

TEAMRGE EVENT 2024 WHERE FUTURE OF END USER COMPUTING MEETS REALITY

10+ community sessions around GPUs, VDI,
DaaS, DEX, Remoting Protocols and AI



15th February 2024

16:00 CEST / 10:00AM EDT / 07:00AM PDT

Register Now

www.teamrge.com/events

This FREE community event is made possible with support of:

DIZZION

itq

EUC Score



Dr. Benny Tritsch
Managing Director at
Dr. Tritsch IT Consulting



Bram Wolfs
Consultant at
Wolfs IT Solutions



Eitjo van Gulik
Principal Product Manager
for HDX Graphics & Seamless
at Citrix



Esther Barthel
Solutions Architect
at Cognition IT



Joe DaSilva
PMTS, Solutions Architect, Cloud
Graphics at AMD



Johan van Amersfoort
Technologist EUC & AI
at ITQ



Magnar Johnson
Manager | Solution Architect
Sopra Steria



Rody Kossen
Senior Principal Quality
Engineer at Citrix



Ruben Spruijt
Field CTO
at Dizzion



Ryan Ververs-Bijkerk
Technical Evangelist
at GO-INIT



Shawn Bass
Start-up advisor and
former EUC CTO of Desktop
Technologies at VMware



Thomas Poppelgaard
Independent Consultant and
Technology Evangelist at
Poppelgaard.com



TeamRGE
Remoting Graphics Experts

THE BEST FREE TOOLS TO ANALYZE USER EXPERIENCE ON GPU-ENABLED VMS



Dr. Benny Tritsch
Managing Director
at Dr. Tritsch IT Consulting

This FREE community event is made possible with support of:





Benny Tritsch

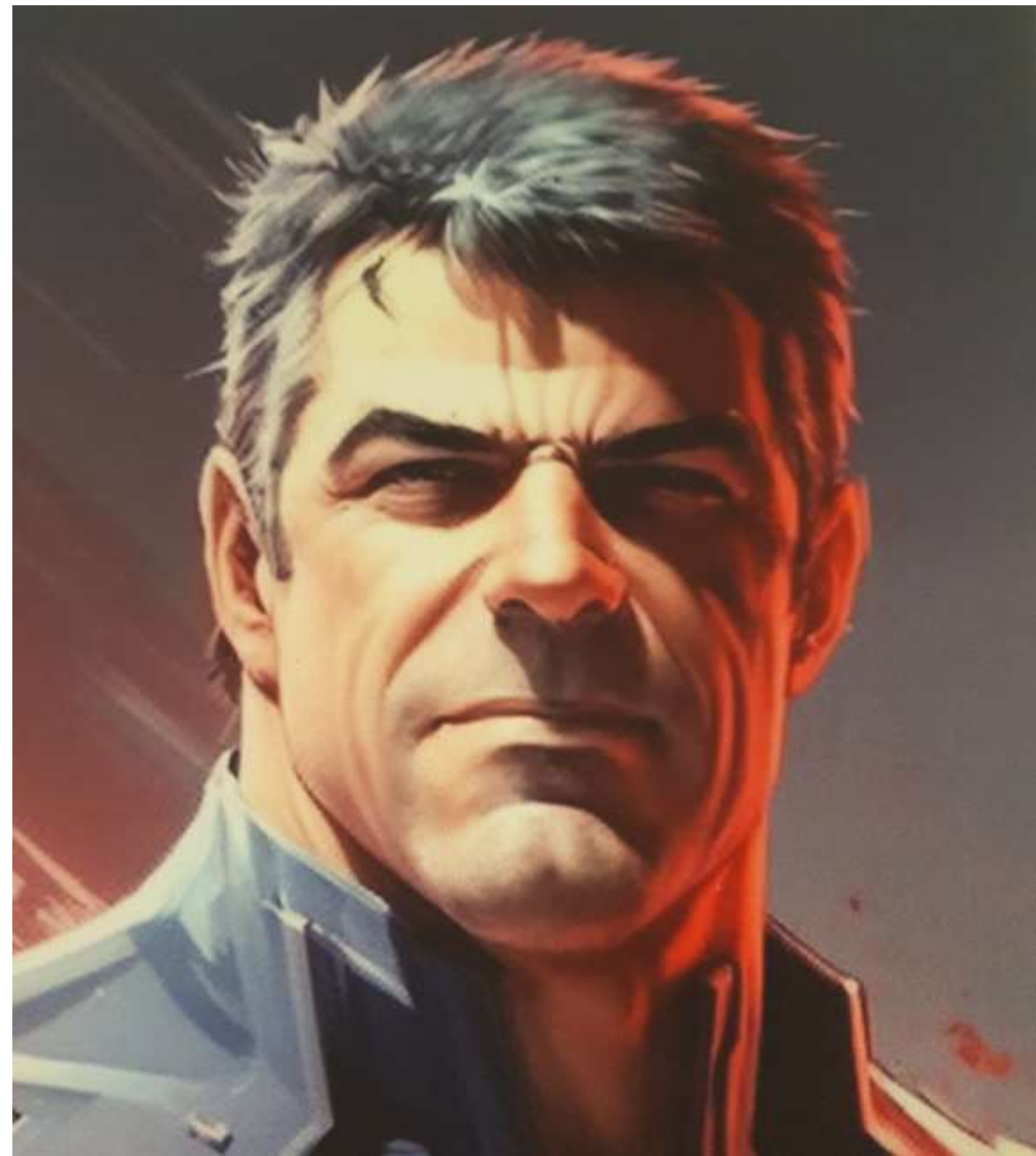
Dr. Tritsch IT Consulting













Performance Data Scientist
DEX4DaaS Cameraman
MVP | CTP | EUC Expert
NGCA | VIPP



benny@drtritsch.com



SCIENCE OF DEX – QUALITY CRITERIA FROM A USER’S PERSPECTIVE

	Boot and logon duration	Measure boot time + logon time + user session load time until it is ready for user interaction
	Application and content load time	Measure time from user starting an application until the content appears and the application is ready for user input
	User input delay (“Lag”)	Measures responsiveness of graphical elements after user-initiated triggers (lag, latency, system response time)
	Graphics APIs supported	Detect incompatibilities when running graphics applications using the DirectX, OpenGL, Vulkan and WebGL APIs
	Media formats supported	Detect incompatibilities when opening media files, such as MP4, MPEG, MOV, WMV or AVI
	Distortion of media	Detect image, animation, and audio/video compression and decompression artifacts and anomalies
	Screen refresh rate	Measure the number of times per second that the desktop or application can draw consecutive images on the screen (fps)
	Screen resolution and display size	Determine the number of pixels and density as well as the screen's visual dimensions
	Application stability	Detect application hangs, freezes, crashes or unhandled exceptions
	Session availability and resilience	Detect user session hangs, disconnects and reconnects

