Fedora Workstation

STATE OF GAMING

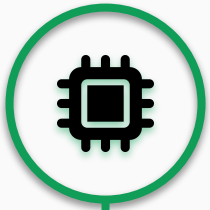
A Case Study of Forza Horizon 5

AKASHDEEP DHAR

Fedora Websites and Apps and Fedora Infrastructure
Red Hat Community Platform Engineering

CONTENTS

Things we will discuss



SETUP

Know how to get your device setup with your distribution along with the related drivers to be able to play your videogames

INSTALL

Learn how to configure necessary storefronts and relevant support applications to install your favorite videogames on the device

PLAY

Understand how to analyze the videogame performance in your favorite videogames and configure for better experiences

SOFTWARE

Things to setup, install and play

SETUP

DISTRIBUTION

Fedora Workstation 38

INSTALL

STOREFRONT

Steam

PLAY

VIDEOGAME

Forza Horizon 5

SETUP

Fedora Workstation 38

STEP #1

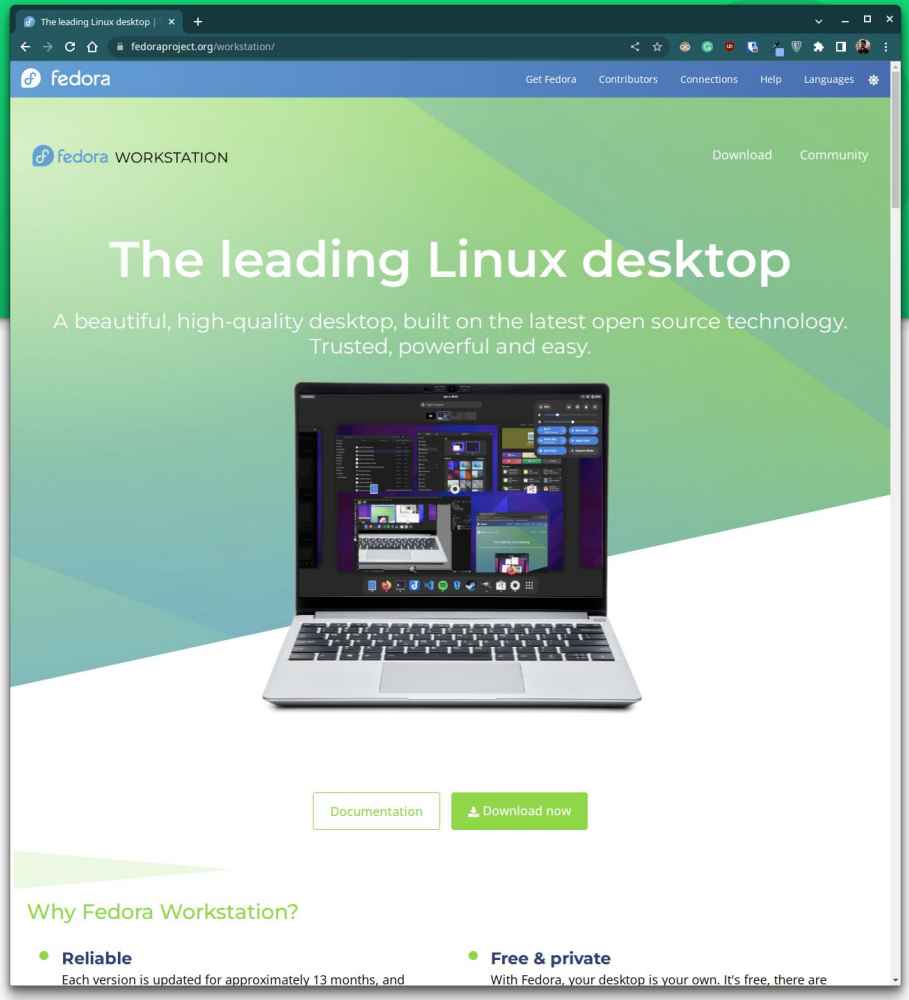
Download Fedora Workstation 38 Live ISO image from the website

