Open each folder in the same window - on

Double - click to open an item - on

Show recently used files in quick access - off

Show frequently used folder in quick access - off

Clear

View

Personal preference

Show sync providers - off

Use sharing wizard - off

Search

Don't use the index - on
When searching non-indexed locations - all off

Ease of access center

Set as above

Taskbar and navigation

Set as below

USER ACCOUNTS

Credential manager

Don't use credential manager
Leave as is

User accounts

Change user account control settings
Never notify

Change my environment variables

Delete onedrive

Delete path

PROGRAMS

Default programs

Set as above

Programs and features

Set as above

Remove unwanted programs and drivers

Uninstall any bloatware or software that came with your pc

View installed updates

Updates forced off as above

Turn windows features on or off

Set as above

HARDWARE AND SOUND

Nvidia control panel

Set as above

Infrared

Turn all off

Power options

Choose what the power buttons do
When i press the power button - shutdown
When i press the sleep button - do nothing
Change settings that are currently unavailable
Turn on fast startup - off

Sleep - off

Hibernate - off

Lock - off

Choose when to turn off the display

Turn off the display - never

Put the computer to sleep - never

Change when the computer sleeps

Turn off the display - never

Put the computer to sleep - never

Choose or customize a power plan

Set as above

Sound

Communications

Do nothing

Sounds

No sounds

Play windows startup sound - off

Recording

Name all devices and choose icons to suit

Setup devices you use

Disable devices you don't use

Microphone

Advanced

2 channel 16 bit 41000hz (cd quality)

Allow applications to take exclusive control of this device - off

Give exclusive mode applications priority - off

Levels

Personal preference

General

Sound

Change icon

Use this device

Set as default device

Set as default communication device

Playback

Name all devices and choose icons to suit

Setup devices you use

Disable devices you don't use

Sound

Spatial sound - off

Turn on 7.1 virtual surround sound - off

Advanced

2 channel 16 bit 41000hz (cd quality)

Allow applications to take exclusive control of this device - off

Give exclusive mode applications priority - off

Enhancements

Turn all off

Disable all enhancements - on

Levels

Personal preference

General

Sound

Change icon

Use this device

Set as default device

Set as default communication device

Playback and recording

Hide disabled devices - off

Show disconnected devices - off

Disable devices you don't use in device manager

Autoplay

Use autoplay for all media and devices - off

Take no action for all

Devices and printers

Add a device

Don't use this

Advanced printer setup

Don't use this

Mouse

Buttons

Switch primary and secondary buttons - off

Double click speed - 11/11

Turn on click lock - off

Pointers

Scheme - none

Enable pointer shadow - off

Pointer options

Select a pointer speed 6/11

Enhance pointer precision - off

Snap to - off

Display pointer trails - off

Hide pointer while typing - on

Show location of the pointer when i press the CTRL key - off

Wheel

Personal preference

Device manager

Set as above

Change windows to go startup options

No

NETWORK AND INTERNET

Infrared

Turn all off

Internet options

Internet explorer is uninstalled for me

Network and sharing center

Change advanced sharing settings

Private

Turn off network discovery - on

Turn off file and printer sharing - on

Guest or public

Turn off network discovery - on

Turn off file and printer sharing - on

All networks

Turn off public folder sharing - on

Use 128 bit - on

Turn on password protected sharing - on

Change adapter settings

Right click

Sharing

Turn off

Networking

Set as above

SYSTEM AND SECURITY

Storage spaces

Do not use storage spaces

Bitlocker drive encryption

Do not use storage spaces bitlocker drive encryption

Backup and restore

Do not use backup and restore

File history

Do not use file history

Power options

Set as above

System

Advanced system settings

Computer name

Set as above

Hardware

Set as above

Advanced

Performance

Settings

Visual effects

Custom

Turn all off

Advanced

Processor scheduling - programs (Set as above)

Virtual memory

Change

Automatically manage paging file size for all drives - off

No paging file

Set

Data execution prevention

Leave this

User profiles

Leave this

Startup and recovery

Default operating system - windows 10

Time to display list of operating systems - on - 3

Time to display recovery options when needed - off - 0

Write an event to the system log - off

Automatically restart - off

Write debugging information - none

Overwrite any existing file - off

Disable automatic deletion of memory dumps when disk space is low - off

Environment variables

Delete onedrive

Delete path

System protection

Disable in services

Remote

Allow remote assistance connections to this computer - off

Don't allow remote connections to the computer - on

Allow connections from only computer running - off

Windows defender firewall

Set as above

Security and maintenance

Change security and maintenance settings - all off

Change user account control settings - never notify

Security

All should be turned off and set as above

WINDOWS SETTINGS



SEARCH

Turn all off

UPDATE AND SECURITY

This menu will not work with the above or below tweaks

PRIVACY

General

Turn all off

Speech

Turn off

Inking & typing personalization

Turn off

Diagnostics & feedback

Turn all off

Delete diagnostic data - delete

Feedback frequency - never

Activity history

This menu will not work with the above or below tweaks

Location

Turn off

Clear

Camera

These are linked to legacy apps now

Leave on (1809+)

Turn off (1803-)

Microphone

These are linked to legacy apps now

Leave on (1809+)

Turn off (1803-)

Notifications

Turn off

Account info

Turn off

Contacts

Turn off

Calendar

Turn off

Call history

Turn off

Email

Turn off

Tasks

Turn off

Messaging

Turn off

Radios

Turn off

Other devices

Turn off

Background apps

Turn all off

App diagnostics

Turn off

Automatic file downloads

Turn off

Documents

Turn off

Pictures

Turn off

Videos

Turn off

File system

Turn off

EASE OF ACCESS

Display

Smallest A

100%

Turn all off

Show notifications for - 5 minutes

Cursor & pointer size

1

Turn off

Magnifier

Turn all off

Color filters

Turn all off

High contrast

Turn off

Narrator

Turn all off

Audio

Turn on mono audio - off

No visual alert

Closed captions

Default

Speech

Turn off

Keyboard

Turn all off

Mouse

Turn off

Eye control

Turn off

GAMING

Game bar

Turn all off

Captures

This menu will not work with the above or below tweaks

It will just show blank

Game mode

On

TIME & LANGUAGE

Date & time

Set time automatically - off

Set time zone automatically - off

Change date and time - set

Time zone - set

Adjust for daylight savings time automatically - on

Don't show additional calendars

Region

Personal preference

Language

Personal preference

Speech

Turn off

ACCOUNTS

Your info

Do not use this

Do not sign in with a ms account

Email & app accounts

This menu will not work with the above or below tweaks

It will just show blank

Sign in options

This menu will not work with the above or below tweaks

It will just show blank

Access work or school

This menu will not work with the above or below tweaks

It will just show blank

Family & other users

Do not use this

Do not sign in with a ms account

Sync your settings

This menu will not work with the above or below tweaks

APPS

Apps & features

Turn off app recommendations

Manage optional features

Uninstall all

Manage app execution aliases - all off

Uninstall programs not needed

Default apps

Set default apps to

Firefox (for web browser)

Vlc player (for music player and video player)

Windows photo viewer (photo viewer)

Use winaero tweeker to enable windows photo viewer

Set defaults by app

Firefox - all

Vlc player - all

Windows photo viewer - all

Offline maps

Turn off

This menu will not work with the above or below tweaks

It will just show blank

Apps for websites

Turn off

This menu will not work with the above or below tweaks

It will just show blank

Video playback

Turn all off

Startup

Turn off/uninstall bloatware this is personal preference

PERSONALIZATION

Background

Personal preference

Colours

Automatically pick an accent color from my background - off

Windows colors - personal preference

Transparency effects - off

Start, taskbar and action center - off

Tile bars - on (separate windows are easier to see and select)

Choose your default app mode - dark

Lock screen

This menu will not work with the above or below tweaks

It will just be greyed out

Themes

This menu will not work with the above or below tweaks

To change desktop icons use the shortcut below

C:\Windows\System32\rundll32.exe shell32.dll,Control_RunDLL desk.cpl,,0

Fonts

Nothing to change here

Start

Turn all off

Choose which folders appear on start

Turn all off - apart from settings

Taskbar

Lock the taskbar - on

Turn all off

Taskbar location on screen - bottom

Combine taskbar buttons - always, hide labels

Select which icons appear on the taskbar

Always show all icons in the notification area - off

Turn all programs to off

Then

Always show all icons in the notification area - on

Turn system icons on or off

Turn all off apart from - clock, volume and network

Turn the rest all off

NETWORK & INTERNET

Wifi

This menu will be buggy with the above or below tweaks

Ignore the error message you can still use the menu

Forget networks you are not using

Use random hardware addresses - off

Find paid plans for suggested open hotspots near me - off

Connect to suggested open hotspots - off

Hotspot 2.0 networks - off

Data usage

This menu will not work with the above or below tweaks

The rest

Personal preference

PHONE

This menu will not work with the above or below tweaks

It will just be greyed out

DEVICES

Bluetooth & other devices

Bluetooth - off

Download over metered connections - off

Printers & scanners

Remove all

Let windows manage my default printer - off

Download over metered connections - off

Print server properties

This menu will not work with the above or below tweaks

Mouse

Select your primary button - left
Roll the mouse wheel to scroll - multiple lines at a time
Choose how many lines to scroll each time - lowest setting
Scroll inactive windows when i hover over them - off

Touchpad

Low sensitivity
Turn touchpad off when you are gaming

Typing

Turn all off

Autoplay

Use autoplay for all media and devices - off
Removable drive - take no action
Memory card - take no action

Usb

Turn off

SYSTEM

Display

Night light - off
Night light settings
Schedule night light - off
Windows hd colour settings - off

Scale and layout

100%

Sound

Nothing to do here

Notifications & actions

Add or remove quick actions
Turn all off

Notifications

Turn all off

Get notifications from these senders

Turn all off

Focus assist

Turn all off

Power & sleep

Never

Never

Battery

Turn battery saver on automatically if my battery falls below - off
Lower screen brightness while in battery saver - off

Storage

This menu will not work with the above or below tweaks
It will just be greyed out

Tablet mode

Use desktop mode
Don't ask me and dont switch
Hide app icons on the taskbar in tablet mode - off
Automatically hide the taskbar in tablet mode - off

Multitasking

Turn all off
All desktops
All desktops

Projecting to this pc

This menu will not be there with the above or below tweaks

Shared experiences

This menu will not work with the above or below tweaks
It will just be greyed out

Clipboard

Turn off
Clear

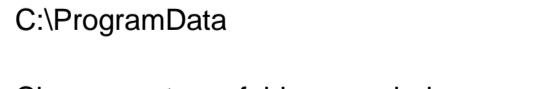
Remote desktop

Turn off
Select users that can remotely access this pc
Remove all

EXTRA TWEAKS

Task manager

Run task manager
Options
Always on top
This will ensure if you ever get locked out of a game or a game crashes and alt+f4 does not work You can still kill the process WITHOUT doing a hard reset



Run memory booster on startup

Big thanks to n1kobg for making this exe

https://drive.google.com/open?id=1nJ2er2E6z-qUGBmJBVKmS16xjo_pRSxR

Set to run on start with taskschd.msc or place a shortcut in the startup folder.

C:\Users\USER\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup

It does the following below

Cleans modifiedpagelist, priority0standbylist, standby list and workingsets

This will get your ram down to 480mb in use if all the tweaks above are applied



n1kobg's guide needs a mention here

A fastasic guide, a great guy and good friend to me. He has been a big help to our cause.

https://n1kobg.blogspot.com/2018_08_12_archive.html?m=1

Memory reminder

You want to make full use of your memory
Make sure memory remap feature is enabled in bios
Check your task manager on boot to see
Hardware reserved = a low number in MB
Sometimes an updated bios can help

Speed: 1600 MHz

Slots used: 2 of 2

Form factor: SODIMM

Hardware reserved: 561 MB

Things to keep an eye on

Regularly use autoruns to check things that have been installed or running that don't need to be

Regularly check task manager to see what is running on startup or in the background

When uninstalling something, use geek uninstaller

It cleans up leftovers in the registry

<https://www.majorgeeks.com/files/details/geekuninstaller.html>

Here are some others

https://revouninstaller.com/revo_uninstaller_free_download.html

<https://ibot.com/en/advanceduninstaller.php>

Program Name Size Installed On

μTorrent (32-bit) 390 KB Feb 08, 2019

3DMark (32-bit) 429 MB Mar 02, 2019

7-Zip 18.06 (x64) 4.95 MB Feb 08, 2019

Ableton Live 10 Lite 6.10 GB Feb 08, 2019

AIDA64 Extreme v5.99 (32-bit) 82.1 MB Mar 22, 2019

Apex Legends (32-bit) 21.0 GB Mar 20, 2019

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CPUID HWMonitor 1.39 3.02 MB Feb 08, 2019

CrystalDiskMark 6.0.2 7.11 MB Feb 08, 2019

Things to keep an eye on

Regularly use autoruns to check things that have been installed or running that don't need to be

Regularly check task manager to see what is running on startup or in the background

When uninstalling something, use geek uninstaller

It cleans up leftovers in the registry

<https://www.majorgeeks.com/files/details/geekuninstaller.html>

Here are some others

https://revouninstaller.com/revo_uninstaller_free_download.html

<https://ibot.com/en/advanceduninstaller.php>

Program Name Size Installed On

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3DMark (32-bit) 429 MB Mar 02, 2019

7-Zip 18.06 (x64) 4.95 MB Feb 08, 2019

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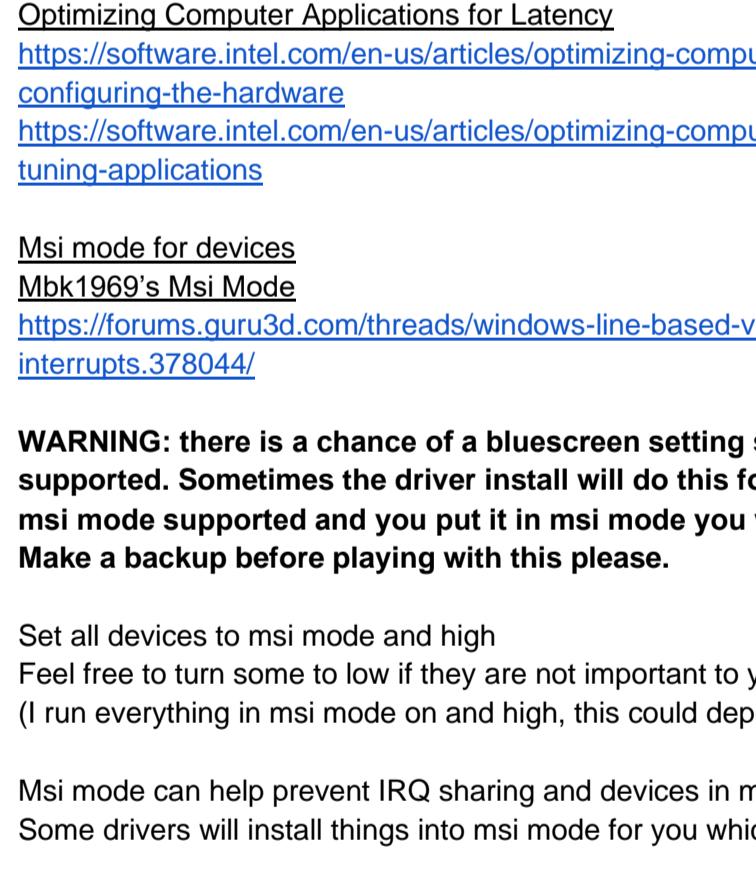
CrystalDiskMark 6.

<https://www.majorgeeks.com/files/details/defraggler.html>

Winaero tweaker

<https://winaero.com/download.php?view.1796>

Dark color scheme - uncheck all
Theme behavior - uncheck all
Ads and unwanted apps - select all
Chkdsk timeout at boot - 0
Disable aero shake - select
Disable aero snap - select
Disable app lookup in store - select
Disable automatic maintenance - select
Disable downloads blocking - select
Disable driver updates - select
Disable mrt from installing - select
Disable timeline - select
Disable windows update - select
Error reporting - select
Hibernation options - disable
Menu show delay - 0
New apps notification - select
Power throttling - select
Screen saver grace period - 0
Show bsod, disable smiley - select
Split threshold for svchost - this should already be set to your ram value
Boot options - uncheck all
Disable lock screen - select
Lock screen slideshow duration - 0
Disable action center - select
Disable live tiles - select
Disable quick action buttons - select
Disable web search - select
Hover to select for virtual desktop - uncheck
Pin more contacts to taskbar - 0
Wallpaper quality - 100
Remove default entries - uncheck all apart from - troubleshoot, pin to start and pin to taskbar
Take ownership - select
Disable online & video tips in settings - select
Insider page - select
Automatic folder type discovery - select
Disable compressed overlay icon - select
Customise this pc folders - remove 3d objects
Disable jump lists - select
Disable search history - select
File explorer starting folder - this pc
Navigation pane default items - uncheck all apart from - this pc and removable drives
Administrative shares - uncheck
Disable uac - disable uac
Disable windows defender - disable windows defender
Protection against unwanted software - uncheck
Windows security/defender tray icon - uncheck
Auto update store apps - select
Disable cortana - select
Disable ink workspace - select
Do you want to close all tabs prompt in edge - uncheck
Edge prelaunch & tab preloading - select all
Windows apps - disable all
Enable classic paint - select
Extra buttons in internet explorer - select all
Disable telemetry - select
Disable shortcut text - select
Activate windows photo viewer - select



SCAN your pc with malwarebytes

<https://malwarebytes.com/>

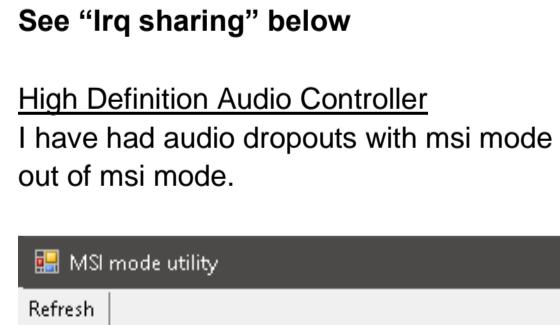
This should be done often

Scan downloads if your unsure about them

You don't need this program running in the background

I don't have any antivirus running in the background on my gaming os

This will kill performance, I recommend you do the same for your tweaked os



LATENCY

Calypto's Windows Latency Guide

I have to mention Calypto in this guide! His guide is by far the most advanced, helpful and elite windows latency guide on the internet. This guy does not get enough credit and can be seen grinding through countless overclocking threads on the internet trying to get solid answers. I've tried my best to dissect and dumb down his tweaks here, but he deserves the full credit.

https://docs.google.com/document/d/1c2-IUJq74wuYK1WrA_bVgb89dUN0sj8-hO3vqmrau4

Reducing Interrupt Latency Through the Use of Message Signaled Interrupts

<https://www.intel.com/content/dam/www/public/us/en/documents/white-papers/msg-signaled-interrupts-paper.pdf>

Optimizing Computer Applications for Latency

<https://software.intel.com/en-us/articles/optimizing-computer-applications-for-latency-part-1-configuring-the-hardware>

<https://software.intel.com/en-us/articles/optimizing-computer-applications-for-latency-part-2-tuning-applications>

Msi mode for devices

Mbk1969's Msi Mode

<https://forums.guru3d.com/threads/windows-line-based-vs-message-signaled-based-interrupts.378044/>

WARNING: there is a chance of a bluescreen setting something in msi mode if it's not supported. Sometimes the driver install will do this for you. If the windows driver is not msi mode supported and you put it in msi mode you will bluescreen. It's trial and error. Make a backup before playing with this please.