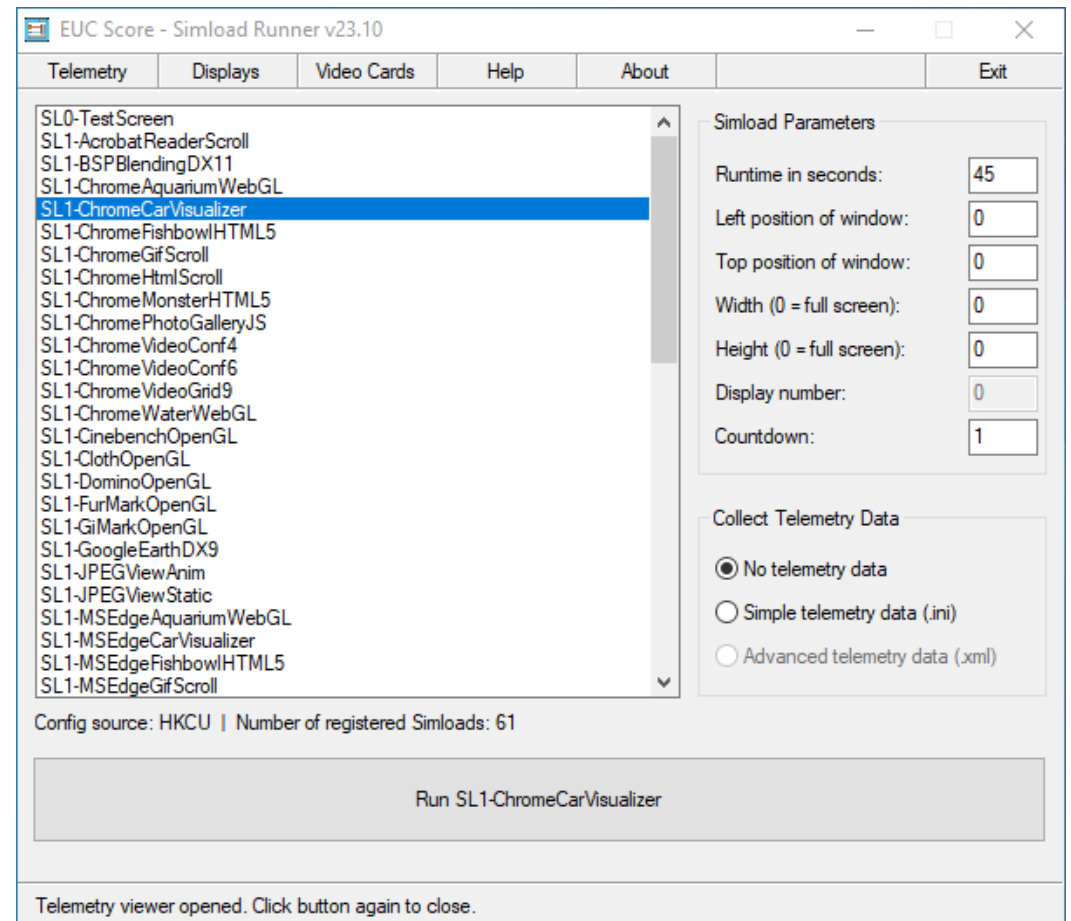
THE STARTING POINT: EUC SCORE TOOLSET

EUC Score Toolset

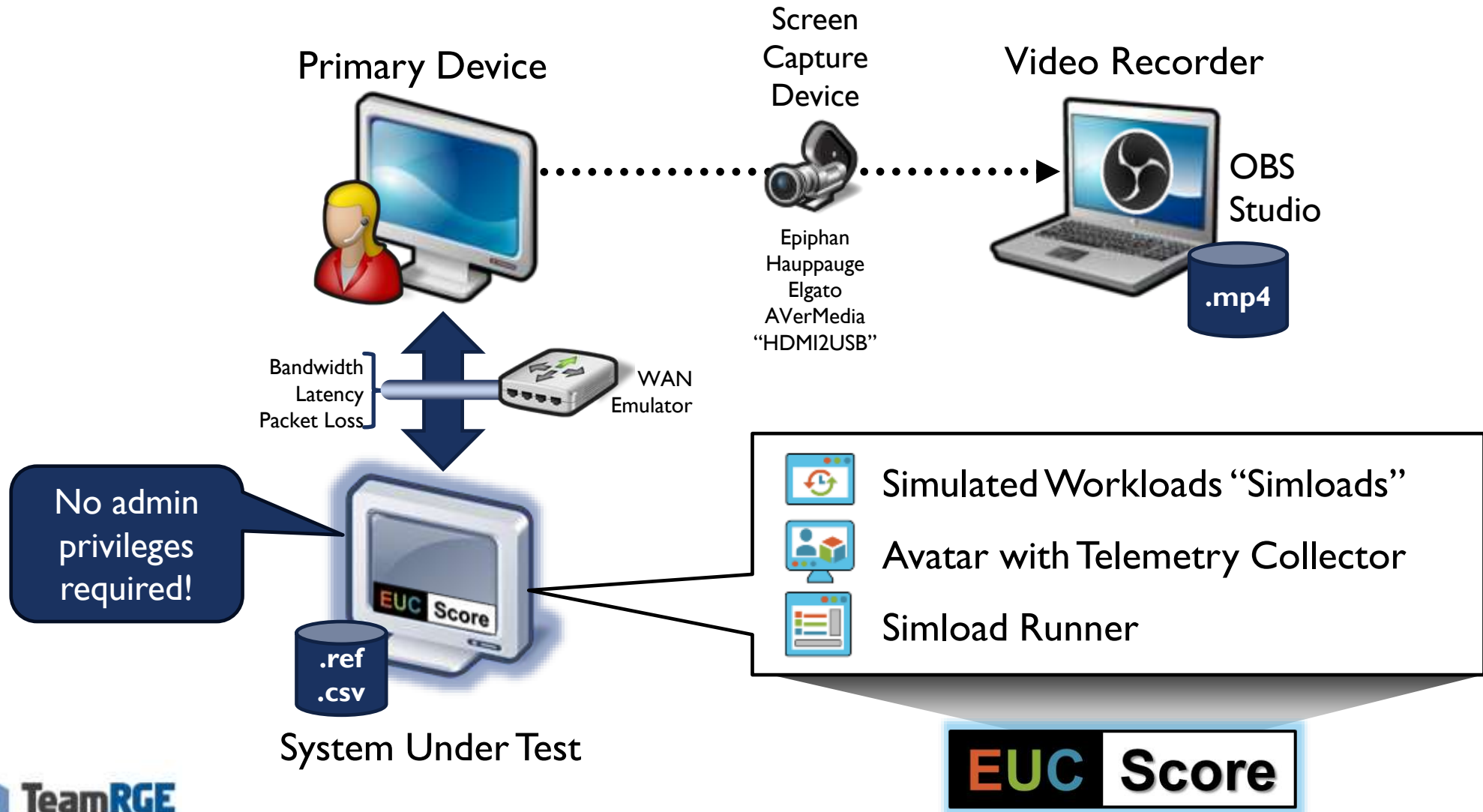
Running Simulated Workloads and collecting telemetry data + screen videos (“Day -1”)

- + Visual Studio Code (Development)
- + Autolt (Scripting user activities)
- + Inno Setup (Installer)
- + OBS Studio (Screen Recording)
- + Ffmpeg (Screen Recording)

