

EUC Score

The Science of EUC Performance Metrics

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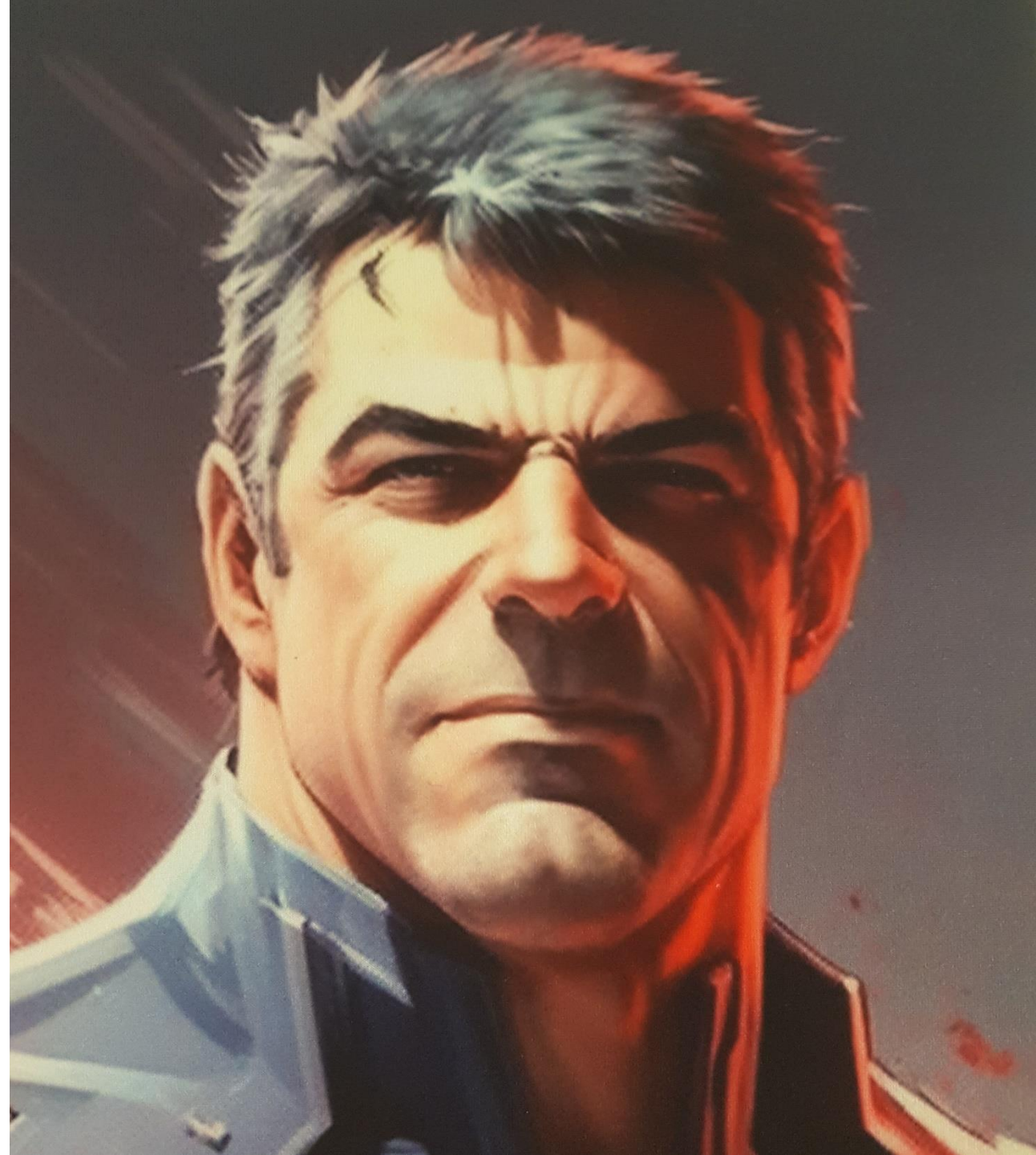
Dr. Tritsch IT Consulting