Set all devices to msi mode and high
Feel free to turn some to low if they are not important to you such as hard drives, network cards (I run everything in msi mode on and high, this could depend on your system!)

Msi mode can help prevent IRQ sharing and devices in msi mode will generally run better. Some drivers will install things into msi mode for you which is a good thing!

As an example in the photo below for windows 7 and 8.1, the bare windows AHCI driver for my hard drives was not in msi mode. Setting the bare windows AHCI driver in msi mode caused a blue screen. Installing the AHCI driver with snappy driver installer put the driver into msi mode for me.

name	irq	msi	limit	max limit	supported modes	interrupt priority
@hdaudbus.inf.%hdaudio.devidesc%High Definition Audio Controller	17	<input type="checkbox"/>	1	LineBased, Msi	Undefined	High
@oem4.inf.%nvidia_dev.1e07%.NVIDIA GeForce RTX 2080 Ti	-6	<input checked="" type="checkbox"/>	1	LineBased, Msi	High	High
@oem2.inf.%e15bcncc.devidesc%ASMedia USB3.0 eXtensible Host Controller	-7	<input checked="" type="checkbox"/>	1	LineBased, Msi	High	High
@oem3.inf.%e15bcncc.devidesc%Intel(R) Ethernet Connection (7)I219V	5	<input checked="" type="checkbox"/>	1	LineBased, Msi	High	High
@oem18.inf.%pciv_ven_8086&dev_1901.devidesc%Intel(R) Xeon(R) E3-1200/1500 v5/6th Gen Intel(R) Core(TM) PCle Controller (x16)-1901	-2	<input checked="" type="checkbox"/>	1	LineBased, Msi	High	High
@machine.inf.%pciv_ven_8086&devidesc%PCI standard PCI-to-PCI bridge	-3	<input checked="" type="checkbox"/>	1	LineBased, Msi	High	High
@oem17.inf.%pciv_ven_8086&dev_a352&cc_0106.devidesc%Intel(R) C600+/C220+ series chipset SATA AHCI Controller	-4	<input checked="" type="checkbox"/>	1	LineBased, Msi	High	High

Irq sharing

This can depend your motherboard layout, drivers and os configuration.

AVOID irq sharing altogether

To check for this

In device manager

View resources by connection

Check there are no shared numbers with the devices

If so have a play around with msi mode as shown above

Or try different devices in different slots/ports (usb/pcie) etc

(ISA) 0x000001FD (509) Microsoft ACPI-Compliant System
 (ISA) 0x000001FE (510) Microsoft ACPI-Compliant System
 (ISA) 0x000001FF (511) Microsoft ACPI-Compliant System
 (PCI) 0x00000010 (16) Intel(R) 8 Series/C220 Series USB EHCI #2 - 8C2D
 (PCI) 0x00000010 (16) SMBus Controller
 (PCI) 0x00000012 (18) Realtek PCIe GBE Family Controller
 (PCI) 0x00000016 (22) High Definition Audio Controller
 (PCI) 0x00000017 (23) Intel(R) 8 Series/C220 Series USB EHCI #1 - 8C26
 (PCI) 0xFFFFFFF3 (-13) Realtek PCIE CardReader
 (PCI) 0xFFFFFFF4 (-12) Realtek RTL8723BE Wireless LAN 802.11n PCI-E NIC
 (PCI) 0xFFFFFFF5 (-11) NVIDIA GeForce 820A
 (PCI) 0xFFFFFFF6 (-10) Intel(R) HD Graphics 4600
 (PCI) 0xFFFFFFF7 (-9) Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
 (PCI) 0xFFFFFFF8 (-8) Intel(R) Management Engine Interface
 (PCI) 0xFFFFFFF9 (-7) Standard SATA AHCI Controller
 (PCI) 0xFFFFFFF0 (-6) PCI Express Root Port
 (PCI) 0xFFFFFFF1 (-5) PCI Express Root Port
 (PCI) 0xFFFFFFF2 (-4) PCI Express Root Port
 (PCI) 0xFFFFFFF3 (-3) PCI Express Root Port
 (PCI) 0xFFFFFFF4 (-2) PCI Express Root Port

THESE ARE SHARED IRQ'S



Another way to see shared irq's

Run msinfo32

System summary

Hardware components

IRQs

System Information		Resource	Device
File	Edit	I/O Port 0x00000000-0x0000001F	Direct memory access controller
Hardware Resources	Conflicts/Sharing	I/O Port 0x00000000-0x0000001F	PCI Express Root Complex
DMA		I/O Port 0x000004D0-0x000004D1	Programmable interrupt controller
Forced Hardware		I/O Port 0x000004D0-0x000004D1	Motherboard resources
I/O		Memory Address 0xF7A00000-0xF7AFF... Memory Address 0xF7A00000-0xF7AFF...	PCI Express Root Port Realtek PCIe GBE Family Controller
IRQs			
Memory			
Components			
Software Environment			

Sometimes a bad motherboard or devices layout no matter the tweaks will still use IRQ sharing. Try your best to avoid IRQ sharing.

Disable page filing

As shown in HARD DRIVE TWEAKS

Is your OS in Legacy MBR?

Legacy has notably lower latency

Clean power

Your house may have a bad earth or bad neutral connection.

This affects everything! Including latency, mouse input and PC performance.

Consider a power conditioner or UPS System that backs up and conditions power.

https://en.m.wikipedia.org/wiki/Power_conditioner

HPET/ Synthetic timer

Make sure HPET is enabled in BIOS and disabled in the OS.

Make sure synthetic timers are disabled and your time resolution is an even number of 0.5000

Set interrupt affinity

https://download.microsoft.com/download/9/2/0/9200a84d-6c21-4226-9922-57ef1dae939e/interrupt_affinity_policy_tool.msi

Sadly microsoft does not always do a good job of this at all.

What we are doing here is changing the interrupt affinity to a single core or to multiple cores.

The trick is finding out which core/cores are the fastest on your system and closest to your memory controller. Some devices work best on one or the core closest to the memory controller.

DO NOT SET AFFINITIES TO YOUR HARD DRIVE = BLUESCREEN

Ideally you would want the workload spread across all cores, although beware too much tweaking with this tool can be a hit and miss. Below is what works well for me.

Windows will usually clump everything to core 0 as you can see here...

LatencyMon (Home Edition) v 6.70 - http://www.resplendence.com			
CPUs			
Index	Group, #	Interrupt cycle time (s)	ISR count
CPU 0	0, 0	0.434149	2234
CPU 1	0, 1	0.084950	0
CPU 2	0, 2	0.098757	0
CPU 3	0, 3	0.102084	0

After my tweaks below

The above photo is a different system but you get the point...

LatencyMon (Home Edition) v 6.70 - http://www.resplendence.com			
CPUs			
Index	Group, #	Interrupt cycle time (s)	ISR count
CPU 0	0, 0	8.288450	90
CPU 1	0, 1	0.647193	0
CPU 2	0, 2	2.372799	34498
CPU 3	0, 3	0.303858	0
CPU 4	0, 4	2.849089	0
CPU 5	0, 5	0.306424	0

These tweaks are very system and cpu dependant so keep that in mind, what might work well for my system could make your system worse. Test for yourself.

Generally speaking in my experience with the 8086k and my system, this is working well.

-Pinning USB xHCI Compliant Host Controller to CPU 2

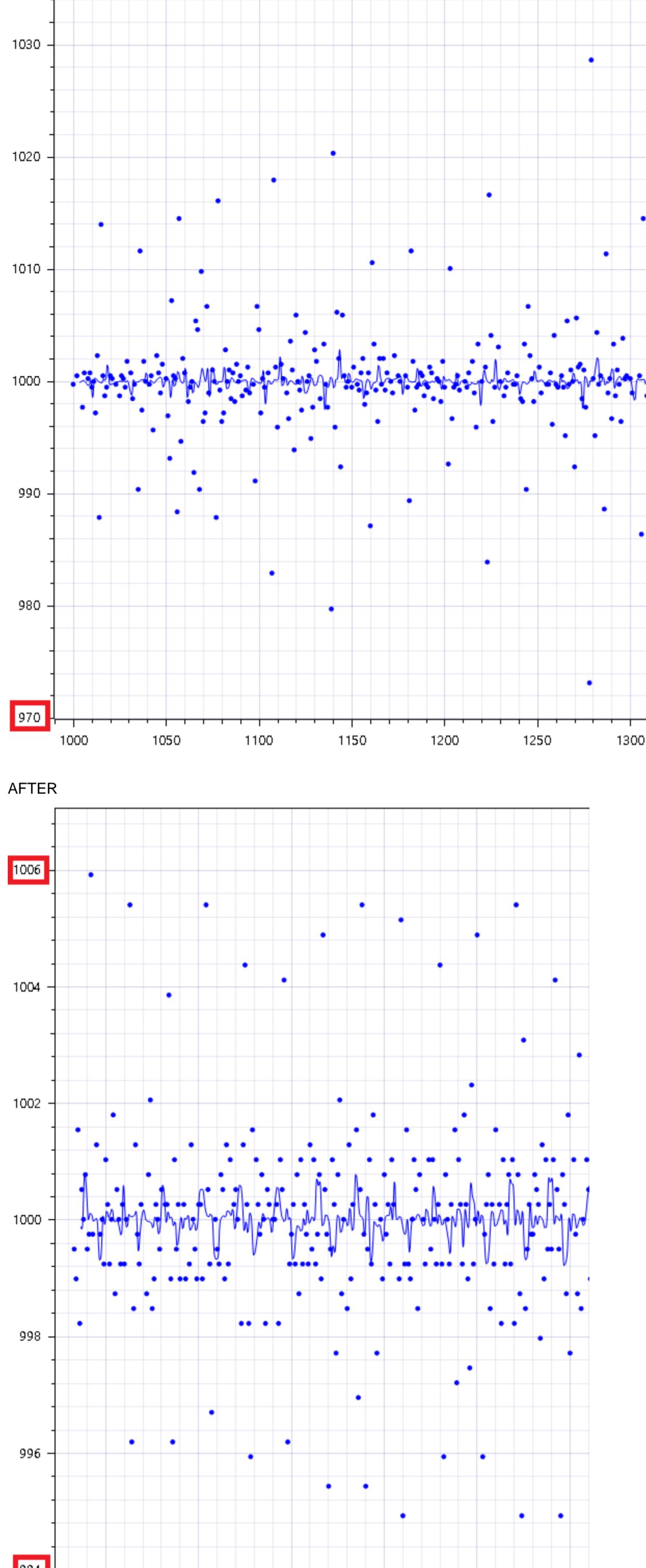
-Pinning NVIDIA GeForce RTX 2080 Ti to CPU 4

-Pinning PCI-to-PCI Bridge (same pci device as above GPU) to CPU 4

Interrupt-Affinity Policy Configuration Tool		Processor Affinity Policy	
Devices:		The Processor Affinity setting controls on which CPUs a device's interrupts can be serviced.	
<input checked="" type="checkbox"/> USB xHCI Compliant Host Controller		<input type="checkbox"/> CPU 0	<input type="checkbox"/> CPU 16
<input type="checkbox"/> USB Composite Device		<input type="checkbox"/> CPU 17	<input type="checkbox"/> CPU 32
<input type="checkbox"/> Motherboard resources		<input type="checkbox"/> CPU 33	<input type="checkbox"/> CPU 49
<input type="checkbox"/> Motherboard resources		<input type="checkbox"/> CPU 49	<input type="checkbox"/> CPU 50
<input type="checkbox"/> Motherboard resources		<input type="checkbox"/> CPU 50	<input type="checkbox"/> CPU 52
<input type="checkbox"/> Motherboard resources		<input type="checkbox"/> CPU 52	<input type="checkbox"/> CPU 53
<input type="checkbox"/> ACPI Fan		<input type="checkbox"/> CPU 53	<input type="checkbox"/> CPU 54
<input type="checkbox"/> ACPI Fan		<input type="checkbox"/> CPU 54	<input type="checkbox"/> CPU 56
<input type="checkbox"/> ACPI Fan		<input type="checkbox"/> CPU 56	<input type="checkbox"/> CPU 58
<input type="checkbox"/> ACPI Fan		<input type="checkbox"/> CPU 58	<input type="checkbox"/> CPU 59
<input type="checkbox"/> ACPI Processor Aggregator		<input type="checkbox"/> CPU 59	<input type="checkbox"/> CPU 60
<input type="checkbox"/> USB Composite Device		<input type="checkbox"/> CPU 60	<input type="checkbox"/> CPU 61
<input type="checkbox"/> PCI standard ISA bridge		<input type="checkbox"/> CPU 61	<input type="checkbox"/> CPU 62
<input type="checkbox"/> ZOWIE XL LCD (DisplayPort)		<input type="checkbox"/> CPU 62	<input type="checkbox"/> CPU 63
<input type="checkbox"/> Volume Manager		<input type="checkbox"/> CPU 63	
<input type="checkbox"/> NVIDIA GeForce RTX 2080 Ti			
<input type="checkbox"/> USB xHCI Compliant Host Controller			
<input type="checkbox"/> Generic SuperSpeed I2R Hub			
Location Info: PCI bus 0, device 20, function 0			
DevObj Name: \Device\NTNPF_PCI0002			
Interrupt Affinity Mask			
Set Mask: Current Policy: IrqPolicySpecifiedProcessors			
Specified Mask: 0x4			
Delete Mask: Current Assignment: N/A			
<input type="checkbox"/> Don't Restart Device When Making Changes	<input type="checkbox"/> Advanced...	<input type="checkbox"/> Done	
		Select All	Select None
		OK	Cancel

Interrupt-Affinity Policy Configuration Tool		Processor Affinity Policy	
Devices:		The Processor Affinity setting controls on which CPUs a device's interrupts can be serviced.	
<input checked="" type="checkbox"/> NVIDIA GeForce RTX 2080 Ti		<input type="checkbox"/> CPU 0	<input type="checkbox"/> CPU 16
<input type="checkbox"/> PCI-to-PCI Bridge		<input type="checkbox"/> CPU 17	<input type="checkbox"/> CPU 32
<input type="checkbox"/> Traktor Audio 2 MK2 WDM Audio		<input type="checkbox"/> CPU 33	<input type="checkbox"/> CPU 49
<input type="checkbox"/> HID-compliant consumer control device		<input type="checkbox"/> CPU 49	<input type="checkbox"/> CPU 50
<input type="checkbox"/> HID-compliant system controller		<input type="checkbox"/> CPU 50	<input type="checkbox"/> CPU 52
<input type="checkbox"/> ACPI Fixed Feature Button		<input type="checkbox"/> CPU 52	<input type="checkbox"/> CPU 53
<input type="checkbox"/> Disk drive		<input type="checkbox"/> CPU 53	<input type="checkbox"/> CPU 54
<input type="checkbox"/> Intel(R) SMBus - A232		<input type="checkbox"/> CPU 54	<input type="checkbox"/> CPU 56
<input type="checkbox"/> Microsoft Windows Management Interface for ACPI		<input type="checkbox"/> CPU 56	<input type="checkbox"/> CPU 58
<input type="checkbox"/> Intel(R) Power Engine Plug-in		<input type="checkbox"/> CPU 58	<input type="checkbox"/> CPU 60
<input type="checkbox"/> USB controller - user-defined device		<input type="checkbox"/> CPU 60	<input type="checkbox"/> CPU 61
<input type="checkbox"/> PCI-to-PCI Bridge		<input type="checkbox"/> CPU 61	<input type="checkbox"/> CPU 62
Location Info: PCI bus 1, device 0, function 0		<input type="checkbox"/> CPU 62	<input type="checkbox"/> CPU 63
DevObj Name: \Device\NTNPF_PCI0001		<input type="checkbox"/> CPU 63	
Interrupt Affinity Mask			
Set Mask: Current Policy: IrqPolicySpecifiedProcessors			
Specified Mask: 0x10			
Delete Mask: Current Assignment: N/A			
<input type="checkbox"/> Don't Restart Device When Making Changes	<input type="checkbox"/> Advanced...	<input type="checkbox"/> Done	
		Select All	Select None
		OK	Cancel

Interrupt-Affinity Policy Configuration Tool		Processor Affinity Policy	
Devices:		The Processor Affinity setting controls on which CPUs a device's interrupts can be serviced.	
<input checked="" type="checkbox"/> Microsoft Basic Render Driver		<input type="checkbox"/> CPU 0	<input type="checkbox"/> CPU 16
<input type="checkbox"/> Intel Processor		<input type="checkbox"/> CPU 17	<input type="checkbox"/> CPU 32
<input type="checkbox"/> Intel Processor		<input type="checkbox"/> CPU 33	<input type="checkbox"/> CPU 49
<input type="checkbox"/> PCI-to-PCI Bridge		<input type="checkbox"/> CPU 49	<input type="checkbox"/> CPU 50
<input type="checkbox"/> Traktor Audio 2 MK2 WDM Audio		<input type="checkbox"/> CPU 50	<input type="checkbox"/> CPU 52
<input type="checkbox"/> HID-compliant consumer control device			



AFTER



As shown above tweaking your PCI/GPU affinity can help with performance.