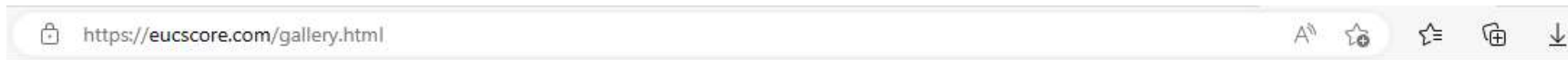
<https://eucscore.com/freeware>

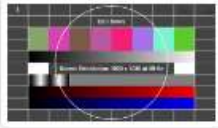








EUC SCORE LAB OVERVIEW

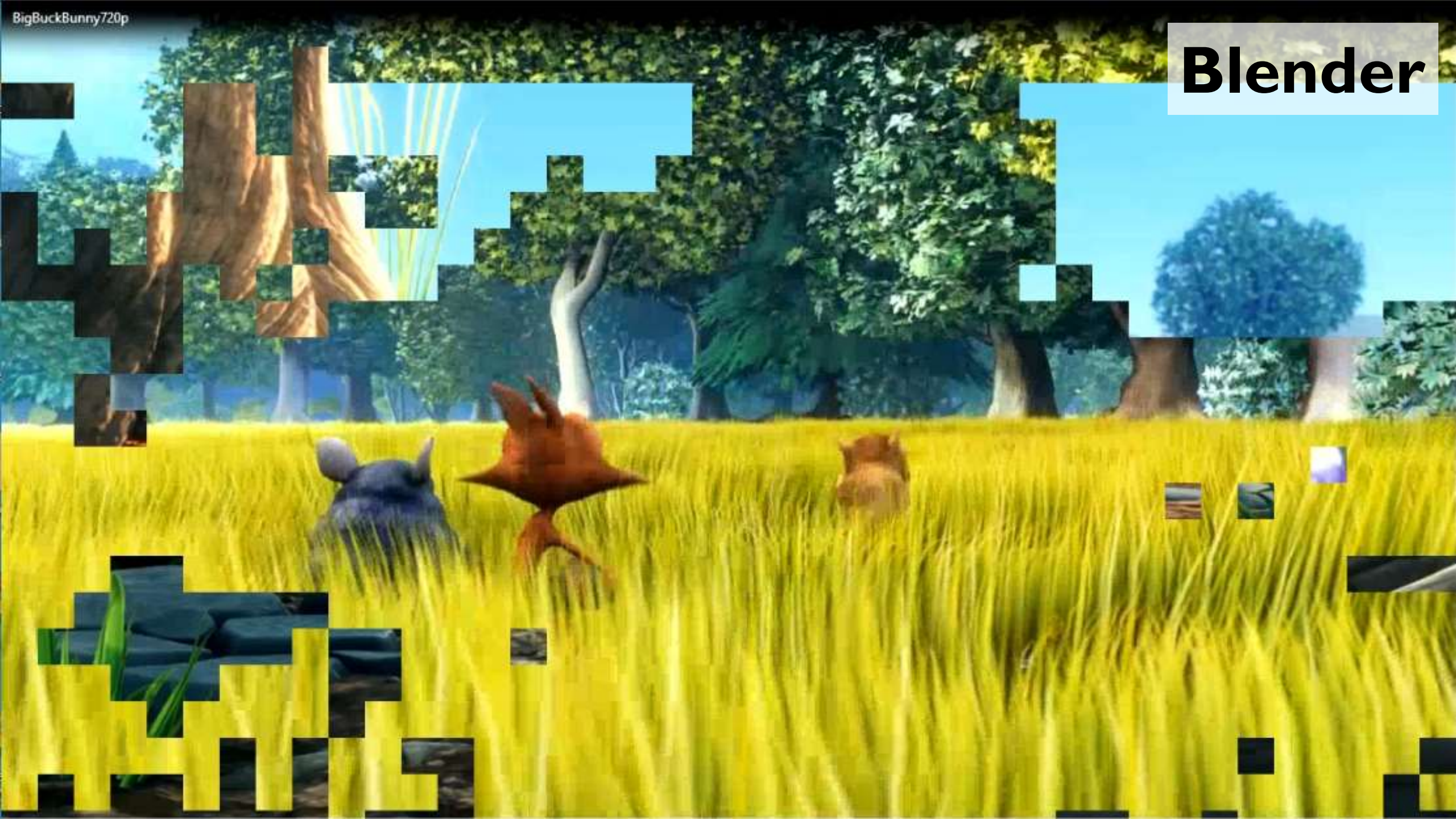


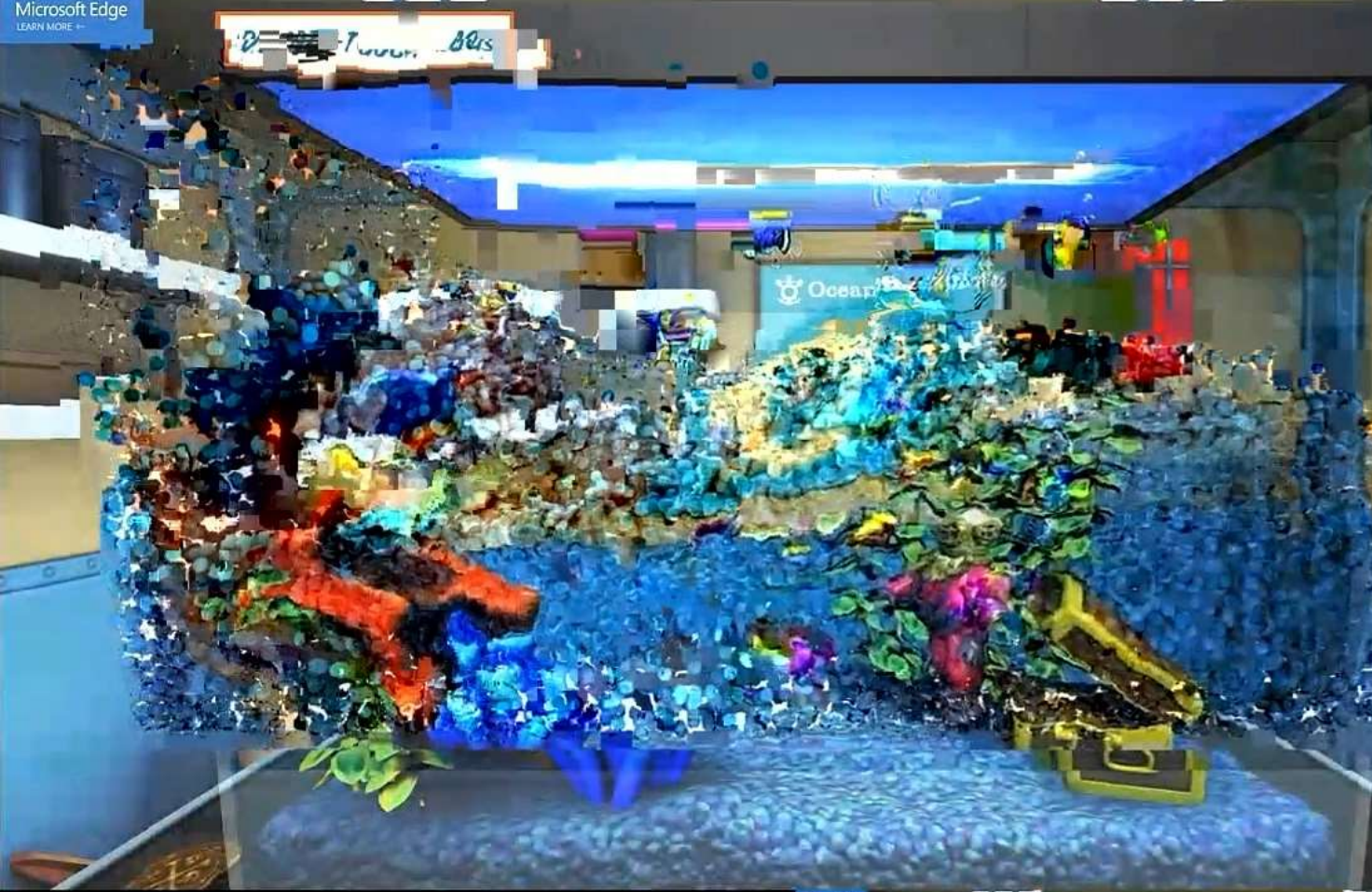
Simload Gallery: <https://eucscore.com/gallery.html>



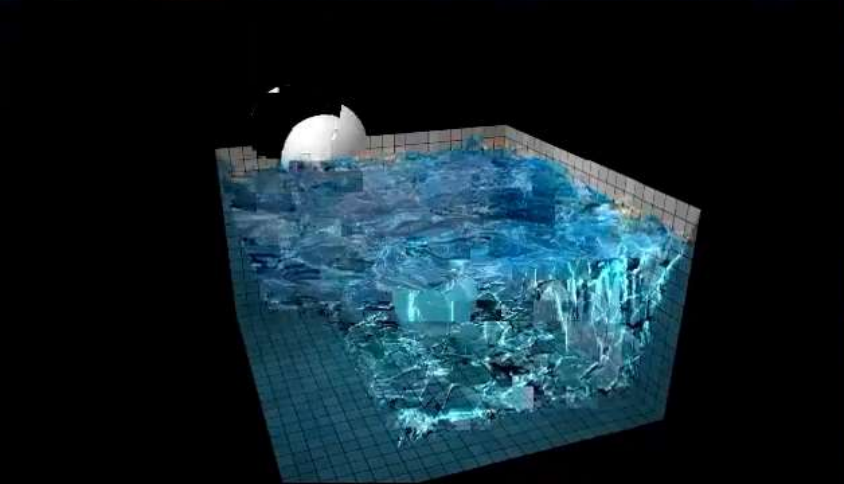
Thumbnail	Simload Type	Description
	System	SL0-TestScreen Open a test pattern screen and save system information.
	Primary Base	SL1-NotepadEdit Open Microsoft Notepad and start writing a novel with random type speed.
	Primary Base	SL1-WordpadScroll Open local DOCX file with PNG images in Wordpad and randomly move pages up and down every second.
	Primary JPEGView	SL1-JPEGViewStatic Open JPEG image in JPEG View. NOTE: This is the most basic Simload as it includes neither animations nor user interactions.
	Primary JPEGView	SL1-JPEGViewAnim Open animated GIF image in JPEG View.
	Primary WMPlayer	SL1-WMPlayer480pWMV Open local 480p WMV video in Windows Media Player, switch from windowed to fullscreen mode.
	Persona Base	SL2-Base Foreground: SL3-AppDialog Background: SL1-JPEGViewAnim

Blender





Videos / Web Apps





EUC Score for AWS
<https://aws.amazon.com/>
Humus



CPU
7% 2.11 GHz

Memory
3.8/15.9 GB (24%)

Disk 0 (C:)
SSD
0%

Ethernet
Ethernet 2
S: 0.1 R: 6.5 Mbps

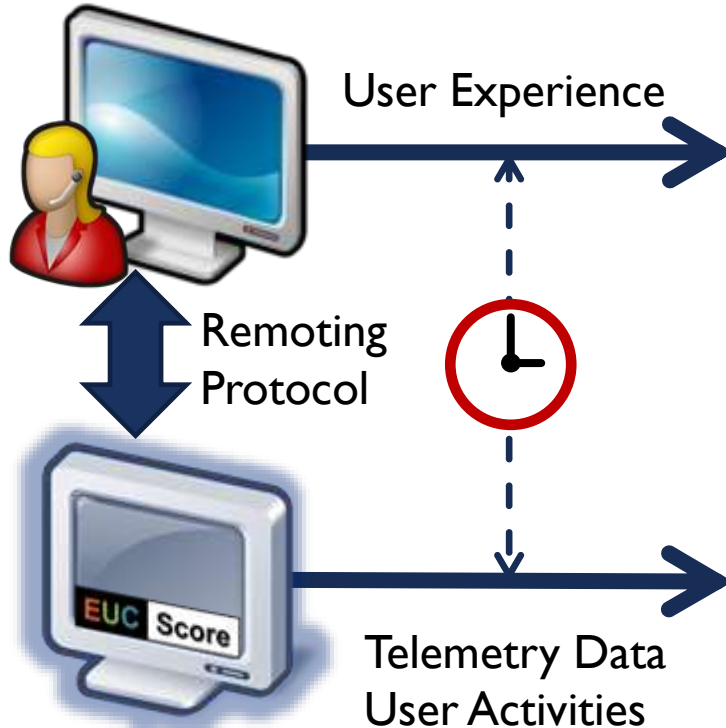
GPU 0
Intel(R) HD Graphi...
0%

GPU 1
Radeon RX Vega ...
1% (47 °C)



VISUAL DATA ANALYTICS – EUC SCORE SYNC PLAYER

Primary User Endpoint



System Under Test

Title

Specs Button

Maximize Button

System Under Test:

Azure West Europe, AVD NV6 VM,
Windows 10 Enterprise for Virtual
Desktops, Intel Xeon E5-2690 v3
6vCPUs @ 2.60GHz, 56GB RAM,
Virtual HD ATA Device 340GB,
NVIDIA M60 GPU (1/2 Card), 8GB
VRAM