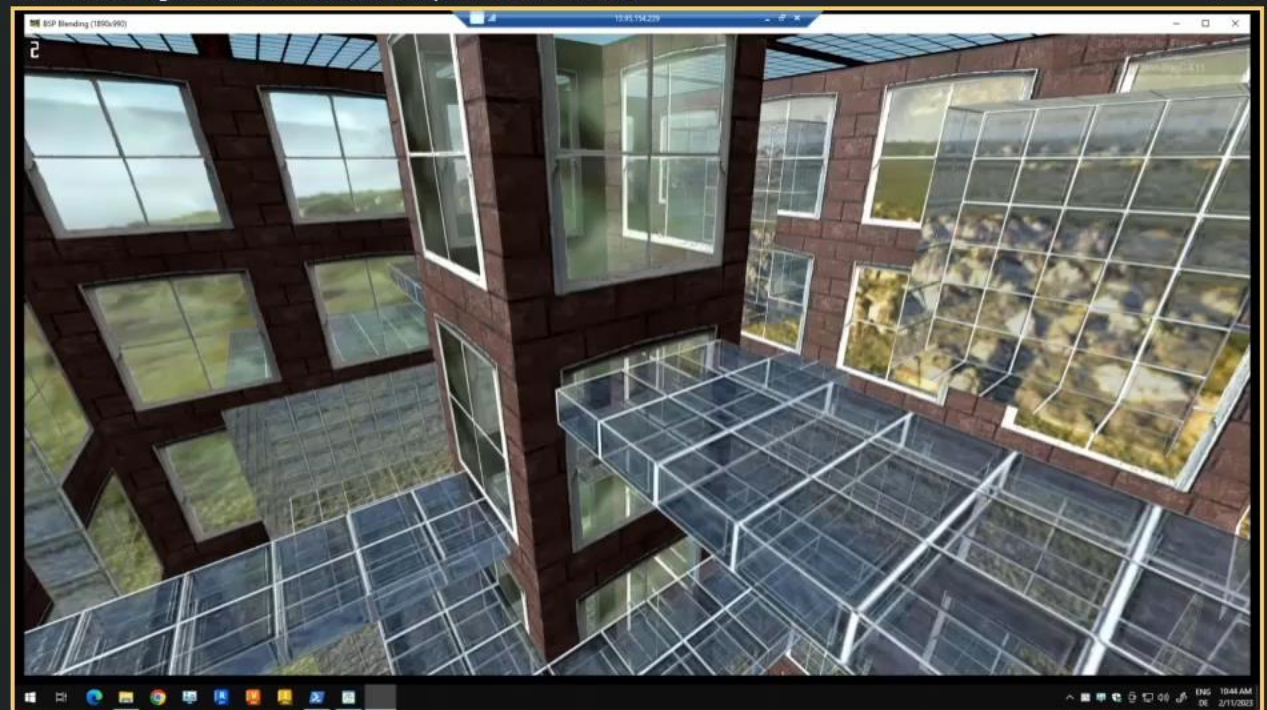


Performance Data Scientist
EUC Documentary Cameraman
MVP | CTP | vExpert EUC
NGCA | VIPP