The PCI/GPU will usually work best on a single core that is not used as much closest to the memory controller, benchmark this. I believe the #4 core shown in the tool = 5th core for a 8086k might be the core closest to the memory controller.

Aim for the highest fps, lowest frame times and lowest latency in latencymon.

BEFORE

Unigine Heaven Benchmark 4.0

FPS: 212.4

Score: 5361

Min FPS: 44.4

Max FPS: 399.5

System

Platform: Windows NT 6.2 (Build 9200) 64bit

CPU model: Intel(R) Core(TM) i7-8086K CPU @ 4.00GHz (4007MHz) x6

GPU model: NVIDIA GeForce RTX 2080 Ti 25.21.14.1691 (4095MB) x1

Settings

Render: Direct3D11

Mode: 1920x1080 8xAA fullscreen

Preset: Custom

Quality: Ultra

Tessellation: Extreme

Powered by UNIGINE Engine

Unigine Corp. © 2005-2019

AFTER

Unigine Heaven Benchmark 4.0

FPS: 215.0

Score: 5415

Min FPS: 44.6

Max FPS: 413.6

System

Platform: Windows NT 6.2 (build 9200) 64bit

CPU model: Intel(R) Core(TM) i7-8086K CPU @ 4.00GHz (4007MHz) x6

GPU model: NVIDIA GeForce RTX 2080 Ti 25.21.14.1691 (4095MB) x1

Settings

Render: Direct3D11

Mode: 1920x1080 8xAA fullscreen

Preset: Custom

Quality: Ultra

Tessellation: Extreme

Powered by UNIGINE Engine

Unigine Corp. © 2005-2019

Setting correct interrupt affinity's can help with driver latency also.

When you do this, regularly check with latencymon.

Laptop users batteries ACPI

A note to laptop users

Batteries

Microsoft AC Adapter - disable

Microsoft ACPI-Compliant Control Method Battery - disable

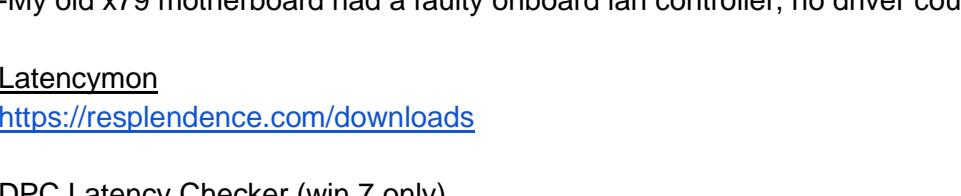
ACPI causes massive input and driver latency

There is no way to uninstall or remove it nor another work around, disable it

If you have an nvidia GPU "Microsoft ACPI-Compliant Control Method Battery"

May have to be re enabled before a restart or shutdown

As if this is disabled, the pc wont recognize your graphics card on boot



What really helped my system

I was able to get my latency down quite low on idle and load

Although the main things that helped me ..

- Switching to usb keyboard from ps2 (disabling the ps2 driver)

- Removing m.2 drives then just running sata drives (disabling the m.2 driver)

- Removing my PC case usb ports

- Removing unneeded usb devices (logitech webcams are the worst for latency)

- Trying different drivers for devices

- Setting the correct interrupt affinities

- Kboost really helps

- Disabling CPU idle really helps

- A performance power plan

- Disabling hyperthreading really helps

- Bios settings really help

- Device manager tweaks really help

- Avoiding sharing IRQ's

- Devices in Ms Mode

- Win32PrioritySeparation=16

- Taking a minimalistic approach on things

- Removing drivers/programs/services that I don't need

- Clean power

- Windows 7 It's just the best OS and can't compare to anything else for low latency**

As mentioned above with removing ps2 and m.2. Leaving some of my creature comforts behind to take a more minimalistic approach. I needed to disable the drivers in regedit, they would still ping quite high and lag in latency monitor even though there were no devices connected.

Windows is just so strange and buggy, just keep this in mind.

Those drivers were called "i8042prt.sys" and "stornvme.sys".

Some drivers for devices will have lower latency than others

If you are having issues with some hardware and have tried a different bunch of drivers still having latency issues, consider changing your hardware.

As a few examples here

- Logitech brio webcam has caused a lot of latency issues, I may replace it in due time.

- My old x79 motherboard had a faulty onboard lan controller, no driver could fix this.

Latencymon

<https://resplendence.com/downloads>

DPC Latency Checker (win 7 only)

https://thesycon.de/eng/latency_check.shtml

Get Latencymon

Restart your pc with no programs running

Run Latencymon for at least 2 minutes

Check drivers tab

Look at highest execution (ms) 1.0 = 1ms

Depending on the system, the latency will vary

You want the least amount of drivers running possible

You don't want any drivers that cause latency issues

Anything under 0.1 is ok

If you have a good system anything under 0.05 is ok

If this is not the case you could have laggy unstable drivers

Microsoft ACPI-Compliant Control Method Battery - needs to be disabled for laptops

Graphics, network, usb or any bad driver can cause bad latency

RUN/INSTALL THE DRIVERS WITH THE LEAST LATENCY

If you are having issues try different drivers

This is a must if you want your pc running smooth

Also to avoid input lag in general use and gaming

Go to stats tab

Scroll down to Measured interrupt to user process latencies (these are your averages)

Ideally you want this as low as possible

I recommend a fresh restart before using this program

Let windows settle for a few minutes after a restart

1. Ideally test latency under idle first, then diagnose and fix bad or unwanted drivers
2. After that test underload with what you do, such as gaming and fix bad or unwanted drivers

Do what you can to get your latency down

Keep in mind nvidia/amd graphics drivers can spike when going from desktop to a fullscreen app

Check stats tab if you are concerned about random graphics driver spikes

The below photos are my idle latency on windows 10

Driver file	Description	ISR count	DPC count	Highest execution (ms)
nvlddmkm.sys	NVIDIA Windows Kernel Mod...	0	7478	0.053690
d3dkmnl.sys	DirectX Graphics Kernel	0	130	0.025899
ntoskrnl.exe	NT Kernel & System	0	4908	0.021535
tcpip.sys	TCP/IP Driver	0	74	0.010642
ndis.sys	Network Driver Interface Sp...	0	37	0.00680
CLASSPNP.SYS	SCSI Class System Dll	0	2	0.004963
storport.sys	Microsoft Storage Port Driver	0	56	0.003527
storahd.sys	MS AHCI Storport Minport D...	0	1	0.003387
rsplLL64.sys	Resplendence Latency Monitor	0	12196	0.000749
NTFS.sys	NT File System Driver	0	8	0.000705
WdfFilter.sys	Microsoft Hardware Filter Driv...	0	1	0.000473
EhStorClass.sys	Enhanced Storage Class driv...	0	0	0
fileinfo.sys	FileInfo Filter Driver	0	0	0

LOOK FOR DRIVERS CAUSING SPIKES →

YOUR HIGHEST AND AVERAGE GET THESE LOW!

The below photo is my idle latency on windows 7

Same tweaks, same everything so go figure.

MEASURED INTERRUPT TO USER PROCESS LATENCIES

The interrupt to process latency reflects the measured interval that a usermode process needed to respond to the scheduling and execution of a DPC routine, the signaling of an event and the waking up of a usermode thread.

Highest measured interrupt to process latency (μs): 31.936091

Average measured interrupt to process latency (μs): 1.206681

Highest measured interrupt to DPC latency (μs): 10.219549

Average measured interrupt to DPC latency (μs): 0.364799

YOUR HIGHEST AND AVERAGE GET THESE LOW!

⚠ PRIORITY TWEAKS

Priority tweaks can be hit and miss for some systems or executables, do your own testing.

This isn't the be all and end all, try it out for yourself and use what feels best for you.

Some pro players love high/realtme, some do not. It's system dependant and preference.

If windows default feels best, leave it at default.

Ideally you want to set unimportant processors to lower priorities and important processors to higher priorities. Ideally just use this for gaming, although I recommend setting csrss.exe permanently to realtime in regedit see below. Some games may stutter in real time for certain PC's, if so try high instead.

Below are two programs that are useful for setting priorities on the go.

Process hacker

<https://processhacker.sourceforge.io/>

Process lasso

<https://bitsum.com/>

Process lasso/Process hacker

Here we change all processes running to...

Priority class - idle

I/o priority - very low

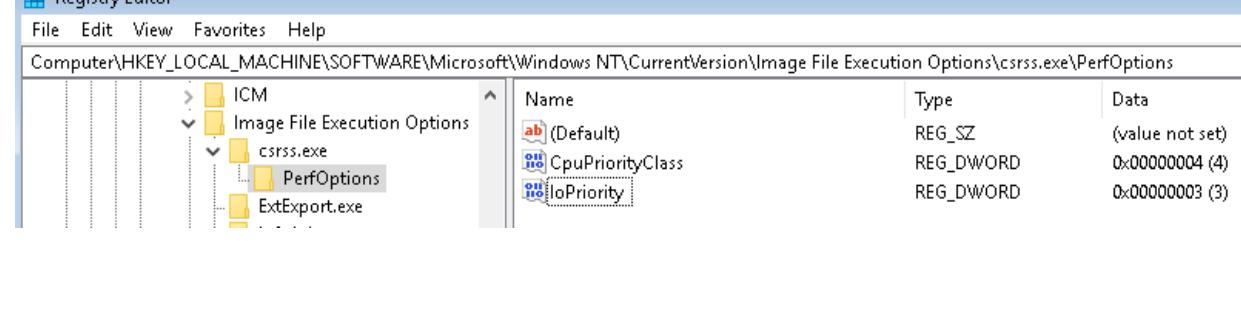
Then change the game.exe/csrss.exe to...

Priority class - real time or high

I/o priority - high

I recommend leaving...

explorer.exe - as is = normal



Game anti cheat flagging process hacker?



Setting csrss.exe or a game to realtime in windows permanently

csrss.exe is responsible for mouse and keyboard input.

Setting this to realtime can help input response.

In regedit

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Image File Execution Options

New key

"csrss.exe"

New key

"PerfOptions"

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Image File Execution Options\csrss.exe\PerfOptions

New DWORD 32bit

"CpuPriorityClass" = 4 (realtime priority)

New DWORD 32bit

"IoPriority" = 3 (high i/o priority)

The same formula above can be applied for a game executable/any executable

CpuPriorityClass=X & IoPriority=X

4=Realtime

3=High

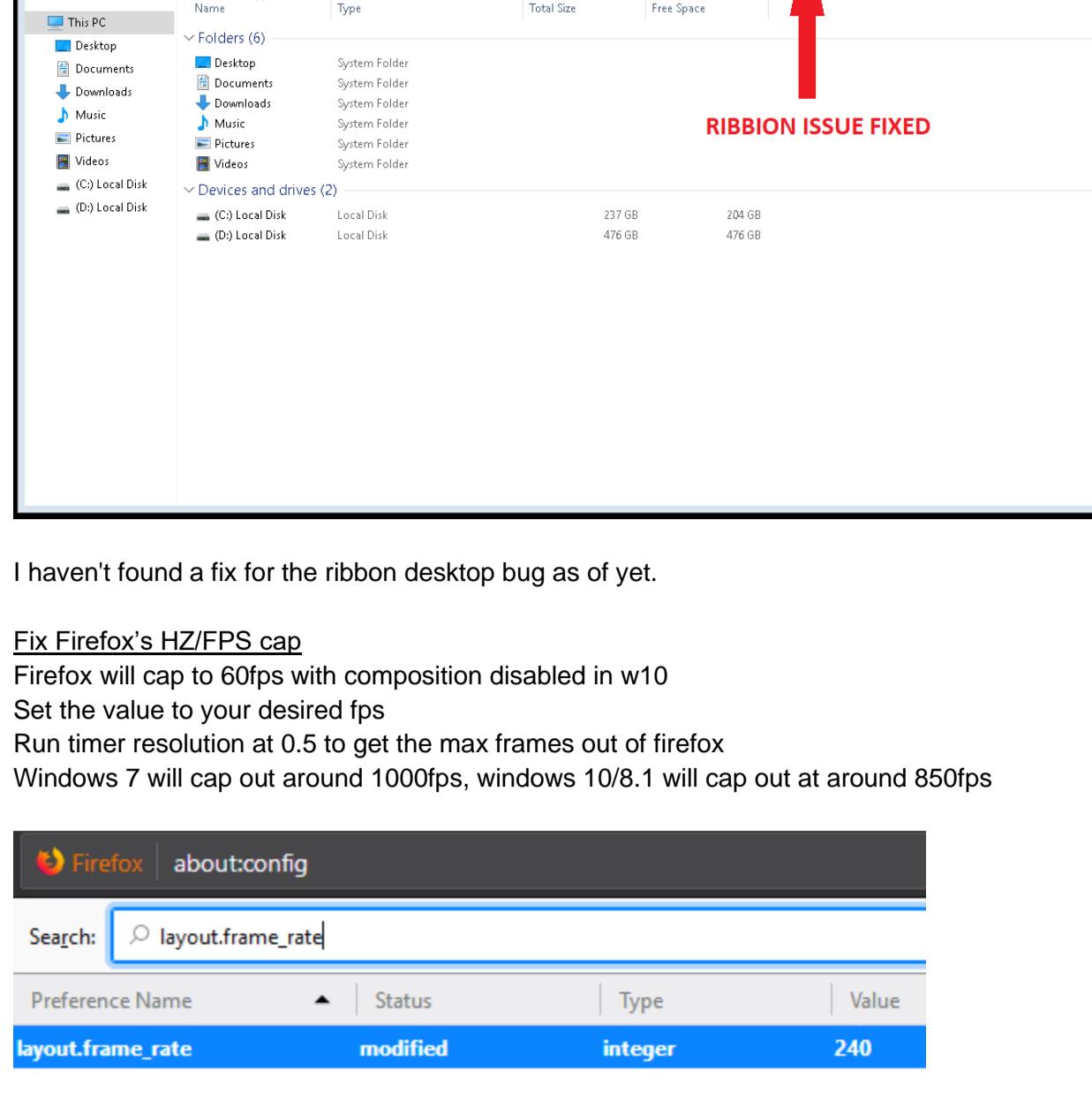
6=Above Normal

2=Normal (Runs at normal by default)

5=Below Normal

1=Low

Avoid using IoPriority=4/Realtime this will cause serious stuttering issues



I haven't found a fix for the ribbon desktop bug as of yet.

Fix Firefox's HZ/FPS cap

Firefox will cap to 60fps with composition disabled in w10

Set the value to your desired fps

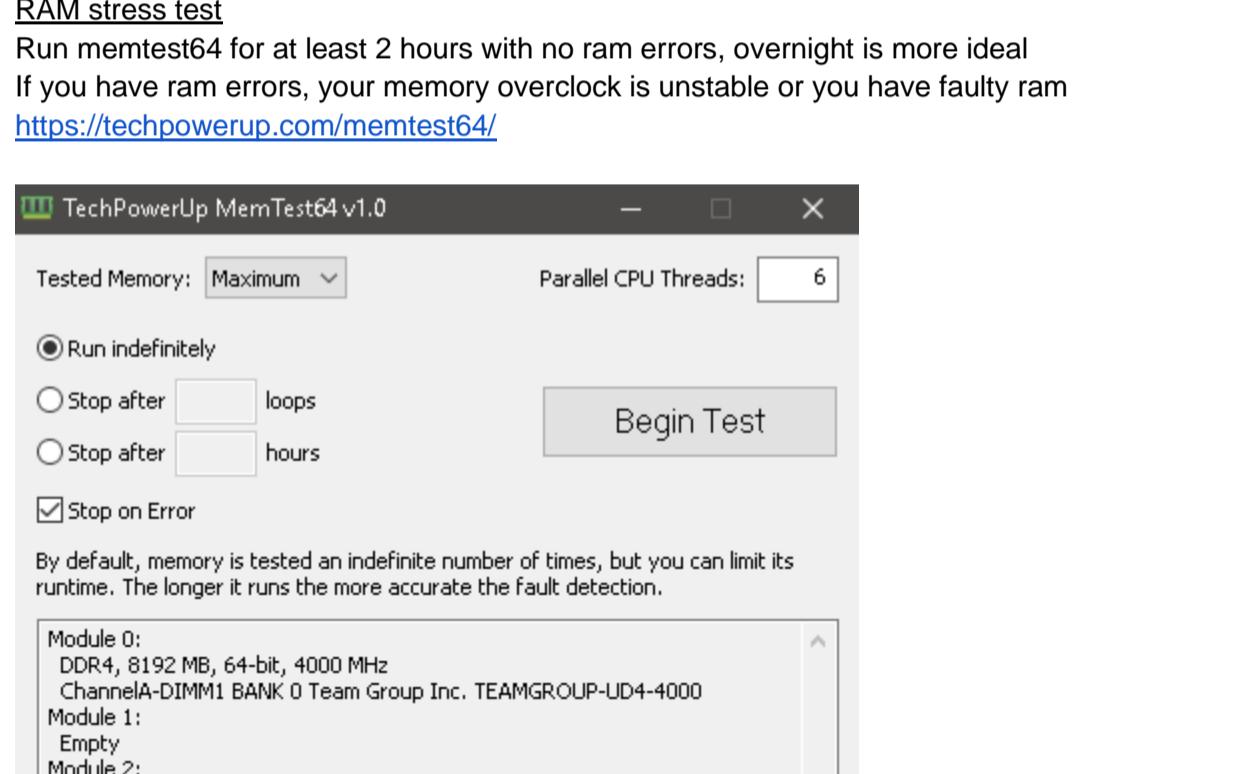
Run timer resolution at 0.5 to get the max frames out of firefox

Windows 7 will cap out around 1000fps, windows 10/8.1 will cap out at around 850fps

Preference Name	Status	Type	Value
layout.frame_rate	modified	integer	240

Test with

<https://www.testufo.com/>



Possible google chrome fix

Google chrome is noted to work fine in 7 and 8.1 with composition disabled.