Connection:
EDIT PROTOCOL AND NETWORK
CONDITIONS

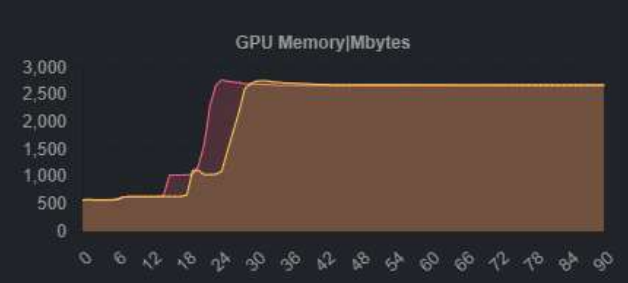
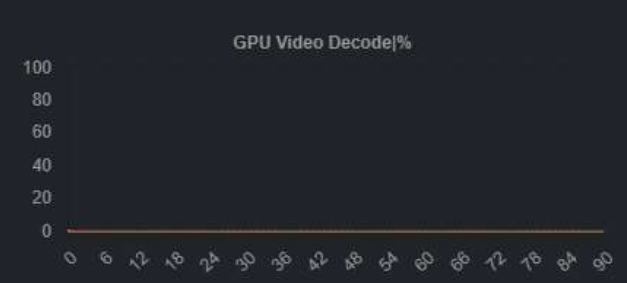
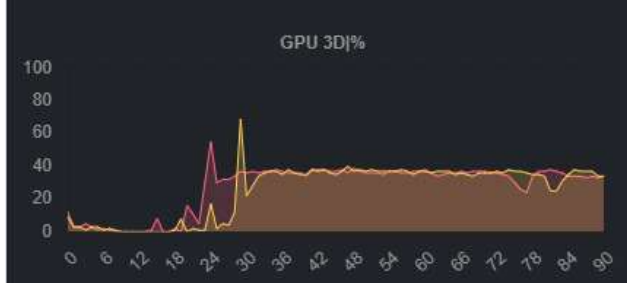
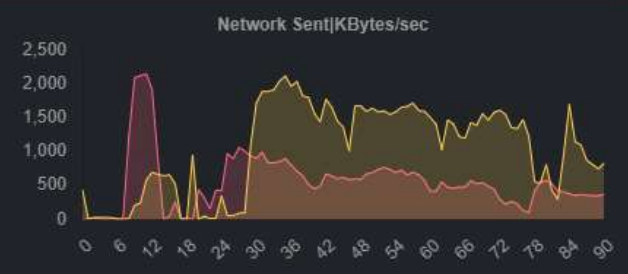
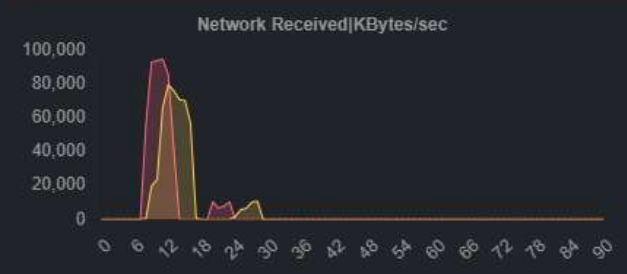
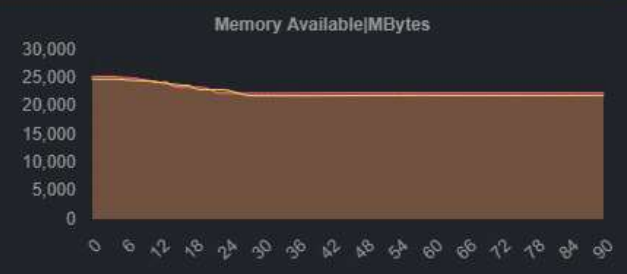
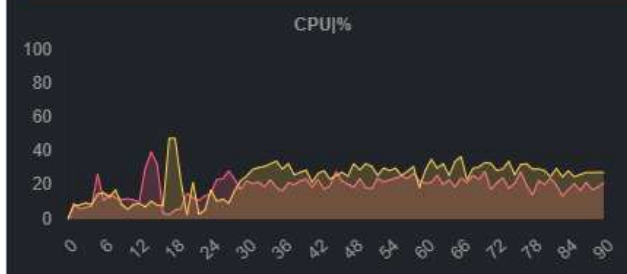
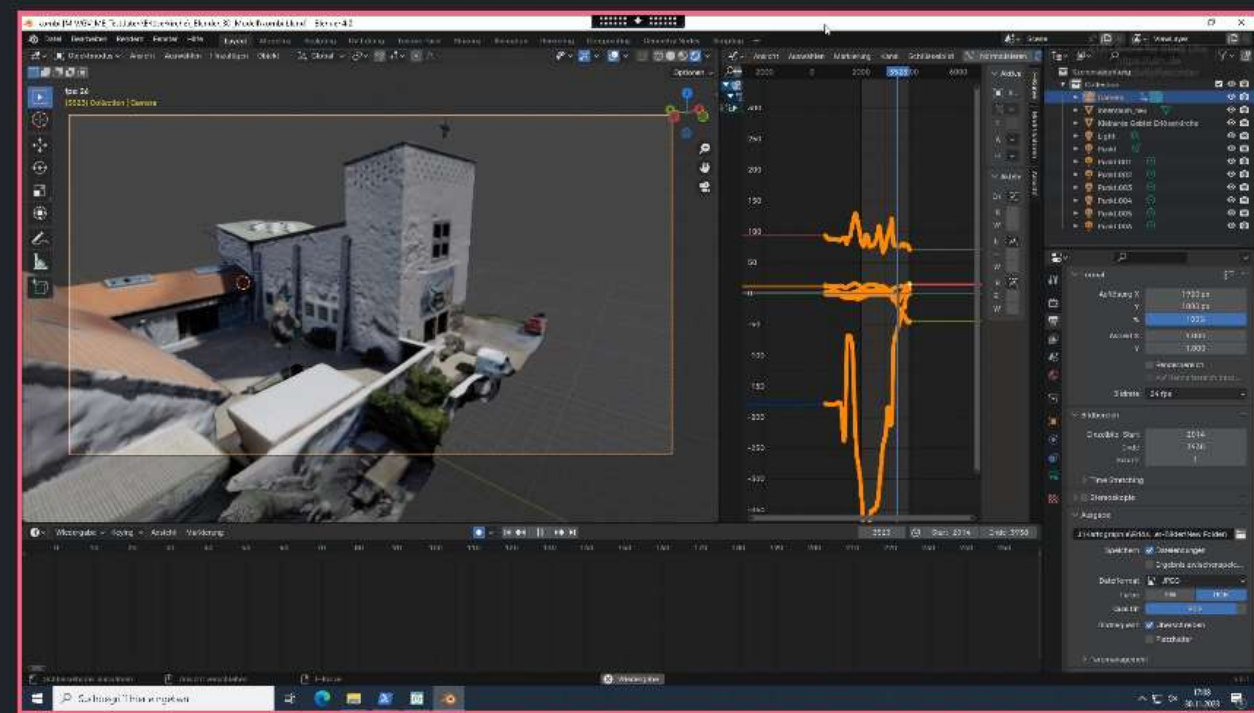
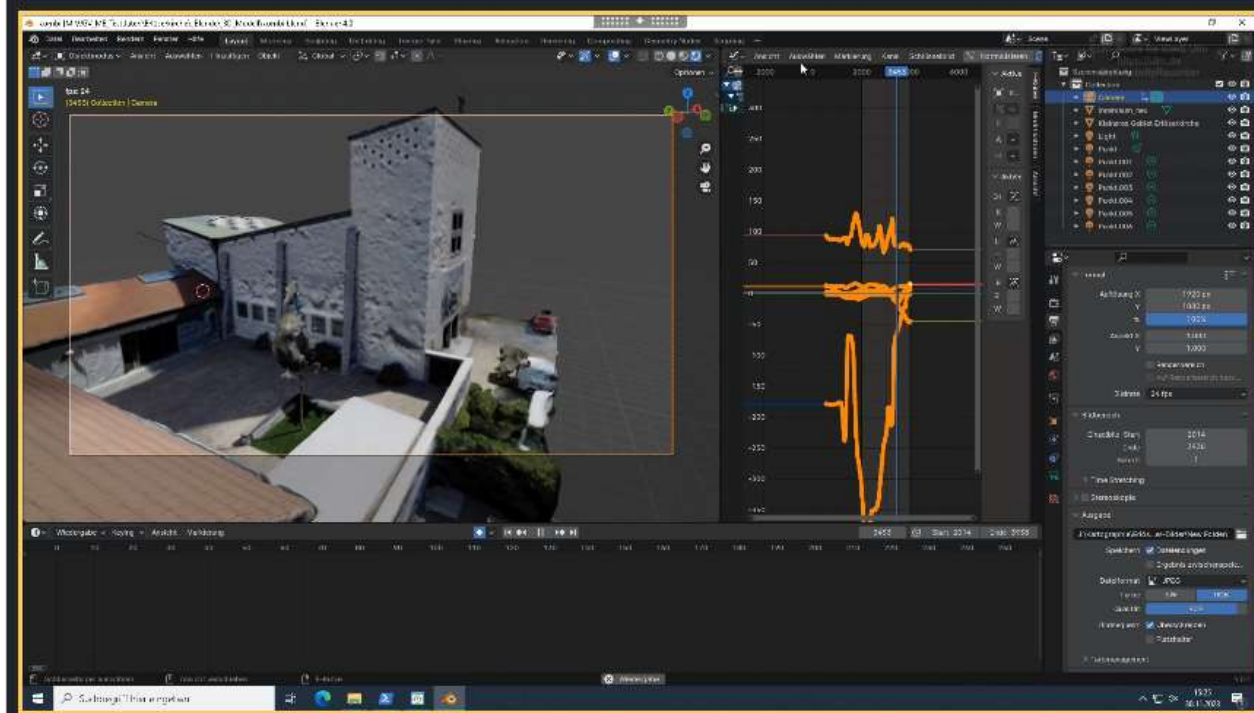
Endpoint:
IGEL UD3 (M150C / LX-60) with
IGEL OS 11.08.230, AMD Ryzen
Embedded R1505G Dual-Core @
2.0 - 2.7GHz, 4GB DDR4 RAM, 8GB
eMMC, AMD Radeon Vega 3 GPU
with 512MB shared memory