STEP #2

Verify the downloaded ISO file and write it on an empty flash drive

STEP #3

Give the live environment a try and install the distribution



SETUP

Graphics Drivers for NVIDIA GPUs

STEP #1

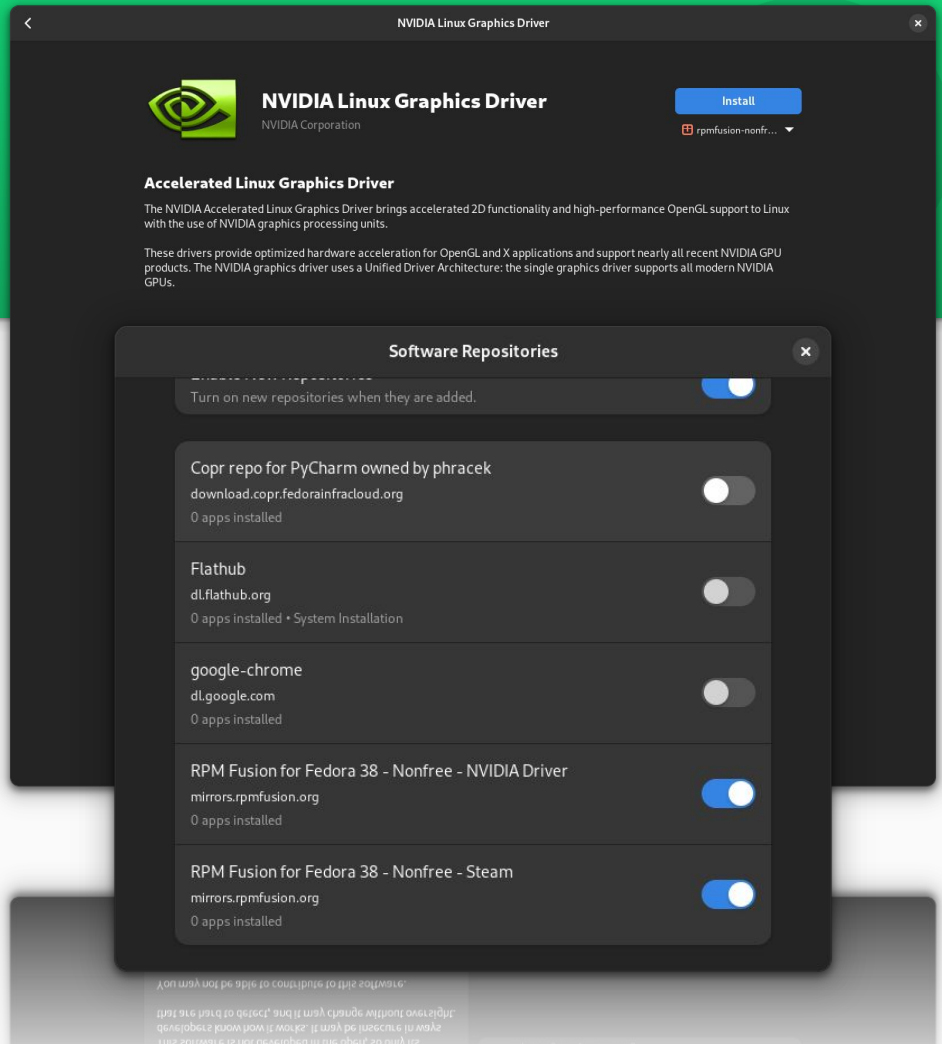
Enable RPM Fusion for Fedora Linux 38 - Non Free - NVIDIA Driver repository

STEP #2

Refresh the repositories to synchronize the newly added one

STEP #3

Install the proprietary NVIDIA drivers from the RPM Fusion repository



SETUP

Graphics Drivers for AMD GPUs

STEP #1

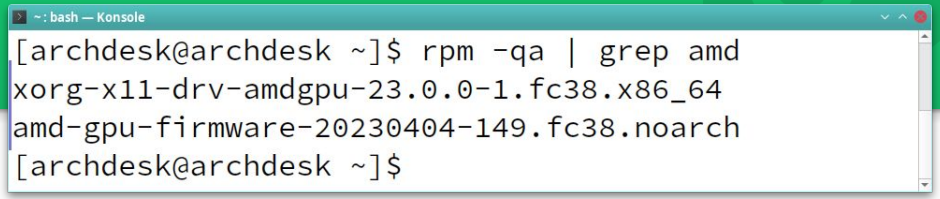
Confirm if the graphics drivers packages are already installed on the device