info@drtritsch.com

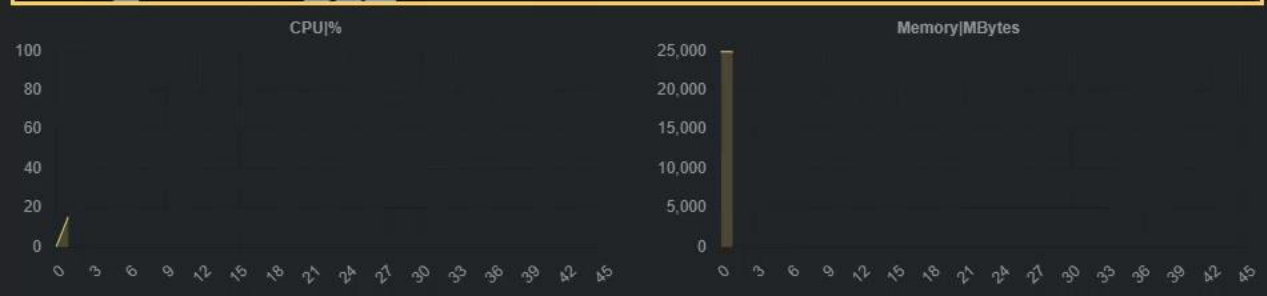
@drtritsch



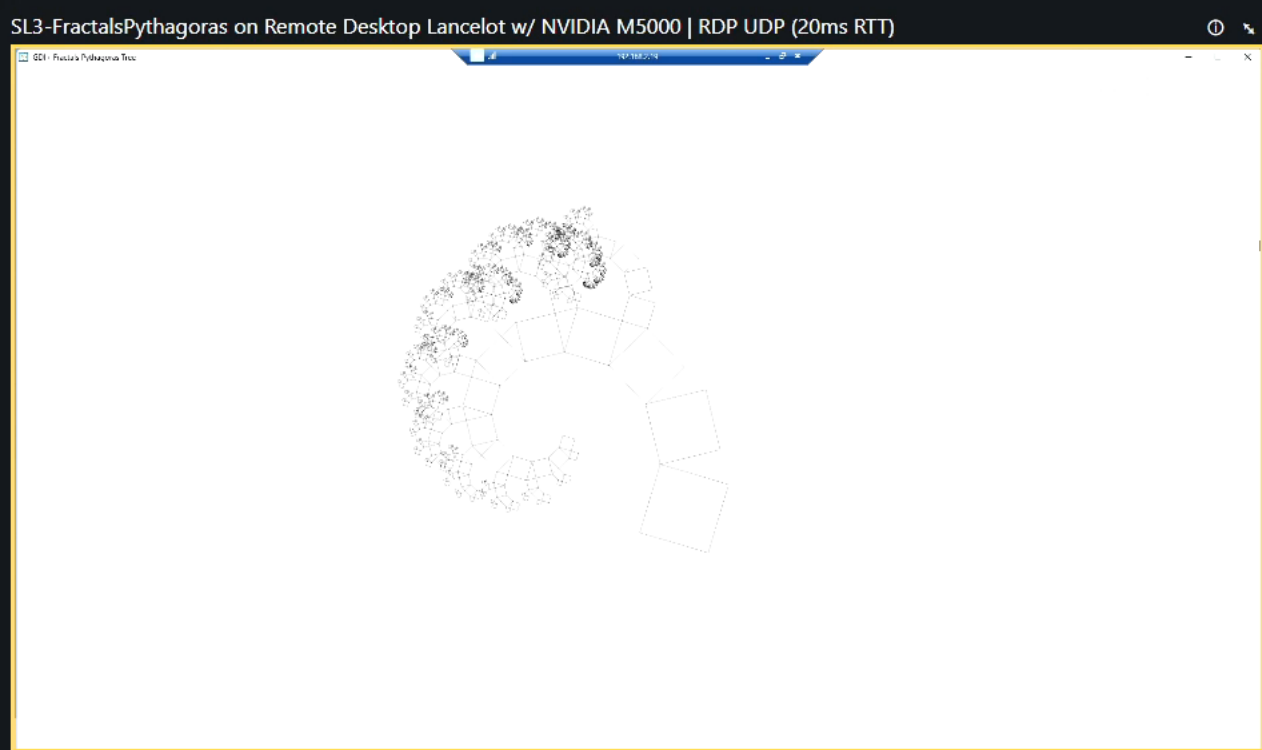


```











00:00:01.000 Date: 2023/02/11 Time: 10:44:19.351 AppName: BSPBlending.exe
00:00:01.631 App launch time: 602 ms
00:00:01.887 Run action initiated
  
```







Science of EUC – UX Quality Criteria

	Time to first byte (TTFB)	Measure boot time + logon time + user session load time
	Application load time	Measure time from user starting an application until the content appears and the application is ready for user input
	User input delay	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