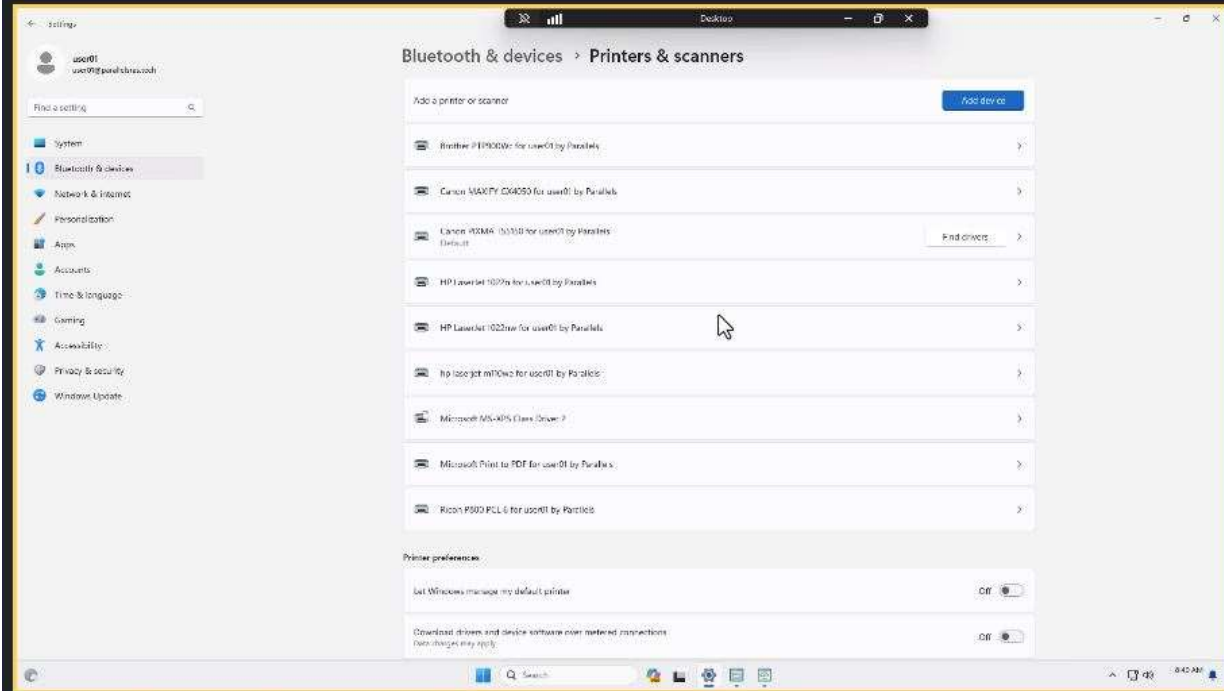
Activities

Telemetry Charts

Timeline and Video Controls

Report Button

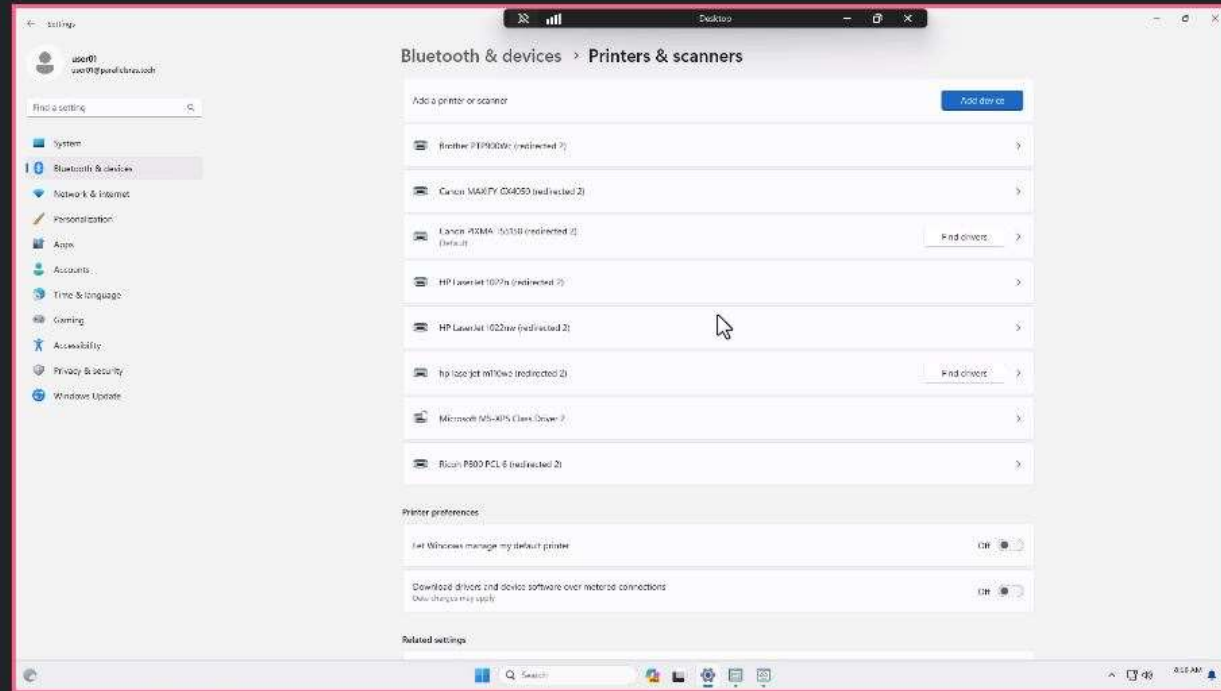




```

00:00:00.000 Simload: SLX-UniversalPrint
00:00:00.000 Number of Monitors: 1
00:00:00.000 Pre-Simload countdown screen was visible for 1 sec
00:00:00.000 Delay between Simload start time and activity log start time: 1.606 sec
00:00:01.237 Delay between Simload start time and core telemetry start time: 0.417 sec
00:00:01.240 Initialize settings
00:00:01.248 Run action initiated
00:00:01.180 LEFT MOUSE button pressed - Open Start menu
00:00:05.150 LEFT MOUSE button pressed - Desktop icon clicked
00:00:06.510 Desktop appears
00:00:07.090 Bluetooth & devices setting dialog appears with all printers in the list
00:00:07.450 Brother PTP900Wc goes online
00:00:07.724 Canon MAXIFY GX4050 goes online
00:00:08.330 HP LaserJet 1022n goes online
00:00:08.330 HP LaserJet 1022nw goes online
00:00:08.720 HP LaserJet m110we added to the printer list
00:00:09.210 Microsoft Print to PDF goes online
00:00:09.600 Ricoh P800 goes online
00:00:10.090 HP LaserJet m110we goes online
00:00:10.090 DONE!!!

```



```

00:00:00.000 Simload: SLX-UniversalPrint
00:00:00.000 Number of Monitors: 1
00:00:00.000 Pre-Simload countdown screen was visible for 1 sec
00:00:00.000 Delay between Simload start time and activity log start time: 1.606 sec
00:00:01.237 Delay between Simload start time and core telemetry start time: 0.417 sec
00:00:01.240 Initialize settings
00:00:01.248 Run action initiated
00:00:01.248 LEFT MOUSE button pressed - Open Start menu
00:00:04.330 LEFT MOUSE button pressed - Desktop icon clicked
00:00:05.600 Desktop appears
00:00:07.660 Bluetooth & devices setting dialog appears with Microsoft MS-XPS in the printer list
00:00:07.720 Canon PIXMA T55150 added to the printer list
00:00:11.630 HP LaserJet m110we added to the printer list
00:00:14.120 HP LaserJet 1022n added to the printer list
00:00:15.330 Ricoh P800 added to the printer list
00:00:16.180 Canon MAXIFY GX4050 added to the printer list
00:00:16.740 HP LaserJet 1022nw added to the printer list
00:00:23.330 Brother PTP900Wc added to the printer list
00:00:23.330 It took a while - but finally it's DONE!!!