STEP #2

Find that the packages are installed and then update them to the latest version

STEP #3

That is really it - Graphics Drivers for AMD GPUs are open-source software



RADEON GRAPHICS

INSTALL

Storefront for your videogames

STEP #1

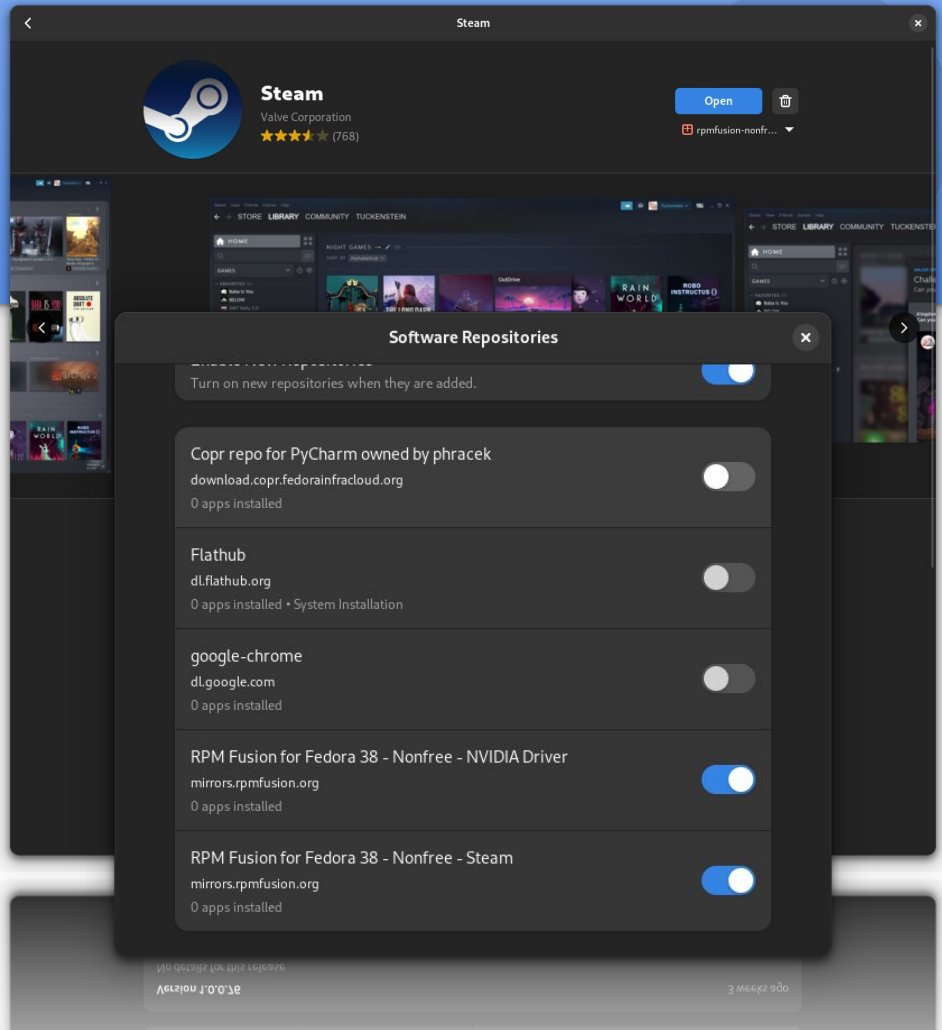
Enable RPM Fusion for Fedora Linux 38 - Non Free - Steam repository

STEP #2

Refresh the repositories locally to synchronize the newly added one

STEP #3

Install the proprietary Steam package from the RPM Fusion repository



INSTALL

Steam Proton compatibility layer

STEP #1

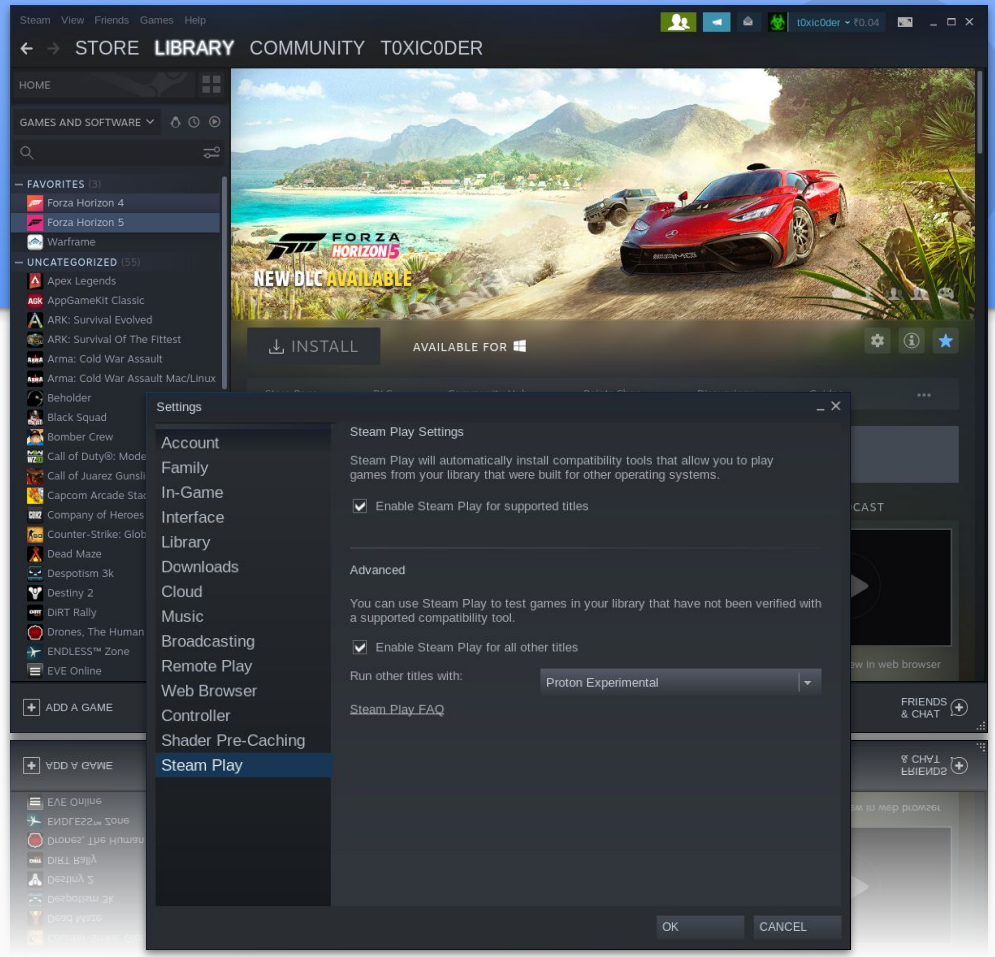
Ensure that the installed Steam package and its dependencies are up-to-date