Although it's a known issue in windows 10 that chrome will break with "dwm.exe" not running.

You can use the "**-disable-gpu**" argument. (you won't get GPU acceleration though)

Also, the "**--disable-dwm-composition**" argument will treat it as if you have Desktop Window Manager switched off.

You must apply these arguments to an application's shortcut path. If you use these two together you must place the "**disable-gpu**" argument after the "**disable-dwm-composition**" argument.

OTHER METHODS

DWM.ForceSwitch

<https://github.com/Phorofor/DWM.ForceSwitch>

Another method/tool worth mentioning here that was discovered later.

I have not tested this, although it looks useful. Test at your own risk!

Automatic-classic-theme-script-windows

<https://www.youtube.com/watch?v=nnFZmULsko0>

<http://winclassic.boards.net/thread/204/automatic-classic-theme-script-windows>

I have tested this and it breaks things with no way to revert back.

Still, It's worth mentioning here.

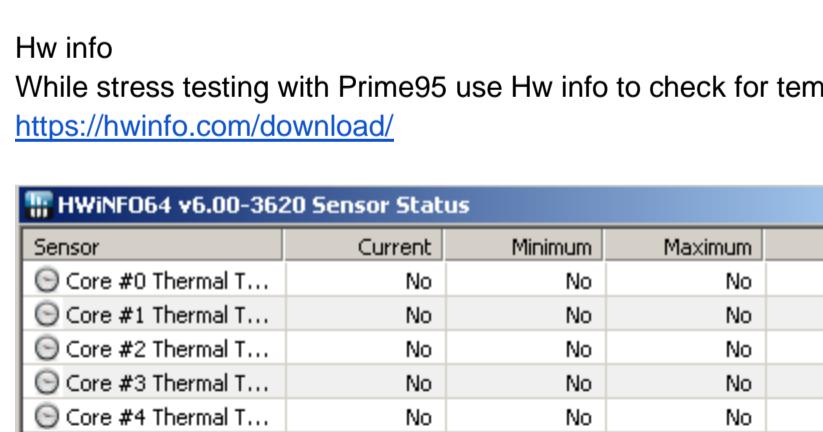
A STABLE SYSTEM

RAM stress test

Run memtest64 for at least 2 hours with no ram errors, overnight is more ideal

If you have ram errors, your memory overclock is unstable or you have faulty ram

<https://techpowerup.com/memtest64/>



CPU stress test

Run prime 95 for at least 2 hours without downclocking, overheating or crashes

For a laptop and desktop keeping the CPU under 90 degrees or lower under stress is ideal

Use the old Prime95 version 26.6

<https://mersenneforum.org/showthread.php?t=15504>

The new Prime95 stresses AVX

90% of us will not be using AVX

Gaming and daily use does not use AVX

This means you are able to overclock higher compared to stress testing WITH AVX

https://en.wikipedia.org/wiki/Advanced_Vector_Extensions

I recommend Prime95 version 26.6 small FFT's to stress test your CPU overclock

<https://drive.google.com/open?id=1qh30QzZh2A2G1919pomQILW-sEYZCrM0>



The photo below is a perfect example of how using new versions of Prime95 is not ideal. General use and gaming will only use a maximum %100 TDP with a NON AVX workload.

<https://forums.tomshardware.com/threads/intel-temperature-guide.1488337/>

Thermal Tests - Steady Workload %TDP Stability Tests - Fluctuating Workload (Peak)

Prime95 v27.7 to v29.4 - Small FFT's (AVX) 130 - 130 (Overload)

125 - 125 OCCT - CPU: OCCT

120 - 120 LinX - Default

115 - 115 AIDA64 - Stress FPU

110 - 110 IntelBurn Test - Standard

PowerMAX - CPU - SSE 105 - 105

Prime95 v26.6 - Small FFT's 100 - 100 AIDA64 - Stress CPU & FPU

95 - 95 Asus RealBench - Stress Test

HeavyLoad - Stress CPU 90 - 90 CineBench - CPU - Render Test

FurMark - CPU Burner 85 - 85

CPU-Z - Bench - Stress CPU 80 - 80 Intel Extreme Tuning Utility - CPU Stress Test

75 - 75

AIDA64 - Stress CPU 70 - 70 (Underload)

Hw info

While stress testing with Prime95 use Hw info to check for temps/throttling

<https://hwinfo.com/download/>

HWINFO64 Sensor Status

Sensor Current Minimum Maximum Average

Core #0 Thermal T... No No No

Core #1 Thermal T... No No No

Core #2 Thermal T... No No No

Core #3 Thermal T... No No No

Core #4 Thermal T... No No No

Core #5 Thermal T... No No No

Core #0 Critical Te... No No No

Core #1 Critical Te... No No No

Core #2 Critical Te... No No No

Core #3 Critical Te... No No No

Core #4 Critical Te... No No No

Core #5 Critical Te... No No No

Core #0 Power Limi... No No No

Core #1 Power Limi... No No No

Core #2 Power Limi... No No No

Core #3 Power Limi... No No No

Core #4 Power Limi... No No No

Core #5 Power Limi... No No No

Package/Ring Ther... No No No

Package/Ring Critic... No No No

Processor Core 0 Temp 0 No No No

Processor Core 1 Temp 0 No No No

Processor Core 2 Temp 0 No No No

Processor Core 3 Temp 0 No No No

Processor Core 4 Temp 0 No No No

Processor Core 5 Temp 0 No No No

Processor Core 6 Temp 0 No No No

Processor Core 7 Temp 0 No No No

Processor Core 8 Temp 0 No No No

Processor Core 9 Temp 0 No No No

Processor Core 10 Temp 0 No No No

Processor Core 11 Temp 0 No No No

Processor Core 12 Temp 0 No No No

Processor Core 13 Temp 0 No No No

Processor Core 14 Temp 0 No No No

Processor Core 15 Temp 0 No No No

Processor Core 16 Temp 0 No No No

Processor Core 17 Temp 0 No No No

Processor Core 18 Temp 0 No No No

Processor Core 19 Temp 0 No No No

Processor Core 20 Temp 0 No No No

Processor Core 21 Temp 0 No No No

Processor Core 22 Temp 0 No No No

Processor Core 23 Temp 0 No No No

Processor Core 24 Temp 0 No No No

Processor Core 25 Temp 0 No No No

Processor Core 26 Temp 0 No No No

Processor Core 27 Temp 0 No No No

Processor Core 28 Temp 0 No No No

Processor Core 29 Temp 0 No No No

Processor Core 30 Temp 0 No No No

Processor Core 31 Temp 0 No No No

Processor Core 32 Temp 0 No No No

Processor Core 33 Temp 0 No No No

Processor Core 34 Temp 0 No No No

Processor Core 35 Temp 0 No No No

Processor Core 36 Temp 0 No No No

Processor Core 37 Temp 0 No No No

Processor Core 38 Temp 0 No No No

Processor Core 39 Temp 0 No No No

Processor Core 40 Temp 0 No No No

Processor Core 41 Temp 0 No No No

Processor Core 42 Temp 0 No No No

Processor Core 43 Temp 0 No No No

Processor Core 44 Temp 0 No No No

Processor Core 45 Temp 0 No No No

Processor Core 46 Temp 0 No No No

Processor Core 47 Temp 0 No No No

Processor Core 48 Temp 0 No No No

Processor Core 49 Temp 0 No No No

Processor Core 50 Temp 0 No No No

Processor Core 51 Temp 0 No No No

Processor Core 52 Temp 0 No No No

Processor Core 53 Temp 0 No No No

Processor Core 54 Temp 0 No No No

Processor Core 55 Temp 0 No No No

Processor Core 56 Temp 0 No No No

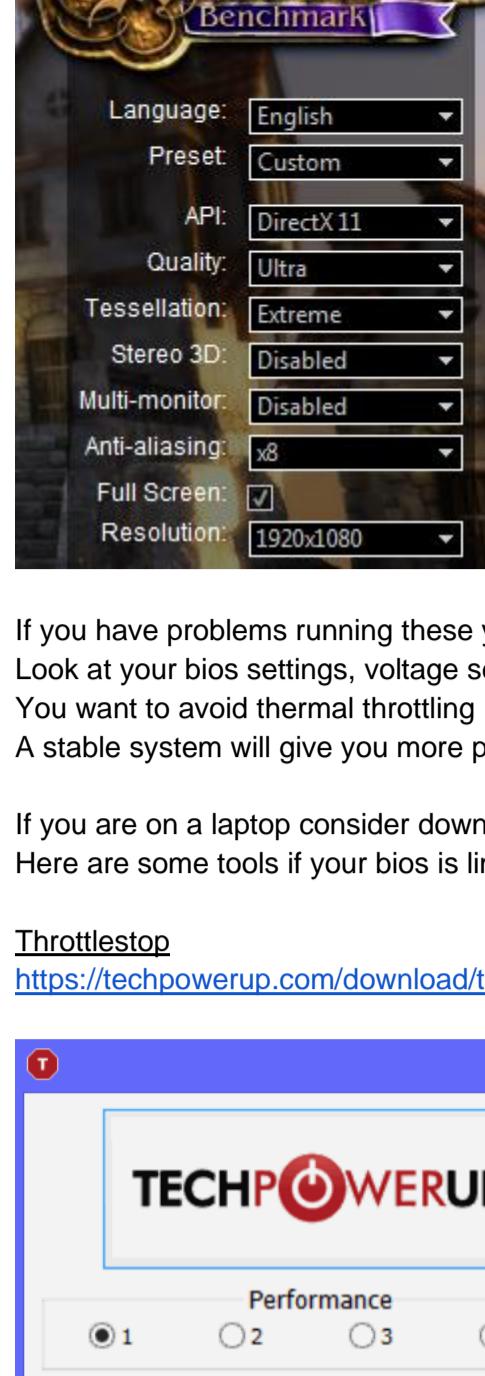
Processor Core 57 Temp 0 No No No

Processor Core 58 Temp 0 No No No

Processor Core 59 Temp 0 No No No

Processor Core 60 Temp 0 No No No

Processor Core 61 Temp 0 No No No

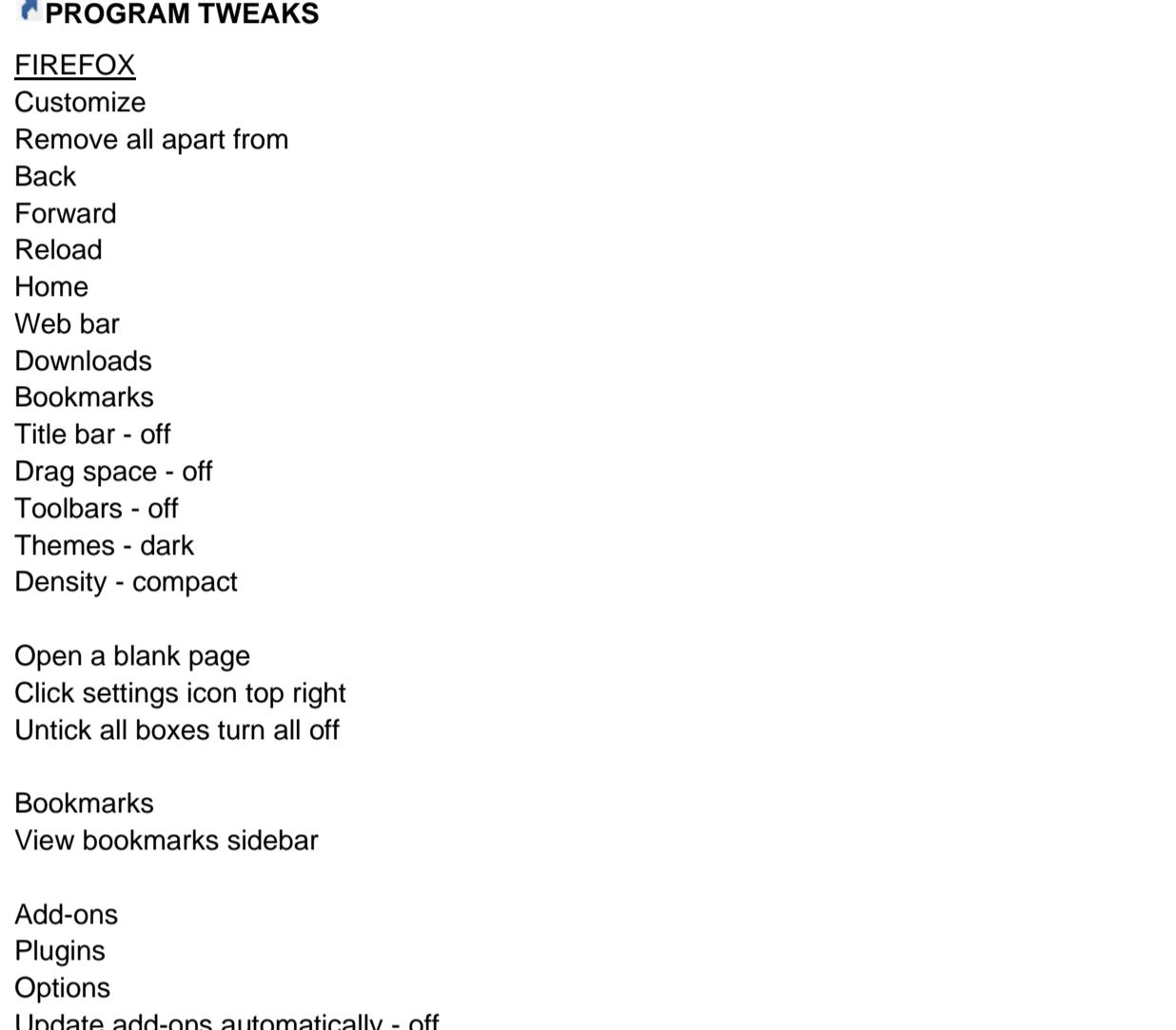


If you have problems running these your system is unstable
Look at your bios settings, voltage settings, overclocks and cooling
You want to avoid thermal throttling
A stable system will give you more performance overall

If you are on a laptop consider downclocking your cpu or undervolting
Here are some tools if your bios is limited, good luck

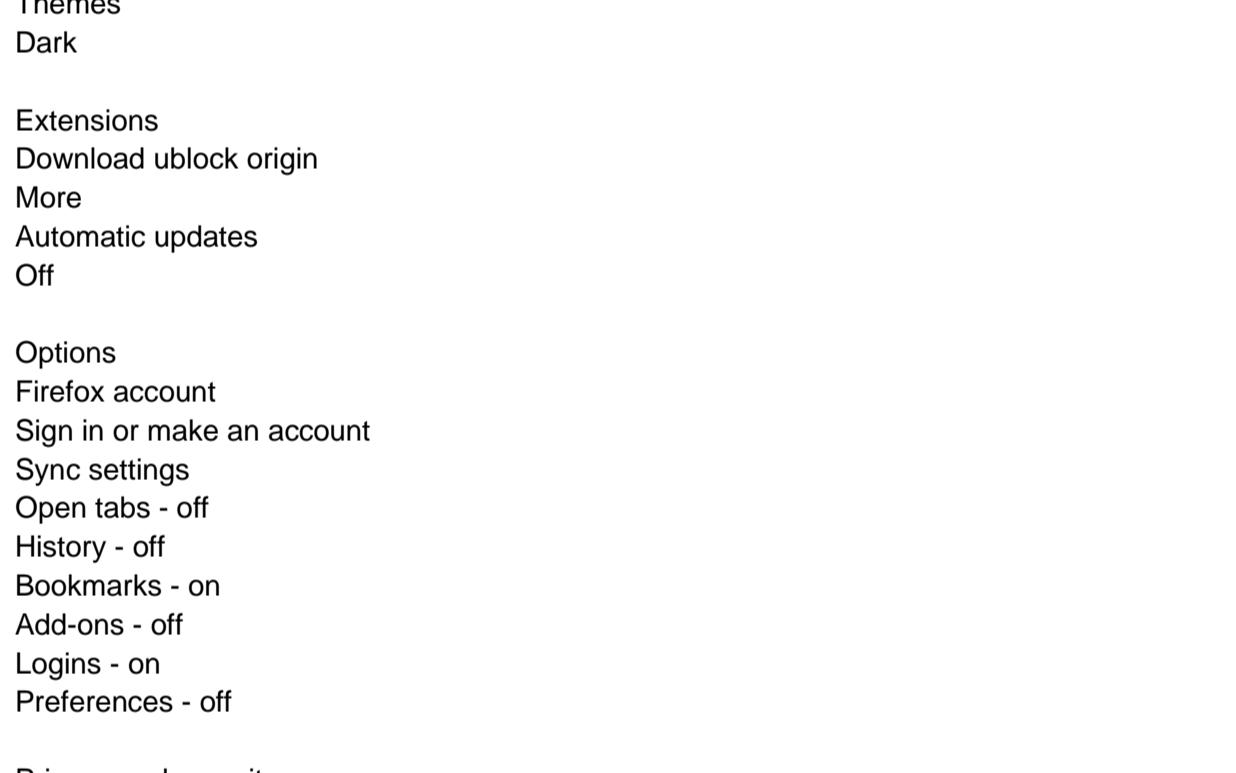
Throttlestop

<https://techpowerup.com/download/techpowerup-throttlestop/>



Intel extreme tuning utility

<https://downloadcenter.intel.com/download/24075/Intel-Extreme-Tuning-Utility-Intel-XTU->