```



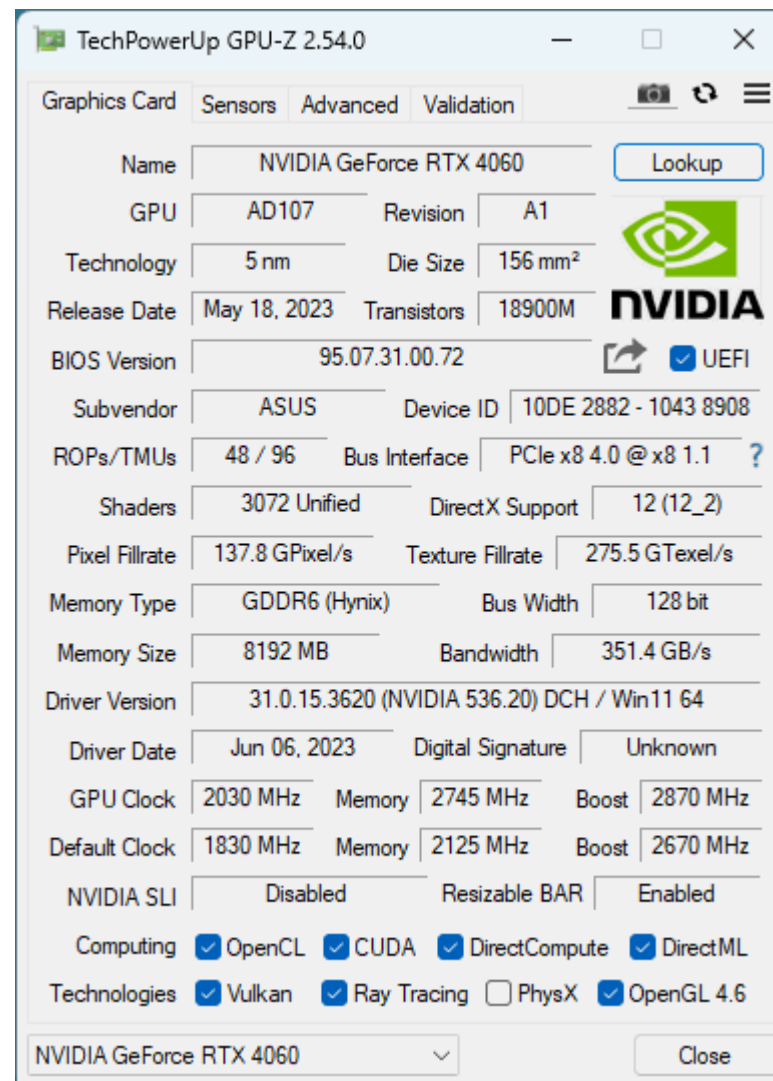
My top 10 tools when benchmarking GPU-enabled VDI/DaaS environments

I OF 10 – GPU-Z (SYSTEM ANALYSIS)

GPU-Z

Lightweight utility designed to give you all information about your video card and GPU

<https://www.techpowerup.com/gpuz/>



TechPowerUp GPU-Z 2.54.0

Graphics Card | Sensors | Advanced | Validation

Name: NVIDIA GeForce RTX 4060 [Lookup]

GPU: AD107 | Revision: A1

Technology: 5 nm | Die Size: 156 mm²

Release Date: May 18, 2023 | Transistors: 18900M

BIOS Version: 95.07.31.00.72 [UEFI]

Subvendor: ASUS | Device ID: 10DE 2882 - 1043 8908

ROPs/TMUs: 48 / 96 | Bus Interface: PCIe x8 4.0 @ x8 1.1

Shaders: 3072 Unified | DirectX Support: 12 (12_2)

Pixel Fillrate: 137.8 GPixel/s | Texture Fillrate: 275.5 GTexel/s

Memory Type: GDDR6 (Hynix) | Bus Width: 128 bit

Memory Size: 8192 MB | Bandwidth: 351.4 GB/s

Driver Version: 31.0.15.3620 (NVIDIA 536.20) DCH / Win11 64

Driver Date: Jun 06, 2023 | Digital Signature: Unknown

GPU Clock: 2030 MHz | Memory: 2745 MHz | Boost: 2870 MHz

Default Clock: 1830 MHz | Memory: 2125 MHz | Boost: 2670 MHz

NVIDIA SLI: Disabled | Resizable BAR: Enabled

Computing: OpenCL CUDA DirectCompute DirectML

Technologies: Vulkan Ray Tracing PhysX OpenGL 4.6

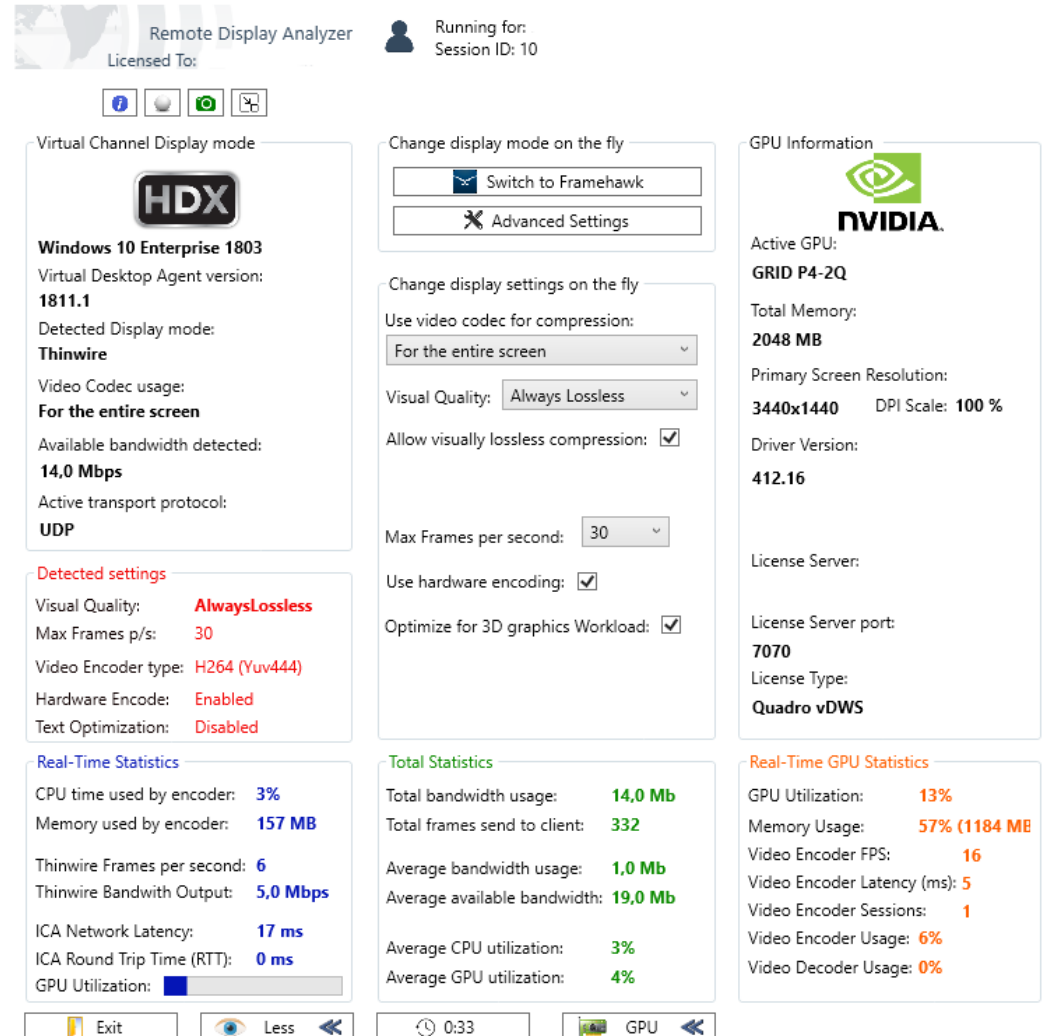
NVIDIA GeForce RTX 4060 [Close]

2 OF 10 – REMOTE DESKTOP ANALYZER (SYSTEM ANALYSIS)

Remote Desktop Analyzer

Analyze and change remoting protocol settings on the fly and collect real-time statistics

<https://rdanalyzer.com/>



Remote Display Analyzer
Licensed To: [Redacted]

Running for: [Redacted]
Session ID: 10

Virtual Channel Display mode: **HDX**


Windows 10 Enterprise 1803
Virtual Desktop Agent version: 1811.1
Detected Display mode: **Thinwire**
Video Codec usage: **For the entire screen**
Available bandwidth detected: **14,0 Mbps**
Active transport protocol: **UDP**

Change display mode on the fly:

Change display settings on the fly:
Use video codec for compression: For the entire screen
Visual Quality: Always Lossless
Allow visually lossless compression:
Max Frames per second: 30
Use hardware encoding:
Optimize for 3D graphics Workload:

GPU Information
NVIDIA
Active GPU: **GRID P4-2Q**
Total Memory: **2048 MB**
Primary Screen Resolution: **3440x1440** DPI Scale: **100 %**
Driver Version: **412.16**
License Server:
License Server port: **7070**
License Type: **Quadro vDWS**

Detected settings
Visual Quality: **AlwaysLossless**
Max Frames p/s: **30**
Video Encoder type: **H264 (Yuv444)**
Hardware Encode: **Enabled**
Text Optimization: **Disabled**

Real-Time Statistics
CPU time used by encoder: **3%**
Memory used by encoder: **157 MB**
Thinwire Frames per second: **6**
Thinwire Bandwidth Output: **5,0 Mbps**
ICA Network Latency: **17 ms**
ICA Round Trip Time (RTT): **0 ms**
GPU Utilization: 

Total Statistics
Total bandwidth usage: **14,0 Mb**
Total frames send to client: **332**
Average bandwidth usage: **1,0 Mb**
Average available bandwidth: **19,0 Mb**
Average CPU utilization: **3%**
Average GPU utilization: **4%**

Real-Time GPU Statistics
GPU Utilization: **13%**
Memory Usage: **57% (1184 MB)**
Video Encoder FPS: **16**
Video Encoder Latency (ms): **5**
Video Encoder Sessions: **1**
Video Encoder Usage: **6%**
Video Decoder Usage: **0%**