STEP #2

Go to the Steam Play section in the Settings window and enable Proton Experimental

STEP #3

Restart the Steam Client to let the changes take effect and download the assets



PLAY

Required videogame assets

STEP #1

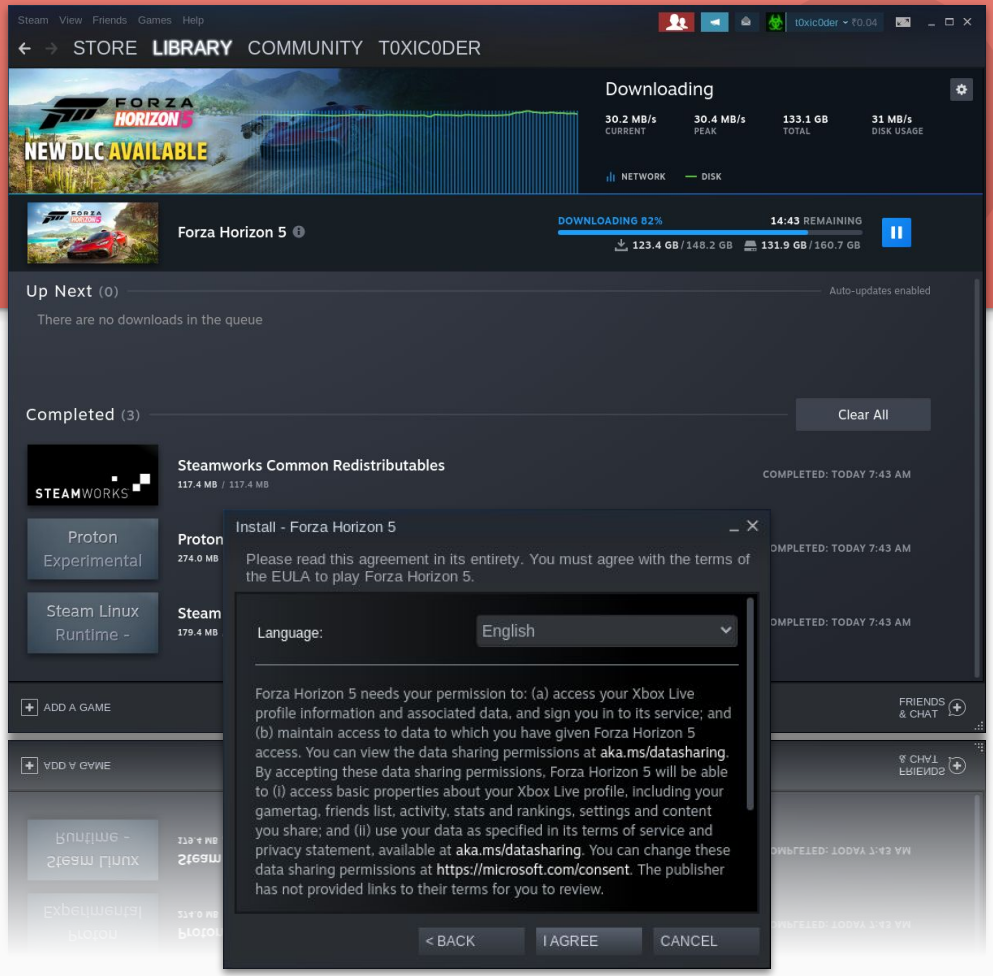
Ensure that the videogame is available in the region and present in the account

STEP #2

Start the installation and wait for the download of videogame assets to complete

STEP #3

Let Steam download and install the necessary runtime services required for the video game



