

# **EUC** Score Introduction











**Q3/2024**

**Benny Tritsch | [info@eucscore.com](mailto:info@eucscore.com)**

---

**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

# From a User's Perspective: EUC Quality Criteria

	<b>Boot and logon duration</b>	Measure boot time + logon time + user session load time until it is ready for user interaction. Includes identity management and authentication methods.
	<b>Application and content load time</b>	Measure time from user starting an application until the content appears and the application is ready for user input, including access to the storage system.
	<b>User input delay (“Lag”)</b>	Measures responsiveness of graphical elements after user-initiated triggers = “time from mouse click to screen update” (lag, latency, system response time).
	<b>Graphics APIs supported</b>	Detect incompatibilities when running graphics applications using the DirectX, OpenGL, Vulkan and WebGL APIs.
	<b>Media formats supported</b>	Detect incompatibilities when opening and playing media files, such as MP4, MPEG, MOV, WMV or AVI.
	<b>Distortion of media</b>	Measure media and screen output quality. Detect image, animation, and audio/video compression and decompression artifacts and anomalies.
	<b>Screen refresh rate</b>	Measure the number of times per second that the desktop or application can draw consecutive images on the screen and in the host frame buffer (frames per sec = fps).
	<b>Endpoint specs and quality</b>	Determine the screens' number of pixels, density, and visual dimensions – frame buffer requirements grow with resolution and screen number. Detect periphery incompatibilities.
	<b>Application reliability and stability</b>	Detect application hangs, freezes, crashes or unhandled exceptions. Measure consistency, dependability and robustness of applications.
	<b>Session consistency and resilience</b>	Check if user state is preserved across subsequent sessions. Measure session disruptions, hangs, disconnects/reconnects, availability, timeouts and redundancy.

# 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



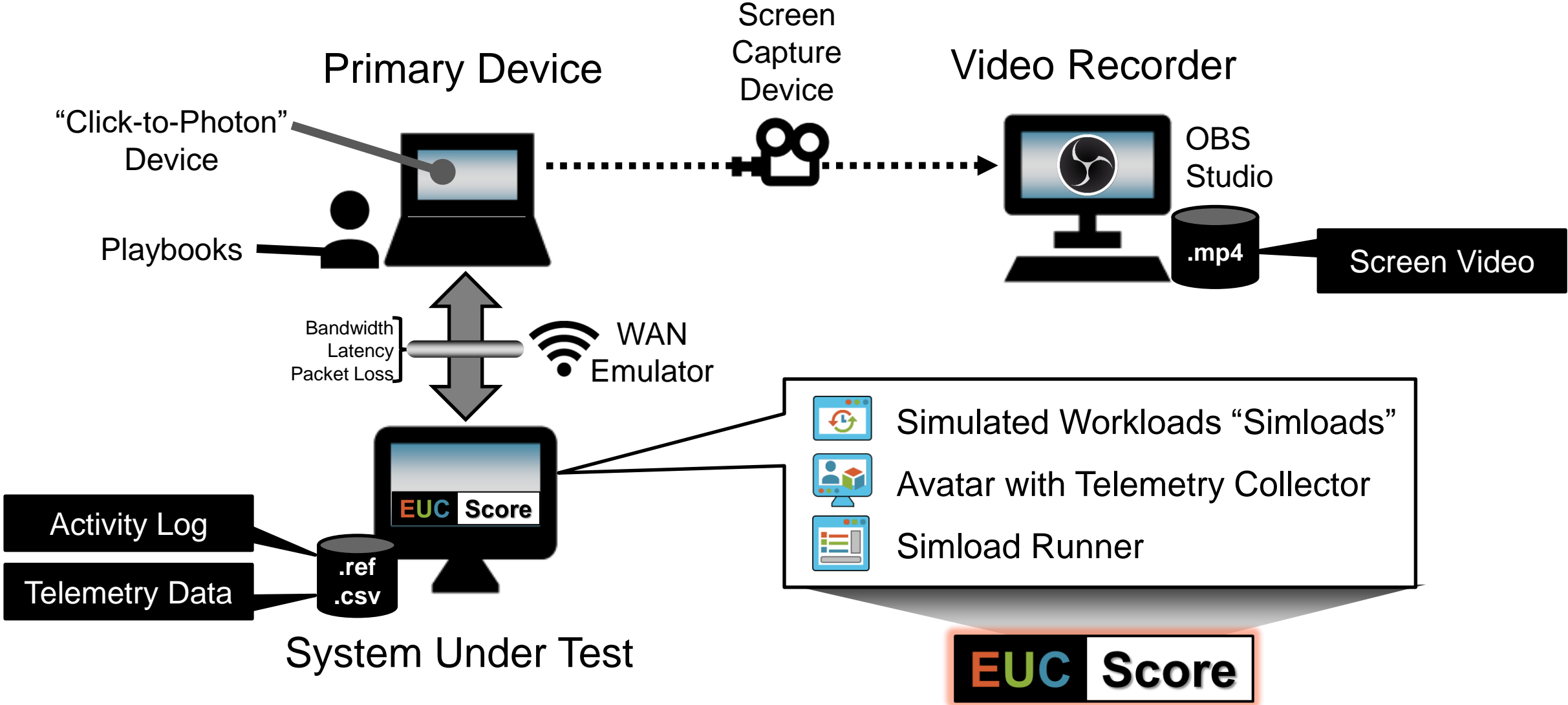
## **Deliver less pain by design**

EUC software quality assurance  
and quality control




# EUC Score Project Phases

- Preparation Phase
  - Define test goal, identify target user group (persona) and select EUC Score Simloads
  - Identify all individual test scenarios and define test conditions accordingly
- Design and Build Phase
  - Install/update and configure the remoting client software + screen recording
  - Deploy/provide system under test and install the EUC Score Toolset
- Perform and Test Phase
  - Run selected Simloads under the conditions defined by the test scenarios and collect data
- Visualize, Analyze & Publish Phase
  - Build Sync Player clips and review test results
  - Side by side comparison of test results with reference data

# Build an EUC Score Test Lab

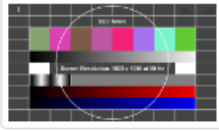



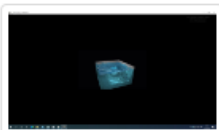




# Simulated Workloads – “Simloads”

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

**NOTE:** Each Simload stores system and user activities in a .ref file and may collect telemetry data into a .csv file if configured accordingly