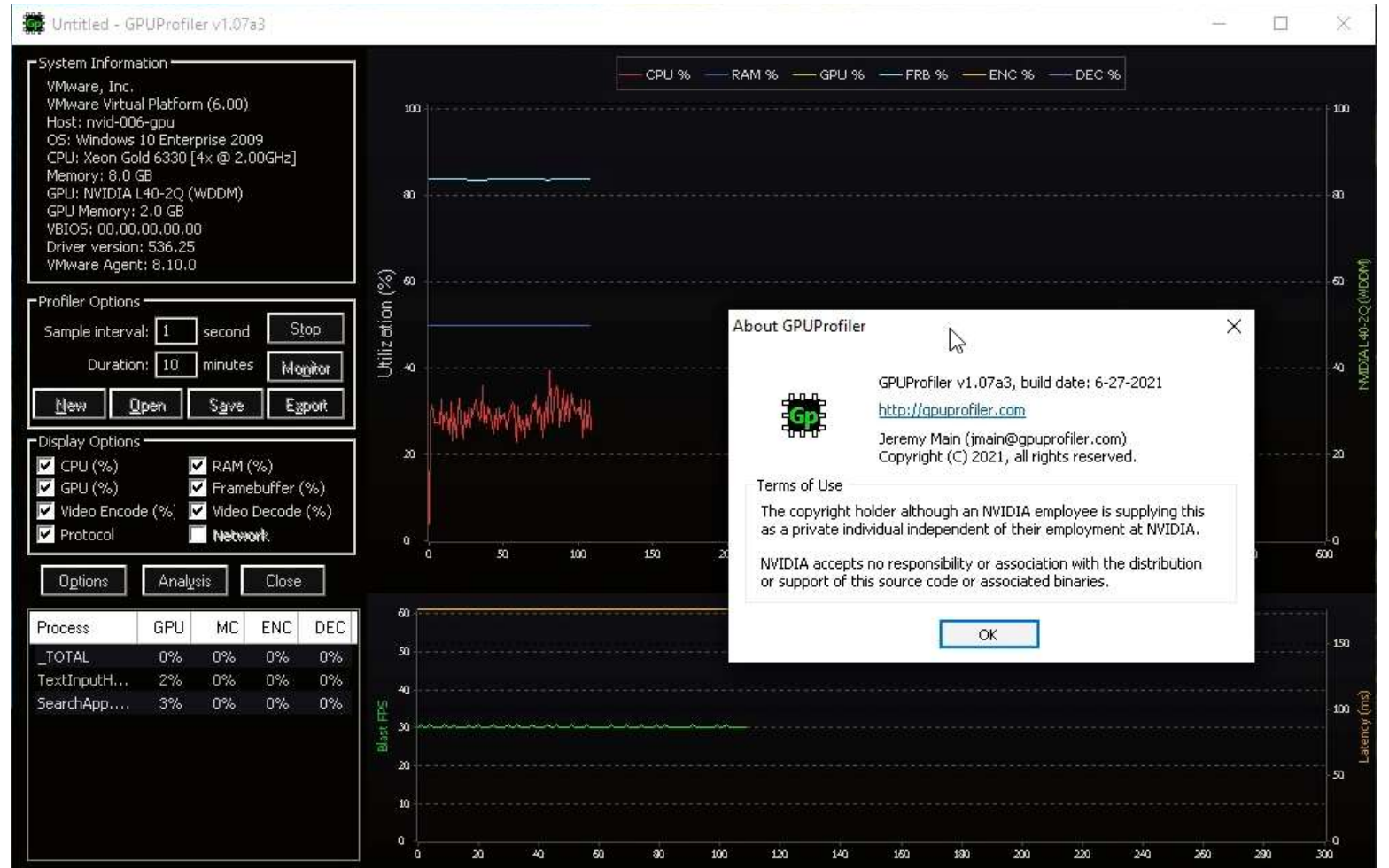
Exit Less 0:33 GPU

3 OF 10 – GPU PROFILER (SYSTEM ANALYSIS)

GPU Profiler

NVIDIA GPU analysis tool
developed by NVIDIA's
Jeremy Main

<https://gpuprofiler.com>



4 OF 10 – CINEBENCH (BENCHMARK)

Cinebench

3D graphics software based on the Cinema 4D rendering engine

<https://www.maxon.net/en/cinebench>



The screenshot displays the Cinebench R15 benchmark interface. On the left, system information is shown, including the processor (Intel Core i5-3470), GPU (NVIDIA GeForce GTX 600M), and a score of 99.6%. On the right, a 3D rendering of a white car is shown in a city environment. The car has a license plate that reads 'MAXON'. The interface also includes a ranking table and a 'Performing OpenGL Test' status bar at the bottom.

Rank	CPU	GPU	Score
1	3.10 GHz	NVIDIA GeForce GTX 680M	99.62
2	2.90 GHz	NVIDIA GeForce GTX 600M	98.62
3	2.70 GHz	NVIDIA GeForce GT 500M	98.62
4	3.10 GHz	Quadro K1000M	98.62
5	3.00 GHz	GeForce GTX 580M	98.62
6	3.20 GHz	GeForce GTX 580M	98.62
7	2.40 GHz	GeForce GTX 580M	98.62
8	2.88 GHz	GeForce GTX 580M	98.62
9	2.70 GHz	Quadro K1000M	98.62
10	2.70 GHz	Quadro K1000M	98.62
11	2.70 GHz	Quadro K1000M	98.62
12	2.81 GHz	GeForce GTX 580M	98.62
13	2.81 GHz	GeForce GTX 580M	98.62
14	2.81 GHz	GeForce GTX 580M	98.62
15	2.81 GHz	GeForce GTX 580M	98.62
16	2.81 GHz	GeForce GTX 580M	98.62
17	3.31 GHz	Quadro K1000M	98.62
18	3.04 GHz	GeForce GTX 580M	98.62
18	2.67 GHz	Quadro K1000M	98.62

5 OF 10 – GEEKS3D GPUTEST (BENCHMARK)

Geeks3D GpuTest

- FurMark (OpenGL 2.1 or 3.2)
- TessMark (OpenGL 4.0)
- GiMark (OpenGL 3.3)
- PixMark (OpenGL 2.1 or 3.2)
- Plot3D (OpenGL 2.1 or 3.2)
- Triangle (OpenGL 2.1 or 3.2)

<https://www.geeks3d.com/gputest/>



6 OF 10 – BLENDER (BENCHMARK)

Blender

Open-source 3D creation and video production software, including a benchmark and many free videos