PLAY

Configuration and account binding

STEP #1

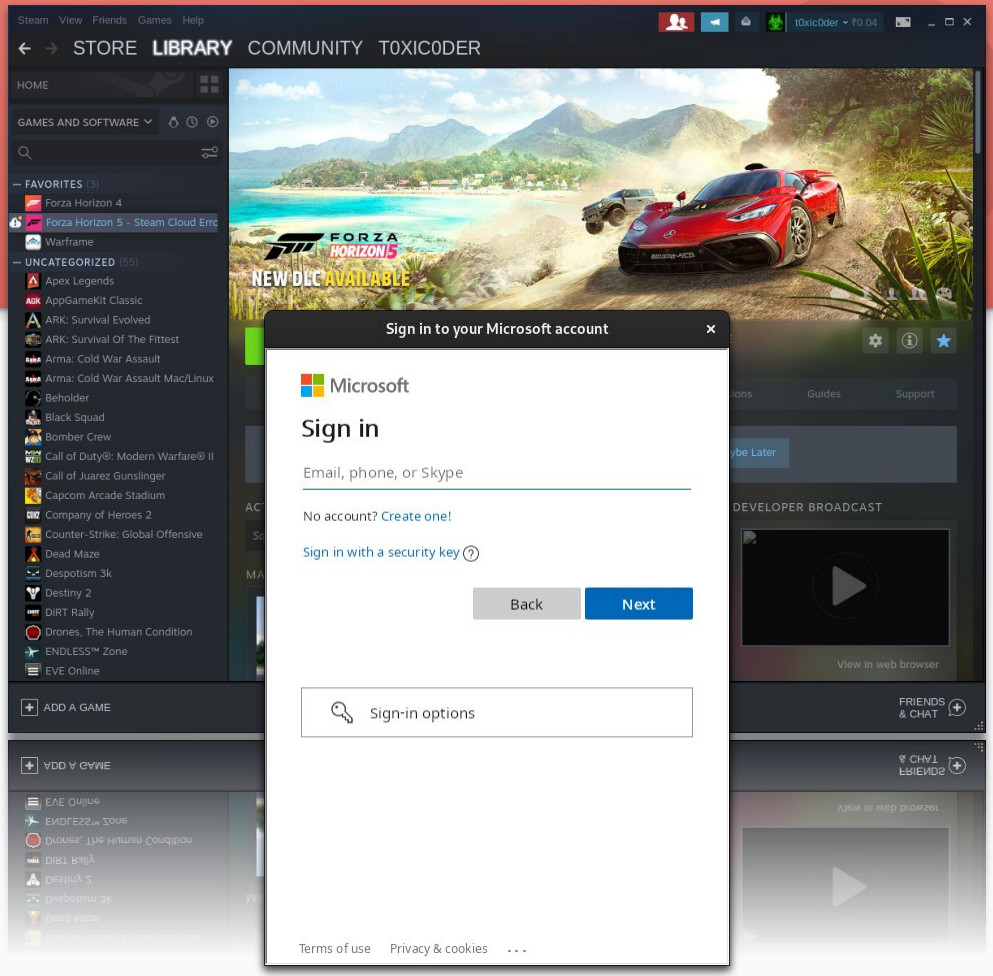
Ensure that the videogame is installed and the assets are locally available

STEP #2

Start the videogame and switch over to the videogame account login window

STEP #3

Log in with the related credentials to synchronize the videogame progress



BENCHMARKS

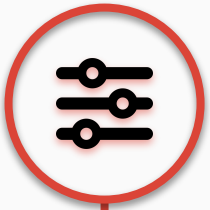
Understanding how the platforms perform

WINDOWS 11 22H2

Framerates achieved on a purpose-created minimal Windows 11 22H2 installation for the videogame across a variety of settings

FEDORA WS 38

Framerates achieved on a purpose-created minimal Fedora Workstation 38 installation for the videogame across a variety of settings



COMPARISON

Understanding which platform performs better than the other one, the reasons behind it and how the other platform can improve

HARDWARE

Device to run these tests on

PROCESSOR
AMD Ryzen 9 5900X

GRAPHICS
AMD Radeon RX 6800 XT

MEMORY
G.Skill 32GB DDR4 3600MHz

MOTHERBOARD
ASUS TUF Gaming X570 WiFi

COOLER
Noctua NH-D15

POWER
Corsair RM850x 850W Gold

FRAMERATE BENCHMARK

Windows 11 22H2

V = Very Low / L = Low / M = Medium / H = High / U = Ultra / E = Extreme / X = Extra