PROGRAM TWEAKS

FIREFOX

Customize

Remove all apart from

Back

Forward

Reload

Home

Web bar

Downloads

Bookmarks

Title bar - off

Drag space - off

Toolbars - off

Themes - dark

Density - compact

Open a blank page

Click settings icon top right

Untick all boxes turn all off

Bookmarks

View bookmarks sidebar

Add-ons

Plugins

Options

Update add-ons automatically - off

Plugin

More

Automatic updates - off

Always activate

Do this for all

Themes

Dark

Extensions

Download ublock origin

More

Automatic updates

Off

Options

Firefox account

Sign in or make an account

Sync settings

Open tabs - off

History - off

Bookmarks - on

Add-ons - off

Logins - on

Preferences - off

Privacy and security

Strict

Send websites a "do not track" signal that you don't want to be tracked - always

Delete cookies and site data when firefox is closed - on

Ask to save logins and passwords for websites - on

History

Firefox will - use custom settings for history

Always use private browsing mode - off

Remember browsing and download history - off

Remember search and form history - off

Clear history when firefox closes - on

Address bar

When using the address bar, suggest

Browsing history - off

Bookmarks - on

Open tabs - off

Location - block new requests asking to access your location

Camera - block new requests asking to access your camera

Microphone - block new requests asking to access your microphone

Notifications - block new requests asking to allow notifications

Block pop-up windows - on

Warn you when websites try to install add-ons - on

Prevent accessibility services from accessing your browser - on

Firefox data collection and use - all off

Security

Deceptive content and dangerous software protection - all on

Certificates - ask you every time

Query ocsp responder servers to confirm the current validity of certificates - on

Search

Use the address bar for search and navigation - on

Add search bar in toolbar - off

Default - google

Provide search suggestions - off

Show search suggestions in address bar results - off

Show search suggestions ahead of browsing history in address bar results - off

One click engines

Off

Options

Firefox account

Sign in or make an account

Sync settings

Open tabs - off

History - off

Bookmarks - on

Add-ons - off

Logins - on

Preferences - off

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One click engines

Off

Options

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Sign in or make an account

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History - off

Bookmarks - on

Add-ons - off

Logins - on

Preferences - off

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Clear history when firefox closes - on

Address bar

When using the address bar, suggest

Browsing history - off

Bookmarks - on

Add-ons - off

Logins - on

Preferences - off

Privacy and security

Strict

Send websites a "do not track" signal that you don't want to be tracked - always

Delete cookies and site data when firefox is closed - on

Ask to save logins and passwords for websites - on

History

Firefox will - use custom settings for history

Always use private browsing mode - off

Remember browsing and download history - off

Remember search and form history - off

Clear history when firefox closes - on

about:config
layout.frame_rate - XXX
Run timer resolution at 0.5 to get the max frames out of firefox
Windows 7 will cap out around 1000fps, windows 10/8.1 will cap out at around 850fps

Add ons
Ublock origin
<https://addons.mozilla.org/en-US/firefox/addon/ublock-origin/>

Disable firefox updates
https://drive.google.com/open?id=1wIQPTph3jrBWAofOLKwmXHc2D4U_fHw

Regedit
Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Policies
New key
Mozilla
New key
Firefox
New
DWORD (32bit)
DisableAppUpdate
DisableAppUpdate=1
Restart
Check in firefox settings if updates are disabled by system administrator

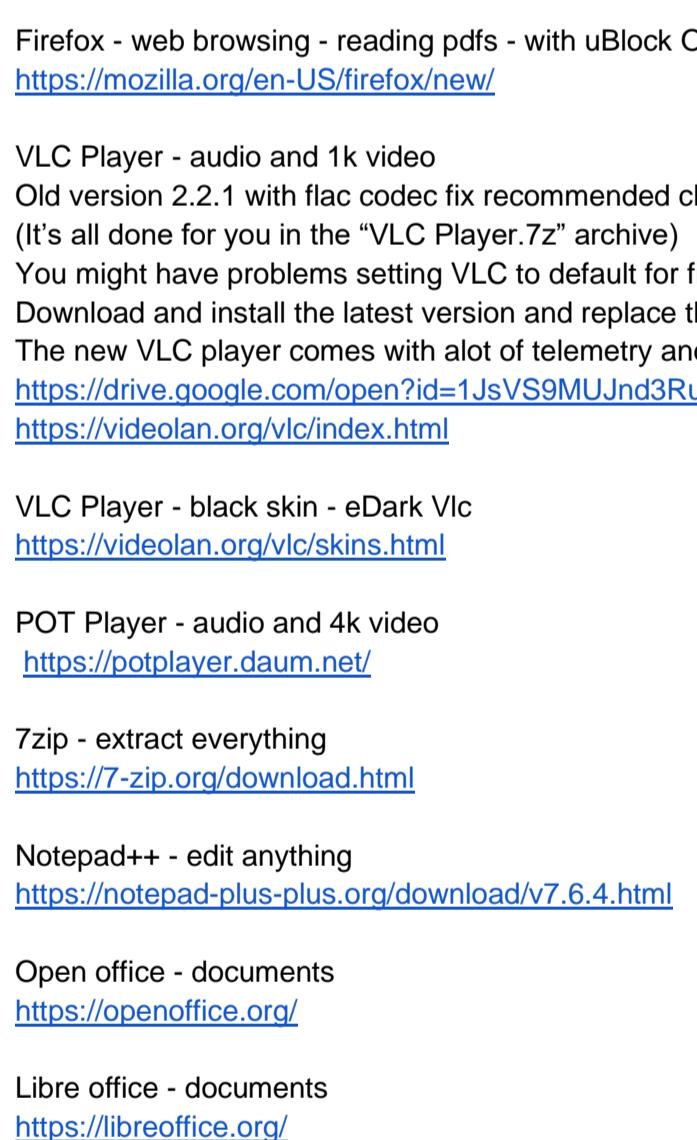
TIPS FOR GAME LAUNCHERS

Disable cloud services
Disable overlays and in game services
Disable sharing services
Disable streaming services
Disable broadcasting services
Disable any hardware acceleration
Disable notifications
Disable automatic updates
Disable telemetry
Disable share hardware, system info, troubleshooting and crash reporting
Disable shader pre caching (this is already done with nvidia control panel)
Disable launcher running on startup
Disable background or helper services

Steam
<https://store.steampowered.com/>
Origin
<https://origin.com/>
Uplay
<https://uplay.ubisoft.com/>
Battle.net
<https://shop.battle.net/>
Good old games
<https://gog.com/>
Epic games
<https://epicgames.com/>

STEAM TWEAKS

Run a steam game without the launcher
Make a shortcut to the actual "exe" of the game
(Not a steam game shortcut!)
Add to the target - "**-no-browser**"



Run steam without the extra exe's
Removes 6 steam processors
Uses the old friends system
Make a shortcut of steam
Add to the target - "**console -no-browser**"



RECOMMENDED PROGRAMS

PROGRAMS

Ninite - a safe compiled program installer

<https://ninite.com/>

Firefox - web browsing - reading pdfs - with uBlock Origin addon
<https://mozilla.org/en-US/firefox/new/>

VLC Player - audio and 1k video
Old version 2.2.1 with flac codec fix recommended check my google drive
(It's all done for you in the "VLC Player.7z" archive)

You might have problems setting VLC to default for files

Download and install the latest version and replace the files with my google drive ones

The new VLC player comes with a lot of telemetry and has been much buggier for me

<https://drive.google.com/open?id=1JsVS9MUJnd3Rud18zjvPQRMr1p3M59Wm>

<https://videolan.org/vlc/index.html>

VLC Player - black skin - eDark Vlc

<https://videolan.org/vlc/skins.html>

POT Player - audio and 4k video

<https://potplayer.daum.net/>

7zip - extract everything

<https://7-zip.org/download.html>

Notepad++ - edit anything

<https://notepad-plus-plus.org/download/v7.6.4.html>

Open office - documents

<https://openoffice.org/>

Libre office - documents

<https://libreoffice.org/>

Obs - recording

<https://obsproject.com/>

Vegas pro - rendering editing videos

<https://vegascreativesoftware.com/au/vegas-pro/>

Gimp - photo shopping

<https://gimp.org/>

Ableton live - music editing

<https://ableton.com/en/>

ANTIVIRUS

I don't have any antivirus running in the background on my tweaked os

This will kill game performance, I recommend you do the same for your tweaked os

Although I do scan with malwarebytes occasionally

Malwarebytes

<https://malwarebytes.com>

Bitdefender

<https://bitdefender.com>

Avast

<https://avast.com>

TESTING & READING PROGRAMS

Memtest86

<https://memtest86.com/>

Karhu

<https://karhusoftware.com/ramtest/>

Memtest64

<https://techpowerup.com/memtest64/>

Asrock timing configurator

[http://asrock.pc.cdn.bitgravity.com/Utility/Formula/TimingConfigurator\(v4.0.4\).zip](http://asrock.pc.cdn.bitgravity.com/Utility/Formula/TimingConfigurator(v4.0.4).zip)

CpuZ

<https://cpuid.com/softwares/cpu-z.html>

Aida 64

<https://aida64.com/downloads>

Prime 95 - Version 26.6

<https://mersenneforum.org/showthread.php?t=15504>

Cinebench

<https://guru3d.com/files-details/cinebench-15-download.html>

Unigine valley

<https://benchmark.unigine.com/valley>

Unigine Heaven (my preferred stress test/benchmark)

<https://benchmark.unigine.com/heaven>

Check scores with
<http://overclock.net/forum/21-benchmarking-software-discussion/1235557-official-top-30-heaven-benchmark-4-0-scores.html>

Unigine superposition (8k preset is the most stressful of tests)
<https://benchmark.unigine.com/superposition>

3dmark
<https://3dmark.com/>

Timer bench
<https://overclockers.at/articles/the-hpet-bug-what-it-is-and-what-it-isnt>
(I have found this program buggy with frametime readings, it prefers a mechanical hard drive)

Hw monitor
<https://cpuid.com/softwares/hwmonitor.html>

Hw info
<https://hwinfo.com/download/>

Msi afterburner + rivatuner statistics server
<https://guru3d.com/files-details/msi-afterburner-beta-download.html>

GpuZ
<https://techpowerup.com/gpu/>

CpuZ
<https://cpuid.com/softwares/cpu-z.html>

Crystal disk mark
<http://crystalmark.info/en/software/crystaldiskmark/>

Performance test
<https://passmark.com/products/pt.htm>
Check scores with
<https://passmark.com>

User benchmark
<https://userbenchmark.com/Software>

Speed test
<https://speedtest.net/>
<http://dslreports.com/speedtest>

Dns benchmark
<https://grc.com/dns/benchmark.htm>

Latencymon
<https://resplendence.com/downloads>

DPC Latency Checker (win 7 only)
https://thesycon.de/eng/latency_check.shtml

Pc building and hardware bench sites
<https://pcpartpicker.com>
<https://passmark.com>

Boot timer
<https://thewindowsclub.com/windows-boot-timer>

CLONING BACKUP

Clone and backup your OS drive to another drive after these tweaks

Recommended

A clone docking station
(Preferred and the cleanest way)

Other methods

Acronis true image
<https://acronis.com/en-us/personal/computer-backup/>

Cleanup after clone
<https://kb.acronis.com/aticleanup>

Clonezilla
<https://clonezilla.org/>

Macrium Reflect
<https://macrium.com/reflectfree>

CLONED DRIVE NEW SYSTEM

Activate windows

Enable all services in nsudo and batch file

Restart

Activate windows with new key

Disable all services in nsudo and batch file

Restart

To change account name

System properties

Computer name CHANGENAME

User accounts CHANGENAME

Run lusrmgr.msc

Users

Find current user

CHANGENAME

Regedit

Computer\HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows

NT\CurrentVersion\ProfileList

Find current user folder S-1-5-XX-XXXXXXXXXX-XXXXXXX-XXXXXXX-XXXXXX-XXXX

ProfileImagePath

Edit

C:\Users\CHANGENAME

Restart

Snappy driver installer drivers

Vendor/internet drivers (if needed)

DDU and graphics driver

Graphics tweaks list

Internet tweaks list

Msconfig tweaks

Diskmgmt.msc

Allocate more space if needed

(If cloned with a dock to a bigger drive)

Clean device manager and uninstall unused/hidden drivers/devices

Uninstall unwanted drivers and programs in control panel

Clean and delete unused drivers with device remover

Be careful with this one it could cause a blue screen

Drivers will remain in the system even if they are uninstalled, this is the fix

Recycle bin size

Autoruns

Diskcleanup

Defrag

Go over tweak guide

This last step isn't needed, although I like to be sure

HARDWARE SETTINGS

Here are my hardware settings

(You should tweak yours also)

Monitor

Zowie xl2740

<https://zowie.benq.com/en/product/monitor/xl/xl2740.html>

Game settings

Black equalizer - 0

Colour vibrance -20

Low blue light - 0

Instant mode - on

Picture

Picture mode - gamer 1

Brightness - 100

Contrast - 60

Sharpness - 10

Gamma - 1

Colour temperature - user define - r 100 g 100 b 100

AMA - premium

Dynamic contrast - 0

Senseye Demo - off

Reset Colour - no

Display

Input - displayport

Display mode - full

System

Headphone

Volume - 0

Mute - on

Osd settings

Language - english

Display time - 30sec

Osd lock - off

Custom key

Custom key1 - brightness

Custom key2 - black equalizer

Custom key3 - colour vibrance

Other setting

Resolution notice - off

Buzzer - off

Input auto switch - off

Auto power off - off

Led indicator - off

Ddc/ci - off

Benq service page

HDMI hpd - off

DVI hpd - off

Logo - off
Auto power - on
Hdmi 10m - off
Internet cafe - off
Blur reduction - on
Intensity - 1
Area -100

Blur reduction off settings for above

(Less input lag but ghosting)
Blur reduction - off
Intensity - 10
Area - 10
Contrast - 50

Beng bios page
This tweak is pointless and won't save
Od gain - on
Od gain - 40 (if it will let you save)
(Od gain will only save temp when in a game)

Keyboard

Zowie celeritas ii

<https://zowie.beng.com/en/product/keyboard.html>

Fn + win key (disable windows key)

Mouse

G pro wireless

<https://logitechg.com/en-au/products/gaming-mice/pro-wireless-mouse.html>

In wired mode

400 dpi

1000hz

Angle snapping - off

Leds - off

Software - uninstalled

Drivers - uninstalled

Microphone

Blue yeti

<https://bluedesigns.com/products/yeti/>

2 channel - 16 bit - 44100hz

Windows level - 100

Pattern - cardioid

Gain - 0

Sound card

Traktor audio 2 mk2

<https://native-instruments.com/en/products/traktor/dj-audio-interfaces/traktor-audio-2/>

2 channel - 24 bit - 44100hz

Windows level - 100

Traktor control panel

Sample rate - 44100hz

Process buffer - 192 samples

Usb buffer - 2ms

Output latency = 9.8ms

(Vs windows/gaming/motherboard/general sound card = 250ms)

Webcams

C920 & Brio

https://support.logitech.com/en_us/product/hd-pro-webcam-c920s

https://support.logitech.com/en_us/product/brio

Default windows driver

Brightness - 128

Contrast - 128

Hue - greyed out

Saturation - 128

Sharpness - 128

Gamma - greyed out

White balance - auto

Backlight comp - 0

Gain - 0

Color enable - greyed out

Powerline frequency (anti flicker) - 60hz

Zoom - 100

Focus - 0

Exposure - auto

Pan - 0

Tilt - 0

Roll - greyed out

Low light compensation - off

NEW GAME GUIDE

Install on an ssd

Game launcher settings

See "TIPS FOR GAME LAUNCHERS" above

Set shortcut as admin

Set game as admin and disable fullscreen optimizations

Globally in regedit

HKEY_CURRENT_USER\System\GameConfigStore

GameDVR_FSEBehavior = 2



In compatibility tab



Windows 7 Set game as admin and disable desktop composition

In compatibility tab

Set firewall

Allow apps to communicate through Windows Defender Firewall

To add, change, or remove allowed apps and ports, click Change settings.

[What are the risks of allowing an app to communicate?](#)

[Change settings](#)

Allowed apps and features:

Name	Private	Public
<input checked="" type="checkbox"/> Battlefield™ 1 (x64)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Battlefield™ 1 Trial (x64)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Nvidia & inspector individual control panel settings

I skip this step and stick with the global settings, it's too much work for all the individual games. This might be worth it for you if you like different profiles for games.

Check for tweaks/fixes on the internet

<https://pcgamingwiki.com/wiki/Home>

Remove intros

Sometimes deleting the video files will work

In game settings

Launch options

Config options

Config sensitivity

Keep the same aim for all games

<http://mouse-sensitivity.com/>

Photos of game settings

Backup config

Cleanup

Defrag

Check autoruns

Check uninstall a program

Defragment
DO NOT DEFRAAGMENT SSD'S

Disk cleanup

When gaming

Disable wifi use ethernet
Disable acpi (if on a laptop)
Turn touchpad off (if on a laptop)
Quit all background programs

WINDOWS 1709

Notable changes in 1709 from the guide above

Known bugs

Activation is required before gpedit.msc tweaks
(Be a speed demon with the ethernet cable)

Colours and themes can bug out

Set and save your sounds, themes and color layout before tweaks

Gpedit.msc

User Configuration\Administrative Templates\Start Menu And Taskbar\Notifications
Turn off notifications network usage - enabled

Language

Control Panel\Clock, Language, and Region\Language\Advanced settings

Switching input methods

Let me see a different input method for each app window - off

Use the desktop language bar when it's available

Personalization data

Don't use automatic learning and delete all previously collected data

Language for web content

Don't let websites access my language list. The language of my dat, time, and number formatting will be used instead. - select

Change language bar hotkeys

Language bar

Hidden

Show the language bar as transparent when active - off

Show additional language bar icons in the taskbar - off

Show text labels on the language bar - off

Advanced key settings

Change key sequence

Switch input language - not assigned

Switch keyboard layout - not assigned

WINDOWS 7

Notable changes in windows 7 from the guide above

Ntlite, drivers and windows 7

You might need to inject drivers into your windows 7 iso to use your PC's usb and nvme

<https://youtu.be/npTbXWRJ1vs?t=1371>

Get drivers from your vendor if possible or here are some other options...

<https://sdi-tool.org/>

<https://www.snappy-driver-installer.org/>

<https://www.win-raid.com/t29f25-Recommended-AHCI-RAID-and-NVMe-Drivers.html>

<https://www.win-raid.com/t834f25-USB-Drivers-original-and-modded.html>

Show non present devices in device manager

Control Panel\System and Security\System

System Properties

Environment Variables - New

devmgr_show_nonpresent_devices

1



Speed up start time

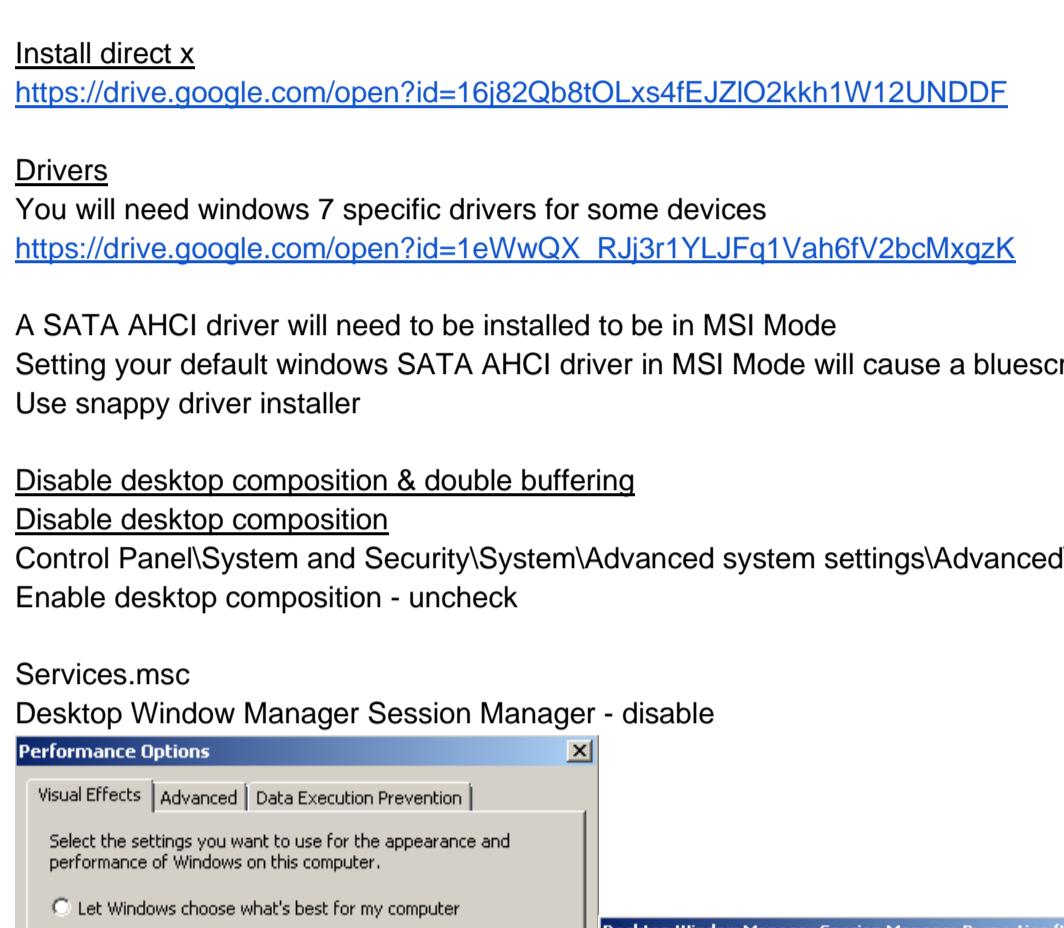
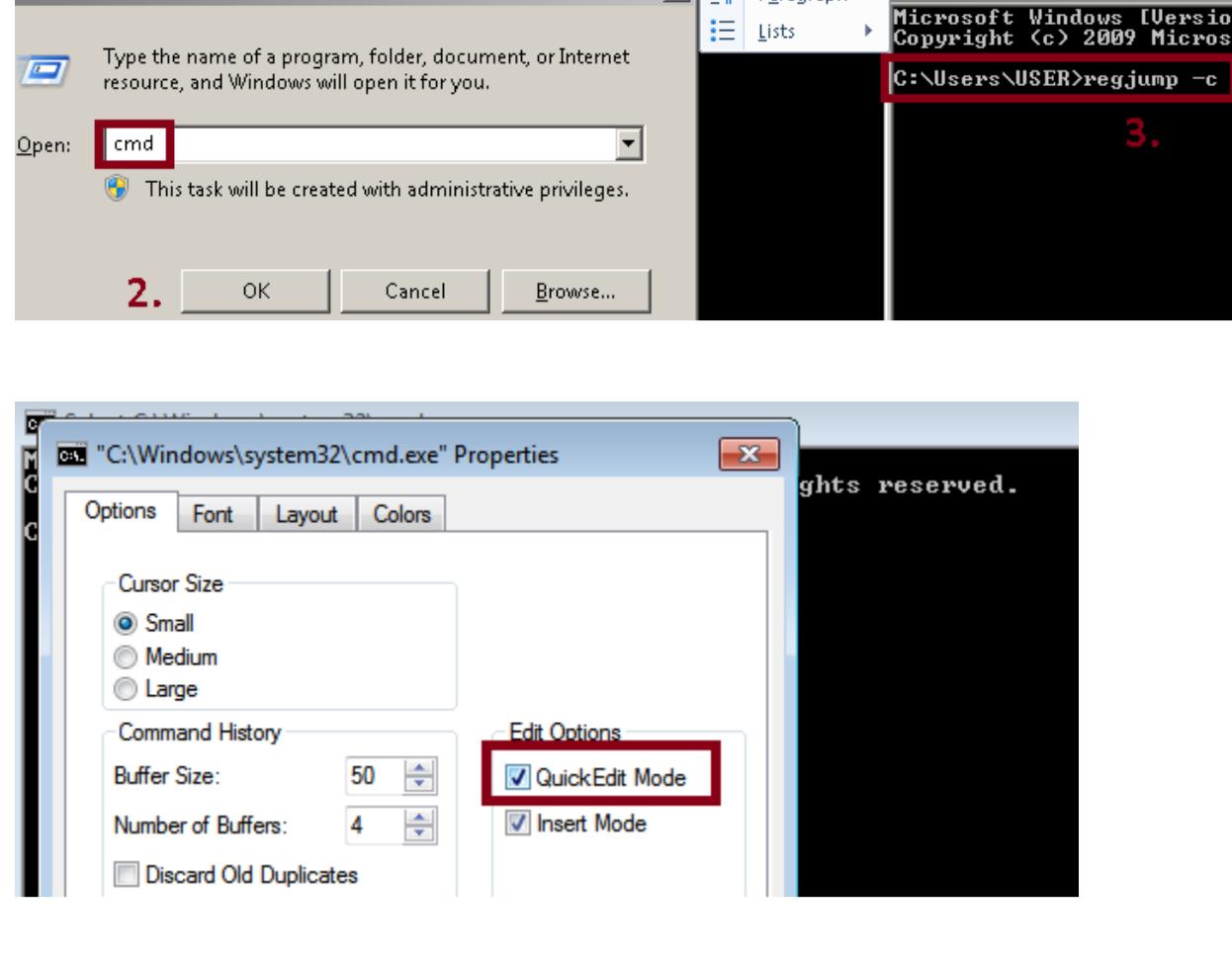
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System

DelayedDesktopSwitchTimeout=0

Regjump a useful tool

<https://docs.microsoft.com/en-us/sysinternals/downloads/regjump>

Place "regjump.exe" in C:\Windows



Take ownership context menu

Winaero tweaker's will not work

<https://drive.google.com/open?id=1A8lucemehFU9iZwb3YFYh-suZtfz7U4Q>

Install direct x

<https://drive.google.com/open?id=16j82Qb8tOLxs4fEJZIO2khh1W12UNDDF>

Drivers

You will need windows 7 specific drivers for some devices

https://drive.google.com/open?id=1eWwQX_RJj3rYLJFq1Vah6fV2bcMxgzk

A SATA AHCI driver will need to be installed to be in MSI Mode

Setting your default windows SATA AHCI driver in MSI Mode will cause a bluescreen

Use snappy driver installer

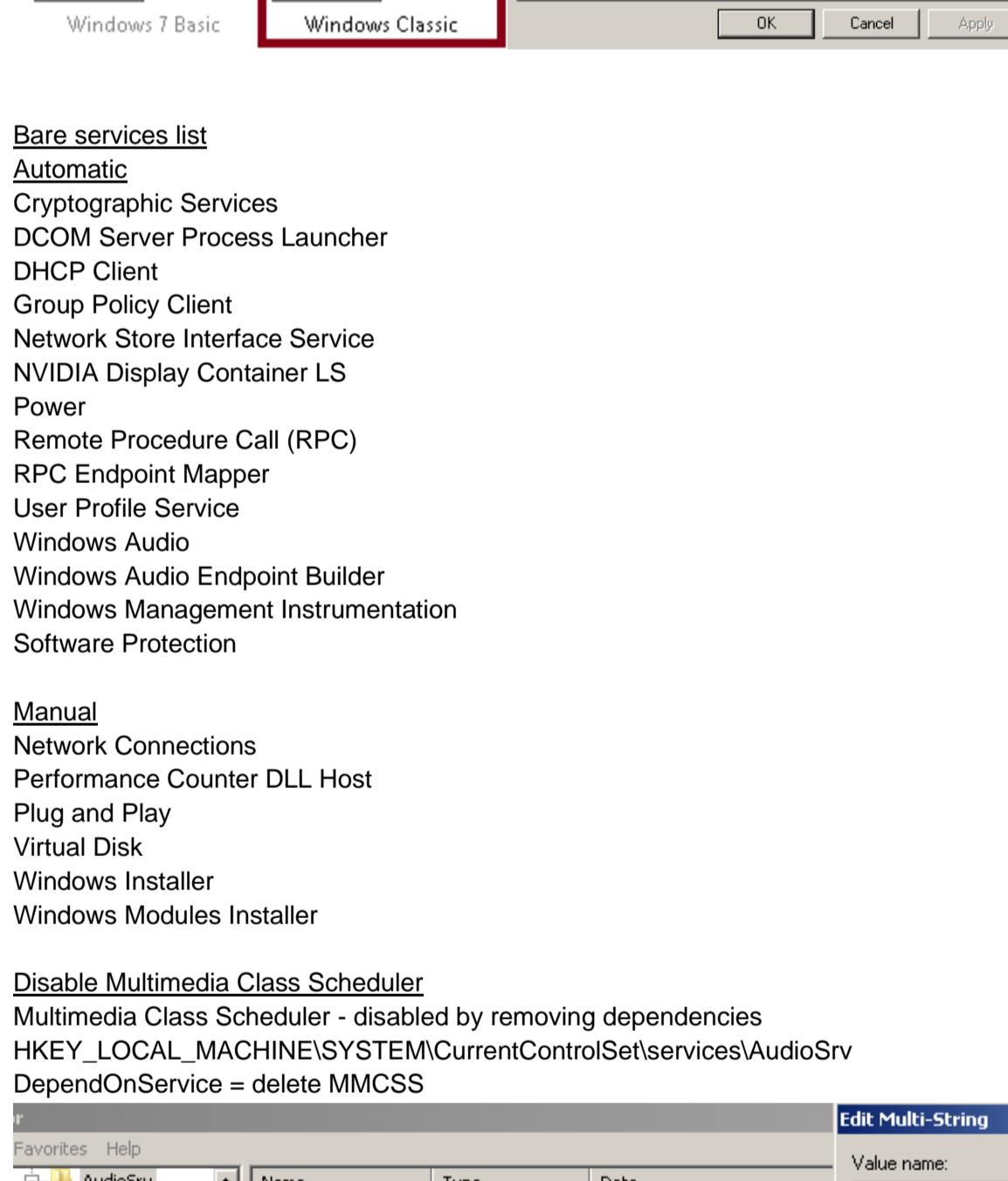
Disable desktop composition & double buffering

Disable desktop composition

Control Panel\System and Security\System\Advanced system settings\Advanced\Performance
Enable desktop composition - uncheck

Services.msc

Desktop Window Manager Session Manager - disable



Disable double buffering

<https://superuser.com/questions/558007/how-does-windows-aero-prevent-screen-tearing>

Running an aero theme causes double buffering

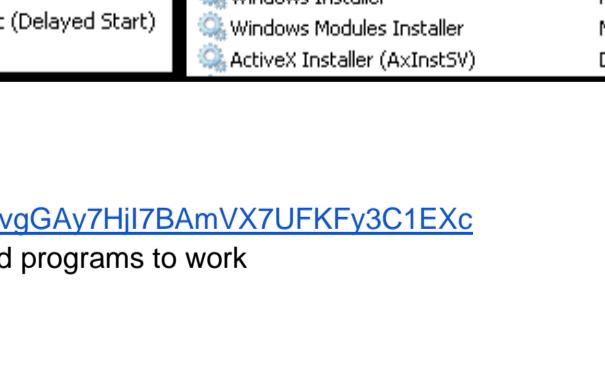
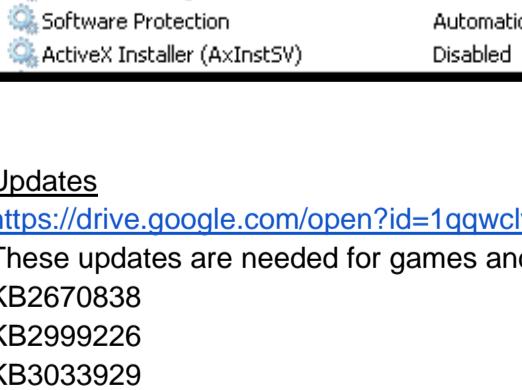
Control Panel\Appearance and Personalization\Personalization

Themes - run a classic theme

Services.msc

Themes - disable

Aero Themes (7) —————



Bare services list

Automatic

Cryptographic Services

DCOM Server Process Launcher

DHCP Client

Group Policy Client

Network Store Interface Service

NVIDIA Display Container LS

Power

Remote Procedure Call (RPC)

RPC Endpoint Mapper

User Profile Service

Windows Audio

Windows Audio Endpoint Builder

Windows Management Instrumentation

Software Protection

Manual

Network Connections

Performance Counter DLL Host

Plug and Play

Virtual Disk

Windows Installer

Windows Modules Installer

Disable Multimedia Class Scheduler

Multimedia Class Scheduler - disabled by removing dependencies

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\AudioSrv

DependOnService = delete MMCSS

Updates

<https://drive.google.com/open?id=1ggwclvgGAy7Hil7BAmVX7UFKFv3C1Exc>

These updates are needed for games and programs to work

KB2670838

KB2999226

KB3033929

KB4019990

KB976902

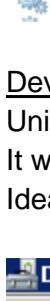
NET 4.8

Update for faceit - CSGO

<https://www.catalog.update.microsoft.com/Search.aspx?q=KB4499175>

Net framework services

Disable all net framework services, things will still work fine

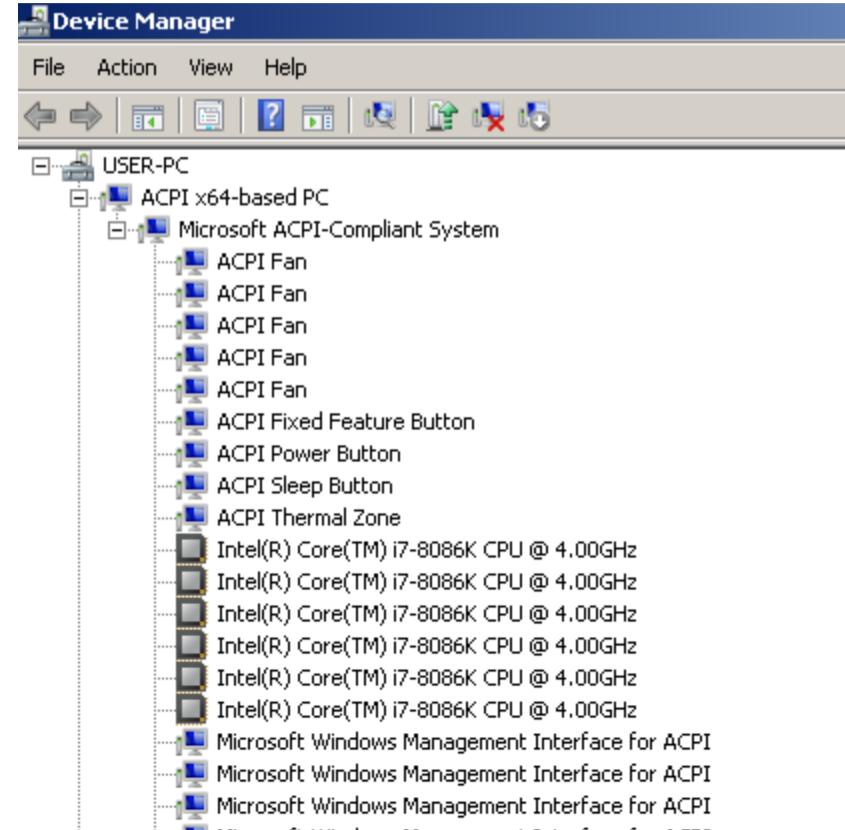
 Microsoft .NET Framework NGEN v2.0.50727_X64 Disabled
Microsoft .NET Framework NGEN v2.0.50727_X86 Disabled
Microsoft .NET Framework NGEN v4.0.30319_X64 Disabled
Microsoft .NET Framework NGEN v4.0.30319_X86 Disabled