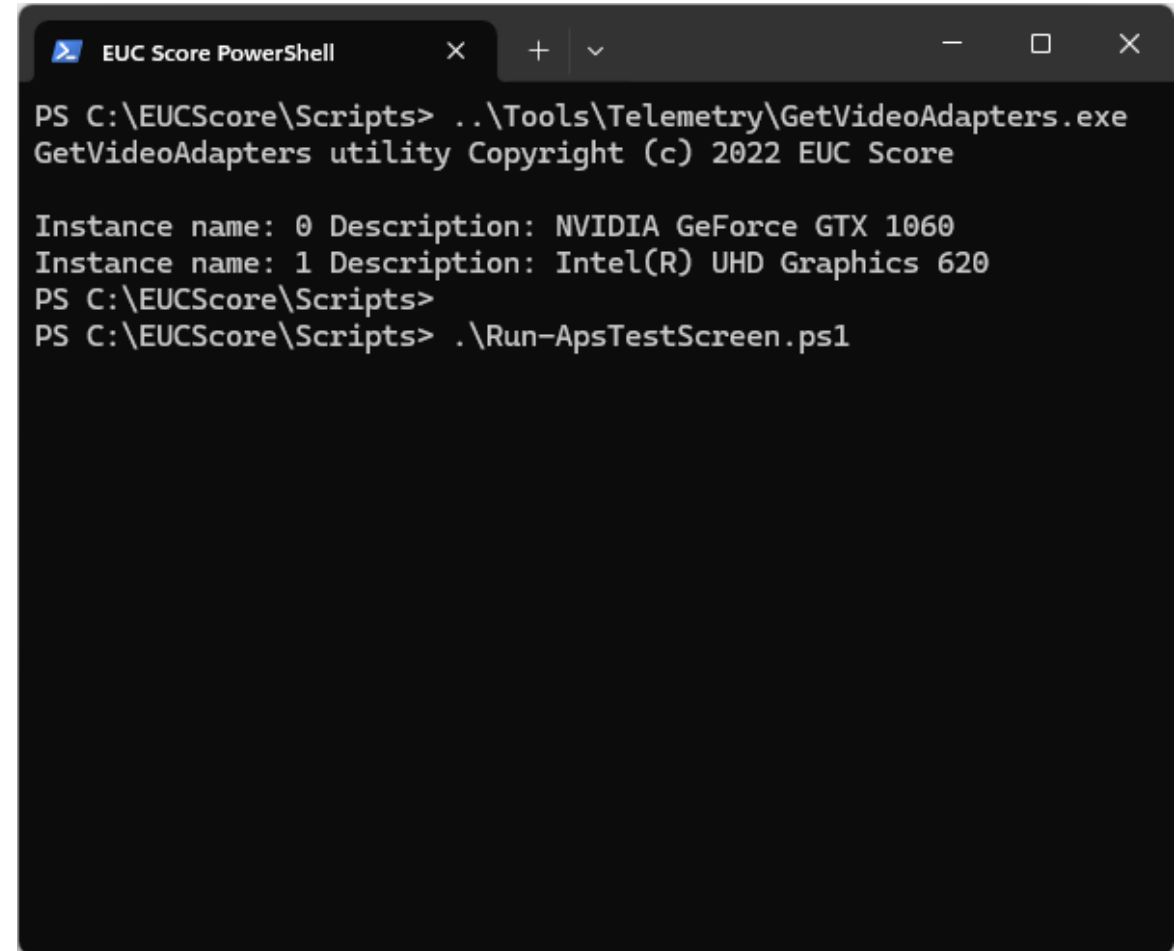
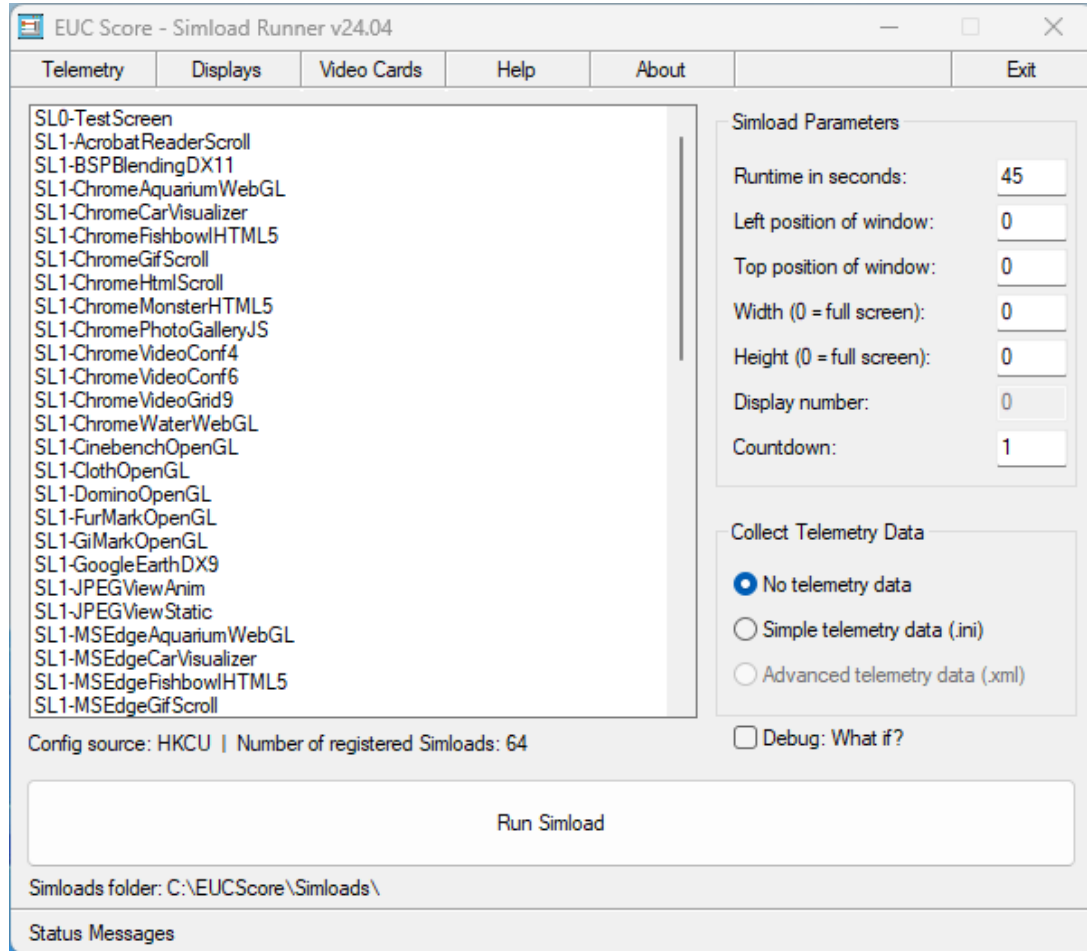
# EUC Score Simload Gallery: <https://eucscore.com/gallery.html>

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

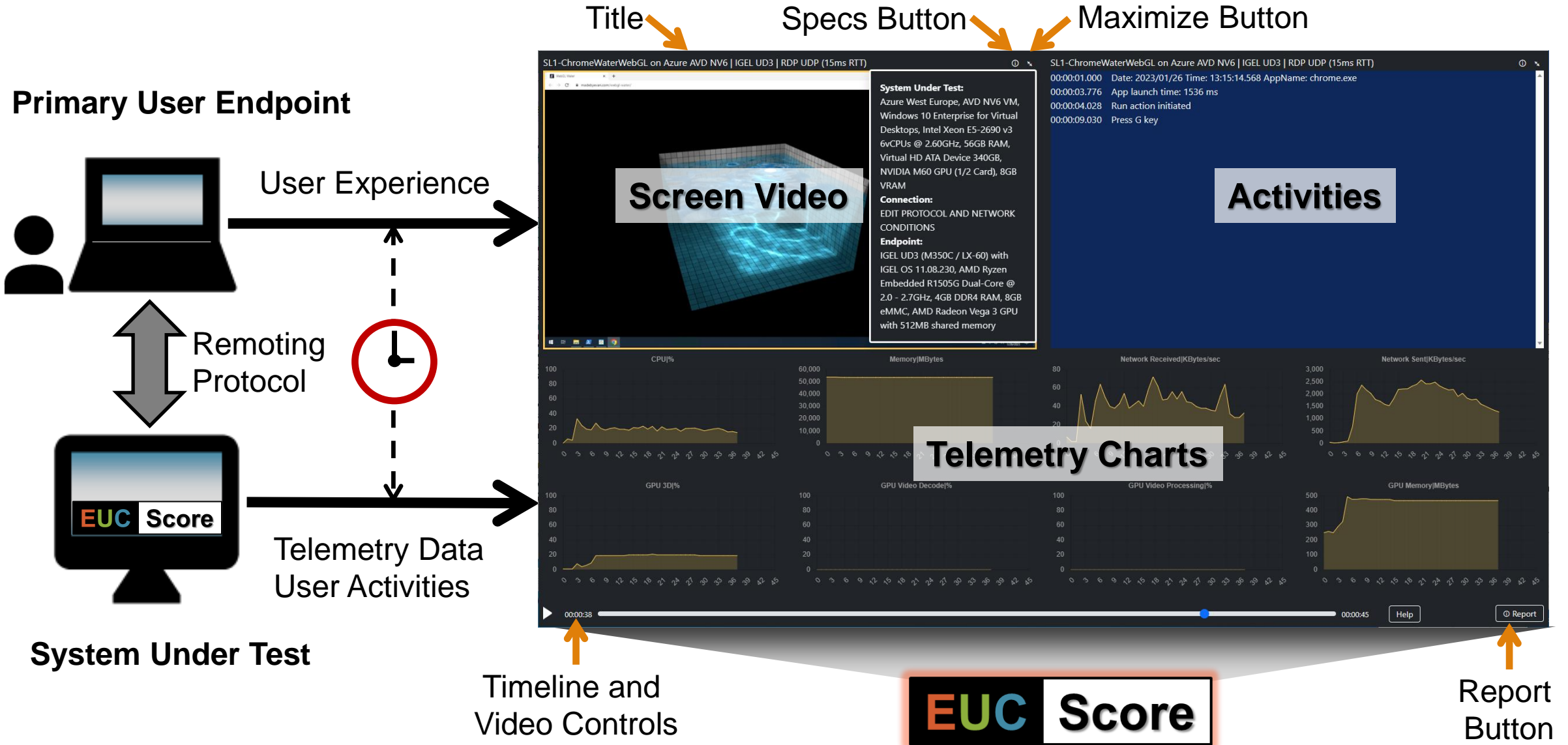
**+ custom  
or manual  
Simloads  
with real user  
playbooks**



# Run Simloads and Collect Test Data



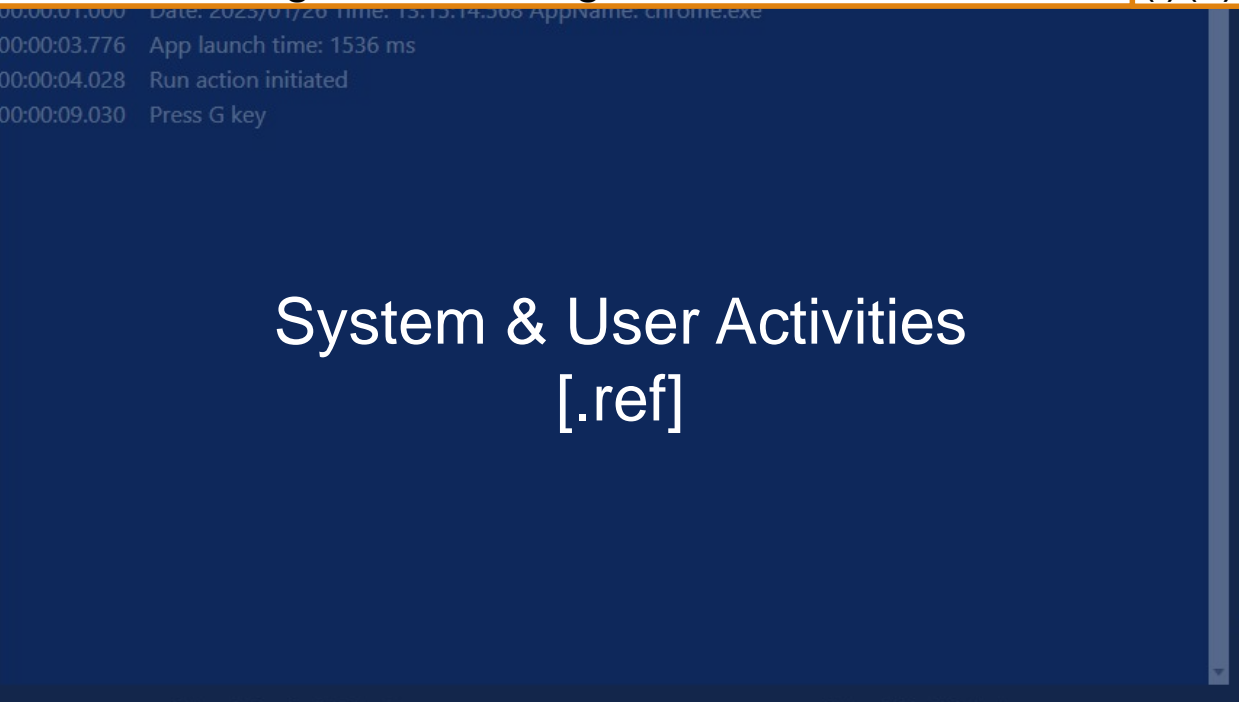
# Visual Data Analytics – Sync Player



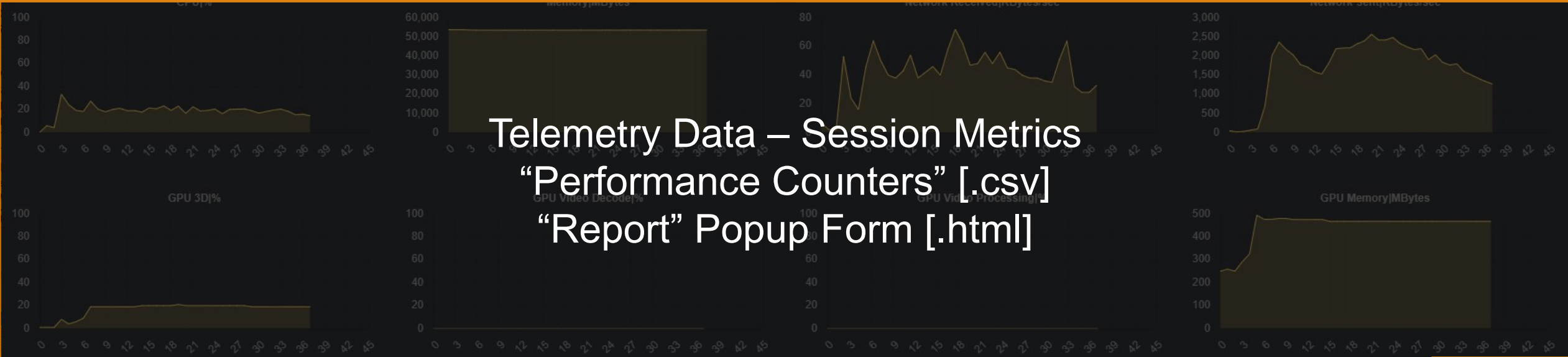
Left Media Tile  
“Screen Recording”  
[.mp4]

Description

System & User Activities  
[.ref]

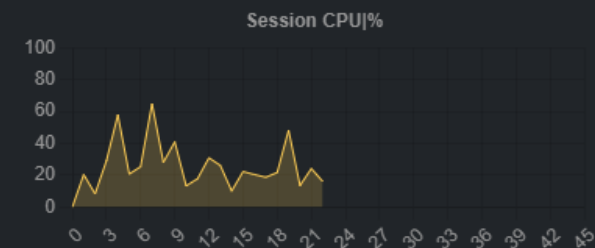
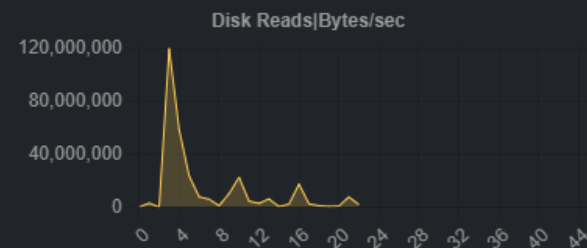
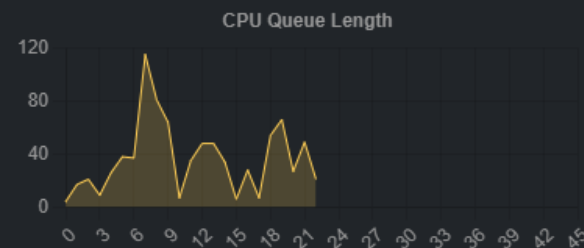
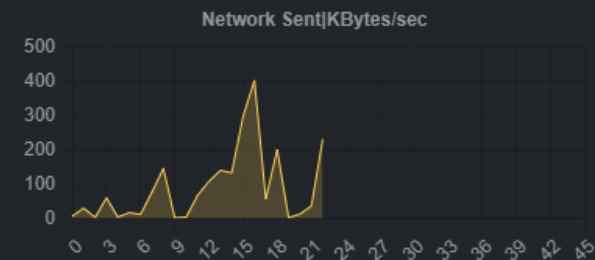
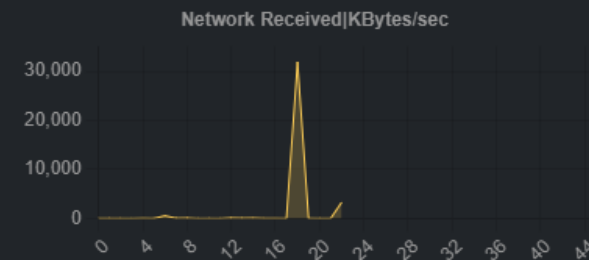
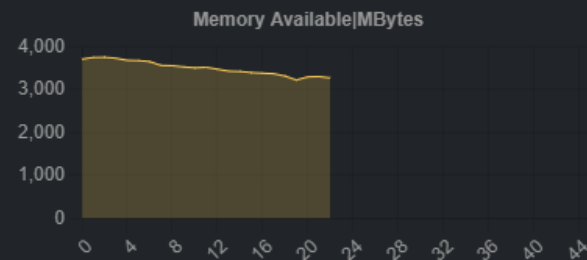
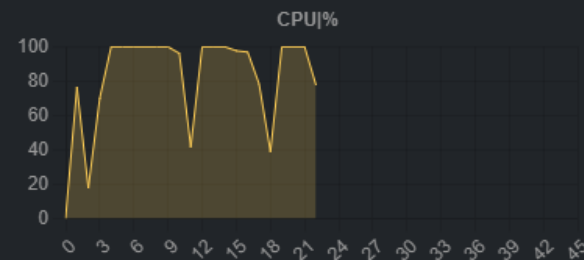


Telemetry Data – Session Metrics  
“Performance Counters” [.csv]  
“Report” Popup Form [.html]



```

00:00:00.000 Date: 2023/10/12 Time: 16:37:40.130 AppName: POWERPNT.exe
00:00:00.000 Simload: SL1-MSOPptSimple Computername: CPC-benny-2TXKL Username: BennyCloudPC
00:00:00.000 Number of Monitors: 1 Default Monitor: 1 (0 | 0 | 1920 | 1080)
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: 1.172 sec
00:00:06.531 App launch time: 5206 ms
00:00:07.937 Run action initiated
00:00:10.062 Press page down
00:00:11.437 Press page down
00:00:12.515 Press page down
00:00:13.656 Press page down
00:00:14.694 Press page down
00:00:16.109 Press page down
00:00:17.120 Press page down
00:00:18.515 Press page down
00:00:19.697 Press page up
00:00:20.731 Press page down
00:00:22.187 Press page up
  
```



Left Title – Side-by-Side View Mode

(i)(z)