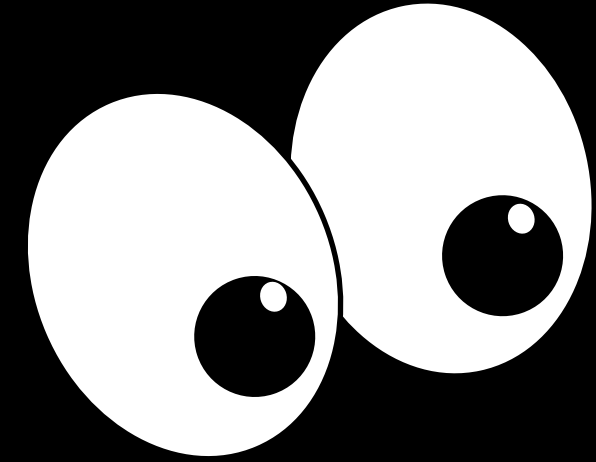
Glossary – Screen Artifacts / Anomalies

- Block boundary – mosaicking, pixelating, quilting, checkerboarding
- Tiling, striping – rendering each section of an image grid, a tile, or a stripe separately
- Smear artifact – grime, smudge, airbrush effect
- Blurriness – out of focus, fuzziness, unsharpness
- Color artifacts – false colors, color bleeding
- Mosquito noise – edge busyness
- Ringing – echoing, ghosting
- Choppy – laggy, jumpy, jerky
- Floating – illusory motion in certain regions while the surrounding areas remain static
- Jitter – loss of transmitted data between network devices
- Flickering – fine-grain flickering and coarse-grain flickering
- Slow motion
- Video stuttering (“micro stutters”)
- Freeze frames

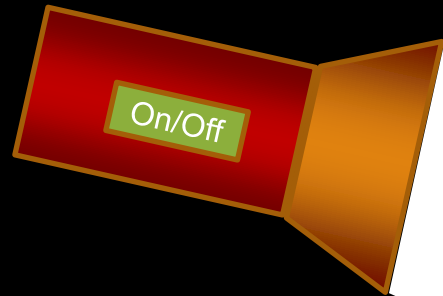
"You can only optimize what you can measure!"

EUC Score measures and quantifies
perceived end-user experience in Windows
remoting and digital workspace environments,
both on premises and in the cloud – fast,
precise, repeatable and intuitive

EUC Score in a Nutshell



Look before you leap!



Six Benefits of Using EUC Score

Diagnose end-user pain symptoms and solve IT support sorrows with proactive synthetic testing



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

Lab Equipment

Digital workspace experience benchmarking and rating

- Simulated Workloads = “Simloads”
- Avatar with Telemetry Collector
- Simload Runner
- [Frame Grabber](#) + Screen Video Recorder
- Sync Player (HTML5) + Build Scripts
- Simload SDK
- [WAN Emulators](#)
- [Reference Client + Host Machine \(Lancelot\)](#)

<https://eucscore.com/docs/>



Client-Side vs Host-Side User Simulation

Client-Side Synthetic Users



Logon simulator and Robotic Process Automation (RPA)