MAXIMUM FRAMERATES RECORDED

VERY LOW PRESET

CPU/SIM/AVG	CPU/REN/AVG	GPU/AVG	ACHIEVED
394.5	288.75	349.55	281

MINIMUM FRAMERATES RECORDED

EXTRA PRESET

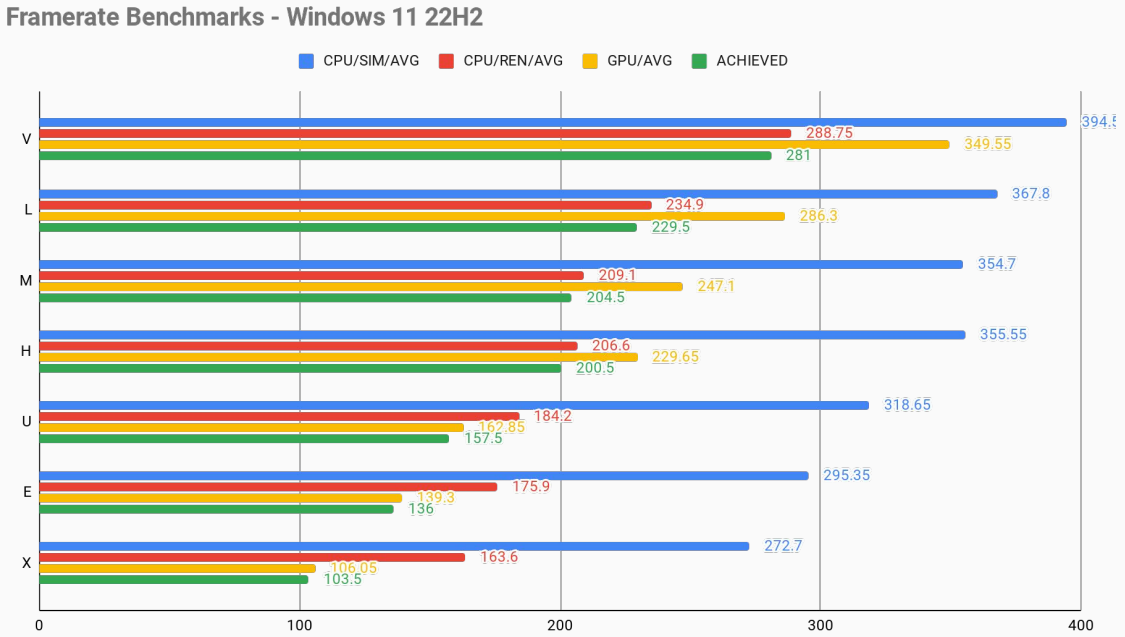
CPU/SIM/AVG	CPU/REN/AVG	GPU/AVG	ACHIEVED
272.7	163.6	106.05	103.5

PERCENTAGE DECREASE

FROM VERY LOW PRESET TO EXTRA PRESET

CPU/SIM/AVG	CPU/REN/AVG	GPU/AVG	ACHIEVED
30.87	43.34	69.66	63.17

RAY TRACING	AVAILABLE



FRAMERATE BENCHMARK

Fedora Workstation 38

V = Very Low / L = Low / M = Medium / H = High / U = Ultra / E = Extreme / X = Extra

MAXIMUM FRAMERATES RECORDED

VERY LOW PRESET

CPU/SIM/AVG	CPU/REN/AVG	GPU/AVG	ACHIEVED
360.9	228.9	253	222.5

MINIMUM FRAMERATES RECORDED

EXTRA PRESET

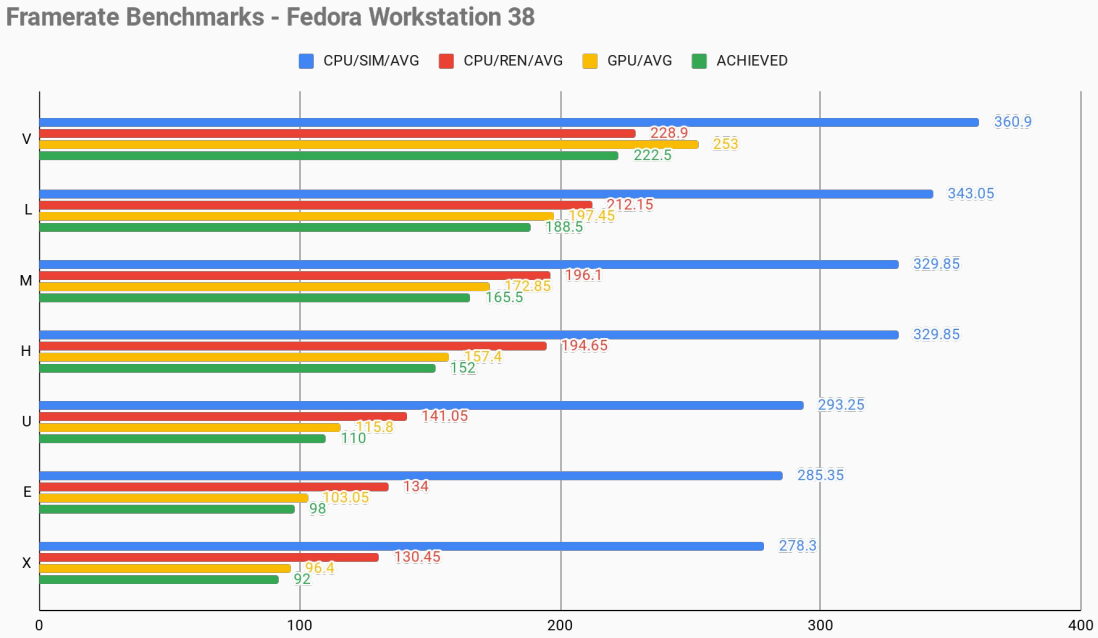
CPU/SIM/AVG	CPU/REN/AVG	GPU/AVG	ACHIEVED
278.3	130.45	96.4	92