Right Title – Side-by-Side View Mode

(i)(z)

**Left Media Tile**  
**“Pacemaker” Video**  
**[.mp4]**

**Right Media Tile**  
**Comparison Video**  
**[.mp4]**

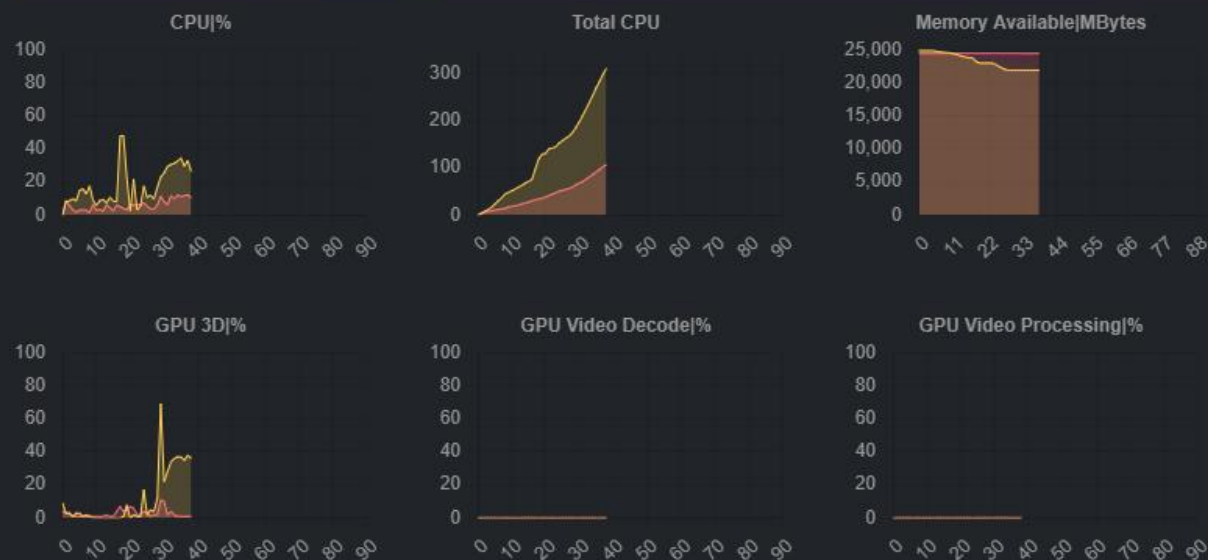
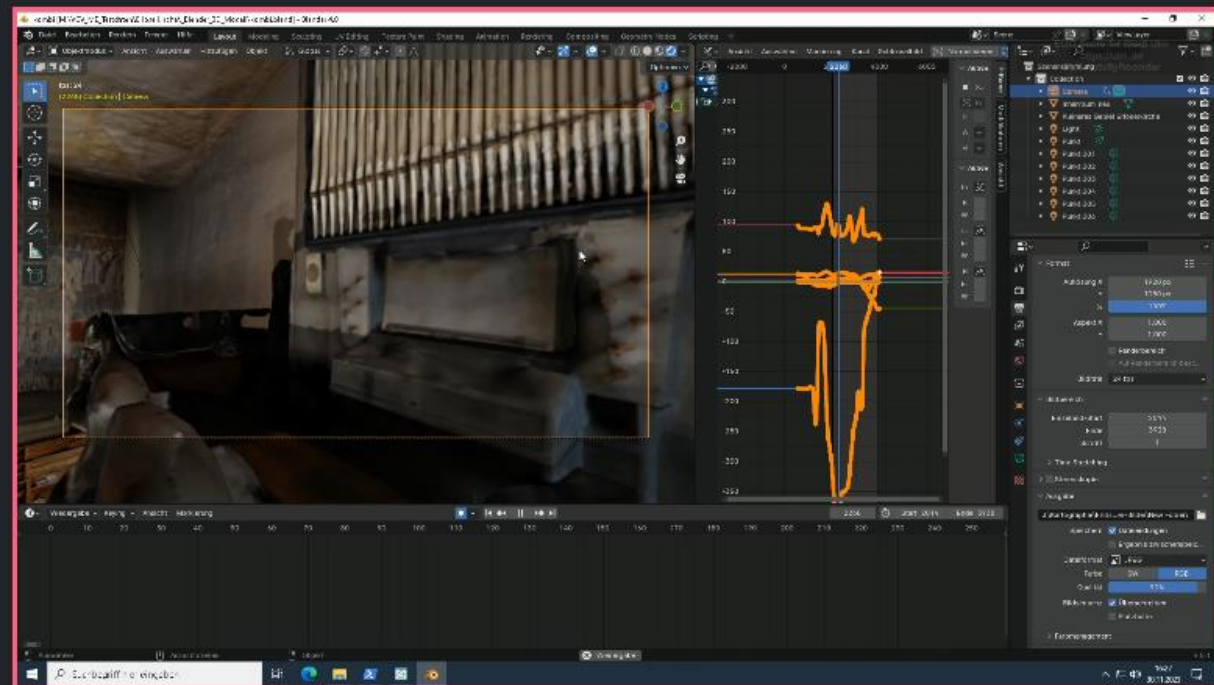
**Color-Coded Telemetry Data – 2 x Session Metrics**  
**“Performance Counters” Overlay [.csv]**  
**“Report” Popup Form [.html]**

Video & Data Animation Controls

Help

Report







**System Under Test:**

VMware TestDrive, Windows 11,  
Intel Xeon Gold 6330 2x2vCPUs  
@ 2.00GHz, 8GB RAM, 120GB  
Storage, NVIDIA L40-2Q,  
VMware Horizon Display Driver

**Connection:**

Blast, 175ms RTT

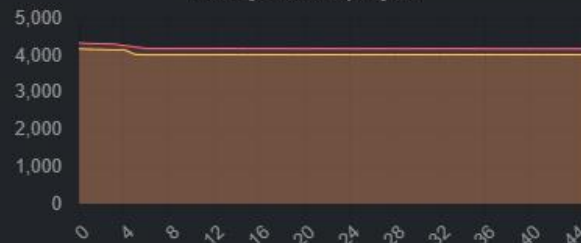
**Endpoint:**

Intel NUC 8i7HNK with  
Windows 11, Intel i7-8705G  
8Threads @ 3.10GHz, 16GB  
RAM, 500GB Samsung SSD 850  
EVO M.2, AMD Radeon RX Vega  
M GL GPU with 4GB VRAM,  
VMware Horizon Client 2306  
8.10.0

CPU%



Memory Available|MBytes



Network Received|KBytes/sec



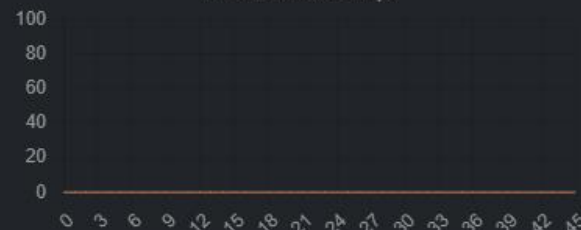
Network Sent|KBytes/sec



GPU 3D|%



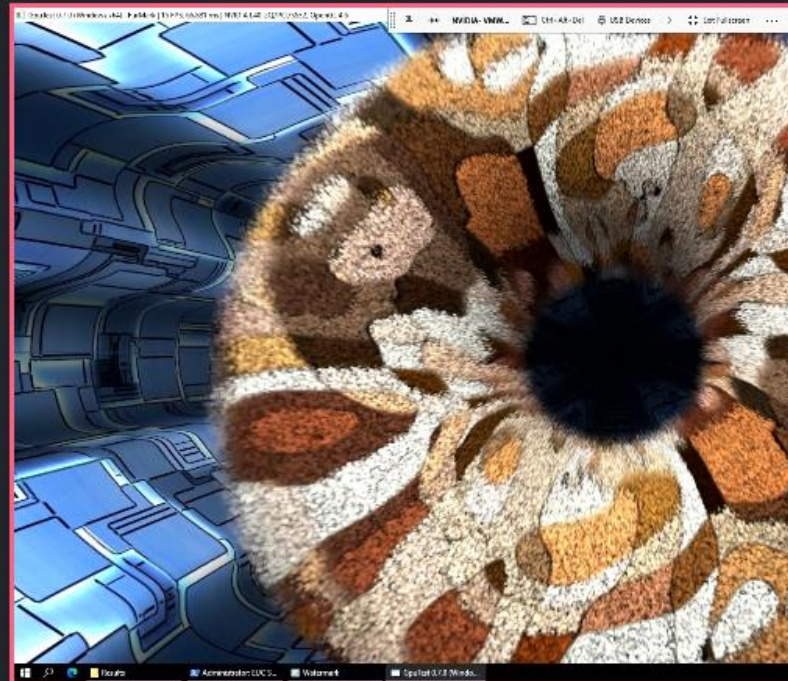
GPU Video Decode|%



GPU Video Processing|%



GPU Memory|Mbytes

**System Under Test:**

VMware TestDrive, Windows 11,  
Intel Xeon Gold 6330 2x2vCPUs  
@ 2.00GHz, 8GB RAM, 120GB  
Storage, NVIDIA L40-2Q

**Connection:**

PColP, 175ms RTT

**Endpoint:**

Intel NUC 8i7HNK with  
Windows 11, Intel i7-8705G  
8Threads @ 3.10GHz, 16GB  
RAM, 500GB Samsung SSD 850  
EVO M.2, AMD Radeon RX Vega  
M GL GPU with 4GB VRAM



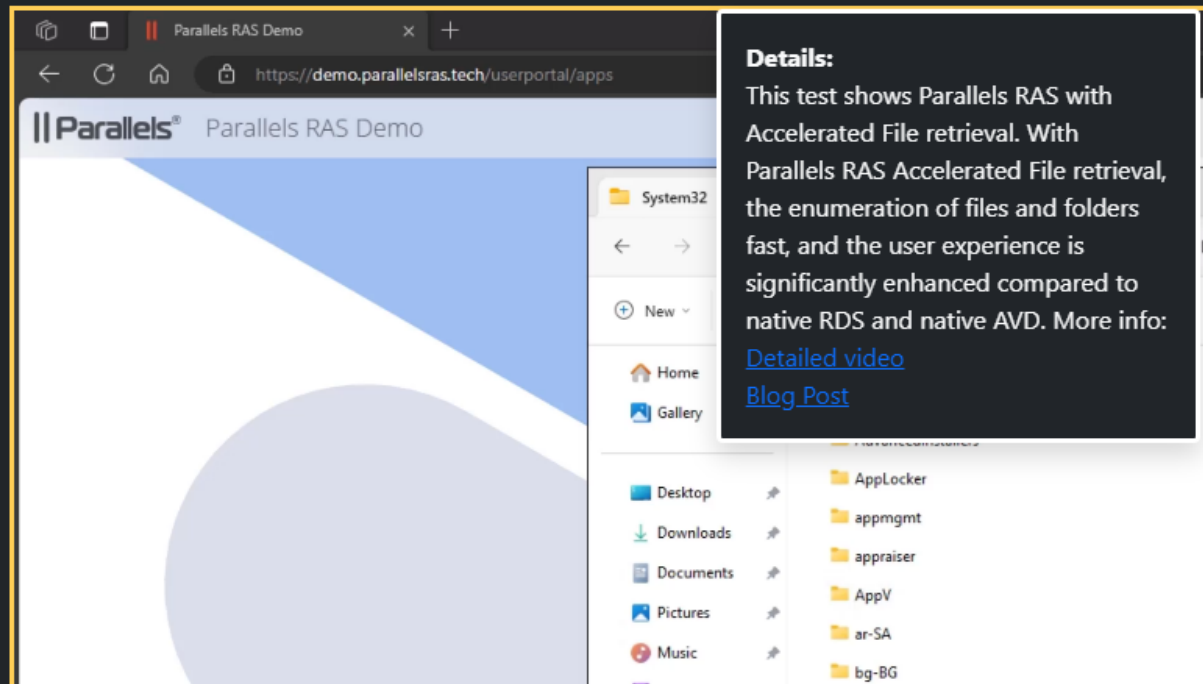
Left Media Tile  
“Pacemaker” Video  
[.mp4]

Right Media Tile  
Comparison Video  
[.mp4]