Device manager

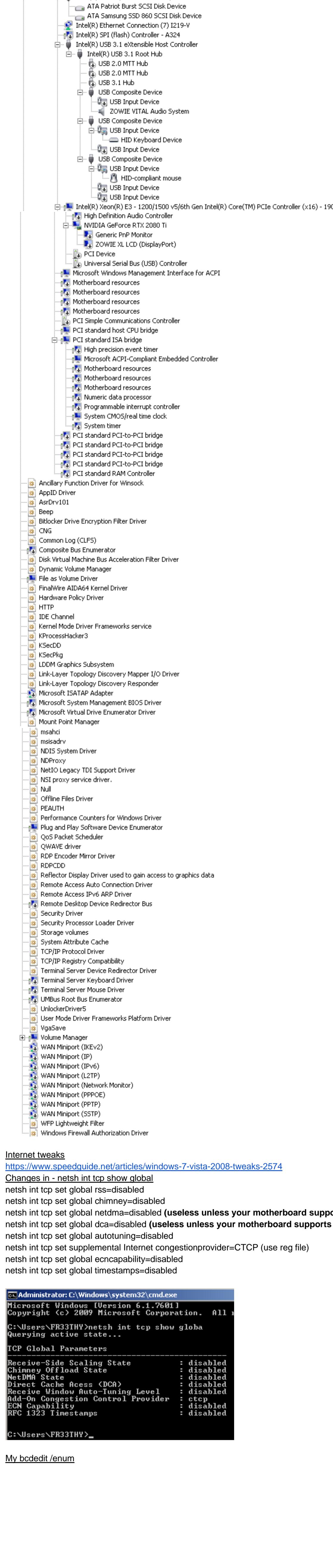
Uninstalling a Non-Plug and Play Driver in device manager will just hide the driver temporarily

It will reappear if set to automatic/manual in regedit

Ideally disable them in regedit if not needed



My disabled tree



Internet tweaks

<https://www.speedguide.net/articles/windows-7-vista-2008-tweaks-2574>

Changes in - netsh int tcp show global

netsh int tcp set global rss=disabled

netsh int tcp set global chimney=disabled

netsh int tcp set global netdma=disabled (**useless unless your motherboard supports it**)

netsh int tcp set global dca=disabled (**useless unless your motherboard supports it**)

netsh int tcp set global autotuning=disabled

netsh int tcp set supplemental Internet congestionprovider=CTCP (use reg file)

netsh int tcp set global ecncapability=disabled

netsh int tcp set global timestamps=disabled

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\FR33THY>netsh int tcp show global
Querying active state...

TCP Global Parameters
-----
Receive-Side Scaling State      : disabled
Chimney Offload State          : disabled
NetDMA State                   : disabled
Direct Cache Access <DCA>     : disabled
Receive Window Auto-Tuning Level: disabled
Add-On Congestion Control Provider: ctcp
ECN Capability                 : disabled
RFC 1323 Timestamps            : disabled

C:\Users\FR33THY>
```

My bcdedit /enum

```

Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright <c> 2009 Microsoft Corporation. All rights reserved.

C:>Users\FR33THY>bcdedit /enum

Windows Boot Manager
identifier {bootmgr}
device partition=C:\Device\HarddiskVolume1
description Windows Boot Manager
locale en-US
inherit {globalsettings}
default {current}
resumeobject {385701dc-8b3f-11e9-8ad8-f450ee62fbe1}
displayorder {current}
toolsdisplayorder {memdiag}
timeout 0

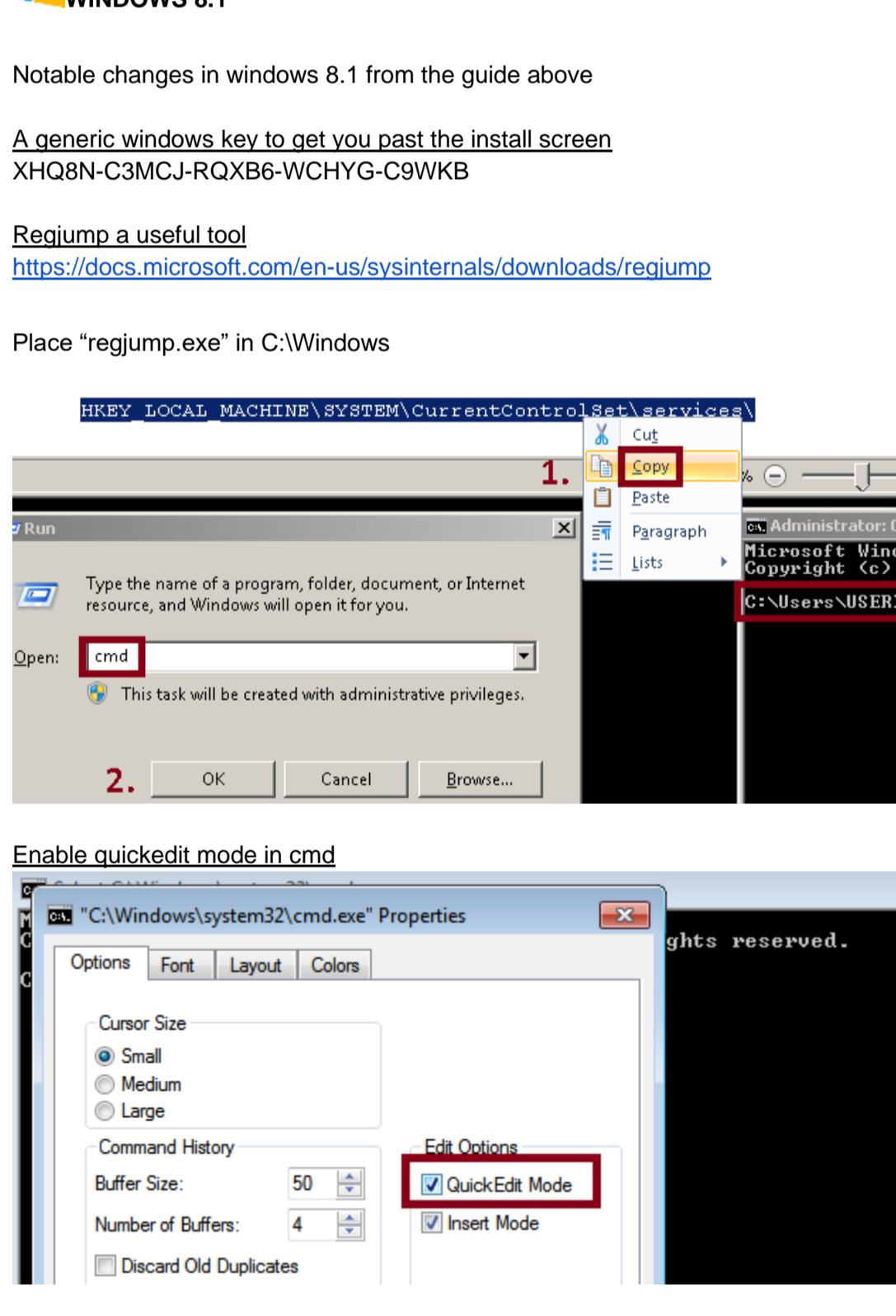
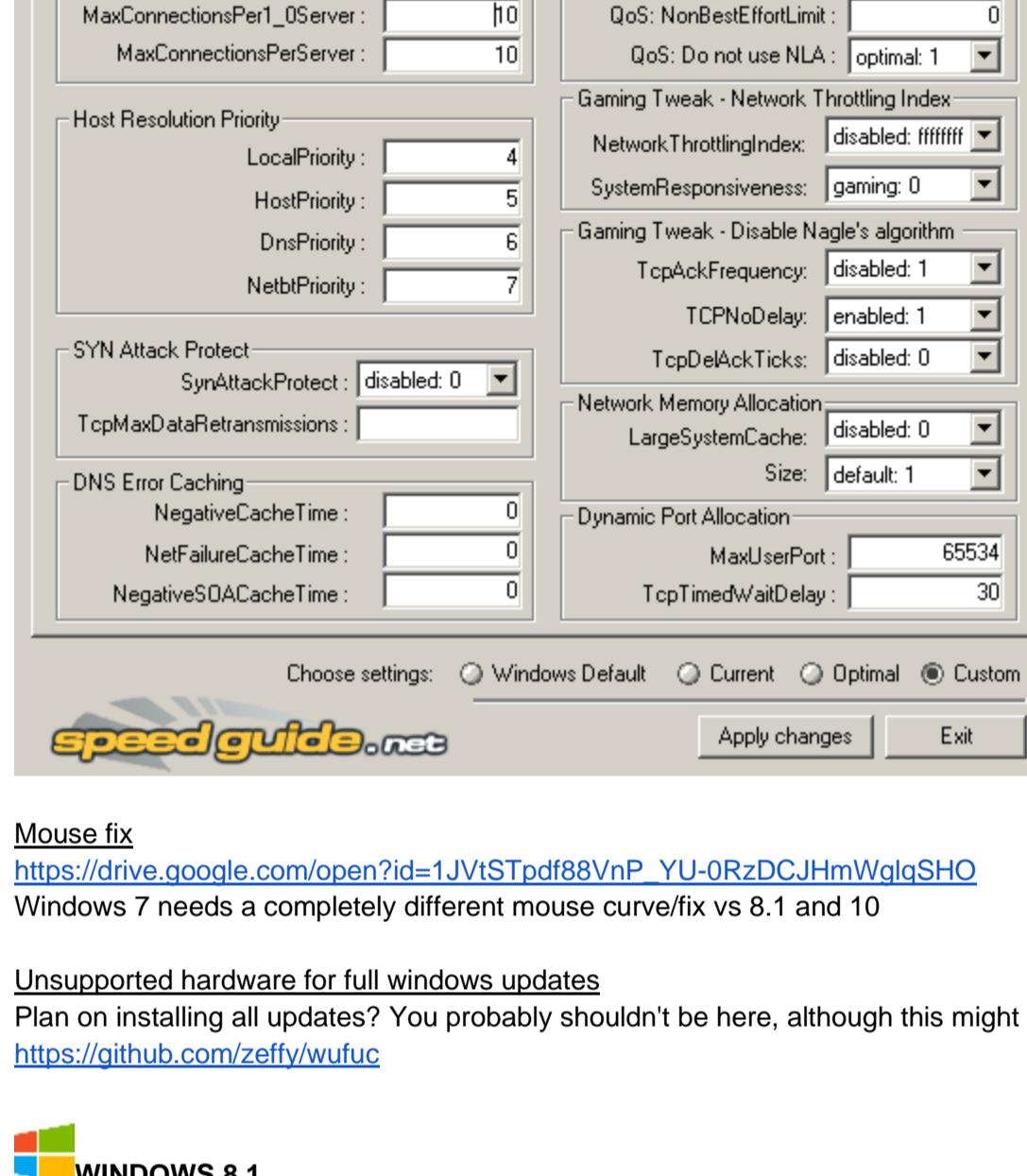
Windows Boot Loader
identifier {current}
device partition=C:
path \Windows\system32\winload.exe
description Windows 7
locale en-US
inherit {bootloadersettings}
recoverysequence {385701dc-8b3f-11e9-8ad8-f450ee62fbe1}
recoverysenabled Yes
nointegritychecks Yes
osdevice partition=C:
systemroot \Windows
resumeobject {385701dc-8b3f-11e9-8ad8-f450ee62fbe1}
nx AlwaysOff
bootux Disabled
x2apicpolicy Enable
hypervisororlauchtype Off
tpmbootentropy ForceDisable
quietboot Yes
uselegacyapicmode No
usefirmwarepcisettings No
useplatformclock No

C:>Users\FR33THY>_

```

Changes in tcp optimizer

NetDMA (TCPA) - disabled (**useless unless your motherboard supports it**)
 Direct Cache Access (DCA) - disabled (**useless unless your motherboard supports it**)
 LargeSystemCache - disabled
 SynAttackProtect - disabled
 Dns Error Caching - 0 - 0 - 0



Mouse fix

https://drive.google.com/open?id=1JVtSTpdf88VnP_YU-0RzDCJHmWgloSHO
 Windows 7 needs a completely different mouse curve vs 8.1 and 10

Unsupported hardware for full windows updates

Plan on installing all updates? You probably shouldn't be here, although this might help.
<https://github.com/zeffy/wufuc>



Notable changes in windows 8.1 from the guide above

A generic windows key to get you past the install screen

XHQ8N-C3MCJ-RQXB6-WCHYG-C9WKB

Regjump a useful tool

<https://docs.microsoft.com/en-us/sysinternals/downloads/regjump>

Place "regjump.exe" in C:\Windows

A SATA AHCI driver will need to be installed to be in MSI Mode
Setting your default windows SATA AHCI driver in MSI Mode will cause a bluescreen
Use snappy driver installer

Bare services list

Automatic

Background Tasks Infrastructure Service
Cryptographic Services
DCOM Server Process Launcher
DHCP Client
Local Session Manager
Network Store Interface Service
NVIDIA Display Container LS
Power
Remote Procedure Call (RPC)
RPC Endpoint Mapper
User Profile Service
Windows Audio
Windows Audio Endpoint Builder
Windows Connection Manager
Windows Management Instrumentation
Software Protection
Group Policy Client

Manual

Device Install Service
Network Connections
Performance Counter DLL Host
Plug and Play
Virtual Disk
Windows Installer
Windows Modules Installer

Name	Startup Type
Background Tasks Infrastructure Service	Automatic
Cryptographic Services	Automatic
DCOM Server Process Launcher	Automatic
DHCP Client	Automatic
Local Session Manager	Automatic
Network Store Interface Service	Automatic
NVIDIA Display Container LS	Automatic
Power	Automatic
Remote Procedure Call (RPC)	Automatic
RPC Endpoint Mapper	Automatic
User Profile Service	Automatic
Windows Audio	Automatic
Windows Audio Endpoint Builder	Automatic
Windows Management Instrumentation	Automatic
Software Protection	Automatic (Delayed Start, Trigger Start)
Group Policy Client	Automatic (Trigger Start)
ActiveX Installer (AxInstSV)	Disabled

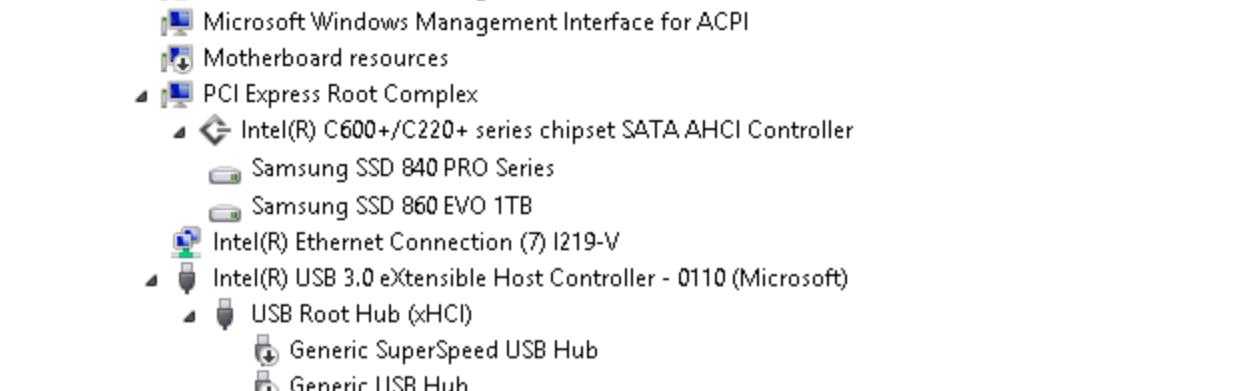
Name	Startup Type
Device Install Service	Manual (Trigger Start)
Network Connections	Manual
Performance Counter DLL Host	Manual
Plug and Play	Manual
Virtual Disk	Manual
Windows Installer	Manual
Windows Modules Installer	Manual
ActiveX Installer (AxInstSV)	Disabled

Disable Multimedia Class Scheduler

Multimedia Class Scheduler - disabled by removing dependencies

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\AudioSrv

DependOnService = delete MMCSS



DELETE THIS

Updates

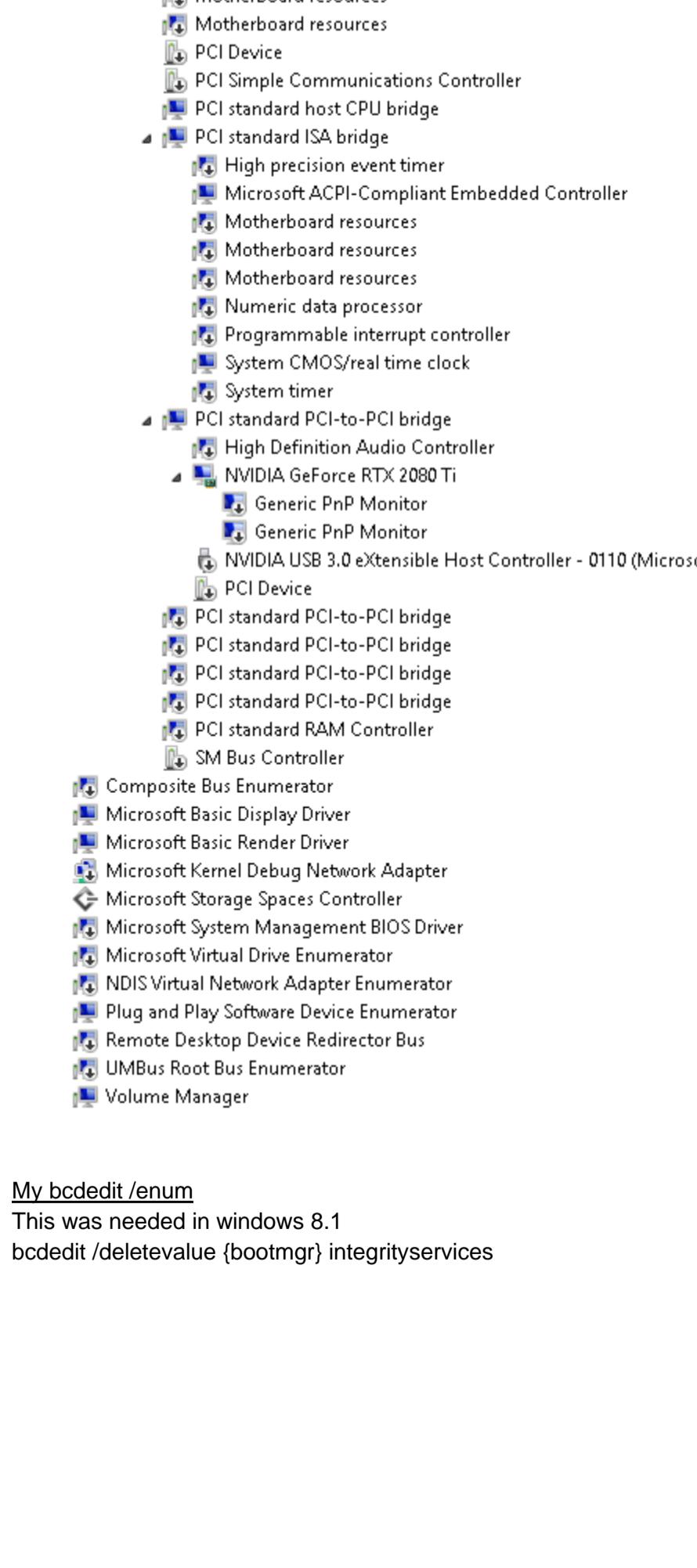
<https://drive.google.com/open?id=1MhWCaKCEaqh7l0JrmTDvEkse2D06sehZ>

This update is needed to fix a mouse issue in some games

KB2903939 - has mouse fix for games includes (KB2908279) - "KB2908279" is the mouse fix

Device manager

My disabled tree



My bcdedit /enum

This was needed in windows 8.1

bcdedit /deletevalue {bootmgr} integrityservices

```

Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\FR33THY>bcdedit /enum

Windows Boot Manager
identifier          {bootmgr}
device              partition=\Device\HarddiskVolume1
description         Windows Boot Manager
locale              en-US
inherit              {globalsettings}
default              {current}
resumeobject        {bf492be0-8821-11e9-bd61-febabacc0e7}
displayorder        {current}
toolsdisplayorder   {memdiag}
timeout             0

Windows Boot Loader
identifier          {current}
device              partition=C:
path                \Windows\system32\winload.exe
description         Windows 8.1
locale              en-US
inherit              {bootloadersettings}
recoverysequence    {bf492be2-8821-11e9-bd61-febabacc0e7}
recovervulnerable  Yes
no integrity checks Yes
allowedinmemorysettings 0x15000075
osdevice            partition=C:
systemroot          \Windows
resumeobject        {bf492be0-8821-11e9-bd61-febabacc0e7}
nx                 AlwaysOff
x2apicpolicy       Enable
tscsyncpolicy      Legacy
bootmenupolicy     Standard
hypervisorlauchtype Off
bootux              Disabled
tpmbootentropy     ForceDisable
quietboot          Yes
uselegacyapicmode  No
usefirmwarepcisettings No
useplatformclock   No
useplatformtick    Yes
disabledynamictick Yes

C:\Users\FR33THY>_

```

Internet tweaks

Changes in - netsh int tcp show global

netsh int tcp set global rss=disabled

netsh int tcp set global chimney=disabled

netsh int tcp set global netdma=disabled (**does not exist in 8.1**)

netsh int tcp set global dca=disabled (**does not exist in 8.1**)

<https://docs.microsoft.com/en-us/previous-versions/windows/hardware/network/netdma-drivers>

netsh int tcp set global autotuning=disabled

netsh int tcp set supplemental Internet congestionprovider=CTCP (use reg file)

netsh int tcp set global ecncapability=disabled

netsh int tcp set global timestamps=disabled

netsh int tcp set global initialRto=2000

netsh int tcp set global rsc=disabled

netsh int tcp set global nonsackrttressiliency=disabled

netsh int tcp set global maxsynretransmissions=2

```

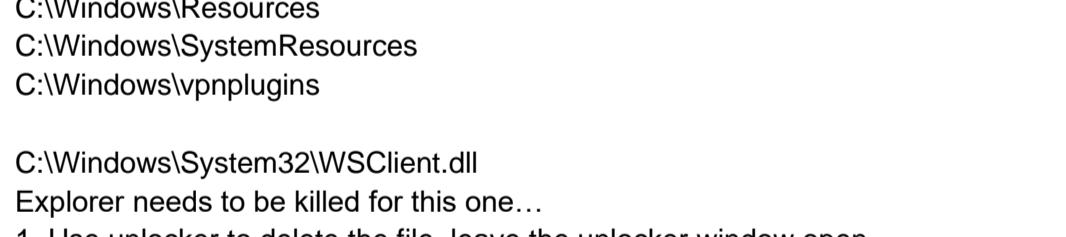
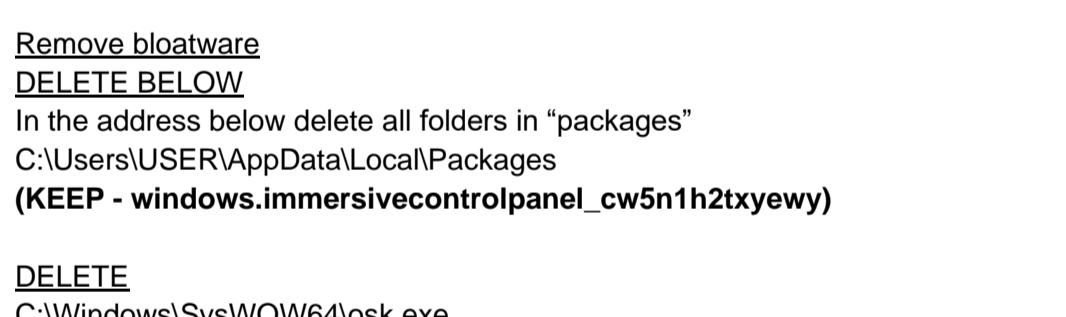
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\FR33THY>netsh int tcp show global
Querying active state...

TCP Global Parameters
Receive-Side Scaling State : disabled
Chimney Offload State : disabled
NetDMA State : disabled
Direct Cache Access (DCA) : disabled
Receive Window Auto-Tuning Level : disabled
Add-On Congestion Control Provider : ctcp
ECN Capability : disabled
RFC 1323 Timestamps : disabled
Initial RTO : 2000
Receive Segment Coalescing State : disabled
Non Sack Rtt Resiliency : disabled
Max SYN Retransmissions : 2

```

Changes in tcp optimizer



Mouse fix

https://drive.google.com/open?id=1qy9EU_jcl2eHqIP08YBFoJbwLPxpMGvx

Use the windows 10 mouse fix

Remove bloatware

DELETE BELOW

In the address below delete all folders in "packages"

C:\Users\USER\AppData\Local\Packages

(KEEP - windows.immersivecontrolpanel_cw5n1h2txyewy)

DELETE

C:\Windows\SysWOW64\osk.exe

C:\Windows\SysWOW64\OskSupport.dll

C:\Program Files\WindowsApps\

C:\Windows\WinStore

C:\Windows\Camera

C:\Windows\FileManager

C:\Windows\Resources

C:\Windows\SystemResources

C:\Windows\vpnplugins

C:\Windows\System32\WSClient.dll

Explorer needs to be killed for this one...

1. Use unlocker to delete the file, leave the unlocker window open

2. End task explorer.exe with task manager

3. Delete the file with unlocker

4. Run explorer.exe with task manager

C:\Windows\System32\WSCollect.exe

C:\Windows\System32\WSReset.exe

C:\Windows\System32\WSService.dll

C:\Windows\System32\WSShared.dll

C:\Windows\System32\WSSync.dll

In - C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Camera

C:\ProgramData\Microsoft\Windows\Start Menu\Programs\OneDrive

C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Photos

C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Store

Disable desktop composition & double buffering

DELETE BUT MAKE A BACKUP OF

C:\Windows\ImmersiveControlPanel

C:\Users\USER\AppData\Local\Packages\windows.immersivecontrolpanel_cw5n1h2txyewy

Use the same dwm.exe formula as windows 10 above

Make sure bloatware is deleted as above - so no UWI apps with composition can run

Less things break like they do in windows 10 with dwm.exe disabled

Disabling composition permanently in windows 8.1 is much more usable vs windows 10

Know things dwm.exe breaks in windows 8.1

-Can't access windows settings and logout menu

Windows settings (win key + i) and (control + alt + delete)

-Pressing the start menu icon will black screen

Going to task manager with (control + shift + escape) will fix it

Use a 3rd party shell program

-Pressing the windows key will black screen

Pressing the windows key again will fix it

-Screenshot tool half broken

Saved screenshots in screenshot folder goes white

Pasting last screenshotted image in paint with (control + v) works fine

-Saving in notepad is buggy

Use file then save not the save icon

-Saving in wordpad is buggy

Use file then save not the save icon

Known issues

-Task manager is bugged with cpu speed - read the speed with a 3rd party program

-Disk cleanup takes its time at windows update cleanup

-Restart or shutdown - unknown hardware error box - maybe winaero tweaker/deleted file?

-WSClient.dll error on startup sometimes - from removing file

-Can't uninstall updates

-Annoying metro drag feature

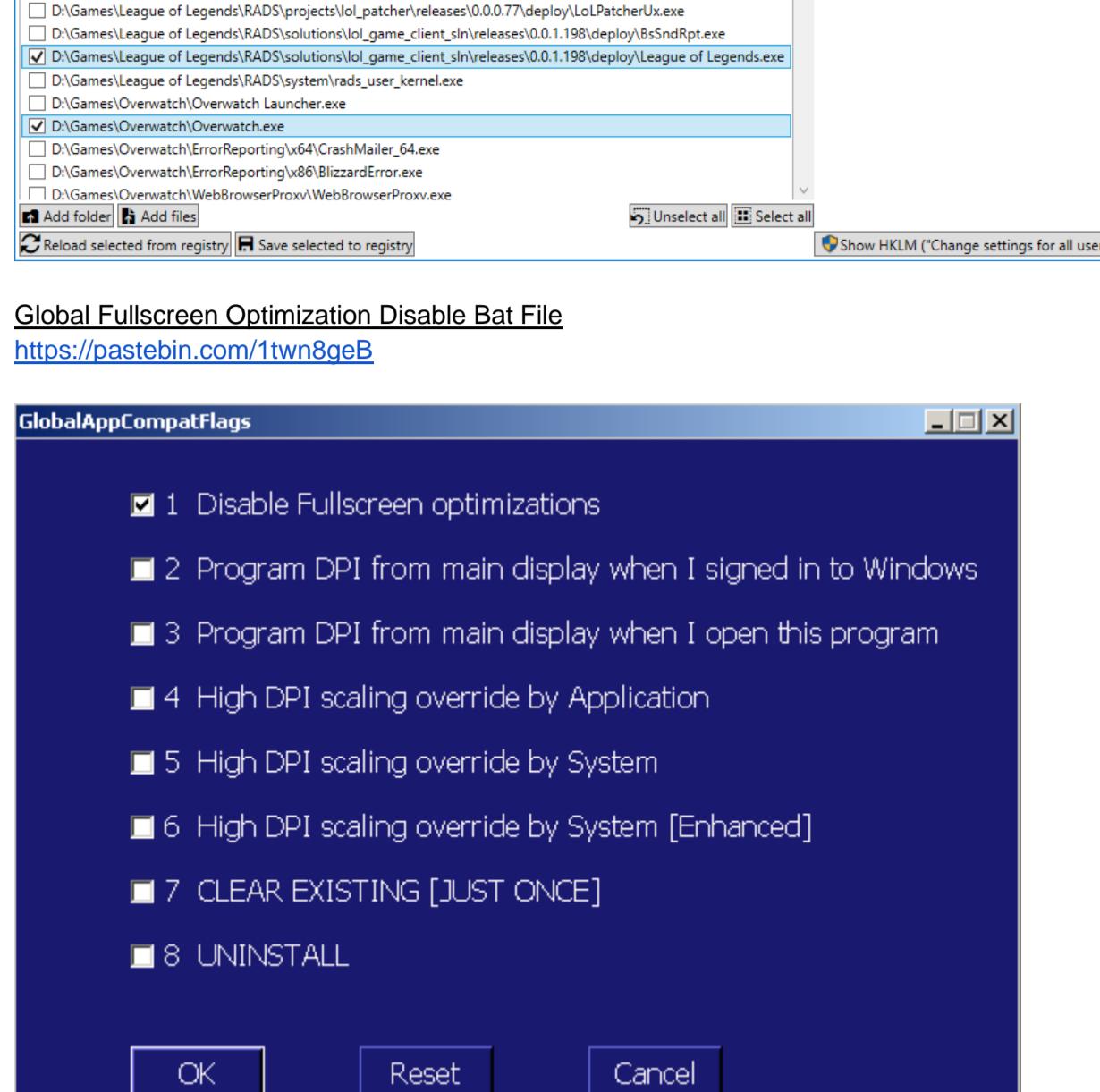
-Drivers/devices won't install/run or update in device manager - start "device install service"

USEFUL PROGRAMS

Compatibility Manager

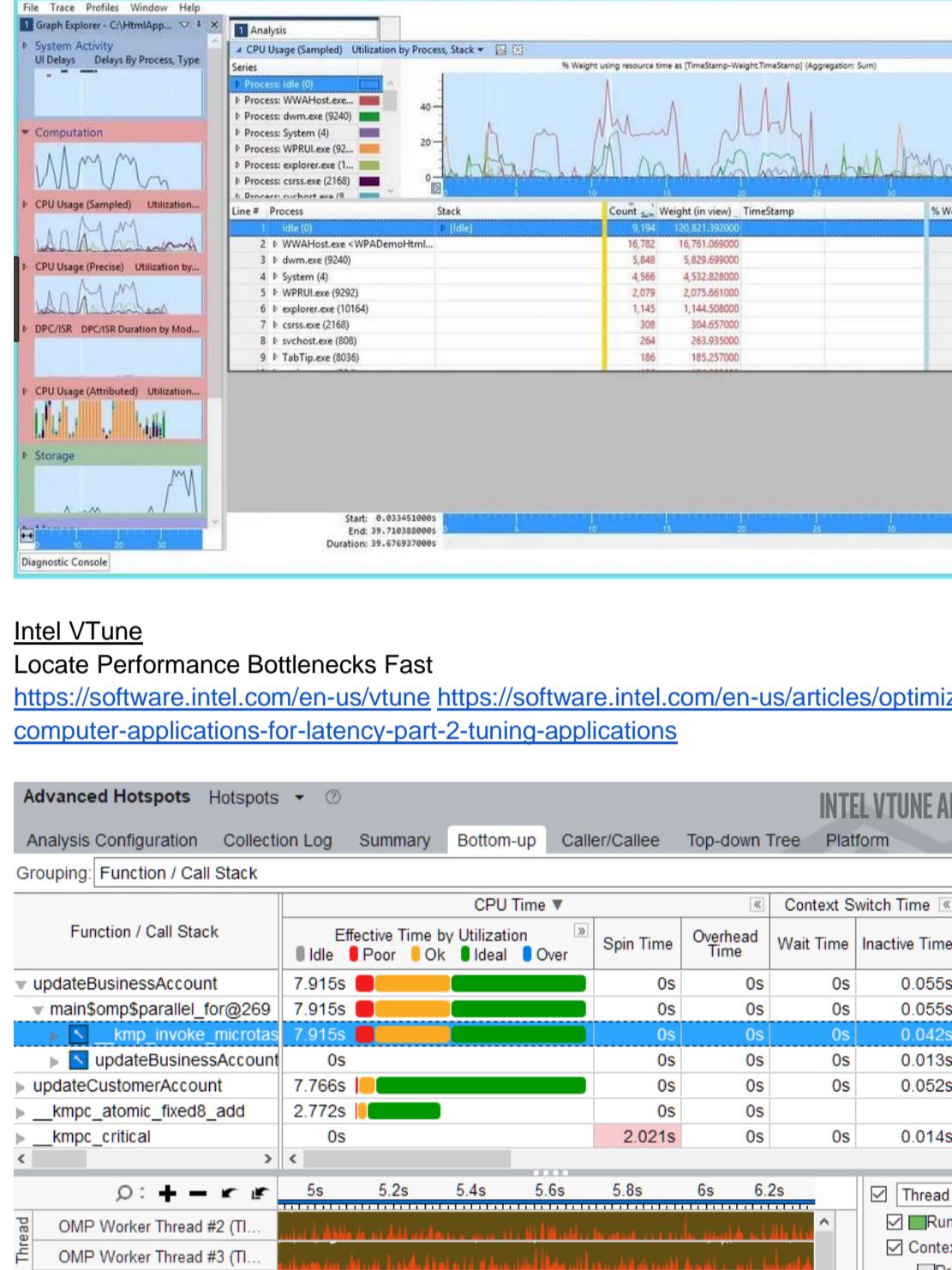
Globally set programs/games for compatibility settings

<https://github.com/Skymirrh/CompatibilityManager>



Global Fullscreen Optimization Disable Bat File

<https://pastebin.com/1twn8qeB>



Windows Performance Toolkit

Test latency in a more advanced way

<https://docs.microsoft.com/en-us/windows-hardware/test/wpt/>



Intel VTune

Locate Performance Bottlenecks Fast

<https://software.intel.com/en-us/vtune> <https://software.intel.com/en-us/articles/optimizing-computer-applications-for-latency-part-2-tuning-applications>