PERCENTAGE DECREASE

FROM VERY LOW PRESET TO EXTRA PRESET

CPU/SIM/AVG	CPU/REN/AVG	GPU/AVG	ACHIEVED
22.88	43.01	61.89	58.65

RAY TRACING	UNAVAILABLE



SETTINGS

Default options staying the same

RESOLUTION
2560 x 1440 EXCLUSIVE

HIGH DYNAMIC RANGE
DISABLED

VERTICAL SYNC
DISABLED

FRAMERATE LIMIT
DISABLED

ANTI-ALIASING
DISABLED

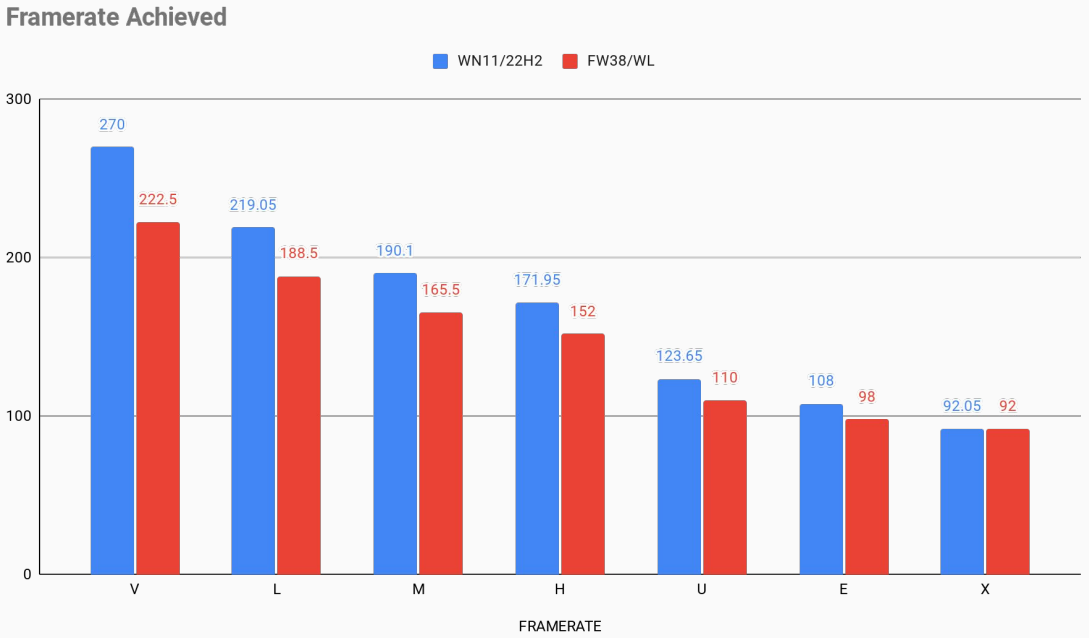
RESOLUTION SCALING
DISABLED

COMPARISON

Picking the better one

V = Very Low / L = Low / M = Medium / H = High / U = Ultra / E = Extreme / X = Extra

- Fedora Workstation 38 falls behind Windows 11 22H2 by a maximum of 17.590% (in VERY LOW preset) and a minimum of 0.054% (in EXTRA preset).
- As the presets go on becoming more advanced - the differences in the framerates achieved go on decreasing to a point where the difference is marginal.
- Fedora Workstation 38 achieves this performance while consuming in an average around 27.834% lesser system memory and 21.396% lesser video memory.
- Use of lesser system resources could make it worthy of being used on battery powered handheld devices and lesser consumption means longer runtime.

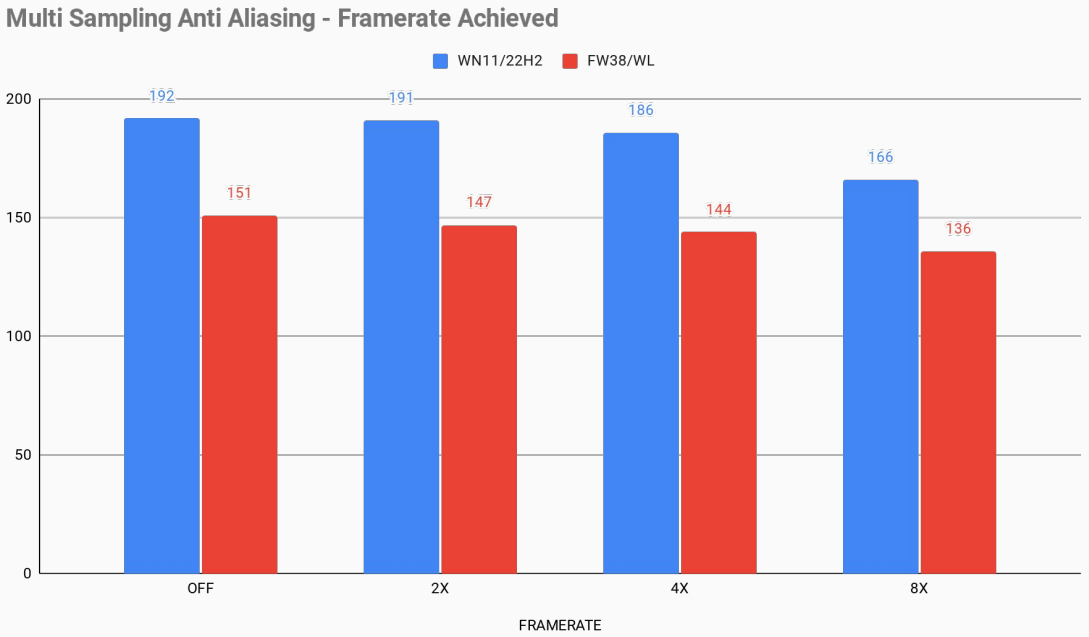


COMPARISON

Picking the better one

V = Very Low / L = Low / M = Medium / H = High / U = Ultra / E = Extreme / X = Extra