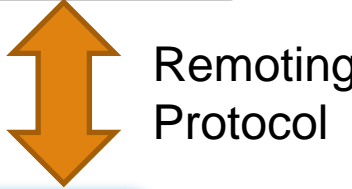


User session(s) with monitoring solution

Host-Side Synthetic Users

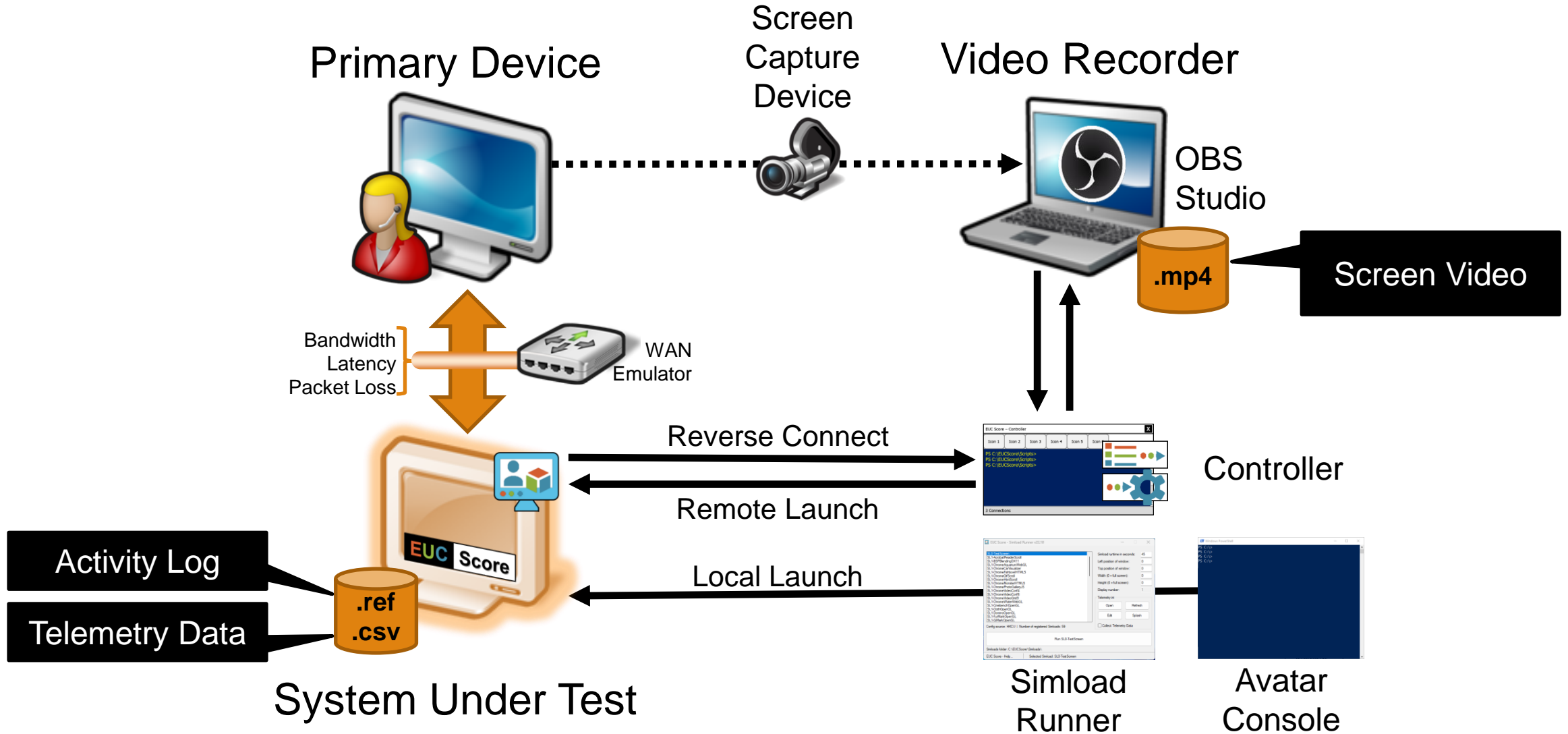


Full range of Remote Connection Clients



User session(s) with Simloads, Avatar and Telemetry Collector

Perform Test Runs



What's New in EUC Score v23.10

- Base telemetry collection feature embedded in each Simload
- New Simload command-line interface
- Updated Simload Runner
- Improved multi-monitor detection
- Free download at <https://eucscore.com/freeware>

Simload Runner / Telemetry Collectors

EUC Score - Simload Runner v23.10

Telemetry | Displays | Video Cards | Help | About | Exit

SL0-Test Screen
SL1-AcrobatReaderScroll
SL1-BSPBlendingDX11
SL1-ChromeAquariumWebGL
SL1-ChromeCarVisualizer
SL1-ChromeFishbowlHTML5
SL1-ChromeGifScroll
SL1-ChromeHtmlScroll
SL1-ChromeMonsterHTML5
SL1-ChromePhotoGalleryJS
SL1-ChromeVideoConf4
SL1-ChromeVideoConf6
SL1-ChromeVideoGrid9
SL1-ChromeWaterWebGL
SL1-CinebenchOpenGL
SL1-ClothOpenGL
SL1-DominoOpenGL
SL1-FurMarkOpenGL
SL1-GiMarkOpenGL
SL1-GoogleEarthDX9
SL1-JPEGViewAnim
SL1-JPEGViewStatic
SL1-MSEdgeAquariumWebGL
SL1-MSEdgeCarVisualizer
SL1-MSEdgeFishbowlHTML5
SL1-MSEdgeGifScroll

Simload Parameters

Runtime in seconds: 45
Left position of window: 0
Top position of window: 0
Width (0 = full screen): 0
Height (0 = full screen): 0
Display number: 0
Countdown: 1

Collect Telemetry Data

No telemetry data
 Simple telemetry data (.ini)
 Advanced telemetry data (.xml)

Config source: HKCU | Number of registered Simloads: 61

Run SL1-ChromeCarVisualizer

Telemetry viewer opened. Click button again to close.

EUC Score

CPU%
11

CPU Queue Length
0

Memory Available|MBytes
52773

Working Set|Bytes
12491984896

Disk Reads|Bytes/sec
65600

Disk Writes|Bytes/sec
168102

Disk IOPS
21

Disk Avg. Queue Length
0

Context Switches/sec
17542

Processes
325

Telemetry Collector GUI

CPU 4 %

CPU Queue Length 0

Memory Available 6213 MBytes

Working Set 13420756992 Bytes

Disk Reads 0 Bytes/sec

Disk Writes 8223 Bytes/sec

Disk IOPS 1

Disk Queue Length 0

Context Switches/sec 8324




Processes 352

Network: Received 5 KBytes/sec

Network: Sent 1 KBytes/sec

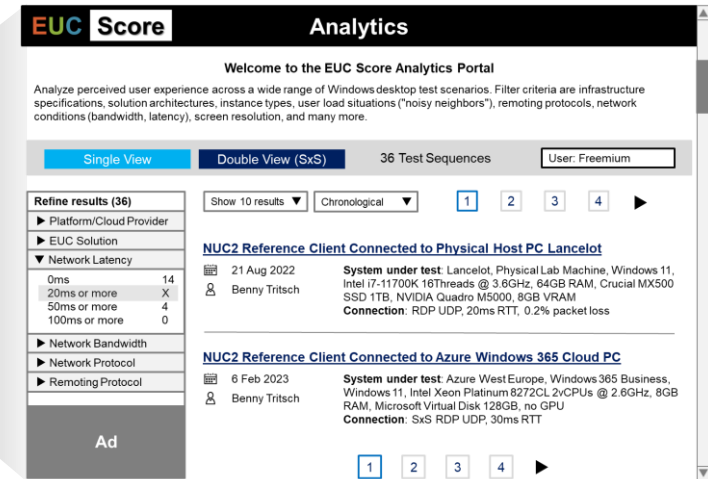
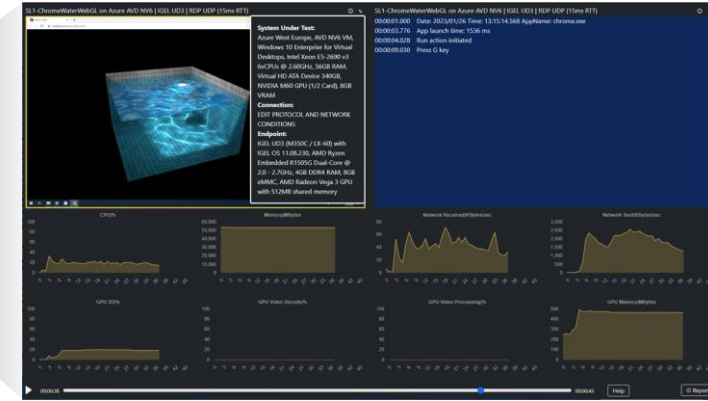
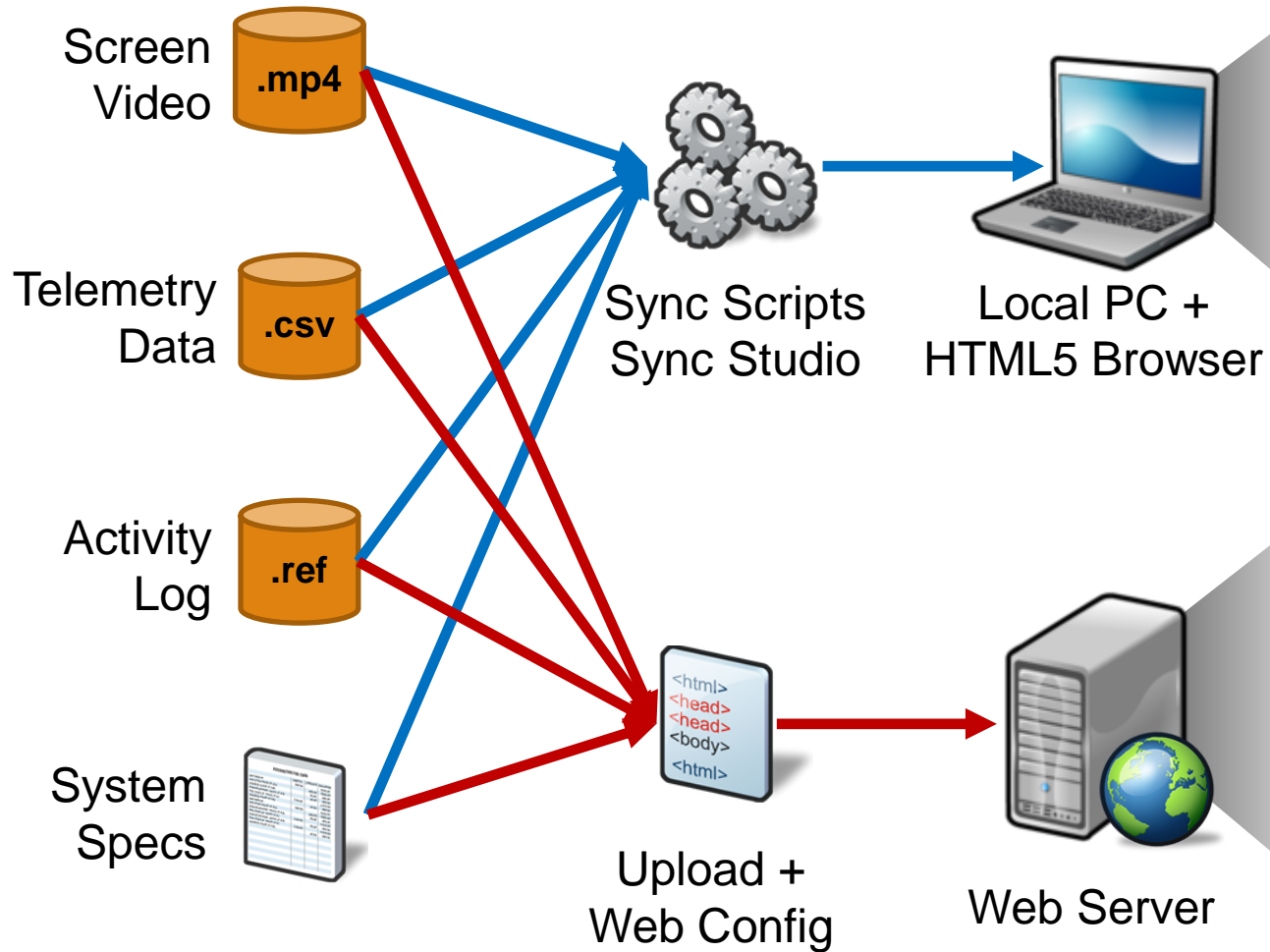
GPU 3D 3 %

Simulated Workloads – “Simloads”

	Type	Description
	Type 1 Primary	Test run with an application that highlights a specific graphic or multimedia format (GDI, DirectX, OpenGL or video) – may require a pre-installed application.
	Type 2 Persona	Sequence of chained or overlaid user activities, orchestrated in such a way they generate the characteristic behavior and consistent load pattern of a predefined interactive user type.
	Type 3 Score	Measures predefined system metrics used to produce a number (= score) that represents the performance. Typically, each score Simload is associated with a specific theme.

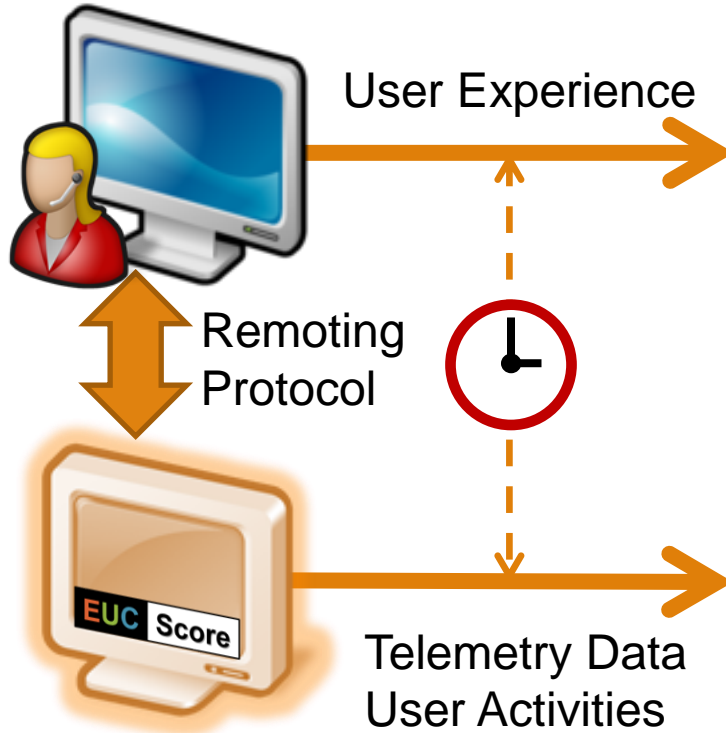
<https://eucscore.com/gallery.html>

Visualize, Analyze & Publish



Sync Player – Visual Data Analytics

Primary User Endpoint



System Under Test

Timeline and Video Controls

Title

Specs Button

Maximize Button

SL1-ChromeWaterWebGL on Azure AVD NV6 | IGEL UD3 | RDP UDP (15ms RTT)

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 (M350C / 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

00:00:01.000 Date: 2023/01/26 Time: 13:15:14.568 AppName: chrome.exe
00:00:03.776 App launch time: 1536 ms
00:00:04.028 Run action initiated
00:00:09.030 Press G key

Screen Video

Activities

Telemetry Charts

CPU%

Memory[MBytes]

Network Received[KBytes/sec]

Network Sent[KBytes/sec]

GPU 3D%

GPU Video Decode%

GPU Video Processing%

GPU Memory[MBytes]

00:00:38

00:00:45

Help

Report Button

EUC Score

Report Button

Left Media Tile
“Pacemaker” Video
[.mp4]

Right Media Tile
Comparison Video
[.mp4]

Color-Coded Telemetry Data – 2 x Session Metrics
“Performance Counters” Overlay [.csv]
“Report” Popup Form [.html]

Video & Data Animation Controls

00:00:41

00:00:45

Help

Report

EUC Score Backlog

- Simload multi-monitor support
- Custom Simloads – semi-automated workloads
- Data Miner – stand-alone performance counter collector
- New Controller component – central management
- Avatar reverse connect to Controller
- Telemetry Collector Windows Service (system context)
- Sync Studio – GUI that orchestrates sync scripts
- Additional Sync Player designs – admin experience view and chart options
- Analytics portal – publishing results
- Updated Simload SDK – for Enterprise customers
- Integration of hardware device to measure user input delay

Call to Action

EUC Score Business Model

- (Individual - \$495/year or \$149/quarter)
- Enterprise - \$5,000/year or \$1,500/quarter
- Project-in-a-Box - \$7,500 - \$25,000

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



More E2EVC Sessions

- Sat, Nov 4th, 10:50 – 11:30, Room 2
Performance and price comparison of GPU-accelerated Cloud VMs when running high-end CAD/CAM and CIM workloads
- Sat, Nov 4th, 11:40 – 12:20, Room 2
Deep Dive: Collecting, analyzing and understanding Windows performance counters

Thank You

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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>
- Test Results (Sync Player): <https://eucscore.com/results>