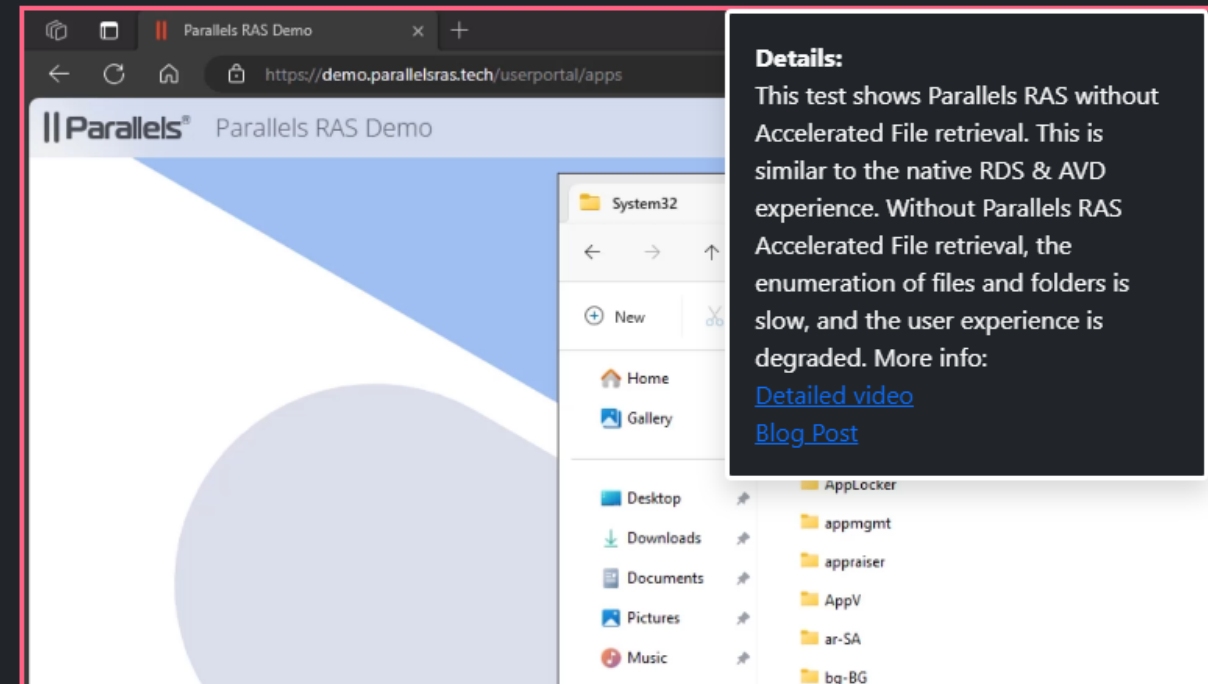
Left System & User Activities  
[.ref]

Right System & User Activities  
[.ref]

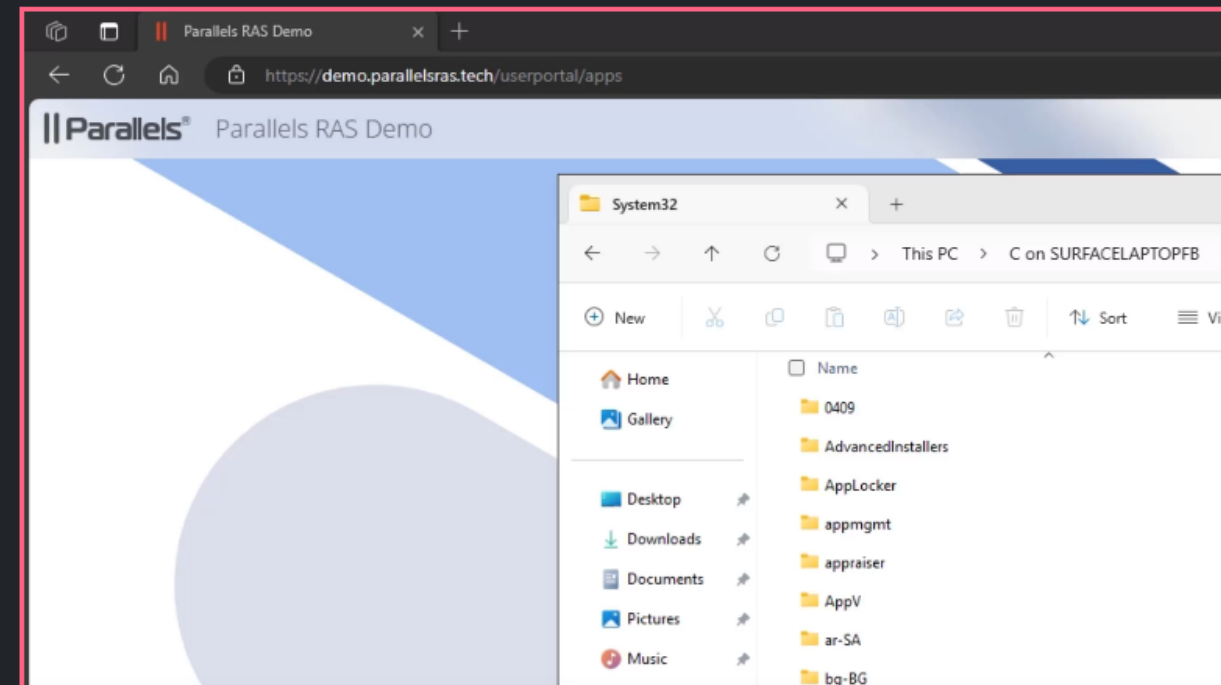
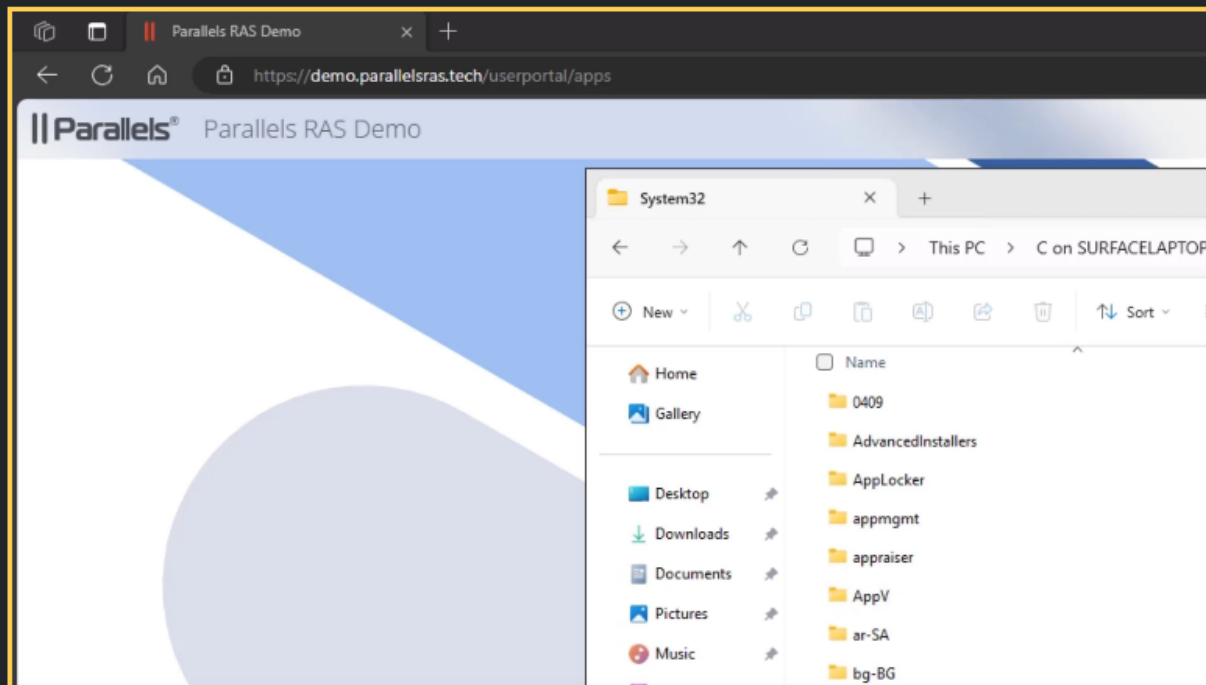




00:00:00.000 Pre-Simload countdown screen was visible for 1 sec  
 00:00:00.000 Delay between Simload start time and activity log start time: 1.606 sec  
 00:00:01.237 Delay between Simload start time and core telemetry start time: 0.417 sec  
 00:00:01.240 Initialize settings  
 00:00:01.248 Run action initiated  
 00:00:07.380 LEFT MOUSE button pressed - Open Start menu  
 00:00:09.520 LEFT MOUSE button pressed - Explorer icon clicked  
 00:00:11.580 LEFT MOUSE button pressed - This PC item clicked  
 00:00:13.440 LEFT MOUSE button pressed - C drive item clicked  
 00:00:16.220 LEFT MOUSE button pressed - Windows folder selected  
 00:00:19.000 LEFT MOUSE button pressed - Scroll  
 00:00:19.320 LEFT MOUSE button pressed - Scroll  
 00:00:20.160 LEFT MOUSE button pressed - Scroll  
 00:00:21.560 LEFT MOUSE button pressed - System32 folder selected  
 00:00:22.300 START Enumerating files & folders list view...  
 00:00:23.040 **DONE That took less than 1 sec!**



00:00:23.520 LEFT MOUSE button pressed - Scroll  
 00:00:25.380 LEFT MOUSE button pressed - System32 folder selected  
 00:00:26.200 START Enumerating files & folders list view...  
 00:00:30.000 Still Working on it...  
 00:00:35.000 Still Working on it...  
 00:00:40.000 Still Working on it...  
 00:00:45.000 Still Working on it...  
 00:00:50.000 Still Working on it...  
 00:00:55.000 Still Working on it...  
 00:01:00.000 **Still Working on it - this may take a little longer...**  
 00:01:05.000 Still Working on it...  
 00:01:10.000 Still Working on it...  
 00:01:15.000 Still Working on it...  
 00:01:20.000 Still Working on it...  
 00:01:25.000 Still Working on it...  
 00:01:30.000 **DONE! That took more than 1 minute!**



## User experience with and without Parallels RAS Accelerated File retrieval

The user opens Windows Explorer as a remote application and navigates to the System 32 folder of the redirected local drive.

**Findings:** With Parallels RAS Accelerated File retrieval enabled, the folder and file list view is populated immediately. When Parallels RAS Accelerated File retrieval is not enabled (similar to native RDS and native AVD), it takes a very long time until the folder and file list view is populated. More info in this [detailed video](#) and this extensive [plug post](#).

### Screen Recording (Left)

Screen video captured with a frame grabber and recorded with Camtasia at full HD resolution and 60 frames per second.

### Screen Recording (Right)

Screen video captured with a frame grabber and recorded with Camtasia at full HD resolution and 60 frames per second.

# EUC Score Editions

## Community Edition

- EUC Score Toolbox subscription: €0 (yes, it's completely free)
- Requires license and registration
- The test results must be made freely available to the public
- No Simload SDK
- EUC Score consulting services are offered at a discounted rate (and we share the results)

## Business Edition

- EUC Score Toolbox subscription: €5,000/year or €1,500/quarter
- Requires license and registration
- The customer owns the test results exclusively
- Simload SDK included
- Full daily consulting rate, with or without extra equipment (frame grabbers or WAN emulators)

Individual Commercial Edition (for Consultants): €495/year or €149/quarter
--

EUC Score Components	Freeware Edition Free Download	Community Edition Requires Free License	Professional Individual Edition Requires License	Enterprise Edition Requires License
Base Simloads (single app)	✓	✓	✓	✓
Simple Personas (multiple apps)	✓	✓	✓	✓
Score Simloads	✓	✓	✓	✓
Simload Runner	✓	✓	✓	✓
Core Telemetry	✓	✓	✓	✓
Command-Line Automation	✓	✓	✓	✓
Shared Results	(✓)	✓	—	—
For Community Usage	(✓)	✓	—	—
Advanced Simloads (single app)		✓	✓	✓
Advanced Personas (multiple apps)		✓	✓	✓
Avatar (tray app)		✓	✓	✓
Telemetry Collector (CSV file & GUI)		✓	✓	✓
PowerShell Object & Automation		✓	✓	✓
Data Miner		✓	✓	✓
Sync Player		✓	✓	✓
Protected Results			✓	✓
For Individual Commercial Usage			✓	✓
Simload SDK				✓
Online Training (2h/quarter)				✓
For Enterprise Commercial Usage				✓
Support	Community	Community	Email	Email
Subscription Fee	Free	Free	€495/year €149/quarter	€5,000/year €1,500/quarter



# Call to Action

If you want to learn more about  
EUC Score, send me an email

**info@eucscore.com**



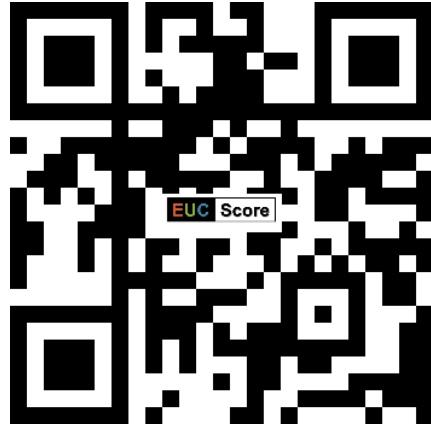
<https://eucscore.com>

<https://eucscore.com/results>

**NOTE:** The EUC Score toolset is free for  
community benchmarking tests when the  
results are made freely available to the public



# EUC Score Links



Home Page



Freeware Download

- Toolset documentation: <https://docs.eucscore.com>
- Test Methodology: <https://eucscore.com/methodology.html>
- Simload Gallery: <https://eucscore.com/gallery.html>
- Test Results (Sync Player): <https://eucscore.com/results>
- Terminology (Glossary): <https://eucscore.com/terminology.html>
- Lab Equipment: <https://eucscore.com/equipment.html>

**Thank You**

**Benny Tritsch | [info@eucscore.com](mailto:info@eucscore.com)**

---