- Fedora Workstation 38 falls behind Windows 11 22H2 by a maximum of 23.03% (in 2X MSAA preset) and a minimum of 18.07% (in 8X MSAA preset).
- As the MSAA presets go on becoming more advanced - the differences in the framerates achieved go on decreasing to a point where the difference is marginal.
- Fedora Workstation 38 remains consistent across the board with the use of multi sampling anti aliasing while Windows 11 22H2 takes major hits in performance across presets.
- It is recommended to run the video game on a higher anti aliasing preset here owing to the comparatively minimal loss in performance with much better picture quality.

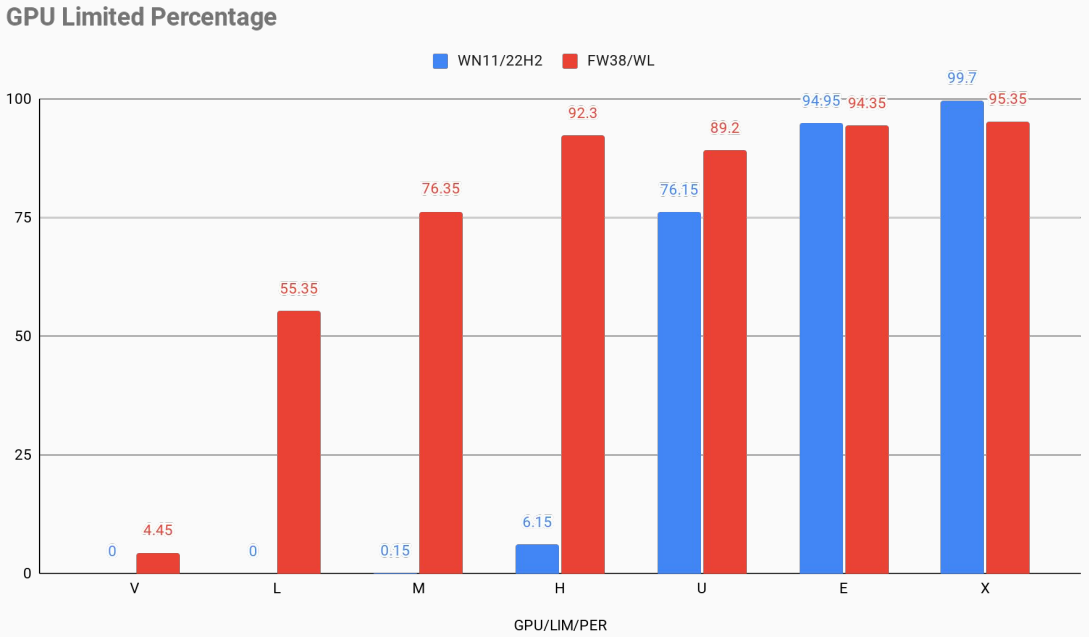


COMPARISON

Picking the better one

V = Very Low / L = Low / M = Medium / H = High / U = Ultra / E = Extreme / X = Extra

- Fedora Workstation 38 has GPU performance bottlenecked by the CPU from the significantly from the LOW PRESET onwards while it is ULTRA PRESET for Windows 11 22H2.
- As the presets go on becoming more resource intensive, the tendency of the CPU to bottleneck the GPU performance increases for both the platforms.
- Changing the CPU governor might help to address the situation by either providing more performance when power is available or reducing it in the absence of power.
- It is recommended to pair the GPU with an equivalently performant CPU to ensure that the GPU performance is not bottlenecked by the processing power.



WHY WOULD YOU WANT TO USE

Windows 11 22H2

RAW PERFORMANCE

The video game clearly performs better on Windows 11 22H2 than it does on Fedora Workstation 38

RAY TRACING

Ray tracing capabilities are still available only on Windows 11 22H2 at the present moment

HIGH DYNAMIC RANGE

Support for a higher palette of colours is still present only on Windows 11 22H2 right now

WHY WOULD YOU WANT TO USE

Fedora Workstation 38

EFFICIENT PERFORMANCE

Great framerates are achieved while using lesser system resources and power consumption

WORKS ON LOW-END

Fedora Workstation 38 uses minimal resources so video games can even work on weaker hardware

PORTABILITY NATIVE

Fantastic runtimes are achieved while playing the video game on Fedora Workstation 38

THANK YOU!

CONNECT WITH ME

https://github.com/t0xic0der
https://gitlab.com/t0xic0der
https://twitter.com/t0xic0der
https://fedoraproject.org/wiki/User:T0xic0der