<https://www.blender.org/>

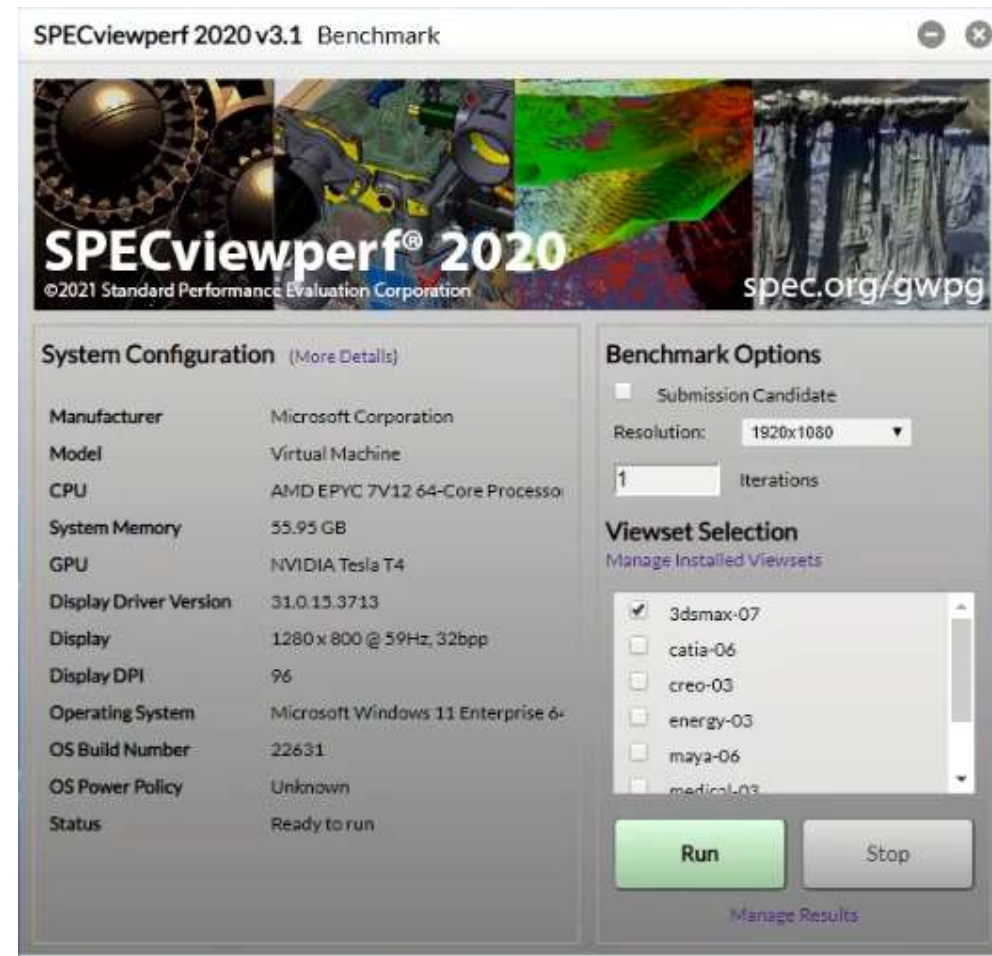


7 OF 10 – SPEC VIEWPERF (BENCHMARK)

SPECviewperf 2020 v3.1

- 3ds Max
- Catia
- Creo
- Maya
- Siemens NX
- Solidworks

<https://gwpkg.spec.org/benchmarks/benchmark/specviewperf-2020/>

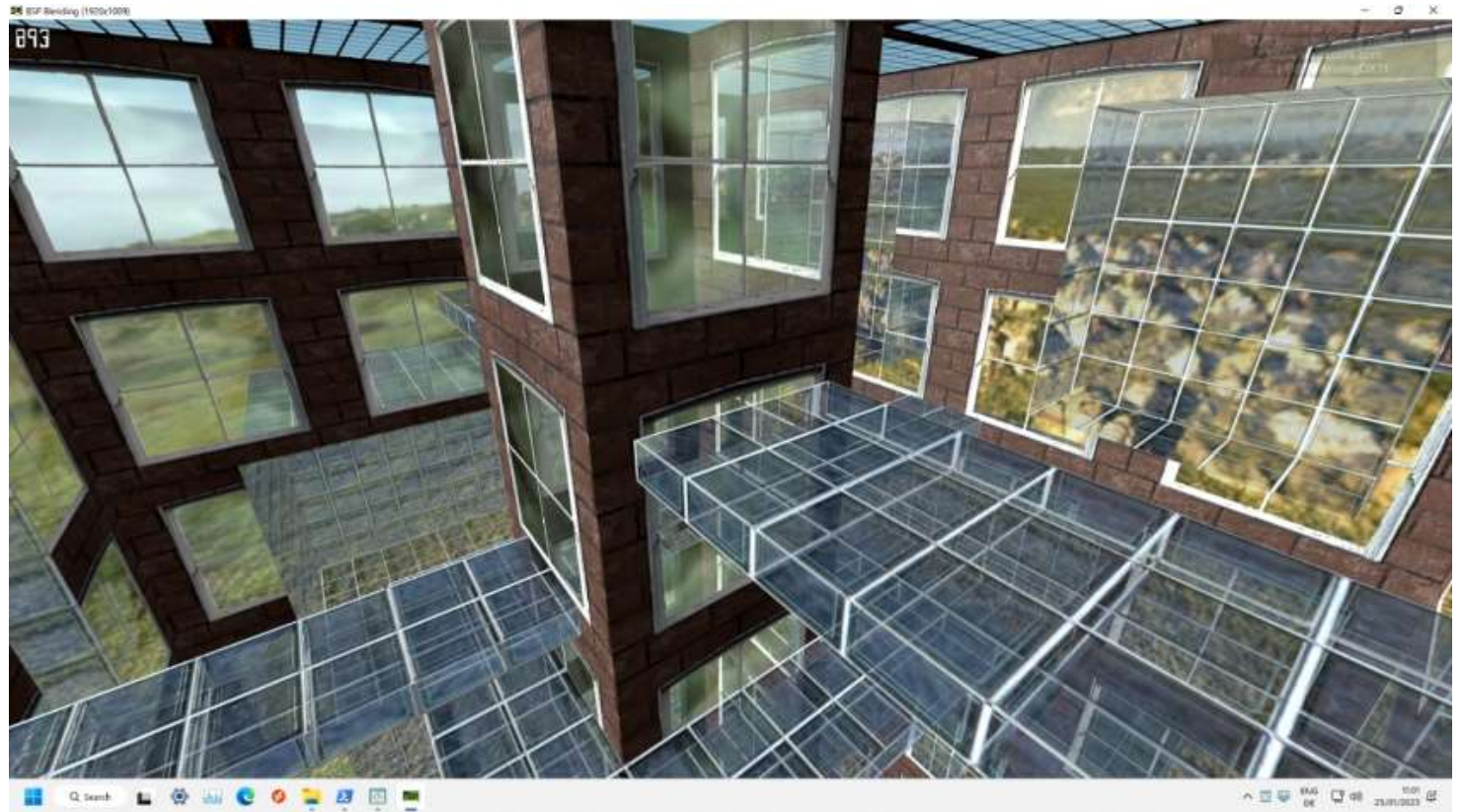


8 OF 10 – EMIL PERSSON AKA “HUMUS” (BENCHMARK)

Emil Persson

3D demo software developed in
OpenGL and DirectX

<https://humus.name>



9 OF 10 – UNIGINE (BENCHMARK)

Unigine

Determine the stability of PC hardware under extremely stressful conditions

- Superposition 2017
- Valley 2013
- Heaven 2009

<https://benchmark.unigine.com/>



10 OF 10 – EZBENCH / UNREAL ENGINE (BENCHMARK)

EzBench

A free Unreal Engine 5 benchmark,
provided by Steam



[https://store.steampowered.com/
app/770170/EzBench_Benchmark/](https://store.steampowered.com/app/770170/EzBench_Benchmark/)

MY TOP 12 WEB APPLICATIONS FOR BENCHMARKING

1. HTML5 Fishbowl - <https://eucscore.com/demos/HTML5-Fishbowl>
2. HTML5 Monster - <https://eucscore.com/demos/HTML5-Monster/deanm.github.io/pre3d/monster.html>
3. Car Visualizer - <http://carvisualizer.plus360degrees.com/threejs/>
4. WebGL Water - <http://madebyevan.com/webgl-water/>
5. WebGL Aquarium - <http://webglsamples.org/aquarium/aquarium.html>
6. Field - <https://webglsamples.org/field/field.html>
7. HTML5 Fluid Particles - <http://david.li/fluid/>
8. Volumetric Particle Flow - <https://david.li/flow/>
9. Vortex Sphere - <https://david.li/vortexspheres/>
10. Elastic Man - <https://www.adultswim.com/etcetera/elastic-man/>
11. Jelly Fish - <https://akirodic.com/p/jellyfish/>
12. Ocean Demo - <https://popov72.github.io/OceanDemo/dist/index.html>, <https://playground.babylonjs.com/#YX6IB8#229>

WEB APPLICATIONS

HTML5 Fishbowl



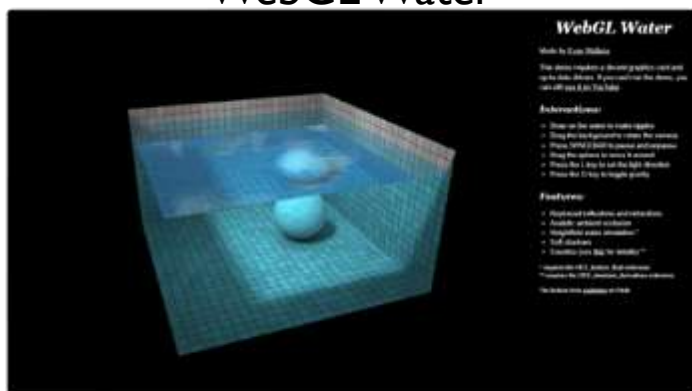
HTML5 Monster



Car Visualizer



WebGL Water



WebGL Aquarium



Field



WEB APPLICATIONS

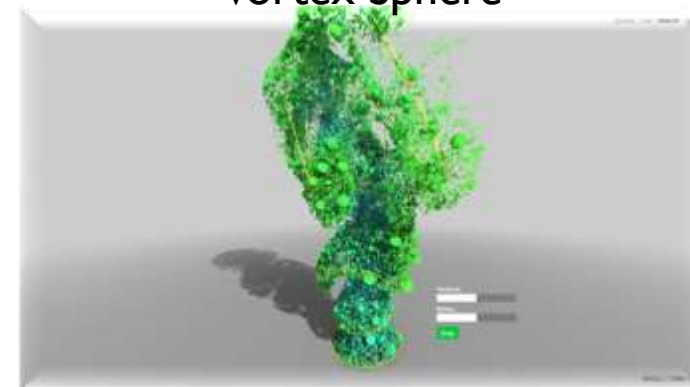
HTML5 Fluid Particles



Volumetric Particle Flow



Vortex Sphere



Elastic Man



Jelly Fish



Ocean Demo



EUC SCORE LINKS

- Home Page: <https://eucscore.com/>
- Terminology (Glossary): <https://eucscore.com/terminology.html>
- Lab Equipment: <https://eucscore.com/equipment.html>
- Test Methodology: <https://eucscore.com/methodology.html>
- Toolset Documentation: <https://eucscore.com/docs/index.html>
- Simload Gallery: <https://eucscore.com/gallery.html>
- Sample Test Results (Sync Player): <https://eucscore.com/results>
- Freeware Download: <https://eucscore.com/freeware>

SIX BENEFITS OF USING EUC SCORE



Identify potential pain
Pre-production capabilities,
performance and load testing



Examine existing pain
Ad-hoc diagnostics in
production environments



Prevent new pain
What-if analysis and
comparison of system designs
and migration scenarios



Quantify pain relief success
Before-after analysis of system
optimizations and software updates



Measure chronic pain
DaaS and VDI service level
agreement management



Deliver less pain by design
EUC software quality assurance
and quality control

CALL TO ACTION

If you want to learn more about
EUC Score projects, send an email to
info@eucscore.com



<https://eucscore.com>

<https://eucscore.com/results>

NOTE: The EUC Score toolset is free for
community benchmarking tests when the results
are made publicly available





THANK YOU



Dr. Benny Tritsch
Managing Director
at Dr. Tritsch IT Consulting
benny@drtritsch.com

This FREE community event is made possible with support of:

